A

ABA AND ABAB DESIGNS

Single-case designs are often used to assess the effects of an intervention. The designs usually focus on one participant who is observed numerous times. Large-sample designs, by comparison, use many participants who are observed only a few times. The simplest single-case design is the AB design. The letter A denotes a baseline phase during which no intervention is in effect; the letter B denotes the intervention phase. The baseline phase serves three purposes. It provides data about a participant's performance prior to instituting an intervention, it provides a basis for predicting a participant's future performance in the absence of an intervention, and it indicates the normal variability in the participant's performance.

The results of AB designs are often presented by means of a graph in which the horizontal axis represents successive observations during the two phases and the vertical axis represents a measure of the participant's performance. Any difference between the A and B phases in the average level of the data points or change in the trend of the data points is attributed to the intervention. The special issues involved in the statistical analysis of single-subject designs are discussed by Kazdin (1984).

Unfortunately the AB design is subject to a number of threats to internal validity, that is, threats to correctly concluding that the intervention is, in fact, responsible for changes in performance. The most serious threats are history, instability, and instrumentation. For example, if a participant's performance changes during the B phase, it is always possible that some unknown variable coincided with the application of the intervention and is responsible for the changes. In order to rule out this possibility, researchers can reintroduce the A phase in which the intervention is withdrawn. The resulting design is called an ABA design. If, when the intervention is withdrawn, the participant's performance returns to or resembles the baseline level, a researcher can be reasonably confident that the intervention and not some other unknown variable was responsible for the changes.

There is a problem with the ABA design: the experiment ends with the baseline phase. As a result, the participant is denied the full benefits of the intervention. This can raise ethical and moral issues. These issues clearly arise in clinical and educational settings where the intervention is designed to reduce an unacceptable behavior or increase a desirable behavior. The solution to this problem is to reintroduce the B phase following the second A phase so that the experiment ends with the intervention phase. The design is called an ABAB design. In addition to solving the ethical and moral issues associated with the ABA design, the ABAB has an added benefit. Internal validity is enhanced because the researcher can monitor three transition cycles: from A to B, from B to A, and from A to B.

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See also: **Time-Series Analysis**

ABILITY TESTS (See Aptitude Testing)

ABNORMAL PSYCHOLOGY

A number of laypeople will be more than happy to say that they know when someone is suffering from mental illness and that they know abnormal behavior when they see it. They purport to be experts on abnormal psychology, with the ability to recognize and perhaps even diagnose abnormality in their fellow human beings. Of course, many of these individuals are incorrect. Here is an example.

You live in an apartment building in a large city. One fine spring day, you hear a man outside singing (in a very

loud voice) an aria. You look out the window and watch him walking down the street, singing in his operatic tenor, loud enough for everyone to hear. This man is well-dressed in a work uniform, appears well coiffed, and is not really interacting with other people. The aria fades as he continues down the street. You detect nothing unusual in his behavior except for the fact that he was singing and doing so rather loudly. Some people were obviously annoyed; some even crossed the street to avoid him (Getzfeld, 2006).

Would this man's behavior be considered abnormal? Is his behavior considered dangerous to himself or to others? Perhaps he is just a happy individual, willing to share his voice with the rest of the neighborhood. Perhaps he is what Weeks and James (1995) call an eccentric. Eccentrics have odd or unusual habits, but they are not mentally ill.

Generally speaking, psychologists define abnormal behavior by using three perspectives. First, the statistical frequency perspective labels behavior as abnormal if it occurs rarely or infrequently in relation to the behavior of the general population. This perspective looks at the individual's behavior and sees if it matches up with the behaviors of the general population. For example, while most people get depressed at some point during the year, most people do not get so depressed that they cannot leave the house because they are so weakened from the depression; or even get out of bed regularly. The opera singer might fit into this category, since people rarely or infrequently sing loudly on the street, especially opera.

Social norms define behavior as abnormal if the behavior deviates greatly from accepted social standards, values, or norms. Norms are spoken and unspoken rules for proper conduct. These are established by a society over time and, of course, are subject to changes over time. Thus, is the opera singer a deviant based on this perspective? Would it be easier to evaluate him if he were walking around half-naked or if he had not showered for a week?

Finally, the maladaptive perspective views behavior as abnormal if it interferes with the individual's ability to function in life or in society. For example, based on this perspective, one would ask is the singing man able to work, take care of himself, and have normal social interactions?

As can be seen, one key feature needed when defining abnormal or normal behavior is the need for as much information as possible before making a diagnosis. It should also be quite clear that determining whether behavior is abnormal or not is a difficult process indeed. In fact, there is not one criterion that completely defines abnormal behavior. As in many areas of applied psychology, many factors are involved. Thus, where does the opera singer fit into this equation?

More information about him might help to clear up the picture. This gentleman goes to work every day in a uniform. In fact, he is a building superintendent who has a hobby of singing arias. In his opinion, he has a wonderful voice, and he desires to share it with others. He knows he will never sing at the Met, but for him music is about making people happy and spreading his good will. Thus, he sings as he walks to work in the morning and when coming back from lunch. He has held jobs for 12 years and, from his perspective, no one really complains about his singing. If they do, he just sings louder! Is this man's behavior abnormal based on the aforementioned perspectives?

It is difficult to clearly define abnormal behavior. To help diagnose, one must also look at factors such as duration, age of onset, and the intensity of the behavior(s). In fact, abnormal behavior has been difficult to define since ancient times. Since the groundwork has never been laid, let us examine the history of abnormal behavior and how such behavior was treated before considering some other issues.

The history of abnormal psychology dates back hundreds if not thousands of years. Stone Age civilizations evidently believed that serious mental illness or abnormal behavior was due to being possessed by evil spirits. Archaeological finds have discovered skulls that have holes borne into them. This process was called trepanation (or trephining): A small instrument (a trephine) was used to bore holes in the skull, the idea being that the holes would allow the evil spirits to leave the "possessed" person. Many believe that the goal was in fact to exterminate the individual. Perhaps these were the first examples of mistreatment of mentally ill individuals. In later societies, exorcisms were performed, usually by a shaman or priest. This was a noninvasive way to drive out the evil spirits in the possessed individual. Exorcisms, although rare, are still performed today. Millon (2004) noted that in Ancient Persia (now Iran) from 900 to 600 B.C.E., all mental as well as physical disorders were considered to be the devil's work.

Views on abnormal behavior were significantly advanced by Hippocrates (460–377 B.C.E.), the father of modern medicine. He viewed abnormal behavior—and illnesses in general—as having internal causes and, therefore, having biological etiologies. Hippocrates did not believe that the devil was responsible for physical and mental illnesses. Hippocrates's prescriptions for the ill included rest, proper diet, sobriety, and exercise, many prescriptions that are still used today.

During the Middle Ages (approximately the fifth to the fifteenth century), the view that demons were causing mental illnesses in certain people once again became popular, and the ancient Greek and Roman views that saw physiological causes of such behaviors lost favor. Plagues were common during these times, and exorcisms reemerged as a form of "treatment" for mental illnesses.

During the Renaissance (around 1400–1700 A.D.), the treatment of the mentally ill improved significantly. The mentally ill were seen as having "sick" minds that needed to be treated along with their bodies. During the fifteenth and sixteenth centuries, asylums were created for the purpose of providing housing for the mentally ill. During this time, the mentally ill were referred to as lunatics; persons with mental retardation were called idiots. The

care provided to them was minimal, and their plights did not provoke much attention. Even though the name "asylum" connotes bad feelings and scenes of patient abuse today, this was not the connotation at their founding. The sole purpose of asylums was to treat the mentally ill in a humane fashion, and founders of these asylums believed that society should be responsible for the treatment of the mentally ill (Grob, 1994). Unfortunately, the asylums soon became overcrowded, and the treatment in them soon turned to punishment and torture in order to manage behavior. Reforms in mental health treatment really did not occur until the nineteenth and twentieth centuries.

During the nineteenth century, two people made particularly important contributions to the mental health reform movement. Philippe Pinel (1745–1826) advocated that the mentally ill be treated with sympathy, compassion, and empathy. Dorothea Dix (1802–1887) helped establish many state mental hospitals in the United States during a nationwide campaign to reform treatments of the mentally ill. She was directly responsible for laws that aimed to reform treatment of this population.

Many significant changes occurred during the late nineteenth and twentieth centuries. Emil Kraepelin (1856–1926) was indirectly responsible for laying the foundation for what would become the psychiatric diagnostic system. Like Hippocrates, he also believed in the concept that physical factors were responsible for mental illnesses.

In 1897, the sexually transmitted disease syphilis was discovered by von Kraft-Ebing (1840–1902). This was important because syphilis sufferers demonstrated delusions of grandeur, which can be a sign of a mental illness. Thus, there was medical evidence that physical illnesses could mimic symptoms of mental illnesses and, more importantly, that physiological factors were somehow involved with some, if not all, of the mental disorders known at that time.

For many psychologists the most important figure began his work in the 1890s in Vienna. Sigmund Freud (1856–1939) was initially a researcher who was studying the reproductive systems of eels. Josef Breuer (1842–1925), another Viennese physician, treated patients who suffered from hysteria, which literally means "wandering uterus." However, upon examining these patients with hysteria, Breuer discovered that they had no physical symptoms. Breuer found that some patient's symptoms eased or disappeared once they discussed the past with him in a safe environment, without censure, and while under hypnosis. Breuer discussed these ideas with Freud, who expanded on them and created psychoanalytic theory, thus leading to an entire movement that is still popular today.

During the 1920s and 1930s, somatic treatments for the mentally ill became widely popular due in part to the legacy of Samuel Woodward, the first superintendent at the Massachusetts Lunatic Asylum in 1833. Woodward claimed that mental illnesses could be cured just like many physical illnesses and that moral indiscretions by individuals were partly to blame for their condition. These ideas led to the widespread use of lobotomies, in which the frontal lobe's nerve fibers are severed and thereby separated it from the rest of the brain. Other common somatic treatment methods included insulin shock therapy (inducing a coma in an individual) and fever therapy (inducing a fever in the individual by injecting blood infected with malaria). All of these treatments were used for a number of years with little or no success.

The field of abnormal psychology reached two major milestones in the early 1950s. Henry Laborit (1914–1955) introduced chlorpromazine (generally known as Thorazine) for the treatment of schizophrenic disorders. Initially this medication was used to tranquilize surgical patients, but Laborit noticed that chlorpromazine managed to calm patients without putting them to sleep. This led to its widespread use for the treatment of schizophrenic disorders. A second landmark in the helping professions was the publication of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) in 1952. This manual contained about 60 different disorders and was based on theories of abnormal psychology. However, the *DSM* and *DSM-II* (1968) were considered to have many limitations; arguably the main limitation was that the concepts had not been scientifically tested. In addition, all of the disorders listed were considered to be reactions to events occurring within the individual's environment, and there was really no distinction between abnormal and normal behavior. In effect, everyone was considered to be abnormal to a certain degree, depending on the severity of their condition.

When the *DSM-III* was published in 1980, the psychoanalytic basis for the *DSM*s was abandoned, and the diagnostic criteria were now based on the medical model and on clinical symptoms, not on theories. The five-part multiaxial system was also introduced. The *DSM* was revised twice more until the current *DSM-IV-TR* was published (American Psychiatric Association [APA], 2000). This volume is heavily research-based and includes much information about the etiologies of all the disorders. The next revision (*DSM-V*) is scheduled to come out in 2011 or 2012.

Abnormal psychology research is somewhat complicated because experiments are conducted on human beings who have some kind of mental illness. Sometimes the most difficult aspect of this research is gaining cooperation from the subject. For example, many individuals with anorexia nervosa are in denial about the seriousness of their problem (Bruch, 2001) and may therefore not agree to be research subjects because they see nothing wrong with them.

Generally researchers will use one of three experimental designs to investigate mental illness. First there is the case study, sometimes called the $N = 1$ design. This method is an in-depth look at the individual being studied over a certain period of time. Case studies often cannot be generalized to the population as a whole, because the

results really only apply to the person under investigation. There are also single- and double-blind studies, sometimes using placebos (e.g., sugar pills that look identical to real medication but are medically inert). In a single-blind design, the experimenters know which group is receiving the actual treatment and which group is the control or placebo, group (the group that receives a presumably inactive treatment). In a double-blind study, even the experimenters do not know who is getting the active treatment and who is getting the placebo treatment.

The best designs usually are double-blind, and they are designed to answer the following kinds of questions: How significant a factor is the environment in the etiology of the mental illness under investigation? What role, if any, do genes play? How successful is the method of therapy being investigated for treating the mental illness in question? Although on the surface these seem relatively simple to answer, they are quite difficult. Psychologists need to find results that are statistically valid and reliable. Not only is research interested in etiological factors, research is also conducted to gain more statistical information about mental illness such as prevalence, racial and ethnic data, gender and age-related information, to name a few. In addition, research is conducted to measure the efficacy of therapy and specific treatment modalities, including medications. Although it is difficult to "prove" that therapy works outside of a controlled experimental setting, research has supported one idea in abnormal psychology; namely, there is no single causal factor for any of the mental illnesses. Stemming from this idea is the notion that no single causal factor works alone without influencing other factors. That is, one thinks a certain thought, the body reacts by demonstrating behaviors, neurotransmitters go to work, and one engages other people as needed.

As for the future of abnormal psychology, the overriding goal in abnormal psychology is to find therapeutic modalities that work best and most effectively for each disorder listed in the *DSM-IV-TR* (APA, 2000; Nathan & Gorman, 2002). This goal clashes with those of insurance companies that demand quick fixes in the fewest sessions possible. The field needs to come to an agreement so the patient's best interests are served. The field also has to determine the proper place for psychotropic medications.

Although medications do not solve all problems, they have been proven necessary in treating some mental illnesses, and they have and will continue to save lives (Getzfeld, 2006; Bezchlibnyk-Butler, Jeffries, & Virani, 2007). Until rather recently, it was widely believed that medication and psychotherapy should not be used together and were mutually incompatible (Gabbard & Kay, 2001). However, this combination has now become common in clinical practices and is not generally considered unusual or incompatible (Thase & Jindal, 2004). Two related issues that remain under investigation include (1) administering medications to children and adolescents because of potential suicide risks (Hammad, Laughten, & Racoosin, 2006; Olfson, Marcus, & Schaffer, 2006); and, (2) how lithium, which is used to treat bipolar disorder, actually works and why (Goodwin & Jamison, 2007).

One important aspect with which the field continually struggles is education, specifically, educating the public at large about the prevalence and nature of mental illness. Some, perhaps many, think of mental illness as being best represented by Charles Manson, Jeffrey Dahmer, and Jigsaw (of the "Saw" movies), for example, who are extreme individuals rather than the norm. Psychology still needs to get the message out that mental illness affects people from all backgrounds, relatives as well as the stranger down the block.

The debate over medication continues in the field, and it does not appear as though it will be resolved any time soon. Some of the issues researchers are exploring include whether psychologists should have prescribing privileges; whether children and adolescents should be medicated; and whether medications are overused because of pressure from family members, pharmaceutical companies, and insurance companies. Related to this is the apparent increase in autistic disorder and bipolar disorder in children. Research has substantiated that the mercury preservation thimerosal, especially present in the Measles/Mumps/Rubella vaccine prior to 2001, has little to no cause and effect relationship with the onset of autism (Schechter & Grether, 2008). Therefore, researchers have yet to discover the causes of this series of disorders, which continue to baffle the field, including finding overwhelming effective ways to treat these disorders.

In sum, abnormal psychology has many questions that remain unanswered and many unresolved conflicts. Medications and treatment modalities continue to evolve and advance, but the core nature of mental illness has remained unchanged, at least since Hippocrates' time. Simply, mental illness has no singular cause, but the origins seem to have biological bases, with the environment and other factors playing significant roles. In many ways, we have come full circle since Hippocrates' time, so perhaps we would be wise to heed his ideas.

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See also: **Abnormality; Emotional Disturbances; Psychopathology**

ABNORMALITY

From time immemorial, societies have consistently classified a small minority of people in their midst as psychologically "abnormal." The classic research of Jane Murphy (1976) demonstrates that people in non-Western cultures, such as the Yorubas of Nigeria and the Yupic-speaking Eskimos of Alaska, readily recognize certain behaviors as abnormal. Moreover, many of these behaviors, such as talking to oneself, are similar to those regarded as abnormal in Western society. Murphy's findings suggest that the concept of abnormality is not entirely culturally relative, and that individuals in disparate cultures often label comparable behaviors as abnormal.

Nevertheless, these observations leave unanswered a crucial question: What is abnormality? Put somewhat differently, what implicit criterion or criteria do individuals use to identify abnormality? Surprisingly, a conclusive answer to this question remains elusive. In this entry we examine several conceptualizations of abnormality and their strengths and weaknesses. All of these conceptualizations strive to provide a definition of abnormality that encompasses both physical and mental disorders, although most place principal emphasis on the latter.

The first and most radical conception examined here is that abnormality is entirely a function of subjective societal values. According to this *subjective values* model, which has been championed by Thomas Szasz (1960), abnormal conditions are those deemed by society to be undesirable in some way. Although this model touches on an important truth, namely that many or most abnormal conditions are perceived as undesirable, it does not explain why many socially disapproved behaviors, such as rudeness, laziness, and even most forms of racism, are perceived as undesirable but not strictly pathological. A comprehensive definition of abnormality seems to involve more than subjective values.

Advocates of a *statistical* approach, such as Sir Henry Cohen (1981), posit that abnormality can be defined as statistical deviation from a norm. Thus, any behavior that is rare in the population is abnormal. Appealing in its simplicity as this conceptualization appears, it suffers from several weaknesses. First, the cutoff points for abnormality are scientifically arbitrary. Should abnormality be defined as the uppermost 1% of population, the uppermost 3%, or some other figure? Second, a statistical approach offers no guidance regarding which dimensions are relevant to psychopathology. As a consequence, it erroneously classifies high levels of certain socially desirable dimensions, such as creativity, intelligence, and altruism, as abnormal. Third, a statistical approach erroneously classifies all common conditions as normal. For example, it implies that the bubonic plague (Black Death), which killed approximately one-third of Europe's population in the fourteenth century, was not abnormal because it was widespread.

Other theorists, such as F. Kraupl Taylor (1971), have embraced the pragmatic position that abnormality is nothing more than the set of conditions that professionals treat. According to this parsimonious "disorder as whatever professionals treat" view, psychologically abnormal conditions are those that elicit intervention from mental health professionals. Although this view avoids many of the conceptual pitfalls of other definitions, it fails to explain why many conditions treated by professionals, such as pregnancy, a misshapen nose corrected by plastic surgery,

and marital conflict, are not by themselves regarded as pathological.

Advocates of a *subjective discomfort* model maintain that abnormal conditions are those that produce suffering in affected individuals. It is undeniable that many psychopathological conditions, such as major depressive disorder and obsessive-compulsive disorder, produce considerable subjective distress. Nevertheless, several other conditions, such as psychopathy (a condition characterized by guiltlessness, callousness, and dishonesty) and the manic phase of bipolar disorder (a condition characterized by extreme levels of elation, energy, and grandiosity), are often associated with little or no subjective distress among affected individuals, although they sometimes cause distress among those close to them. Moreover, like the statistical model, the subjective discomfort model offers no guidance concerning what cutoffs should be used to define abnormality. How much discomfort is required for a condition to be pathological?

Most of the aforementioned definitions focus largely or entirely on subjective judgments concerning the presence of abnormality. In contrast, proponents of a *biological model*, such as R. E. Kendell (1975), contend that abnormality should be defined by strictly biological and presumably objective criteria, particularly those derived from evolutionary theory. For example, Kendell argued that abnormal conditions are marked by a reduced life span, reduced biological fitness (the capacity of an organism to transmit its genes to future generations), or both. Despite its potentially greater scientific rigor relative to other models, a biological model is subject to numerous counterexamples. For example, being a soldier in a war tends to reduce one's longevity but is not a disorder; priesthood (which results in having no children) tends to reduce one's fitness but is similarly not a disorder. Moreover, a biological model falls prey to the same problem of arbitrary cutoffs that bedevils the statistical model: How much below average must life span or fitness be for a condition to be regarded as abnormal?

Whereas some of the preceding conceptualizations of abnormality primarily invoke social criteria, such as value judgments, others primarily invoke biological criteria. Jerome Wakefield (1992) suggested that the correct definition of abnormality requires both social and biological criteria. Specifically, he posited that all abnormal conditions are *harmful dysfunctions*. The *harm* component of Wakefield's conceptualization refers to social values regarding a condition's undesirability, whereas the "dysfunction" component refers to the failure of a system to function as "designed" by natural selection. Panic disorder is abnormal, according to Wakefield, because (a) it is viewed by society as harmful; and (b) the fear system was not evolutionarily designed to respond with intense anxiety in the absence of objective danger.

Wakefield's analysis is a significant advance in the conceptualization of abnormality, because it distinguishes those features of abnormality that are socially constructed from those that are scientifically based. Moreover, his analysis may help to distinguish from largely expected reactions to life circumstances from genuine mental disorders. As Allan Horwitz and Wakefield (2007) argued, some conditions, such as extreme sadness triggered by life events (e.g., divorce, loss of a job) are presently classified as depressions even though they often do not reflect true psychological dysfunctions.

Nevertheless, Wakefield's analysis may have its shortcomings. It assumes that all mental disorders involve breakdowns of evolved psychological or physiological systems. Yet some disorders, such as anxiety disorders, may be extreme cases of evolved defensive reactions to perceived threats. For example, as David Barlow (2002) observed, panic disorder may reflect "false alarms," that is, extreme fear reactions that are evolutionarily adaptive but expressed in situations that do not pose direct threats to the organism. In addition, Wakefield's analysis may be difficult to apply in practice because of the lack of a clear-cut distinction between adaptive function and dysfunction. The functioning of many psychological systems, such as the human systems for anxious and depressed mood, may be distributed continuously with no unambiguous dividing line between normality and abnormality.

In response to the difficulties with earlier efforts to provide an adequate definition of abnormality, some authors, such as David Rosenhan and Martin Seligman (1995) and Scott Lilienfeld and Lori Marino (1995), have proposed a *family resemblance* model of abnormality. According to this model, the concept of abnormality cannot be defined explicitly, because abnormality is an inherently fuzzy concept with unclear boundaries. Instead, conditions perceived as abnormal share a loosely related set of characteristics, including statistical rarity, maladaptiveness, impairment, need for treatment, and perceived dysfunction.

The family resemblance view implies that all efforts to construct a clear-cut definition of abnormality are doomed to failure. Moreover, according to this view, disagreements concerning whether certain conditions, such as attention-deficit/hyperactivity disorder or alcohol dependence (alcoholism), are truly "mental disorders" are probably inevitable, because there are no strictly defining criteria for abnormality. At the same time, this view implies that there will often be substantial consensus regarding whether many or even most conditions are abnormal, because individuals rely on largely overlapping features when identifying abnormality.

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See also: **Psychopathology**

ABORTION COUNSELING

Induced abortion is the deliberate termination of a pregnancy and is subcategorized into therapeutic and elective. *Therapeutic abortion* is performed following medical advisement in order to save the life of the pregnant woman, preserve the woman's physical or mental health, prevent the birth of a child with a congenital disorder that would be fatal or associated with significant morbidity, or selectively reduce the number of fetuses to lessen health risks associated with multiple conceptions. *Elective abortion* is the termination of a pregnancy performed for any other reason.

The types of procedures employed are essentially determined by timing. During the 1st trimester (when 90% of abortions occur), options include surgical abortion or medical (nonsurgical) abortion—where women have greater involvement in the process. Suction Aspiration (or suction curettage or vacuum aspiration) is the surgical procedure utilized between 6 and 12 weeks gestation. Medical abortions, using Methotrexate and Misoprostol (MTX) or Mifepristone and Misoprostol (also referred to as RU-486, the abortion pill and Mifeprex), are performed up to 7 weeks or 7 to 9 weeks gestation, respectively. During the 2nd and 3rd trimesters, only surgical procedures can be utilized; dilation and curettage (D&C) (13 to 15 weeks) and dilation and evacuation (D&E) (15 to 21 weeks) are typically used, whereas induction abortion is used rarely. Dilation and extraction (D&X) (or intrauterine cranial decompression), which is performed after 21 weeks, is not permitted in the United States as per the *Partial-Birth Abortion Ban Act of 2003*, except under certain circumstances.

Approximately 22% of the 205 million annual pregnancies worldwide end in induced abortion (Sedgh et al., 2007). In 2003, 26 of every 1,000 women of childbearing age (15–44) were estimated to have had an induced abortion in developed countries (versus 29 of every 1,000 in developing countries). In places where abortion is legal, it is generally safe and utilizes the procedures indicated above.

Abortion is one of the most commonly performed gynecological procedures in the United States, with CDC and Guttmacher Institute estimates of 839,226 legal elective abortions voluntarily reported in 2004 and more comprehensive estimates suggesting approximately 1.2 million. Of those, 17.4% were less than 19 years of age, 32.8% were 20–24 years, and the majority were white (54.1%, versus 38.2% black, and 7.7% other), non-Hispanic (78.5% versus 21.5%), and unmarried (82.8%). Approximately half of all pregnancies to American women, excluding those ending in miscarriage, are unintended, and 4 in 10 of these are terminated by abortion (Finer, L. B. et al., 2006). Forty-three percent of all U.S. women will have had at least one induced abortion by the time they are 45 years of age.

Counseling Issues

Therapeutic abortion. After the woman and her partner have been informed of the medical circumstances prompting the recommendation of therapeutic abortion, pre-abortion counseling involves discussion of options that require decision making. The primary decision may be whether to take action (e.g., induce labor), as opposed to allowing the pregnancy and birth to follow its natural course despite the risks of perinatal morbidity and mortality. This discussion includes the types of procedures that are available given the woman's medical condition and the stage of the pregnancy. That such pregnancies may be planned, wanted, and possibly difficult to achieve in the first place may exacerbate feelings of uncertainty, grief, and despair as parents struggle with decision making. Religious and ethical concerns can arise in counseling. Following therapeutic abortion, genetic and grief counseling can lessen the severity of the grief reaction.

Elective abortion. With up to half of all pregnancies in the United States unanticipated, pre-abortion counseling may focus first on decision making—that is, helping the woman to choose whether to continue the pregnancy and raise the child or to authorize an adoption or other parenting arrangement, or to choose elective abortion. (Online resources, such as pregnancyoptions.info, also exist). Counseling may help women evaluate their reasons for considering abortion. For example, an unanticipated pregnancy can result in disruption of academic, career, or other life plans and can present a financial burden. Pregnancies that occur in the context of domestic violence or as a result of rape or incest may not be desired. If the woman is unmarried or there is a lack of a committed partner, the pregnancy can result in social stigma, as well as relationship dissolution and strained relationships with family and community (e.g., friends, religious affiliates).

Adolescent women also must confront their perceived maturity and readiness for parenthood, hindered social development, and also possible isolation from family or family discord because of the pregnancy. A woman's religious orientation and attitude toward abortion, as well as that of her partner and family (and associated pressure), can contribute to decision-making challenges and may be discussed in pre-abortion counseling. Depending on the entity providing the counseling, there may be a specific purpose/agenda. Every state requires patients to provide informed consent before a medical procedure is conducted, but in some cases the provision of information under the guise of required "counseling" can be irrelevant or misleading (Richardson & Nash, 2006). In addition to counseling on procedure options, pre-abortion contraception counseling also may be provided and has been found to improve the correct use of contraception in the short-term post-abortion (Schunmann & Glasier, 2006).

An elective abortion itself does not necessitate post-abortion counseling. A range of emotions may be experienced following elective abortion, with distress generally greatest prior to abortion as opposed to after its occurrence. Methodologically sound reviews of the scientific literature (Boonstra et al., 2006) substantiate, and the American Psychological Association and American Psychiatric Association recognize, that although post-abortion responses can involve feelings of sadness, anxiety, guilt, or regret, most women are not at risk for developing severe negative psychological reactions. Lack of social support, coerced decision making, and greater ambivalence regarding the pregnancy and the meaning of abortion may contribute to negative reactions, as can preexisting circumstances (e.g., poverty, prior mental health problems). Feelings of relief and other positive responses also are observed, particularly among those who perceive support from their partner and family for the termination of an unwanted pregnancy.

Given that women's experiences are unique to their particular life situations, life values, moral and religious beliefs, age, and the time since the abortion, the focus of post-abortion counseling can be very individualized. Although a variety of approaches may be helpful, no specific protocols have been published. In general, post-abortion counseling helps women identify and articulate the emotions they are experiencing, as well as how other aspects of their life may be impacting or impacted by their experience. There may be a focus on enhancing and activating adaptive coping behaviors. To assist with personal resolution, women may be encouraged to engage in some type of spiritual ritual or other activity (e.g., writing a letter, burying a memento, gestalt dialog with the fetus) in order to "say good-bye." Such online self-help and referral sites as 4exhale.org and heartsite.com also are available.

Spontaneous Abortion

Spontaneous abortion, or miscarriage, involves the spontaneous termination of an intrauterine pregnancy before 27 completed weeks of gestation and results in fetal death. Miscarriage occurs in approximately 12%–15% of clinically recognized pregnancies, but because many pregnancies end before even the woman recognizes she is pregnant, some estimates indicate that there may be as many as 45%–50% of all pregnancies. This amounts to approximately 500,000 to 650,000 miscarriages annually in the United States. Risk appears to vary substantially by age: 9% for women aged 20–24 years, but 75% for women older than 45 years. The U.S. rate of stillbirth, defined as late fetal death with a fetus weighing more than 500 grams, is 6–7 deaths per 1,000 live births, amounting to 26,000 to 30,000 annually. Risk factors that have been established or speculated in one or more studies can be broadly classified as environmental or biological (e.g., chromosomal abnormalities).

Counseling Issues

Pregnancy loss constitutes an unanticipated and sometimes physically painful event that involves an "ambiguous death" not recognized by many social and legal definitions. Since the loss often remains unknown to all but a woman's most intimate confidants and her healthcare providers, the grieving process may be further compounded by limited social support, by feelings associated with the loss of a potential child, and by comments from others that appear to minimize her individual loss (e.g., "You can get pregnant again"). Psychologically, miscarriage may produce fears and doubts about procreative competence, as well as sadness, distress, anger, guilt, and self-reproach. Controlled research has established that miscarriage is a risk factor for depressive symptoms, minor depressive disorder, and major depressive disorder in the six months after loss (Klier, Geller, & Ritsher, 2002). Women also may be anxious about immediate medical symptoms, possible underlying genetic or medical factors that may have contributed to the loss, or their ability to carry a subsequent pregnancy

to term. Controlled research demonstrates that anxiety symptoms may be elevated and sustained for at least four months after miscarriage and that miscarriage increases risk for a recurrent episode of obsessive-compulsive disorder, and posttraumatic stress disorder (Geller, Kerns, & Klier, 2004).

A goal of post-loss counseling is to validate the death and legitimize feelings of grief. Counseling typically focuses on symptom reduction and grief management, but also may address coping resources and psychosocial factors such as women's relationships with their partners and children, as well as attachment to future children.

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See also: **Counseling**

ABREACTION

In mental health, abreaction has come to mean an intense emotional release or discharge in an involuntary, vivid, sensory reliving or re-experiencing, of an event that was originally neurobiologically overwhelming (i.e., "traumatic") and thus could not be remembered (or forgotten) in normal ways. Abreaction has its origins in psychoanalytic theory, but because it taps essential principles of emotional functioning, memory, and mind-body interaction, aspects of it are blended into diverse modalities across theoretical orientations. Originally, abreaction was viewed as curative in itself, believed to be healing through the discharging of excessive, dysregulating emotions thought to be the cause of dysfunctional symptoms.

Beliefs about the curative elements in abreaction derive from notions both ancient and pervasive across cultures and fields of inquiry, including philosophy, medicine, and religion. The historical belief that disease or disharmony is the result of the accretion of toxins, often thought to result as punishment for the crossing of sociocultural taboos (e.g., plague viewed as punishment for sin; mental illness seen as evidence of character weakness), and that restoration of health or harmony requires purgation of the toxins, resulting in purification or cleanliness, recurs so frequently across centuries that one could theorize an aspect of biological or phylogenetic imperative or truth contributing to the maintenance of this notion over millennia.

Whether considering medical treatments ranging from bloodletting to purgative cathartics; chelation therapy, expectorants, or steam showers; religious rituals ranging from blood sacrifice to purification from baptismal waters; or social solutions ranging from scapegoating (derived from ancient Hebrew practices) to saunas; or the catharsis of theater or reality television, we are dealing with the abiding belief that purging the body and mind of toxins, through ejection or release, restores health. Equally abiding has been the observation that the calming effects of purgation tend to be short-lived, and crises of toxic eruptions recur. One response to this observation has been to prescribe repeated treatments of purgation. Another has been to augment purgation with structure-building that prevents or diminishes recurrences. This is no different in the field of mental health.

In mental health, intense emotional releases, reaching epileptic-like proportion, were described in the 1700s in response to Mesmer's treatment of psychological distress using the energy of magnetized rods. Following these seizure-like experiences (named "une crise"), patients were exhausted, then calm, and then emerged cured of presenting symptoms. These episodes of physical and emotional dyscontrol were not unlike those seen during religious exorcisms of earlier and simultaneous periods, viewed in these latter contexts as indicative of demons exiting the person's body/soul, releasing the person of symptoms of madness.

The term *abreaction*, to describe such emotional releases, was first utilized by Breuer and Freud (1893). However, contrary to popular understanding, Breuer and Freud did not prescribe spontaneous emotional reliving of traumatic events as curative. Their understanding of trauma, and the therapeutic action of abreaction, was more sophisticated and nuanced than that. Breuer and Freud used the term abreaction to name the full emotional and motoric response to a traumatic event required to adequately relieve a person of being repetitively and unpredictably assailed by the trauma's original, unmitigated emotional intensity.

Breuer and Freud described that, without adequate abreaction, a person is plagued with persisting "freshness" (p. 9) of emotions of the original event, that come with "hallucinatory vividness," as well as a lack of control over access to, or freedom from, the memory. Adequate abreaction can be blocked during trauma because action is prevented by social circumstances or because the intensity or quality of the stimulated emotions is paralyzing. Without adequate abreaction, traumas cannot be disposed of through normal means of associations. Instead, splits, or disruptions in continuity (disconnects) occur among multiple aspects of consciousness.

The result is that a person cannot adequately forget (or intentionally remember) by utilizing the normal means of memory storage. Instead, an "attack" (p. 16) of hysteria (spontaneous abreaction or flashback) occurs in place of memory. Treatment, as proposed by Breuer and Freud, consisted of utilizing hypnosis, and in later years, free association, to access the sensory-emotional flashback, and then help the patient adequately reconnect the sensory experience with words in order to effect an "adequate" abreaction, or full response, that, they believed, could lay the traumatic memory to rest by discharging the original emotion and reconnecting the experience to the associational processes necessary for normal memory storage.

Subsequent clinicians' interpretations of Breuer's and Freud's work, perhaps misled by Breuer's and Freud's use of the word "cathartic" as well as primed by the millennia-old belief in the efficacy of purgation, misconstrued their description of abreaction as an endorsement of discharge through re-exposure to the original traumatic event, missing their emphasis on integration of disconnected associational processes and adequate, full response to the trauma. It was this misconstruction of the term abreaction that has endured as its definition. As a result of this misconstruction, clinicians during subsequent decades have rediscovered, lost, and rediscovered again the fact that abreaction as uncontrolled reliving not only does not heal; it can cause harm by lowering the threshold for subsequent uncontrolled flashbacks, bathing the brain in noxious chemicals, and even affecting brain structural development and neuronal cell death (e.g., van der Kolk, 1996).

Current clinical understanding of the therapeutic place for abreaction has been elaborated upon and expanded by advances in both infant development research and neuroscience (Porges, 1996; Schore, 2001). The splintering of aspects of experience ("dissociation") is now seen as the central disruptive element in trauma, capable of interfering with not only adequate affect regulation, but also with capacity for trust, confidence in reality testing, a sense of continuity of self, and the experience of enlivenment and spontaneity in life. Integrating the neurobiologically-based, trauma-induced disconnections—between sensory and verbal aspects of experience, between experiences of oneself inside differing emotions ("self states"), between permitted and prohibited perceptions of others—has become the focus of trauma therapy (van der Hart & Brown, 1992).

Abreaction is no longer pursued as a purifying cathartic (sometimes chemically or therapeutically induced as it was during World War II and post-Vietnam). If it is pursued (i.e., in modalities such as exposure therapy or EMDR), it is done so in a carefully dosed way, only after structures within the patient have been built or strengthened—structures allowing for sustaining trust, maintaining reality testing, and restabilizing in the face of disruption. In most trauma treatment modalities, abreaction is not pursued; it is understood as inevitable, and when it occurs, the therapist works actively and rapidly to utilize the access abreaction provides to sensory-motor aspects of traumatic memories as an opportunity for integrating disconnections. Sometimes the goal is to use higher cortical understanding, mediated by language, to override conditioned responses. Other times, the goal is a more ambitious rewiring of the conditioned amygdala reactivity, the rigidly repetitive neuro-associational pathways, and the toxic neurochemical responses through mindful and paced experimentation with new behaviors and activities that allow for exposure to new environmental responses and thus new neuropsychological responses.

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See also: **Catharsis; Emotions**

ABSENT-MINDEDNESS (See Attention Lapses)

ACADEMIC ACHIEVEMENT

Academic achievement has been an important societal topic for many years. In the years following World War II, schools educated increasing numbers of students. To optimize achievement, teachers geared their lessons to students' ability levels. The advent of the space age further elevated the importance of achievement, especially in mathematics and science. In the 1960s there was greater emphasis on disadvantaged children and on making school more relevant and less threatening. But declining achievement by the 1970s produced higher standards and greater accountability. The publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) led educators to improve teaching quality, curriculum requirements, and achievement standards.

Currently the *No Child Left Behind Act of 2001* (U.S. Department of Education, 2002) requires testing of children in reading and mathematics. Results often show high percentages of students not meeting minimums. Schools are accountable for students' achievement. All students are expected to master basic skills to be successful in college and the workforce.

Definition and Assessment

Achievement is "Task-oriented behavior that allows the individual's performance to be evaluated according to some internally or externally imposed criterion, that involves the individual in competing with others, or that otherwise involves some standard of excellence" (Spence & Helmreich, 1983, p. 12). *Academic achievement* is achievement in an academic domain such as reading, mathematics, science, and social studies.

Academic achievement reflects a student's learning, but learning and achievement are not synonymous in meaning. Achievement is assessed by behavior—oral, written, performance. It is assumed that achievement reflects underlying learning, but students may not display (achieve) all that they have learned for various reasons (e.g., illness, low motivation).

There also is no automatic relationship between achievement and ability (e.g., verbal, spatial). Students with similar abilities do not achieve at similar levels (Zimmerman, 2000). Dweck's (2006) research in fields such as education, business, and parenting, shows that achievement depends on people believing that their abilities can be improved through effort and persistence.

School achievement is assessed by tests, quizzes, oral responses, projects, papers, and performances (e.g., correctly demonstrating laboratory procedures). A distinction is made between formative and summative evaluation (Ercikan, 2006). Formative evaluation takes place during learning and is used by teachers to determine what students have learned and where improvement is needed. Summative evaluation occurs at the end of units or courses and often serves as the basis for grades.

Influences on Academic Achievement

Theory and research support the idea that several variables can influence academic achievement (Table 1). These variables are grouped in three categories: personal, social/cultural, contextual.

Personal

Students differ in their abilities to learn academic content. Students with learning disabilities, for example, often have difficulty acquiring reading and mathematical skills. But achievement depends on more than ability because high, average, and low achievers are found across all ability levels. Students' knowledge and skills affect their achievement, as do their prior experiences. Those with more experience taking tests and working on group projects should perform better on tests and group projects, respectively, than students with limited experience. Motivation is an internal process that instigates and sustains goal-directed behavior (Schunk, Pintrich, & Meece, 2008). Some important motivational variables are students' self-efficacy (perceived capabilities), academic goals, and the value they place on achievement. Self-regulation refers to the process whereby students activate and sustain behaviors, cognitions, and affects systematically oriented toward attaining their learning goals (Zimmerman, 2000). Students with better self-regulatory skills (e.g., planning, monitoring, self-evaluating) achieve at higher levels.

Social/Cultural

Socioeconomic status (SES) often is implicated as an influence on achievement, but SES is a descriptive variable that includes a family's capital or resources: financial/material, human/nonmaterial, social. Higher SES families have greater capital, provide computers and educational materials for their children, use their social

Table 1. Influences on Academic Achievement

Personal	Social/Cultural	Contextual
Abilities	Socioeconomic Status	Instruction
Knowledge and Skills Family		Teacher Support
Prior Experiences	Cultural Norms	Formative Evaluation
Motivation	Community Models	School/Classroom Culture
Self-Regulation	Peer Groups	Feelings of Relatedness

connections to secure opportunities, and stress academic achievement. Some cultural norms also may be influential. In mathematics, Asian American and White American students tend to outperform African American and Hispanic American students (Byrnes, 1996). Achievement can be affected by communities. Where education levels are higher there are more models for students to emulate. Peer groups are important. High school students who associate with higher-achieving peers achieve better than students who start high school comparable to them but associate with lower-achieving peers (Steinberg, Brown, & Dornbusch, 1996).

Contextual

Academic achievement is affected by the quality of instruction. Achievement benefits from teachers who teach skills and strategies and raise students' self-efficacy. Teacher support is critical because teachers who provide needed academic support promote students' learning. Teachers who use formative evaluation to plan their lessons should raise achievement more than those who rely only on summative evaluation. The culture of the school and classroom can affect achievement; some learning environments stress achievement more than others. Students' feelings of relatedness to the school are important (Ryan & Powelson, 1991). Many students who drop out of school feel isolated. Feelings of relatedness contribute to motivation and learning.

Improving Academic Achievement

Although there is no clear strategy for raising student achievement, theory and research provide some guidance.

Ensure that students learn skills and strategies they need to be successful. Most school learning is oriented toward basic skills, and all students should be able to acquire these. Students benefit from high expectations, sound instruction, and positive support.

Teach self-regulation. Self-regulation includes strategies such as setting goals, monitoring and evaluating progress, and seeking help when needed. These actions promote learning and achievement.

Address student motivation. Students motivated to learn achieve more. Motivation will be high when students set learning goals, feel efficacious about attaining them, and are interested in (value) the learning.

Use models. Models teach skills and build students' self-efficacy for learning. Using as models successful peers whom students view as similar to themselves can motivate observers to learn.

Use formative evaluation. Formative evaluation aids in lesson planning and conveys to students their progress in learning. This teacher support motivates students to learn and achieve.

Academic achievement is important for educators, parents, students, and policy makers. There are multiple influences on achievement, many of which can be modified to raise achievement. Improving student achievement can help to reduce school dropout rates and prepare students well for their futures.

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See also: **Learning Disabilities; Motivation; Self-Monitoring**

ACADEMIC SKILL DISORDER (See Learning Disabilities)

ACCULTURATION

Acculturation is commonly understood as a process of change that results from prolonged cultural contact. The anthropologists Redfield, Linton, and Herskovits (1936) defined acculturation as "those phenomena which result when groups of individuals having different cultures come into continuous firsthand contact, with subsequent changes in the original culture patterns of either or both groups" (p. 149). The modern concept of acculturation traces its disciplinary roots to anthropology and sociology, where scholars sought to understand the effects of cultural contacts arising from various forms of colonization, immigration, and modernization taking place during the nineteenth and twentieth centuries.

Acculturation became a central construct in cross-cultural psychology and ethnic minority psychology in the late twentieth century as scholars sought to understand the psychological experiences of immigrants and ethnic minorities, both of whom face the task of negotiating the sometimes competing demands of their heritage culture and the dominant or host culture. Psychological acculturation is thought to involve changes in several domains of behavior, values, preferences, and cultural identity. Furthermore, research has demonstrated that acculturation is most likely not a linear, unidirectional process in which an acculturating individual starts out as a monocultural person identified with a heritage culture and is presumed to undergo a change process toward becoming a monocultural person identified with the new or dominant culture. Such a unidirectional model of acculturation implies that the movement toward host culture orientation is accompanied simultaneously by a movement away from heritage culture orientation.

Of the various contemporary acculturation theories that have been put forth in psychology, Berry's (1980) bidimensional model of acculturation has garnered the most attention. This conceptual model posits that each individual holds a relative preference for maintaining one's heritage culture and a relative preference for participating in the second culture. These two attitudinal dimensions are thought to interact to produce four acculturation strategies. Assimilation strategy results from the individual seeking interaction and participation in the second culture but not wishing to maintain heritage culture participation and identity. Integration strategy (sometimes referred to as biculturalism) results from individuals wishing to maintain both their heritage cultural identity and participation as well as participating in the second culture. Separation strategy describes individuals who value their heritage culture maintenance and do not wish to participate in the second culture. Finally, the marginalization strategy describes individuals who have relatively little interest or the capacity neither to maintain their heritage culture nor to participate in the second culture.

By positing the possibility of various forms of acculturation, including integration or biculturalism, Berry's and other similar bidimensional models of acculturation hold much conceptual appeal. However, debates abound with respect to empirical support for this bidimensional model. Critics have raised concerns regarding its lack of attention to contextual factors (such as ideologies and policies of the dominant cultural group toward minorities and immigrants), lack of consistent and reliable assessment methods, and simplification of a complex process into four typologies. Acculturation remains a vibrant theoretical and research topic in psychology.

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See also: **Cross-Cultural Psychology**

ACHIEVEMENT MOTIVATION

Motivational psychologists study what moves people to act and why people think and do what they do (Weiner, 1992). Motivation energizes and directs actions, and so it has great relevance to many important developmental outcomes such as school achievement, performance in other activity areas, and overall mental health. Fundamentally, motivational theorists and researchers work to understand the motivational predictors of choice, persistence, and effort (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). Achievement motivation refers more specifically to motivation relevant to performance on tasks in which there are criteria to judge success or failure. Examples of these kinds of tasks are school activities, work activities, and competitive sport activities. In all such activities competence is a crucial part of motivation to achieve. Motivation in all forms is most directly observable in the level of energy in individual's behaviors.

Historically, drives, needs, and reinforcements were proposed as the primary sources of motivation (Weiner, 1992). Much current theory and research on motivation can be characterized as having a social cognitive emphasis and so focuses on individuals' beliefs, values, and goals as primary influences on motivation (Wigfield et al., 2006), although needs are still prevalent in some models. Major theories of motivation emphasize different aspects of these beliefs, values, and goals. Some theories focus primarily on competence-related beliefs, including perceived self-efficacy, perceptions of control, and other competence-related beliefs. Others focus on purposes or aims that individuals pursue; goal theories are the primary example. Expectancy-value theories integrate these two sets of constructs as ways of explaining individuals' performance on different activities and choices of which to do. Self-determination theorists emphasize the role of basic psychological needs (competence, relatedness, autonomy) and also the importance of intrinsic motivation, or an individual's sense of internal control over their task.

Development of Motivation

There are important changes in children's beliefs, values, and goals as they grow up. Many children begin school with positive competence beliefs, strong interest in school and other activities, and a focus on mastery and improvement. Young children's beliefs and interest are relatively general. Children's competence beliefs and values concerning many school subjects decline as they go through school. Their beliefs, values, and goals also become more differentiated and variable across different activities, such that they can form complex patterns. These variables also relate more closely both to children's performance in and out of school and choice of activities to do (Wigfield et al., 2006). Through adolescence and adulthood, beliefs, values, and goals continue to be further differentiated across activity areas and continue to influence the choices individuals make about which activities to do. These beliefs, values, and goals also become relatively stale during adolescence although they can change based on the pattern of experiences of success and failure.

There are also important individual and group differences in the development of motivation. Gender differences in children's beliefs, values, and goals often mirror cultural stereotypes about which activities are more or less appropriate for boys and girls to do, although these differences often narrow as children go through adolescence (Wigfield et al., 2006). Racial and ethnic differences in motivation are complex and can interact with gender. Further research on ethnic differences in motivation is a strong priority for future research.

Impact of Socialization Agents

Parents can support students' motivation by their provision of mastery experiences, the ways they react to children's successes and failures and their support of student's autonomy in doing different activities. When parents react too strongly to children's failures, focus too much on children's competence rather than effort, and exert too much control over their children, negative motivational patterns can develop, even in the early childhood years (Dweck, 2002).

Recent work on motivation emphasizes the importance of contextual influences on motivation (Turner & Patrick, 2008). Teachers and schools' instructional practices can enhance students' motivation when the work they do is meaningful, they have some control over their own learning, and feedback about how they are doing focuses on the importance of effort and improvement rather than ability. The increase in high-stakes testing likely has negative influences on many students' motivation, particularly those doing poorly on the tests (Deci & Ryan, 2002).

New Directions in Motivation Research

Although social cognitive models and their focus on beliefs, values, and goals remain important, there is increasing interest on unconscious motivational processes along with the impact of the social cognitive variables on motivation (Schultheiss & Brunstein, 2005). Such work is prevalent in social psychology, but is beginning to emerge in developmental and educational psychology as well. As just noted, there is increasing interest in the complex interactions of the individual and the contexts in which individuals study and work on motivational and achievement outcomes (Turner & Patrick, 2008). Motivation clearly is not only a characteristic of the individual, but also greatly influences the kinds of contexts they experience. These experiences greatly influence the development trajectories of individuals' motivation. Finally, researchers are increasingly interested in the

neurobiological underpinnings of different aspects of motivation, and fMRI studies will become more prevalent in the field in the coming years.

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See also: **Academic Achievement; Achievement Need**

ACHIEVEMENT NEED

Achievement Need (*n*Ach) is a recurrent concern to excel or to do better at a task for the intrinsic satisfaction of doing better. It is measured using nondeclarative measures such as the Thematic Apperception Test (TAT), or more commonly using the Picture Story Exercise (PSE; McClelland, Koestner, & Weinberger, 1989). McClelland, Atkinson, Clark, and Lowell (1953) created the content-coding system for *n*Ach that includes major coding subcategories for the presence of a wish, need, or goal related to competition with a standard of excellence, for positive emotional reaction after a successful achievement outcome, and for reference to a unique accomplishment.

People motivated by *n*Ach display four characteristic modes of behavior. First, they have a preference for moderately challenging tasks, set moderately difficult goals, and work harder when the chances of succeeding are only moderately great (Atkinson, 1957). This is the most consistent finding associated with *n*Ach, and it has been related to such outcomes as career aspirations and distances chosen during a ring-toss game. Atkinson provided a formula for explaining the moderate risk-taking behavior typical of people who are high in achievement need. The formula states that the tendency to approach tasks is a joint function of the amount of achievement motive, one's probability of succeeding at the task, and the incentive provided by succeeding at the task (Tendency = Motive × Probability × Incentive). Since probabilities of success are presumed to be inversely related to incentives of success, a moderately difficult task with moderate levels of probability and incentive would be most attractive to those motivated by *n*Ach.

Second, people motivated by *n*Ach have a need for autonomous and independent goal setting. They compete for personal accomplishment through their own efforts, and thus they are uninterested in taking part in activities such as gambling that rely on luck and chance. Consequently, achievement motivated individuals also avoid interacting with committees and in other situations in which they have to undertake goals that have been dictated by others or in which performance is used not as a measure of personal accomplishment but in order to obtain external incentives such as money or time off (McClelland, 1987).

Third, people motivated by *n*Ach have a preference for engaging in activities in which there is consistent, immediate, and concrete feedback (French, 1958). Activities such as academic work where another person (such as the teacher) determines the degree of progress and accomplishment but does not provide immediate and direct feedback are less motivationally satisfying.

Finally, high *n*Ach people possess a greater degree of innovativeness than other people and research their environment with more initiative and concern for variety (McClelland, 1987). They may do so by traveling more, trying out new things, and engaging in more entrepreneurial activities.

Several criterion variables related to executive success and economic achievement have been positively correlated with high *n*Ach. With respect to executive success, McClelland and others have reported a consistent positive relationship between *n*Ach and managerial and organizational effectiveness (e.g., McClelland & Boyatzis, 1982). However, Spangler and House (1991) pointed out that the *n*Ach need to have personal control over one's goals

has negative implications for performance in high-level leadership positions in nontechnical positions. In a study of 39 elected American presidents, they found that *n*Ach is negatively related to the president taking direct presidential action while in office, as in entering into war, avoiding war, or making decisions that have major worldly impact.

As for economic achievement, McClelland (1961) provided cross-cultural evidence that higher societal levels of achievement need would lead to greater numbers of entrepreneurs, which in turn produces more national economic growth. However, McClelland's proposal has received mixed support from subsequent studies. Some researchers have found that, although *n*Ach does correlate with later economic development, the effects are smaller than those originally reported by McClelland, and others have found negative or even nonsignificant correlations (e.g., Mazur & Rosa, 1977).

There has been some limited research on whether and how *n*Ach can be cultivated. It is assumed to be developed through parenting experiences in which parents expect a higher standard of excellence while simultaneously providing positive reinforcers for successfully reaching challenging but developmentally appropriate goals (Rosen & D'Andrade, 1959). Based on the logic that the more clearly a person conceptualizes the cognitive and behavioral associative network defining a motive, the more likely the person is to develop that motive, McClelland and Winter (1971) educated Indian, Mexican, and American executives and businessmen on components of achievement motive coding systems. In the Indian and U.S. samples, they found that the achievement training generally produced greater business and industrial activity levels.

The expression of *n*Ach is affected to some extent by gender roles. A study of elite well-educated women in the 1960s found that *n*Ach declines in the years immediately after college graduation, because these women are in a phase of life when establishing one's home and family is a major concern, thus dampening their desire for personal accomplishment; however, women with high *n*Ach were the most likely to reenter full-time employment in the years after their family life has been established (Baruch, 1967).

It is generally acknowledged that TAT/PSE measures and questionnaire measures of *n*Ach capture different types of motivation and predict different types of outcomes. TAT/PSE scores are significantly correlated with industrial and agricultural output, career success, and other similar outcomes that have intrinsic or task-related incentives, whereas questionnaire scores are significantly correlated with grades and other similar outcomes that have extrinsic incentives or carry social-evaluative implications (McClelland, Koestner, & Weinberger, 1989). However, scores on implicit and explicit measures of *n*Ach become more congruent if a person has greater private body consciousness, is low in self-monitoring, and has a high preference for consistency (Thrash, Elliot, & Schultheiss, 2007).

A distinction has also traditionally been made between the active, approach-oriented aspects of *n*Ach—also named hope of success—and the anxiety-based, avoidant tendencies of fear of failure. However, research on this approach-avoidance distinction has been inconsistent at best, because of the lack of an experimentally derived and easily-accessible nondeclarative measure of hope of success and fear of failure.

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See also: **Achievement Motivation; Underachievement**

ACQUIRED DRIVES

One of the raging controversies in the history of psychology once centered on the aspect of the nature-nurture issue, which asks whether motives are inborn or learned. Some psychologists, of whom William McDougall was the most important, took the instinctivist position that motives are inborn, unlearned, universal within species, and—at least to a degree—continuous between species. Other psychologists, for whom John B. Watkins was the most important spokesman, argued that motives are acquired through learning and therefore differ from individual to individual, culture to culture, and species to species. As occurred generally with the nature-nurture issue, the intensity of this controversy has lessened with time. It is now clear that all motives are a joint product of biological and environmental forces. If the question is asked at all, it is in terms of the relative importance of these two contributions.

Certain motives, sometimes called *primary drives*, are chiefly biological. Hunger, thirst, pain avoidance, and sex are examples. Even in these cases, however, experience plays a part. Rhythms of feeding and drinking, sensitivity to pain, and preferences in sexual partners are all influenced in this way. Other motives, sometimes called *secondary* or *acquired drives*, are determined primarily by experience, as for instance fears, affection for parents, drug addictions, and functionally autonomous habits such as miserliness. These examples show something of the variety of acquired drives. They also suggest that different acquired drives may depend on forms of learning that differ at least superficially.

Acquisition of Fear

One of the forms of learning just referred to is *classical conditioning*. Experimental evidence that some motives are acquired as the result of this process dates at least to the famous study of Watson and Rayner, who conditioned the boy "little Albert" to fear a white rat. The rat (CS) was shown to the child, simultaneously with a loud and unpleasant sound (US) produced by the striking of a steel bar behind the child's head. The sound caused the child to cry (UR). After a few repetitions, Albert cried at the sight of the rat (CR), and this fear generalized to other furry objects such as a fur neckpiece or a Santa Claus mask. Attempts to repeat the Watson and Rayner study were not always successful, and Valentine made the cogent point that fears might be much more easily conditioned to furry objects such as a caterpillar or a rat than to others such as a pair of opera glasses. In spite of these criticisms, the impact of the Watson and Rayner study on the history of psychology was considerable. It indicated that reactions once thought to be instinctive were more properly seen as the result of learning.

Affectional Responses

The young of many species come to treat the first large, moving, noisy object they see as if it were a parent. In most cases this object is in fact a parent, but the process of *imprinting*, as it is called, may produce such attachments to other species and even inanimate objects.

Various lines of evidence indicate that an essential component of imprinted reactions is motivational. The hatchlings of precocial birds, if imprinted on any object, stay near that object and will climb over obstacles to get near it; further, they make distress calls in its absence. The process of learning involved in imprinting bears a strong resemblance to classical conditioning.

Social Techniques

Literature in the area of acquired motivation suggests that some motives may be acquired by a process that is akin to instrumental learning. E. C. Tolman has given us an account that is fairly representative. Figure 1 summarizes his view, which holds that in infancy the individual has only a set of biological drives. Inevitably these drives are subjected to frustration, and new techniques are developed to satisfy them. Whatever techniques lead to relief from frustration are learned, and they become characteristic of the individual's repertory of responses to the world. As Tolman's drive-conversion diagram (Figure 1) also suggests, these first primitive adjustments achieved by the individual are not adequate to deal with all situations. They are too frustrated, with the result that new learning occurs and the individual's reactions to the world are modified further.

It should be noted that, so far in this account, nothing has been said about motives. Yet a glance at Figure 1 will reveal that several of the social techniques are ones that we often describe in motivational terms. Aggression, hostility, social approval, loyalty, identification, and self-punishment are all terms that probably occur more often in psychological literature in the context of motive than in that of habit. This suggests that there must be

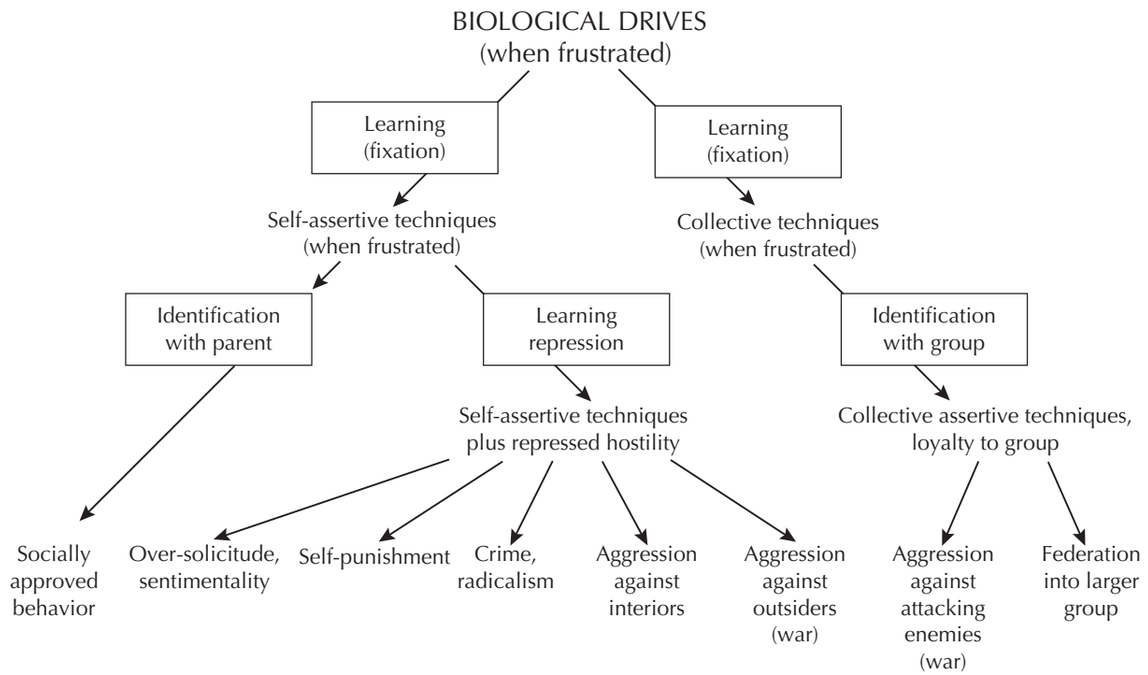


Figure 1. Tolman's drive-conversion diagram.
Source: Figure adapted from G. A. Kimble (1961). Based on E. C. Tomlin (1942).

some sense in which habits are, or can become, motives. Gordon Allport once suggested in an article that such is the case, and he offered the concept of functional autonomy, whereby well-established habits become ends in themselves—that is, motives. It should be noted, however, that functional autonomy does not explain such effects; it only describes them.

Addictions

Addictions to tobacco, alcohol, and other substances are of special interest because they dramatize certain features of the psychology of acquired motivation. The motivational power of the addictions is obvious: Lives have been devoted to, and even lost to activities performed to support an addiction. Established addictions no doubt represent a change in the physiology of the addicted person, probably a change in how certain neurotransmitters function. But at the same time, addictions are clearly acquired. This testifies to the power that experience may sometimes have over biological processes.

The mechanism of learning an addiction appears to be a two-stage process. In the first stage, the future addict experiments with the addictive substance out of curiosity or a yielding to peer pressure, or for some other reasons that soon becomes irrelevant. In the case of some drugs, like the opiates, only a few such encounters are required to leave the individual with a powerful craving after the initial euphoria produced by the drug wears off. The only ways to relieve this craving are either painful waiting for the craving to subside or taking more of the substance in question. People who become addicted choose the latter alternative, thus beginning the vicious circle: drug—euphoria—agonized craving—drug again. In abstract terms, the learning process appears to be of the operant or instrumental variety, with the relief from craving and the agony of abstinence playing a greater role than the positively reinforcing euphoric experience initiated by the drug.

Motivation and Emotion

The literature on the various acquired drives and drugs provides a particularly straightforward way of making a methodological point. Although common speech and some psychological theories make a distinction between motives and emotions, it is clear that these terms refer to different aspects of the same process. *Motivation* refers to the power of an acquired drive to promote certain kinds of behavior, chiefly those of reaching certain goals—being near a parent, relief from fear, achieving certain social goals, or avoiding withdrawal symptoms. *Emotion* refers to the subjective experience associated with the arousal of these states.

These points are all very nicely integrated in R. L. Solomon's opponent-process theory of emotion. The essential ideas in this theory are the following: (1) the conditions that arouse a motivational/emotional state (State A) also call out a more sluggishly acting opposed state (State B); (2) State B is a "slave" state, which occurs as an inevitable

accompaniment of State A; (3) termination of the original emotional circumstances leaves State B as the individual's dominating emotional state; and (4) State B, but not State A, increases with use and decreases with disuse.

Solomon and others have applied this opponent-process theory to many different motivational/emotional reactions. The application provides a rich account of the details of such behavior and a means of understanding the changes in such reactions after many arousals of the emotion. In opiate addiction, for instance, at first the effect of the drug (State A) is a feeling of euphoria, a "rush"; when the drug wears off, its aftereffect (State B) is craving. With continued usage and the strengthening of State B, the effect of the drug is less intense and is often described as a feeling of contentment. Its aftereffect is now much more intense—an excruciatingly painful set of withdrawal symptoms. Similar accounts are put forward for other emotional experiences.

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See also: **Pavlovian Conditioning**

ACTING OUT

The term "acting out" has been used to label behavior in a variety of contexts, ranging from preschools and kindergartens (to describe kids such as Johnny, who has decimated a prized collection of stuffed animals, and thrown them about) to psychological treatment settings (with regard to patients like Mildred, who has punched her therapist in the nose after he offered her a particularly insightful interpretation). The concept is most extensively in vogue, however, in organizations that deal with criminal offenders or persons who have been diagnosed as having mental health problems.

"Acting out" as a process denotes a deficit or a lapse in the exercise of appropriate self-control. As an adjective applied to another person's behavior (never one's own,) "acting out" carries a pejorative connotation, in that it implies (1) that the person has failed to keep in check particularly unsavory feelings, or primitive impulses that most people would not overtly express; and (2) that the person has provided evidence of deficits in his or her upbringing or failure to assimilate the most elementary norms of civilized conduct. Acting-out behavior is also deemed to be both destructive and self-destructive—not a testimonial to the inception of a promising career.

In the world of the theater, acting out connotes dramatic behaviors whereby actors convey inner conflicts or private feelings to an audience. Such activity calls for considerable acumen, and for special thespian skills, and it is undertaken deliberately. By contrast, spontaneous acting out—such as during psychological treatment, involves the revelation of inner conflicts without conscious intent or awareness. Patients like Mildred can thus communicate information against their own best judgments, surfacing emotions they may not be ready to face, or enacting experiences they may not be ready to discuss. Such junctures are variously reacted to by therapists. Wolberg (1977) points out that

> There are some psychotherapists who take the view that acting-out can serve a useful purpose in some patients. That it may be growth-inducing and, particularly where basic problems originated in the preverbal stage, constitute a preliminary step toward gaining insight. Consequently, they tend to encourage and even to stimulate acting-out. Other therapists, however, regard acting-out as always detrimental to therapeutic progress since it drains off the tension that should be employed for a requisite understanding and working through of conflicts. (p. 619)

Ideally, psychotherapy provides a safe venue for the expression of volatile emotions. In his therapeutic play sessions, Johnny (or Bobby) can thus be permitted to be quite destructive, and even to disembowel an occasional stuffed bear (assuming that his parents are willing to pay for its replacement). There are, however, limits to what Johnny or Bobby would be licensed to enact as play. Johnny would not be allowed to assault his therapist, though he might be encouraged to kill the therapist in effigy (Dorfman, 1951, p. 258). Such violence by proxy can paradoxically promote closer relatedness, because once the child has expressed his violent resentment, he may feel free to become more amiable, and to ultimately become more amenable to treatment. For example

> *Therapist:* I am all gone now?
> *Bob:* You're dead. I killed you.
> *Therapist:* I am killed.
> *Bob:* You're all washed up.
> *Therapist:* I am very, very dead?
> *Bob:* You sure are. *(Suddenly, he smiles.)* I'll have you a game of catch now.
> *Therapist:* You want to play with me now? Ok. (p. 260)

Acting-out behavior is expressive behavior. By releasing feelings, it serves to reduce tension when a person feels frustrated or under stress. The result, unfortunately, can feel threatening to observers caught in the wake of the behavior, who are not likely to make allowances for the function the behavior serves. Some who come to see themselves as targets of acting-out behavior are likely to demonstrate resentment or assertively express displeasure. Behavioral sequences that follow in such situations

can become cyclical chain reactions. Angry responses by bystanders can contribute to the stressed person's stress, producing an escalation of his acting-out behavior, which may invite further responses from those who feel affronted by the behavior.

In institutional settings, the cycle tends to be exacerbated by structural constraints. Acting-out behavior invariably violates institutional rules, and rule-transgressions eventuate in punishments meted out by institutional staff. Unsurprisingly, punishments by staff are experienced as stressful by those being punished, which can give impetus to further acting-out behavior. Occasionally, a point is reached in punitive cycles where staff members who have been functioning as sources of stress get to experience stress themselves, and are goaded into engaging in acting-out behavior of their own.

Some people demonstrate a redundant propensity for acting out (Toch & Adams, 2002). There are individuals who appear to explode with rage at the slightest provocation. Others present themselves as perpetually helpless victims of preemptive impulses, or advertise ineluctable chips on their shoulder. There are persons who are known for low boiling points or for hair-trigger sensitivity to perceived affronts. Others are renowned for picking fights or for richly earned reputations for unpredictable craziness.

The latter reputations, on the face of it, are not calculated to earn admiration, but they do inspire fear, which in some circles is a vehicle for acquiring status. In groups that are composed of self-styled tough and formidable delinquents, acting-out behavior can make the individual a role model for peers who aspire to replicate his intimidating ferocity. Acting out in groups of less seasoned delinquents can be emotionally contagious when the atmosphere is volatile. In this regard Redl and Wineman (195l) have observed that

> The mere fact that a youngster sees one of his less relaxed contemporaries throwing things around, banging his fork against the plate ferociously, jumping up and crawling under bed and table, may in itself suddenly set loose behavior in him of which he really hadn't thought until that very minute. In short, it seems as though sometimes behavior will "spread" and become "infectious" by the very lure its visualization implies. (p. 87)

Particularly among preadolescents, impulse-release and tension-reducing behavior lends itself to being emulated. This fact makes acting out a group phenomenon as well as a manifestation of individual misconduct—and both permutations are understandably apt to be of continuing concern to psychologists and educators.

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See also: **Conduct Disorder; Juvenile Delinquency**

ACTION SELECTION

Action selection, also known as response selection, refers to how people determine specific actions to perform and, as studied in choice-reaction tasks, to processes involved in deciding which response to make to a presented stimulus. Action selection is considered to be distinct from perception and from the processes involved in the execution of movements to carry out the actions. F. C. Donders (1869/1968) was among the earliest researchers to study action selection in his investigations of the temporal properties of information processing. Recent years have witnessed an expansion of interest in action-selection phenomena, since the linking of perception and cognition to action is fundamental to all behavior.

Stimulus-Response Uncertainty and the Hick-Hyman Law

Contemporary research on action selection can be dated to the early 1950s when W. E. Hick and R. Hyman reported studies showing a lawful increase in reaction time as event uncertainty increased. The Hick-Hyman law is based on information theory, for which the amount information in bits (binary digits) is $\log_2$ of the number of alternatives. According to the Hick-Hyman law, reaction time is a linearly increasing function of the amount of information transmitted by the performer, which is essentially the information provided by a stimulus that can be determined from knowing the response. For equally likely stimuli, each with a unique response, the information transmitted is $\log_2$ of the number of alternative stimuli if no errors are made. The amount of information transmitted will be less if stimuli occur with different frequencies and if errors are made, resulting in shorter reaction times. Researchers

quickly rejected information theory, with its emphasis on binary decisions, as providing an adequate explanation of the processing underlying the Hick-Hyman law.

Usher and McLelland (2001) developed a model that attributes the Hick-Hyman law to accumulation of information in competing decision units for each stimulus-response alternative. In this model, when a stimulus occurs, information starts accumulating in the respective decision units, with the response corresponding to a particular unit selected when its threshold is reached. Because the accumulation process is noisy, each additional decision unit provides another opportunity for an incorrect response to be selected. To prevent the error rate from increasing dramatically as uncertainty increases, people set the decision-unit criteria at higher levels, lengthening reaction time.

Stimulus-Response Compatibility

Also in the early 1950s, P. A. Fitts and colleagues reported the first investigations of stimulus-response compatibility effects, which are thought to provide relatively pure measures of action selection. Compatibility effects are differences in reaction time and accuracy as a function of the relation between stimulus and response sets or the mapping of members of the stimulus set to members of the response set (Proctor & Vu, 2006). Spatial compatibility effects are most widely known and investigated. Performance is better: when the spatial arrangement of stimuli matches the spatial arrangement of responses; and, when each stimulus is mapped to its spatially corresponding response. However, compatibility effects occur whenever there is similarity, or overlap, between the dimensions of the stimulus and response sets. This similarity does not have to be physical, as it does for spatial locations; but it can also be conceptual (e.g., the words "LEFT"–"RIGHT" mapped to left–right keypresses yield a compatibility effect). Moreover, a third form of similarity, structural, affects performance in a variety of situations for which there is no physical or conceptual similarity. Structural similarity may be of ordered relations (e.g., numbers 1–4 mapped to a left-to-right ordering of response keys) or of the polarities of codes for binary classifications (Proctor & Cho, 2006).

Compatibility effects are among the most reliably obtained phenomena in psychology, and they are resistant to practice. Their magnitude often decreases over the first few hundred trials, but the effects typically remain sizeable across extended practice (Dutta & Proctor, 1992). The benefit for a spatially compatible mapping is reduced and often eliminated, though, only for situations in which compatible and incompatible stimulus-response mappings are intermixed (Proctor & Vu, 2002). This benefit is also eliminated when a task for which location is relevant is intermixed with a task of the type described next, for which stimulus location is relevant and another stimulus dimension relevant.

The Simon Effect

The concept that spatial compatibility effects occur when stimulus location is irrelevant was first demonstrated by J. R. Simon in the 1960s. For example, when red and green stimuli are presented in left and right locations and participants are to make a left keypress to red and right keypress to green, responses are faster when the stimulus location corresponds with the response assigned to the color than when it does not. The term *Simon effect* is used nowadays with reference to these correspondence effects. The Simon effect has attracted considerable interest since the mid-1990s because it illustrates that action selection is influenced by stimulus properties that are not part of the action goals (Hommel & Prinz, 1997). The effect is related to the more familiar Stroop color-naming effect with the major difference being that the Simon effect can be attributed more directly to action selection since similarity exists only between the irrelevant stimulus-location dimension and the response-location dimension.

Most accounts of compatibility and Simon effects attribute them to two action-selection routes (Hommel & Prinz, 1997). One route is automatic and response activation is presumed to occur through it by way of long-term stimulus-response associations. A stimulus will produce activation of its corresponding response via this route, providing the basis for the Simon effect. The second route is intentional, and it is presumed to involve short-term associations implemented to perform the instructed task. This route is a major factor in compatibility effects obtained for relevant stimulus-response mappings.

Attributing the Simon effect to automatic activation suggests that the effect should be difficult to override. Yet, it is not (Proctor & Vu, 2002). When the response keys are labeled so that the relevant stimulus dimension can be mapped incompatibly to the responses (e.g., press the green key to the red stimulus), the Simon effect reverses to favor the noncorresponding response. Likewise, when trials of a Simon task are intermixed task with trials for a task in which stimulus locations are mapped incompatibly to responses, the Simon effect reverses to favor the noncorresponding responses. Even more surprising, fewer than 100 practice trials with an incompatible spatial mapping can eliminate or reverse the Simon effect in a subsequent transfer session, even after a one-week delay. Thus, the "short-term" associations established for one task persist to influence performance of a later task for which they are inapplicable.

The codes on which action selection is performed in spatial compatibility and Simon tasks are thought to be predominantly spatial. One of the clearest demonstrations of spatial coding is that the effects remain relatively unaltered if the hands are crossed such that a right key is

operated by the left hand and a left key by the right hand (Wallace, 1971). Thus, anatomical factors such as the mapping of stimuli to hands are of secondary importance. Moreover, the spatial coding of actions does not necessarily involve the location of the responding effector. If each hand holds a stick that is crossed to press the key on the opposite side, the stimulus-key relation determines the compatibility effect. If the goal of the action is to produce an effect (e.g., turning on a light) to the left or right, the relation between the stimulus and the action effect is crucial rather than that between the stimulus and the key pressed by the hand to produce the action effect.

Dual-Task Performance

Limitations in dual-task performance are usually attributed to action selection. When two tasks must be performed, the response for the second task is slowed when its stimulus occurs within a few hundred milliseconds after onset of the first task's stimulus. This phenomenon, known as the psychological refractory period effect (Pashler, 1994), has been attributed to a response-selection bottleneck. Considerable research effort is currently being devoted to whether this bottleneck is part of the cognitive strategic or architecture, and whether the capacity for response selection can be divided between tasks or must be devoted to one task at a time. An additional issue concerns conditions under which the bottleneck may be bypassed. Several recent studies have demonstrated cross-task effects between tasks similar to the Simon effect, suggesting that at least some cross-task activation of response information occurs.

In conclusion, spatial compatibility, Simon effects, and related phenomena may seem at first glance to be of limited relevance to most psychologists. However, such effects reflect fundamental cognitive processes that come into play in a variety of situations. For example, Simon effects have been used in recent years to study activation of emotional information (the affective Simon effect), of specific actions afforded by objects, and of mental representations of numbers. They have been used to investigate effects of aging across the lifespan and various other individual differences in processing. With the recent advent of the "embodied cognition" view, which ascribes meaning and thought to action, compatibility effects of various types have moved to center stage in psychology.

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ACTUALIZATION

The general common meaning of actualization is moving from potential into reality–actuality. Actualization is broadly valued in American culture, as is evident in the saying that anyone can become president, and in a recent army advertisement campaign urging potential recruits to "Be all that you can be." In American psychology, self-actualization has come to refer to a person's bringing into reality his or her own potential for a richly fulfilling, open, and appreciative life. In most recent times,

actualization is more explicitly coming to include moving beyond self to identifying with humanity, nature, and the cosmos.

Within American psychology, actualization is most closely associated with humanistic psychology, especially with Carl Rogers' (1902–1987) position that humans are growth-oriented (1951, 1961), and with Abraham Maslow's (1908–1970) conception of self-actualization (1954, 1971). The psychologists who founded what became known as humanistic psychology were critical of the prevailing assumptions and foci of 1940s psychology. At that time the major psychological theories were strict behaviorism and drive- and aggression-oriented psychoanalysis; both were reductive and deterministic. Psychology was primarily university-based and concerned with being a science in the manner of the successful natural sciences. Academic psychology rarely addressed consciousness, choice, health, or possibility. Into the 1950s and 1960s (and residually into our twenty-first century), educational and clinical psychology emphasized classification; psychology and psychiatry further emphasized identification and treatment of deficiency and disease.

Humanistic psychology came into being to address aspects of being human that were not being addressed by mainstream psychology. Eventually Maslow named the diverse efforts to develop alternative views to deterministic psychoanalysis and behaviorism as "the third force." Much of this force also became known as the human potential movement, which encouraged people to pursue positive human values such as joy, love, commitment, hope, interpersonal connection, and service to others. In significant respects, humanistic psychology has served as a forerunner to contemporary "positive psychology."

Parallel to and sometimes overlapping the earlier humanistic movement, there was a popular "humanistic" movement that opposed not so much deterministic psychological theories and practices as the restrictions of the 1950s and 1960s culture. This was largely a self-centered, counterculture movement, not a psychological movement.

Rogers proposed that humans have a basic tendency to strive toward being fully functioning, to actualize their full potential. He described this process as requiring courage, but as often attended by joy as well as by pain and heartbreak. The process is continuous, not a completed achievement. Rogers described his approach to counseling and psychotherapy as "nondirective"—limited to providing the conditions that allowed the person to strive. Later he referred to the approach as "person-centered" and "client-centered," stressing the importance of recognizing the person's worth, perceived world, and potential to grow. In this approach, the counselor empathically but matter-of-factly speaks back what the client has said, with no effort at interpreting or directing. In turn, the client further clarifies and deepens his or her own understanding. The client discovers contradictions among beliefs, affect, and behavior and, without direction from the counselor, strives toward a coherent grasp. This striving promotes growth, and the counselor's nonjudgmental "unconditional positive regard" allows the client's understandings to deepen in an integrated way.

Rogers viewed maladjustment as inconsistencies in one's self-concept, maintained through ignoring relevant sensations and feelings. Providing a respectful, calm, accepting presence allows people to recognize fuller perspectives and to allow themselves to grow toward integrated functioning. Fully functioning persons continually strive to be open to possibility and to avoid distortion. They trust their judgment and dare to be creative. These persons are open to their own needs and seek to balance them. Beyond therapy, Rogers extended his approach to the field of education and developed a learner-centered model that stressed "the freedom to learn." In his later years, Rogers applied his approach to group, national, and international conflict, promoting individual empowerment and social change.

Maslow was one of the few nontherapist humanistic writers. He was primarily university-based and a major theorist of humanistic psychology. He founded the Association of Humanistic Psychology and its journal, the *Journal of Humanistic Psychology,* as well as the *Journal of Transpersonal Psychology*. Although he was trained as an experimental psychologist, his work was observational and theoretical. He is best known within psychology and by the public for having described the characteristics of well-known people who were emotionally healthy and achieving and whom he regarded as self-actualized, for example, Abraham Lincoln, Eleanor Roosevelt, and Albert Schweitzer.

He found that such persons were self-aware and attuned to their inner impulses and made choices to improve and to change. They also were diligent problem-solvers, both practically and creatively. They were not particularly culturally constrained, and often were seen as detached, although they also maintained close personal ties. They were nonjudgmental and accepting. They often were closely attuned to and deeply appreciative of simple social or natural events. More than most people, they were open to and changed by peak experiences, often in nature, in which their sense of self was transcended as they found themselves in holistic relation to humans in general, to other species, to nature, and to the cosmos. These transcendent experiences often moved these people to further their commitments.

Maslow found that self-actualizing people of course were not actualized in every moment. Moreover, actualization was not an achieved status; rather, these people repeatedly answered the call toward growth. Maslow extended his work into business management models that hold an optimistic view of human nature (e.g., Eupsychian management and Theory Z). Contemporary times have extended self-actualization to include identification with humanity, nature, and all that is, particularly through

pursuing humanistic values, service, deep ecology, and mediation practices.

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See also: **Client-Centered Therapy; Humanistic Psychotherapies**

ACTUARIAL PREDICTION (See Statistical Prediction)

ADAPTIVE TESTING (See Computerized Adaptive Testing)

ADDICTION

Addiction is a term widely used to indicate any type of excessive repetitive involvement with an activity or substance, and colloquially it is applied as readily to exercise, eating chocolate, and computer gaming as to alcohol, methamphetamine, or heroin use. Such broad use of the term detracts from its technical value, and thus in this entry *addiction* will be used to refer only to substance use disorders.

Problematic substance use can be described by two distinct patterns—Abuse and Dependence (American Psychiatric Association, 2000). Abuse refers to life problems from substance use: Use in situations that are physically dangerous, use interfering with occupational roles (e.g., work or school) or with family and other social relationships, or use resulting in legal difficulties. By contrast, Dependence includes physiological, behavioral, and psychological components. Physiological aspects of dependence may include tolerance (the need for increasing amounts of the substance to attain the same behavioral and subjective effects) or withdrawal (a physical syndrome activated by cessation from or cutting down on use of the substance). Behavioral components include using larger amounts of the substance over longer periods of time than intended; spending excessive amounts of time obtaining, using, and recovering from the substance; or using instead of engaging in other recreational and social pursuits. Psychological components include continued use despite knowledge of medical or psychological conditions caused or exacerbated by substance use, and desires or actual attempts to reduce or cease use of the substance.

Use of alcohol, other sedative/hypnotic/anxiolytic drugs, cocaine, other stimulants, opioids, cannabis, hallucinogens, inhalants, or nicotine all can lead to Substance Abuse or Dependence. A withdrawal syndrome can be associated with all except for cannabis, hallucinogens, and inhalants. Note that legality and addictiveness are not interchangeable; some illegal substances are not considered physically addictive and many legal substances are addictive.

Epidemiology

Regular use of alcohol is common among adults in the United States (67% lifetime prevalence), unlike regular use of illicit drugs (just 16%). Similarly, Alcohol Abuse and Dependence are relatively common (a lifetime prevalence of 42% for men and 29.5% for women; Hasin, Stinson, & Ogborn, 2007), whereas illicit-drug abuse or dependence are less common (13.9% of men and 7.2% of women; Compton, Thomas, & Stinson, 2007). Nicotine dependence remains prevalent as well: 23.9% of men and 18.0% of women smoked cigarettes in 2007 (Centers for Disease Control, 2007). After alcohol and nicotine, the most common drug of abuse or dependence is cannabis, followed by prescription drugs, cocaine, amphetamines, hallucinogens, opioids, and sedatives.

Etiology

The causes of addiction are complex and involve an interplay among three dimensions—the biological, the psychological, and the social. The relative importance of each dimension varies with the specific substance of abuse and with the individual user. In general, individuals vary in their genetic vulnerability to develop dependence on any substance, and this vulnerability interacts with their physiological make-up, psychological characteristics, social environment, and access to the substance.

Substance use disorders run in families, and research has attempted to distinguish genetic from familial aspects

of etiology. Both twin and adoption studies suggest a heritable component to Alcohol Dependence. With other drugs, some studies suggest genetic elements, such as evidence of common drug preferences in monozygotic twins and increased risk for drug dependence in families. Candidate genes have been associated with increased vulnerability to specific substance use disorders, but evidence to date suggests that multiple genes interact to increase risk, and there is no single gene that determines whether a person develops an addiction. The majority of offspring from families with a substance use disorder do not develop problems, and the majority of those with a substance use disorder do not have a clear family history.

Genetic vulnerability is expressed through specific physiological and psychological vulnerabilities. For example, individuals vary in the forms of specific enzymes (isozymes) that break down alcohol in the body; some forms of these isozymes increase susceptibility to developing dependence on alcohol, and other forms are protective. Neurochemical research points to differences in sensitivity to dopamine or to deficiencies in GABA. Psychologically, vulnerable individuals often have inherited a temperament that is high in sensation seeking, low in harm avoidance, and low in reward dependence that makes them more susceptible to substance use.

Exposure to alcohol or drugs also leads to changes at the cellular or molecular level that may contribute to the development or maintenance of dependence. A number of different neuronal changes have been suggested as causing Alcohol Dependence, including changes in neuronal membranes, changes in the excitability and function of nerve cells mediated through the calcium and GABA receptor/chloride channels, changes in the activity of excitatory neurotransmitter systems, and changes in second messenger systems (see Moak & Anton in McCrady & Epstein, 1999). Research on opioid dependence has failed to find changes in opioid receptors associated with addiction. However, at the subcellular level, chronic exposure to opioids has been demonstrated to lead to long-term changes in specific G protein subunits (see Stine & Kosten in McCrady & Epstein, 1999).

Psychological research also has demonstrated the importance of interactions between the individual and environment. Repeated exposure to drug use situations can lead to conditioned physiological responses to the situations that are similar to physiological responses to the actual drug. The development of strong positive expectancies about the effects of certain drugs can also contribute to continued use. Individuals with substance use disorders also show deficiencies in self-control in that they have difficulties inhibiting behavior or making decisions that favor long-term over short-term rewards. However, it is not clear whether these tendencies are a cause or consequence of substance use. Individuals may use substances to enhance positive moods as well as to cope with negative emotions, and those with other psychological problems are at particularly high risk for the development of substance use disorders as well.

Alcohol and drug use occurs in a social context. Introduction to alcohol and drug use most commonly occurs with either peers or family members. Individuals who are at high risk for using drugs and for other problem behaviors often join with peers of a similarly high risk level and these peer groups then may influence those within the group to use or experiment with substances and other high-risk behaviors. Adolescents are less likely to develop alcohol or drug problems if they come from families that provide consistent and fair discipline, spend time together on a regular basis, and have a positive religious orientation.

Prevention

Prevention of addiction has taken many forms, including broad-brush prevention programs in schools (e.g., DARE); prevention targeted at specific populations (e.g., pregnant women); and environmentally focused interventions that change laws and policies, decrease access to the substance, and increase penalties (e.g., raising tobacco taxes, restricting alcohol sales near college campuses, and installing mandatory ignition-interlock devices following DUI). Some individually and environmentally focused interventions have been successful in preventing or delaying the onset of use, decreasing use among those already using, and decreasing harmful consequences to using individuals or to others. Motivational enhancement, social-norms feedback, and behavior-modification approaches are consistently effective; however, education-only, morality, and fear-based programs are often ineffective.

Treatment

Treatment efforts include both psychological and pharmacological approaches. Several psychological therapies are effective in the treatment of Substance Abuse or Dependence. Brief, motivationally focused interventions are effective for individuals with milder problems, and they also may enhance treatment outcomes when combined with ongoing treatments. Cognitive-behavioral therapies—including community reinforcement treatment, relapse prevention, social skills training, and behavioral couples therapy—are well-supported for treating Alcohol Dependence (Miller & Wilbourne, 2002). Interventions effective in treating illicit-drug dependence include family therapy and community reinforcement approaches (Copello et al., 2005), as well as contingency management programs (Prendergast et al., 2006). Treatments to facilitate involvement with mutual-help groups (e.g., Alcoholics Anonymous) are also effective (Miller & Wilbourne, 2002), and continued active participation in those groups correlates with better outcomes.

Aside from medications for withdrawal, there are few effective pharmacotherapies to treat substance-use disorders. Naltrexone, acamprosate, and disulfiram are supported for treating alcohol dependence, and a long-acting injectable form of naltrexone is now available. Methadone and buprenorphine have strong evidence of effectiveness in the treatment of opioid dependence (see Barber & O'Brien in McCrady & Epstein, 1999). Nicotine replacement products (delivered by transdermal patch, gum, sublingual tablet, lozenge, nasal spray, or inhaler) are effective in the initial phases of treatment for nicotine dependence, and bupropion is effective for longer-term pharmacotherapy. Nortriptyline and clonidine are recommended for patients who are unable to use nicotine replacement products or bupropion, and the tranquilizer buspirone might also help smokers to reduce withdrawal-related anxiety (Cofta-Woerpel et al., 2006). The newer drug varenicline has produced favorable quit rates over placebo or bupropion and its effectiveness looks promising (Gonzales et al., 2006).

The term *addiction* is overused, but it is useful in referring to a range of substance use problems. Etiology of these problems is complex, with multiple biological, psychological, and social factors contributing. Prevention is possible, and a number of effective treatments are available.

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See also: **Drug Addiction; Food Addiction; Gambling Addiction**

ADHD (See Attention-Deficit/Hyperactivity Disorder)

ADJUSTMENT DISORDER

When individuals, regardless of their age, are subjected to a significant psychosocial stressor, two possible outcomes are likely—in one instance the person is not significantly affected by the stressor and proceeds on with their life without indication of perceptible problem. In the other possible scenario, the individual experiences a negative reaction to the stressor. Herein, at some point the person begins to exhibit behavioral, mood, or emotional symptoms, the person is then described as manifesting an adjustment disorder, and there is then the need to initiate change in order to restore even functioning. It is important to emphasize that adjustment disorders differ from acute stress disorders in that the latter represent reactions to extraordinary traumatic stressors (i.e., life-threatening events).

The diagnosis of adjustment disorder in children, adolescents, and adults is not without debate and controversy regarding diagnostic specificity and prevalence. It has been referred to as a "waste-basket" diagnosis (Fard et al., 1979), so vague as to not be helpful, and deemed unstable as a diagnostic entity (Greenberg et al, 1995). This reflects some recent commentary questioning the utility of the diagnosis. A major reason why critics are skeptical about the classification relates to the variability in diagnosis with respect to children (Newcorn & Strain, 1992) as well as adults (Strain, Smith, & Hammer, 1998). Casey et al.

(2001) draw attention to the debate around the utility of the diagnosis and urge continued research with sensitivity to tightening diagnostic specificity in relation to symptoms and areas of dysfunction.

Although critics have questioned the reliability and validity of this diagnosis, there are other positions. These assertions are countered by several studies that report adequate construct and predictive validity (Andresen, Hoenk, & Synder, 1990; Kovacs, Ho, & Pollack, 1995). Finally, the diagnosis is often cited as too frequently employed in order to meet the treatment criteria demanded by managed care (Pomerantz & Segrist, 2006). However, an interesting counter position suggests that this diagnosis may actually be employed less frequently because clinicians are more inclined to diagnosis children with more severe disorders in order to receive reimbursement (Harpez-Rotem & Rosenheck, 2004).

These controversies notwithstanding, the diagnosis is widely employed with standardized criteria used to inform diagnostic decisions. Determining whether an individual is exhibiting symptoms suggesting an adjustment disorder sees most clinicians referencing the five criteria outlined by the American Psychiatric Association (i.e., American Psychiatric Association, 2000).

- By definition an adjustment disorder occurs within three months of a significant external stressor and may not persist for longer than six months; after this it either dissipates or becomes a more ingrained problem and may now meet the criteria for a significant emotional disorder or syndrome.
- The distress exceeds what would normally be expected as a reasonable response to the stressor, and there may be indication of significant social or occupational/academic impairment.
- The disturbance does not meet the criteria for another specific Axis I diagnosis and is also not a flare-up of an already diagnosed Axis I disorder.
- The symptoms are not a bereavement reaction and finally, once the stressor or its effects on the person have attenuated or terminated.
- The symptoms do not persist for more than an additional six months. An important exception can occur if the person is experiencing a chronic stressor (e.g., an abusive foster parent) or to a stressor whose ramifications and impact may endure (e.g., a difficult and financially disabling divorce).

The DSM-IV-TR classification system delineates six specific variations of adjustment disorder reflected in Table 1.

Table 1. DSM-IV-TR Classification of Adjustment Disorders

Adjustment Disorder
With Anxiety
With Depressed Mood
With Mixed Symptoms of Anxiety and Depression
With Disturbance of Conduct
With Mixed Disturbance of Emotions and Conduct
Unspecified

A recently developed alternative to the DSM-IV-TR classification system, the Psychodynamic Diagnostic Manual (PDM) (i.e., PDM Task Force, 2006), expands DSM-IV criteria by including reference to how adjustment disorders influence internal experiences: affective states, cognitive patterns, somatic states, and relationship patterns. Thus, this paradigm adds more breadth and depth to the DSM-IV diagnostic composite, offering a developmental psychoanalytic theoretical perspective in describing adjustment disorders.

The remaining sections will illustrate brief clinical vignettes of adjustment disorders in children, adolescents, young and older adults in order to provide the reader with illustrative clinical examples.

Adjustment Disorders in Children

Certain environmental events may trigger adjustment disorders in young children. For example, the child who at age 5 is expected to make a major developmental transition (i.e., leaving home and attending school) experiences separation problems when he or she enters school—symptoms of nocturnal enuresis, nightmares, and diffuse fears—are cited by parents. The situation persists for several weeks but suddenly abates and the child now trundles off to school without any of the aforementioned problematic symptoms. Another youngster in the same class also exhibits a very similar constellation of symptoms but, unlike his classmate, after three months continues to demonstrate significant separation issues not only in relation to school but with respect to home as well—he refuses to let his parents go out for an evening without tantrums and desperate pleas they stay home. The problems continue past the six-month point and the clinical situation, first an apparent adjustment disorder, now moves into another realm suggesting that this child is manifesting symptomatology consistent with DSM-IV-TR diagnosis of Separation Anxiety Disorder.

Adjustment Disorders in Adolescence

Adjustment disorders in adolescents may also be triggered by separation demands. College mental health services are familiar with late adolescence adjustment disorders as these occur with considerable frequency in the first college year. This initial adjustment is a challenge for many students who have to confront an array of novel situations—a separation from all that is familiar and predictable. For the majority of students the multiple challenges (i.e., separation from family and friends, adjusting to less structure

in many instances, and the academic demands) are confronted and handled, but for some, significant problems may arise.

Consider the case of a young woman who begins to attend a large state university located in a major urban area where she has no ties or connections (not at all an unusual occurrence) and who comes from a tight-knit, small rural community. She feels overwhelmed by academic and social pressures (e.g., roommates who are not welcoming, large and impersonal classes, requests to party and date) and she becomes distraught, wondering if she would have better off attending a local community college. She has difficulty sleeping and suffers from loss of appetite; she stays in her room or seeks solace in the school library because she finds it unpleasant to be with roommates. She experiences self-doubt about her abilities, has difficulty budgeting her time, meeting deadlines and staying focused. Frequent calls to her parents and attendance at a group in her dormitory for incoming first year students help her to stay afloat. Discussions with the residence counselor provide opportunities to obtain additional support and reassurance. By the end of the first semester she is sleeping better, has joined some campus organizations, and is finding that the first round of papers and examinations can be managed. Her symptoms are ameliorating and a follow-up interview sees her doing well.

Adjustment Disorders in Young Adulthood

Young adulthood brings new developmental and phase-specific demands to the table. Leaving home, entering the world of work, entering into and sustaining intimate ties, beginning a family, obtaining specialized training and/or higher education, entering the armed forces would cover most of the late adolescence/early adult transitions and tasks that might be confronted. And again, what is routine and ordinary for one person may see another individual momentarily derailed and overwhelmed to the point where a cluster of symptoms are manifest, suggesting an adjustment disorder.

A young father suddenly begins to experience heart palpitations, gastrointestinal distress, and fears that he will contract a fatal illness and die. He has trouble sleeping, experiences early-morning wakening, and has episodic thoughts he will harm his wife or infant daughter. At work he has trouble concentrating and focusing. He seeks assistance through the Employee Assistance Program where he experiences almost total symptom relief after being instructed in cognitive-behavioral interventions designed to target his obsessive, ego-dystonic thoughts, and after being advised that his fears about being up to the task of being a new father are juxtaposed against the fact that his own father was often unavailable because of work demands and personal problems. His ability to understand how unresolved and conflicted feelings about his own father were activated by his becoming a father was an important connection that served to help him place matters in a more understandable perspective.

Adjustment Disorders in Older Adults

Older adults, middle-aged, and those more senior are particularly susceptible to adjustment reactions precipitated by real and imagined loss not involving bereavement. More specifically, the theme of loss may naturally involve physical attributes and skills that are of course inevitable but exceedingly difficult for some individuals to accept. Loss may intertwine with identity and self-regard issues.

Consider an individual, recently retired, who has spent the majority of his career in one setting (e.g., a civil servant, career military personnel, a teacher) who now is acutely aware of the loss of camaraderie, self-worth, and security. For some, this phase of life hurdle is easily forded and the person moves on; for others, there is the emergence of anxiety, depression, and loneliness, a sudden confrontation with an existential type of loss. It is quite expected that the types of losses that increasingly confront one in the later years call for taking stock, and may momentarily derail some people. For those who temporarily languish, mourn the loss of what might have been, and are unable to move on (i.e., become symptomatic), then the initial concern, if the requisite amount of time has passed, would be to suggest the person is exhibiting an adjustment disorder.

The aforementioned clinical examples depict different types of adjustment disorders that usually resolve with minimal clinical intervention. To reiterate, an adjustment disorder may be construed as a reasonable response to an identifiable stressor. It suggests external or internal factors have coalesced to momentarily derail the person, resulting in the development of symptoms, dictating the need to initiate corrective measures so that emotional homeostasis is restored.

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ADLER, ALFRED (1871–1937)

Alfred Adler founded the school of Individual Psychology, a theory of personality and psychopathology, as well as a method of psychotherapy. Based on the concepts of the unit, goal striving, and active participation of the individual, it is a humanistic view of psychology rather than a mechanistic drive psychology. It stresses cognitive rather than unconscious processes. Adler accepted being called "father of the inferiority complex."

Adler graduated from Vienna Medical School in 1895 and became a general practitioner. He soon wrote articles on public health issues, in line with his early interest in the social democratic movement. In 1902, he and three others were invited by Freud for weekly discussions of problems of neurosis. From these meetings the Vienna Psychoanalytic Society developed; Adler became its president in 1910.

In 1911, Adler resigned from the society to form the Society for Free Psychoanalytic Research, soon afterward renamed the Society for Individual Psychology. He objected primarily to what became known as Freud's metapsychology, then essentially limited to mechanistic concepts of libido and repression. Adler sought a conception of neurosis "only in psychological terms, or terms of cultural psychology." In this quest he published in 1907 his *Study of Organ Inferiority and Its Physical Compensation*, broadening the biological foundation from sex to the entire organism. In 1908, he wrote a paper on the aggression drive, which he identified as a drive to prevail, thus replacing sex as the primary drive. Then in 1910 he wrote a paper identifying a feeling of inferiority and masculine protest as overcompensation and replaced the concept of drive altogether with one value. Masculine protest, in its original sense, was shortly afterward replaced by a striving power aimed at gaining superiority. Adler saw the individual in its unity and goal orientation operating as if according to a self-created plan, later called lifestyle. Drives, feelings, emotions, memory, and the unconscious are all processes that are subordinated to the life style.

In 1912, Adler presented his new psychology in *The Neurotic Constitution*. It contained most of his main concepts, except that of social interest. This last concept, in 1918, became, along with striving for overcoming inferiority feelings, Adler's most important concept—the criterion for mental health. In cases of psychopathology, which Adler called failures in life, the aptitude for social interest is not adequately developed. Such persons are striving on the socially useless side for personal power over others, versus the healthy, socially useful striving for overcoming general difficulties. The psychotherapist raises the patient's self-esteem through encouragement, demonstrates the patient's mistakes to the patient, and strengthens his or her social interest. Thus, the therapist works for a cognitive reorganization and more socially useful behavior. In particular, early recollections and birth-order position, as well as dreams, are used to give the patient an understanding of his or her lifestyle.

During the 1920s Adler became largely interested in prevention. This included child-guidance training of teachers at the Vienna Pedagogical Institute where Adler had his first academic appointment, the establishment of numerous child-guidance centers in public schools, and adult education courses that resulted in his popular book, *Understanding Human Nature*. From 1926 on, Adler visited the United States regularly, lecturing to a wide range of audiences. He was a successful speaker, attracting up to 2000 listeners per lecture. In 1932, he became a professor of medical psychology at Long Island Medical College and in 1934, he settled permanently in New York City.

In the personal realm he married Raissa Timofejevna Epstein, a radical student from a highly privileged Jewish family in Moscow. During the course of their marriage, she worked with Adler at several different times. They had four children, three girls and a boy, of whom the second child, Alexandra, and the third, Kurt, became Adlerian psychiatrists. Alfred Adler died of a heart attack on May 28, 1937, in Aberdeen, Scotland.

Regarding Adler's work there is a paradox: His concepts have been generally validated and have entered most personality theories, including psychoanalysis in particular, yet this has remained largely unrecognized. However, Adlerian tradition is being continued by the North American Society of Adlerian Psychology, which publishes both a newsletter and the quarterly *Individual Psychology*, and holds regular meetings and sponsors workshops. There are Adlerian training institutes as well as scores of local organizations, family education centers, and study groups, for which the groundwork was done chiefly by Rudolf Dreikurs (1897–1972). Abroad, Adlerian societies exist in numerous countries, the largest being in West Germany, which publishes the quarterly *Zeitschrift fur Individualpsychologie*. An International Association for Individual Psychology holds congresses every three years. Affiliated with it is the International Committee for Adlerian Summer Schools and Institutes, which constructs a yearly two-week institute in various countries.

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ADMISSIBILITY OF EXPERT TESTIMONY

The first test for the admissibility of expert testimony occurred in 1923 in a case entitled *Frye v. United States* (293 F 1013, 1923). Although this case dealt with the admissibility of the polygraph in court, it has been used in a much wider context to decide the admissibility of any proffered or proposed expert testimony. It is described as a general acceptability theory. That is, if the theory, methodology, or conclusion that is being "proffered" or offered as expert testimony is "generally accepted" within the relevant scientific field, it is deemed to meet the criteria for acceptability. Reliability, in other words, is determined by general acceptability. One of the problems with the *Frye* standard is that it did not define what "generally acceptable" meant. Subsequent commentary by various legal scholars has described general acceptability as referring to acceptance by "a substantial majority of the relevant scientific discipline," but once again the term "substantial majority" was not defined. In a similar manner, the "relevant scientific discipline" was not well-defined either.

One of the other major problems that the *Frye* standard encountered was that the criterion of general acceptability left no room for the admissibility of a well-validated but innovative or new technique. Let us assume that a particular scientist has done extensive work validating a new scientific procedure. No matter how extensive the validity studies are, under a *Frye* standard it could not be admitted into evidence unless it is also well-known and well-accepted in the scientific community. A good example of this shortcoming occurred during the trial of John Hinckley Jr., the attempted assassin of President Reagan, when some of the proffered expert testimony the defense wanted admitted had to do with a neuropsychiatrist's diagnosis of Hinckley as schizophrenic based on what was then a new technique of brain imaging studies. This work was very well-validated from a scientific point of view; however, because the idea of abnormal brain chemistry in schizophrenic persons was not generally accepted in the scientific community in 1981, the testimony was ruled inadmissible. Had that testimony been proffered in the present day and age, when this technique is well-accepted, it would certainly be admitted into evidence.

1975 Federal Rules of Evidence

In 1975, the Federal Rules of Evidence were adopted by the U.S. Federal Court system. The rules had special sections (Rules 702 through 705) to assist the Court with criteria for the admissibility of expert testimony. The Federal Rules of Evidence have been incorporated into the evidence codes in many states, so that some of them now have either an exact replica or words closely approximating them as the basis for their own rules of evidence. These relevant sections for the present discussion dealt with what was called "scientific, technical or other specialized knowledge." These Rules of Evidence stated that if such scientific, technical, or other specialized knowledge would be of assistance to the triers of fact (i.e., judges or juries) and out of the "ken" or knowledge base of the ordinary layperson, then an expert who was qualified by knowledge, skill, education, experience, and training could render an opinion.

It is important to note that these Federal Rules of Evidence deal with broader information than merely the scientific, for it talks about the possible introduction into expert testimony of technical or specialized knowledge also. This becomes a particularly critical issue when the admissibility of social science evidence (such as psychology) is debated. Is psychology scientific, is it technical knowledge, or is it some other kind of specialized knowledge? How this question is answered leads to different answers regarding admissibility.

The second important phrase in the Rules I is the one stating that the material should be "of assistance to the trier of fact." This may seem somewhat paradoxical. Why would we be discussing material at all if it were not of assistance to the trier of fact? What is meant here is that the knowledge proposed by the expert witness must not be something already known by the average person. In other words, it must add something new to the knowledge base of the layperson or provide some information to challenge misinformation that the trier of fact could be expected to deduce from common sense.

Rule 703 discusses the criteria required for the methodology on which experts base their opinion. It indicates that the methodology used by the expert must be of the sort "reasonably relied upon by other experts in the same field." One of the problems with this aspect of the Federal Rules of Evidence is that the phrase "reasonably relied upon" was not defined, leaving it to the courts to figure out if a method is scientific or not.

Daubert, Kumho, and Relevant Case Law

In actual practice, following the introduction of these Federal Rules of Evidence, courts used some informal combination of the *Frye* standard and the Federal Rules of Evidence to determine admissibility of expert testimony until 1993, when the U. S. Supreme Court, in deciding a case called *Daubert*, dramatically altered the standards of admissibility of expert testimony in Federal Courts. In *Daubert v. Merrell Dow Pharmaceuticals* (509 U.S. 579, 113 S.Ct. 2786, 1993), a case concerning whether a particular medication caused birth defects, the attorneys for the plaintiff wanted to introduce expert testimony by a biochemist who reanalyzed the prior medication tests (called trials) and found that the trials that had declared the medication was safe were not done properly. The trial court ruled that the testimony was inadmissible, finding the reanalysis of the prior trials to be "junk science" because the biochemist had used a new methodology that was not generally acceptable and therefore failed to meet the *Frye* standard.

The U. S. Supreme Court, in a majority opinion authored by Justice Blackmun, described the *Frye* standard as too austere, not allowing for innovation and creativity, and suggested using the Federal Rules of Evidence with some important modifications for judges to test for the scientific reliability of a proposed expert's opinion. These new standards are now called the *Daubert* standards and have been adopted by a number of different states, and in 2001 they were incorporated into the newly revised Federal Rules of Evidence. The reasoning behind this Supreme Court decision was to give judges more guidance in how to make these difficult admissibility decisions. An important point to be noted is that Justice Blackmun restricted the analysis in the case only to scientific evidence, because that was the nature of the evidence being considered in the *Daubert* case. The implication of Justice Blackmun's comment was that the criteria he was proposing would be applicable only to scientific testimony and that technical or other specialized information could well be judged by other criteria. Nevertheless, many people misinterpreted *Daubert* as requiring the application of certain standards useful in judging scientific evidence to all kinds of expert testimony.

Justice Blackmun also noted that the criteria to be outlined were suggested guidelines and were not "dispositive"; that is, these were guidelines that the judge, as "gatekeeper," would utilize to determine the admissibility of expert scientific testimony. Some legal scholars believe that the *Daubert* decision gives judges more power to decide what expert to admit and whom to keep out of the court, whereas others see *Daubert* only as a guide to the decision-making power judges always had under *Frye* and the Federal Rules of Evidence.

The following criteria suggested by Blackmun appear to be an elaboration of the undefined "reasonable reliance" discussed in Federal Rule of Evidence 702: (1) the hypothesis to which the matter pertains is testable; (2) the procedure has been tested; (3) the procedure has a known error rate; (4) the procedure has been published; (5) the procedure has been peer reviewed; and (6) the procedure is generally accepted by the scientific community.

As already noted, there was a good deal of discussion following the handing down of the *Daubert* decision, not only among legal scholars but also among mental health professionals wondering exactly where expert psychological testimony would fall. It takes only a moment's reflection to realize that much of what clinical forensic examiners do in their evaluations may not have testable hypotheses or known error rates. What, for instance, is the testable hypothesis in a child custody evaluation? How does one determine the "known error rate" of a clinical interview? Does it have to do with whether or not the judge or jury agrees with the proposed testimony? These are all issues that appear to separate clinical forensic evaluations from the kinds of criteria enumerated in the *Daubert* case if they are strictly followed, rather than just used as guidelines as Blackmun suggested.

Many courts adopted this rather narrow interpretation of *Daubert*, which resulted in the exclusion of a large body of expert testimony that could not be "scientifically validated." On the other hand, more clinically oriented individuals were of the opinion that the narrowly construed *Daubert* criteria would keep a great deal of valuable clinical material out of consideration in the courts. How one conceptualizes psychology is a critical issue. Is psychology a science? It is technical knowledge? Or, is it specialized knowledge? These questions were debated by psychologists in a very heated manner for a good number of years following the *Daubert* decision.

Further clarification appeared to come in 1999 in the case of *Kumho Tire v. Carmichael* (526 U.S. 137, 119 S.Ct.

1167, 1999). In this case, which dealt with proffered expert testimony of a "tire expert," the trial court ruled as inadmissible the expert's testimony, because he had not conducted any controlled scientific experiments. The expert had, on the other hand, based his opinion on 30 years of experience, rather than on empirical studies. On appeal, the Court of Appeals for the Eleventh Circuit reversed the trial court, indicating that the *Daubert* criteria should be applicable only to scientific testimony and not to "experience-based testimony."

When the case reached the U. S. Supreme Court, however, the court ruled that *Daubert* should apply to all proposed expert testimony, but that it should be interpreted flexibly, and that the six criteria enumerated earlier were only guidelines and were not intended to be taken as rigidly excluding different kinds of expert testimony. In fact, the Supreme Court went on to state that the important issues were "relevance and reliability" and that it was at the discretion of the trial judge to determine how relevance and reliability could be determined. This ruling essentially reopened the area for clinical forensic psychological expertise, since a judge did not have to rely only on those six factors. *Kumho* was important because it made the admissibility of expert testimony far more flexible and far more at the discretion of the individual trial judge than *Daubert*.

2000 Federal Rules of Evidence

More recently, Rule 702 of the Federal Rules of Evidence was modified and adopted in December 2000. The modifications did not replace Rule 702, but supplemented it with two additional criteria: (1) the testimony must be based on sufficient facts or data, and (2) the testimony derives from reliable principles and methods.

The first part of the new modification is important for mental health professionals, because it parallels very closely what appears in various codes of ethics: we make diagnoses, draw conclusions, and give recommendations only when there are sufficient data to support them. The second part of the modification, calling for the testimony to derive from reliable principles and methods, is apparently another attempt to discourage the use of invalidated or unreliable methods. To meet this part of the criteria, the proposed expert witnesses must demonstrate that they have applied the principles and methods reliably to the facts of the case. In other words, experts must be aware of what are the appropriate scientific psychology procedures and demonstrate that they have reached their conclusions by using the proper procedures and have utilized them in an acceptable manner.

Clinical forensic psychologists need to show that the methods by which they have performed evaluations meet the psychological standards. This may include use of standardized tests for which there are reliability and validity measures as well as standard errors written in the manuals. It may also include utilizing textbooks that describe clinical examinations using mental status exams, standard clinical interview techniques, and various ways of assessing samples of behavior. Many clinical forensic psychologists have begun using structured interviews to meet these standards. Including tests that measure the over-reporting or under-reporting of symptoms of mental illness may be another way to demonstrate the careful methodology that was used before coming to an opinion.

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See also: **Confidentiality and Legal Privilege; Forensic Psychology**

ADOLESCENT DEPRESSION

Depression during the adolescent years is a major public health problem. While somewhat rare in childhood, the rate of depressive disorders escalates over five-fold in the adolescent years, moving from a 12-month prevalence of less than 3% in the sixth- to ninth-grade years to a prevalence of 17% during the eighteenth year of life (Hankin**,** Abramson, Moffitt, Silva, McGee, & Angell, 1998). Whereas rates of depression increase during this period for both boys and girls, by mid to late adolescence, depressed females outnumber depressed males by a ratio of 2:1 (Hankin et al., 1998). It is estimated that 20% of young people will have at least one episode of clinical depression by age 18, and 65% will experience transient or less severe depressive symptoms (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993).

Adolescent depression compromises the process of development by interfering with academic and social functioning, and it represents a risk factor for both substance use and suicide. Moreover, the sequelae of adolescent depression include a host of later psychosocial deficits, including poor global and adaptive functioning, academic and occupational impairment, disrupted interpersonal relationships, early childbearing, reduced life satisfaction, and substance abuse/dependence (Fergusson & Woodward, 2002; Glied & Pine, 2002; Lewinsohn, Rhode, Seeley, Klein, & Gotlib, 2003).

Clinical Presentation

Clinical depression as seen in adolescents is characterized by depressed mood and/or loss of interest in activities as well as related symptoms such as sleep difficulties, appetite changes, a sense of hopelessness, increased aches

and pains, loss of self-esteem, difficulties with concentration, and thoughts of death and dying, sometimes with active suicidal plans. Many adolescents express their depressed mood via extreme irritability. Given that brief periods of low mood are common, the presence of a clinically significant depression should be considered when multiple depressive symptoms are present at the same time, persist for a period of at least two weeks, and are associated with significant impairment in the adolescent's functioning. Impairment can be observed if a teen's depressed mood, loss of interest in activities, and/or irritability interfere with his/her ability to participate in activities, go to school regularly and keep up with school work, or if they lead his/her teachers, parents, and/or friends to become upset with him/her. Parents, teachers, and primary care providers should offer support and monitor transient periods of low mood, while keeping a watchful eye out for a clustering and persistence of symptoms, especially when they are associated with a decline in functioning and social participation.

In some young people, episodes of clinical depression can last for many months and can interfere significantly with the adolescent's ability to keep up in school and remain active with friends. Adolescent depression is also associated with a high recurrence rate, with up to 69% of depressed adolescents experiencing a relapse within two to five years.

Causal Models

Current research suggests that, rather than a single specific pathway, depression arises from the convergence of a number of risk factors. Biological vulnerability is one of these factors: Children whose parents have had significant depression are at increased risk for depression as well as other behavioral and emotional problems. Children may inherit a genetic risk for depression or temperamental qualities such as sensitivity to negative emotions, or they may learn depressive coping styles modeled by their parents. Recent research on genetic risk factors has focused on the serotonin transporter (SERT) gene, a transmembrane protein that facilitates reuptake of serotonin. The SERT gene, located on 17q, contains a well-described insertion/deletion polymorphism (5-HTTLPR) in the promoter region. Research following a group of youth through adolescence and into early adult life found that individuals who carry one or two copies of the short (s) allele of the SERT gene are significantly more likely than those homozygous for the long (l) allele to experience depression following exposure to life stressors (Caspi et al., 2003).

Significant stressful life events are also considered a key element in triggering depression. Vulnerability to depression may be greater in adolescents who respond when exposed to stressful life events with a depressive or negative way of thinking that leads them to view themselves, the world, and their future in a negative manner. This is frequently described as seeing "the glass as half empty," while others can look at the same situation and see the possibilities—"the glass as half full." Many times individuals with a "depressive" cognitive style may come to see all failures as due to their own inherent faults but any success as pure chance or a fluke (Cole et al., 2008). This is called a negative attributional style. For adolescents, stressful events frequently include parental separation or divorce, moves, or exposure to abuse or neglect, with more recent attention given to the role of bullying, sexual harassment, and social pressures around physical presentation. Antidotes for depression include increased social support and social activity as well as teaching skills needed to manage stress.

Intervention Approaches

Although initial efforts to prevent the onset of depression in at-risk young people and to treat depression in children and adolescents were promising, concerns about how best to treat adolescent depression have emerged more recently. There is support for both pharmacological and psychosocial interventions for depressed youth, but the efficacy data suggest that a significant subset of teens do not respond to these interventions and, of those who do respond, many experience a relapse of symptoms within one year (Brent, et al., 2008). Many adolescents are resistant to taking medications, and serious concerns have been raised regarding the potential increased risk of suicide in youth using antidepressant medication (Newman, 2004).

Two structured psychotherapeutic approaches have shown promise in the treatment of youth who are clinically depressed. Cognitive behavioral therapy (CBT) is a 12 to 16 week individual treatment approach that focuses on teaching teens how to identify and then challenge (change) negative thought patterns as well as how to increase participation in pleasant events and improve stress management and social support. Interpersonal psychotherapy (IPT), another brief treatment (12 weeks), stresses the importance of the youth's social relationships and conceptualizes depression as occurring when a young person is in the midst of a change in social role (i.e. the adolescent transition) or does not have the social skills or social support to maintain a sense of well-being. Initial studies of this approach indicate success in improving overall social function, which may in turn lead to a decrease in depressed mood. Recent reports suggest more modest effects associated with these psychotherapeutic approaches (Goodyer et al., 2007; March et al., 2004; Weisz, McCarty, & Valeri, 2006), which underscores the need for further development of innovative treatment options for depressed adolescents.

In the context of these precautions, the current approach recommended is combined treatment. Many care providers begin with a trial of psychotherapy and add pharmacotherapy as an additional component when sleep

disturbance and/or recurrent worries are present or when a teen's depressed mood is so severe that it interferes with his/her ability to engage in psychotherapy. Prozac is generally recommended as the first choice medication, as it is FDA approved for use with youth and has proven efficacy for use with youth with Major Depressive Disorder (Simon, 2006). Care recommendations include the need for careful evaluation to assure that depression is the core problem and to identify co-occurring problems that may also need attention. Adolescents and their families must be warned about the potential risk of increasing suicidal ideation and in some cases aggressive behaviors as they begin both pharmaco- and psychotherapy. Plans need to be established for managing suicidal behavior should it arise, including attention to alternative coping strategies for the young person, safety proofing the home environment (i.e. securing medications and firearms), and regular follow-up with active outreach.

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See also: **Depression; Lifespan Depression; Mood Disorders**

ADOLESCENT DEVELOPMENT

Adolescence may be defined as the period in life when most of a person's biological, cognitive, psychological, and social characteristics are changing in an interrelated manner from what is considered childlike to what is considered adultlike. When most of one's characteristics are in this state of change, one is an adolescent.

Three Phases of the Scientific Study of Adolescence

Historically, the scientific study of adolescent development can be described as occurring in three overlapping phases (Lerner & Steinberg, 2004). The first phase was initiated by the work of G. Stanley Hall (1904), who conceptualized adolescent development from a deficit perspective. Adolescence was portrayed as a period marked by what Hall regarded as evolutionary-based and therefore inevitable "storm and stress." Although other major theorists during this phase in the study of adolescence (e.g., Erikson, 1959; Anna Freud, 1969) described adolescence in different terms, they accepted Hall's biologically based, deficit conception of this period.

A characteristic of the second phase in the development of this field was a focus on research about adolescent transitions. This work provided evidence that there are multiple pathways through this period of life—only a

minority of which can be characterized as reflecting deficits or "storm and stress." These findings elicited an interest in diversity within adolescence, as well as a concern with developmental plasticity (the potential for systematic variation in the structure and function of behavior) across this and other periods of life.

These interests ushered in the third and current phase in the study of adolescence, which is framed by a focus on developmental systems models. These conceptions involve the study across development of bidirectional, individual-context relations (represented as individual ↔ context relations) (Lerner, 2002). Moreover, the individual is seen as constituted by multiple levels of structural organization (e.g., genes, tissues, organ systems) and of multiple functional systems (e.g., physiology, cognition, emotion, motivation, and behavior), that are all reciprocally linked to multiple levels of the ecology of human development (e.g., families, communities, culture, the physical setting, and history).

In this third phase, these systems models guide research and application, and involve collaborative efforts among researchers and practitioners. As a key sample case of the scholarship involved within this third phase of the development of the field, we may point to research and applications associated with the Positive Youth Development (PYD) perspective.

Studying and Promoting Positive Youth Development

Developmental systems models emphasize that plasticity derives from variations within and across people in individual ↔ context relations across life. Adolescence is a transitory period, during which an individual is experiencing a considerable amount of change in regard to his or her individual and contextual domains. These multiple transitions include changes in the self (e.g., pubertal, cognitive, and emotional changes), family, peer groups, and institutions (e.g., in many societies, youth make transitions from elementary schools to middle schools). Although all adolescents experience these shifts, there are individual differences in the timing, speed, and outcomes of these transitions. As such, diversity becomes a core, substantive focus of developmental analysis and, because of plasticity, researchers and practitioners can be optimistic that combinations of individuals and contexts can be found to optimize development among diverse people.

Within the adolescent period, the ideas of plasticity and diversity have been used to understand how the well-being of adolescents can be fostered by maximizing the alignment of their strengths (e.g., their potential for change) with the developmental assets within their ecological context (e.g., home, school, and community). Such assets, conceived of as resources needed for the growth of a healthy, thriving, young person, may involve support from adults (e.g., parents, teachers, or mentors), effective out-of-school time activities (e.g., 4-H, Boys & Girls Clubs, Big Brothers/Big Sisters, YMCA, or Scouting), and opportunities for young people and adults to work together on valued community activities (e.g., food drives, school boards, or community service projects).

Positive Youth Development (PYD) is believed to occur as a consequence of this alignment between individual strengths and ecological assets, and has been conceptualized as involving several latent variables referred to as the Five Cs (Competence, Confidence, Connection, Character, and Caring). If an adolescent acquires these qualities across time, then he/she is "thriving" and on a path toward positive adulthood, where a sixth "C" arises, Contribution—defined by contributions to self, family, community, and institutions of civil society. The 4-H Study of Positive Youth Development has found that higher levels of the Five Cs are associated within and across the early adolescent years (e.g., grades 5 through 8) with higher scores for Contribution and lower scores for externalizing and internalizing problems (e.g., Lerner et al., 2005).

As evidenced by the research on PYD that has burgeoned across the third and current phase in the study of adolescence, current models of this developmental period stand in marked contrast with earlier descriptions of this period as one of "storm and stress." Adolescence is not a period of biologically inevitable problems or distress. Instead, it is a time of life involving enormous changes in the young person and opportunities to enhance the course of development among *all* youth. Simply, the potential for change in the course of development across an individual's life is a fundamental strength of human development, and certainly of adolescent development.

Accordingly, the current status of the field of adolescence provides an opportunity for researchers, practitioners, and policy makers to capitalize on the strengths of young people and the resources of their contexts to promote more positive development among the diverse youth of the world. As such, the cutting edge of current scholarship in the study of adolescence is to understand how research and applications (i.e., programs and policies) can mutually inform each other and serve both the advancement of science and the enhancement of the lives of youth.

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See also: **Cognitive Development; Emotional Development; Personality Development**

ADULT INTELLECTUAL DEVELOPMENT

Why do some individuals retain their behavioral competence well into advanced old age, whereas others show early decline? This question has long been a central topic in the psychology of adult development and aging. Five central questions and relevant research findings address this issue: (1) Does intelligence change uniformly through adulthood or are there different life-course ability patterns? (2) At what age is there a reliably detectable decrement in ability, and what is the magnitude of that decrement? (3) What are the patterns of generational differences, and what are their magnitudes? (4) What accounts for individual differences in age-related changes in adulthood; and (5) Can cognitive decline in old age be reversed?

The Measurement of Adult Intelligence

Most large-scale studies of adult intelligence conducted during the past few decades have used either the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1939), one of its derivatives, or a derivative of Thurstone's (1935) work on the primary mental abilities. Findings of these studies differ markedly, however, depending on whether age comparisons have been made cross-sectionally or whether the same individuals have been followed longitudinally over time.

Differential Patterns of Change

There is no uniform pattern of age-related changes across all intellectual abilities. Studies of overall intellectual ability (IQ) are therefore insufficient to monitor age changes and age differences in intellectual functioning for either individuals or groups. Age-difference work with the WAIS suggests that verbal abilities are maintained well, whereas performance tests show early age differences favoring younger adults (Matarazzo, 1972). Longitudinal data on the WAIS also show high levels of stability of verbal behavior into advanced old age, while performance scores begin to decline in midlife. Studies of Primary Mental Abilities indicate that active or fluid abilities tend to decline earlier than passive or crystallized abilities. These findings are complicated by ability, gender, ability-by-age, and ability-by-cohort interactions. For example, women tend to decline earlier in the active abilities, whereas men decline sooner on crystallized abilities. Although fluid abilities begin to decline earlier, crystallized abilities appear to show steeper decrement once the late 70s are reached.

Age Level and Magnitude of Age-Related Intellectual Decline

Cross-sectional studies with the WAIS suggest that significant age differences favoring young adults can be found by the 30s for performance tests and by the 60s for verbal tests. These differences, however, confound cohort effects in education and health status. By contrast, in longitudinal studies, reliably replicable average age decrements in intellectual abilities are rarely found before age 60 but are observed for all intellectual functions at least by age 74. Analyses of individual differences in intellectual change, however, demonstrate that even at age 81 less than half of all observed individuals showed reliable decremental change over the preceding seven years. An example of trajectories for six abilities taken from the Seattle Longitudinal Study (Schaie, 2005) is provided in Figure 1.

Generational Differences

The existence of generational (cohort) differences in intellectual abilities has been conclusively demonstrated. Almost linear positive cohort shifts have been observed for inductive reasoning, with more spasmodic positive shifts for verbal ability and spatial orientation. A curvilinear

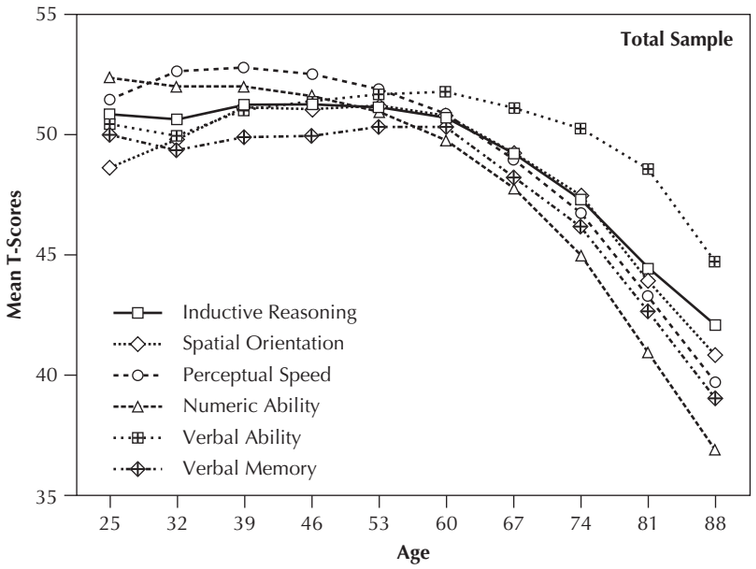


Figure 1. Longitudinal age changes in adulthood on six latent intellectual abilities. From K. W. Schaie, 2005.

cohort pattern has been found for number skills, which reach a peak for birth cohorts in the 1920s and then follow a largely negative slope. A similar curvilinear cohort pattern also has been observed for word fluency. As a consequence, cross-sectional studies of intellectual aging underestimate age changes before age 60 for abilities with negative cohort gradients and overestimate age changes for abilities with positive cohort gradients.

Individual Differences in Age-Related Change in Adulthood

Individual differences are large at all ages, such that substantial overlap among samples can be found from young adulthood into the mid-70s (Schaie, 2005). Very few individuals decline on all or most abilities. Indeed, maintaining functioning of one or more abilities is common for most individuals well into advanced old age. A number of factors account for individual differences in decline, some of which have been shown to be amenable to experimental intervention. Predictors of favorable cognitive aging include (1) absence of cardiovascular and other chronic diseases; (2) favorable environment as indicated by high SES; (3) involvement in a complex and intellectually stimulating environment; (4) flexible personality style at midlife; (5) high cognitive status of spouse; and (6) maintaining one's level of perceptual processing speed.

Reversibility of Cognitive Decline

Present understanding of individual differences in cognitive decline suggests that unless neurological pathology is present, cognitive interventions may serve to prevent known intellectual decline and reduce cohort differences in individuals who have remained stable in their own performance over time but have become disadvantaged compared with younger peers. The effectiveness of cognitive interventions has been demonstrated in various laboratory studies as well as in a recent major clinical trial (Willis et al., 2007). Cognitive decline in many older people may well be the result of disuse of specific skills and can be reversed by appropriate training regimens. In two studies, approximately 66% of the experimental subjects showed significant improvement, and about 40% of those who had declined significantly over 14 years were returned to the pre-decline level (Schaie, 2005).

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See also: **Aging and Intelligence; Primary Mental Abilities**

ADULTHOOD AND AGING

People are inherently social beings. Although this need for social relationships is observed in people of all ages, the structure and relative importance placed on various members of the social network changes across the lifespan. The convoy model of social relations discusses both the stability and changes that occur in social network composition over time. According to the convoy model, an individual moves through life embedded within a network of people who provide aid, assistance, and support, as well as serve as a secure attachment base from which the individual may explore his or her world. The size of this network is posited to change predictably across the lifespan to reflect shifting social roles and family composition. These changes follow a curvilinear pattern, with numbers of close relationships lowest in early childhood, increasing throughout early and middle adulthood, and then decreasing in later adulthood (see review by Antonucci, Akiyama, & Takahashi, 2004).

The age-related reduction in social network size is one of the most reliable findings in social gerontology. Although shifting roles and changes in family composition may, in part, be responsible for decreases in social network size, socioemotional selectivity theory posits that this age-related shift is the result of a developmental process of social selection that begins early in adulthood. According to this theory, people actively reduce the number of peripheral partners with whom they interact, but retain the same number of emotionally close social partners across the life-span, a pattern documented across ethnically diverse groups of Americans and in cross-cultural samples (see review by Charles & Carstenson, 2007).

People Comprising the Social Network

Social networks consist of both friends and family members. Friendships comprise various types of associations, from casual relationships to more intimate, collaborative, and enduring bonds. Friends serve as confidants, model coping strategies, enhance self-esteem, and buffer stressful life events. Despite the finding that the number of peripheral relationships decrease with age, older adults still maintain a small number of acquaintances in their social networks. For older adults, these casual friendships provide companionship that contributes to well-being and lower levels of loneliness (see review by Rook, Mavandadi, Sorkin, & Zettel, 2007).

In contrast to the decreases in number of casual acquaintances with age, the number of intimate social partners remains relatively stable in late life. In addition, reported satisfaction with family members increases with age (see review by Charles & Carstensen, 2007). Compared with younger adults, older adults report more intense positive emotional experiences with family members, equally as intense positive emotional experiences with established friends, and less intense positive emotional experiences with new friends, which may reflect the value placed on these different social partners.

Turning to familial relationships, connections with siblings are enduring relationships that are related to emotional well-being. In addition, the marital tie is also important to overall well-being, but reports of satisfaction vary over time. Relational satisfaction for people who are married or in a long-term partnership decreases over time. People whose marriages survive into old age, however, report high levels of marital happiness and contentment. Although they report that difficult times occurred in their marriage, they attribute their marriage's longevity to strong levels of mutual commitment and friendship (e.g., Henry, Berg, Smith, & Florsheim, 2007).

The parent-child bond is also a source of satisfaction for parents of all ages. Research by Karen Fingerman reveals that middle-aged mothers enjoy watching their daughters enter adulthood, and report greater investment in these relationships than do their adult daughters. Relationships between parents and children are, by and large, marked by reciprocity, with both generations reporting high levels of shared emotional and instrumental support. This reciprocity extends across the lifespan, where time investment with children earlier in life predicts the social support provided by these adult children when the parents reach old age (Silverstein, Conroy, Wang, Giarusso, & Bengtson, 2002).

The extant work on family ties may not necessarily capture the changes in family structure currently observed in the United States. The majority of research examining family ties has focused predominantly on the insular traditional family group of children and parents, but the definition of family is changing. With greater life expectancy, intergenerational connections will become more important to family members to fulfill emotional and practical needs. In addition, higher rates of divorce and remarriage introduce understudied unions that will also influence social networks of older adults. Moreover, non European-American family systems often include extended kin networks, and the importance of these family members has been relatively ignored in the literature.

The Importance of Social Connection for Health and Well-Being

The structure of the social network shifts across the life span; yet, regardless of age, social connections are necessary for mental and physical well-being. Among older adults, having meaningful relations is associated with better immune profiles, improved cardiovascular indices such as lower blood pressure and decreased cardiovascular reactivity, faster recovery from illness, lower chances of illness relapse, and lower risk of mortality compared to those with poor social support indices (see review by Rook et al., 2007). In fact, the effects of low perceived social support in later life may be even more detrimental to physical

health when it occurs in an older, more physically vulnerable system. The influence of social ties extends to cognitive outcomes as well. Higher levels of cognitive functioning are associated with higher levels of social support and greater social integration, whereas social disengagement is associated with greater cognitive decline (e.g., Beland, Zunzunegui, Alvarado, Otero, & del Ser, 2005).

The Negative Side of Social Relationships

Despite the positive outcomes associated with social relationships, negative consequences also can occur. Older adults report fewer interpersonal conflicts than do younger adults, but these negative exchanges have stronger associations with affective and physical well-being than do positive social exchanges. For example, stable high levels of negative social interactions across time are also associated with poorer self-rated health, a greater number of chronic health conditions, and a greater incidence of functional limitations (Newsom, Mahan, Rook, & Krause, 2008).

One source of interpersonal stress that increases in prevalence with age is the strain associated with spousal caregiving. Spousal caregiving for a spouse with dementia is a situation marked by unpredictability, loss of control, and higher levels of distress (Schulz & Beach, 1999). The role of spousal caregiver demands emotional and physical stamina and takes its toll in both of these domains. With the exception of a minority of adults who experience increases in their sense of purpose and life satisfaction, most caregivers experience decreases in well-being. Rates of depression and anxiety are higher among caregivers than the general population, and physical complaints often increase with the added physical and emotional strain of caregiving (Schulz & Beach, 1999).

Social processes are critical at every age and by no means diminish in importance across the adult life span; over time, the number of social partners may decrease, but the meaning of close friends and family members becomes even more central to the daily lives of older men and women. Most social relationships are positive, yet interpersonal conflict and strain sometimes occurs, and this conflict is strongly tied to affective distress. These social relationships, which comprise sources of both joy and strain, remain strongly related to physical and affective well-being across the adult life span.

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See also: **Geropsychology; Human Development**

ADVERTISING PSYCHOLOGY

Consumer psychologists utilize psychological concepts to understand, influence, and predict consumer behavior. Of these concepts, the study of attitude formation and change are of particular interest. Marketers use a wide variety of advertisements to attempt to persuade consumers to buy their products and services. These "ads" can be classified in terms of the type of attitude they are designed to change and in terms of consumers' regulatory focus (Kardes, 2005). People regulate themselves or control their behavior by focusing on information that is most relevant to their goals.

An attitude is an evaluative judgment that consumers form about people, objects, and issues. It consists of two main components: direction (e.g., good or bad, positive or negative) and extremity (e.g., slightly good, somewhat good, fairly good, very good, extremely good) (Kardes, 2002). There are four major types of attitudes based on the functions they serve: knowledge, value expression, ego defense, and adjustment (Kardes, 2005). Attitude function theory suggests that, to be effective, a persuasion strategy must match consumers' attitude function (Katz, 1960). Research has demonstrated that persuasive messages receive more attention and are considered more

carefully when persuasion techniques match attitude functions (Petty & Wegener, 1998).

There are two major types of regulatory focus: (a) a promotion focus or concern about achieving a desirable end state; and (b) a prevention focus or concern about an undesirable end state (Higgins, 1998). Regulatory focus theory suggests that personality traits and situations jointly influence whether people are more concerned about achieving their hopes, wishes, and ideal end states (a promotion focus). For maximal effectiveness, advertising techniques should match both consumers' attitude function and regulatory focus. Combining attitude function theory and regulatory focus theory results in eight distinct categories of advertisements related to consumer motives and goals. These categories are summarized in Table 1.

Attitudes that serve a knowledge function summarize large amounts of information to provide consumers with an organized, meaningful, and stable perception of the world. Attitudes serving this function simplify consumer decision making by integrating information into a single overall evaluation. Once the overall evaluation is formed, it is no longer necessary to evaluate the relative benefits and costs of all relevant decision options each time we are faced with a decision. Even deciding what to eat at McDonald's would be remarkably difficult and time-consuming: The benefits (e.g., taste, aroma, satiating properties, appearance) and cost (e.g., price, calories, messiness) of each and every item on the menu would need to be evaluated each and every time a consumer walks into a McDonald's restaurant. The best way to change attitudes that serve knowledge function is to focus on facts and arguments and to anticipate how consumers will use these facts and arguments while thinking and reasoning about an advertisement. In general, knowledge appeals work best for complex products with a large number of attributes.

Promotion-focused knowledge ads rely on strong arguments in the form of factual, logical, and comparative ads to encourage consumers to form favorable brand attitudes that are held with a high degree of certainty and confidence. These types of appeals provide meaningful information about specific features and uses of products relative to achieving a desired end state. Prevention-focused knowledge appeals use ambiguity, uncertainty, and confusion to reduce resistance to persuasion. Good examples of these types of ads are mystery (teaser) ads, surprise ads, and confusion (disruption) ads. These types of ads gain consumer attention and encourage open-mindedness through building curiosity and interest, introducing a surprising piece of information, or creating confusion. Open-minded consumers are more likely to try new brands that they have never used before. Further, Kardes et al. (2007) demonstrated that confusing consumers with a disruptive message and then reducing ambiguity by reframing the message increases persuasion.

Table 1. Types of Advertisements

Attitude Function	Promotion-Focused Ads	Prevention-Focused Ads
Knowledge	Factual Logical Comparative	Mystery Surprise Confusion
Value Expression	Image Celebrity	Nerd Alerts
Ego Defense	Authority Figures Experts	Fear
Adjustment	Pleasure	Pain

Source: Adapted from Kardes (2005)

Knowledge appeals involve the use of strong arguments provided by the advertiser and careful thinking on the part of the consumer. These are hallmarks of the central route to persuasion, which involves carefully thinking about information that is relevant (or central) to the merits of a product (Petty et al., 2005). The other appeals to be discussed (value expression, ego defense, adjustment) often involve simple cues provided by the advertiser and relatively little thinking on the part of the consumer. That is, the other appeals often involve the peripheral route to persuasion in which consumers rely on a simple cue (e.g., brand new reputation, likeable spokesperson, cute babies or animals, music, mood) to form an attitude quickly and easily (Petty et al., 2005).

Attitudes that serve a value-expressive function help us to communicate our traits, preferences, and interests to others, thereby aiding in social interactions. As consumers, we express ourselves through attitudes toward products and services. Ads that appeal to the value-expressive function work best for products that are used publicly. Promotion-focused value-expressive appeals emphasize the attainment of positive self-expression. For example, preferring conservative clothes reflect conservative attitudes and lifestyles, whereas preferring daring clothes reflect daring attitudes and lifestyles. If we want to appear sophisticated, we may express favorable attitudes about goods like Dom Perignon champagne, Rolex watches, and BMWs. If we want to express our patriotism, we may buy only American-made products. If we want to express our concern for the environment, we may purchase environmentally friendly ("green") goods. Consumers who are highly concerned with projecting positive self-images are highly susceptible to image appeals and celebrity advertising. These types of ads utilize attractive actors and celebrities that consumers wish to emulate. Surprisingly, consumers continue to believe that celebrities really like the products they endorse even when they are reminded that celebrities are paid handsomely for their endorsements (Cronley, Houghton, Goddard, & Kardes, 1998).

Prevention-focused value-expressive appeals emphasize avoiding a negative image. These types of ads utilize unattractive actors and celebrities that are portrayed in a socially negative fashion using an ineffective competing brand. These poor, sad, physically unattractive actors may wear thick glasses and ugly clothes, display unintelligent facial expressions and use products that are completely ineffective (e.g., cooking utensils that fall apart during use, cleaning products that do not remove any type of stain). These types of ads are referred to as nerd alert ads. One way of not emulating unattractive or undesirable people is to not use the products they use. Consistent with the implications of attitude function theory, image-conscious teens are more influenced by nerds and cool kids than by boring facts, figures, and statistics (knowledge appeals) about the negative effects of tobacco, drugs, and alcohol (Herr, Kardes, & Kim, 1991).

Attitudes that serve an ego-defense function bolster our self-esteem and help us feel better about ourselves. These attitudes help people deal with frustration, emotional conflict, and threats to our ego. Religious and political beliefs typically fit in this category, and, consequently, religious and political beliefs are rarely swayed by facts and figures (knowledge appeals), image (value-expressive appeals), or hedonic concerns (adjustment appeals). Attitudes toward protection devises such as security systems (for homes and cars), insurance policies, retirement policies, guns, condoms, medicines, and other health-related products are also influenced primarily by ego-defensive appeals. These appeals involve the use of Freudian defense mechanisms like wishful thinking (good things will happen to you and bad things will not), denial (refusing to believe what you do not want to believe), repression (forgetting things you do not want to think about), and projection (seeing your flaws and weaknesses in others). Freudian defense mechanisms help people to feel safe from real or imagined threats and to feel superior to real or imagined groups (e.g., stereotypes) (Amodio & Devine, 2005). Ego-defense ads are most effective when targeted toward insecure consumers.

Promotion-focused ego-defense ads use trusted authority figures (e.g., political and religious leaders) and experts (e.g., doctors, lawyers, and scientists) to help consumers feel safe and secure from real or imagined threats. Advertisements often utilize character actors, stereotypic attire and behavior, and specific settings and props to give the impression of authority or expertise. For example, a careful placement of an impressively large bookshelf filled with scholarly books behind a politician, a lawyer, or a banker can make the person look more intelligent (Cialdini & Sagarin, 2005). Prevention-focused ego-defense ads use fear appeals to make consumers feel threatened. Fear is a powerful emotion that is useful in motivating consumers to buy products that make them feel more safe and secure. For fear appeals to work, consumers must believe that they are capable of changing their behavior; if they do not believe they are capable, they give up prematurely.

Attitudes that serve an adjustment function help consumers to gain immediate rewards and avoid immediate pain. The pleasure/pain principle can be very motivating and persuasive to consumers. Consumers buy products simply because the product tastes good or feels good and consumers avoid some products simply because the products taste bad or feel bad. Complex arguments and logical thinking (knowledge appeals), the image of consumers who use this type of product (value-expressive appeals), and concerns about safety or self-esteem (ego-defensive appeals) are largely irrelevant for these types of goods.

Promotion-focused adjustment ads emphasize benefits (e.g., simple pleasures, incentives) to encourage consumers to buy the advertised brand. Simple benefits, such as saving money and feeling good, are often emphasized in promotion-focused ads. These types of appeals work for both hedonic and utilitarian products. Hedonic products, especially "guilty pleasures," include high-calorie foods and beverages, comfortable but ugly clothing, and entertainment products that no one wants to admit they like. Shavitt (1990) further demonstrated that promotion-focused adjustment appeals are persuasive for utilitarian products like air conditioners. Air conditioners serve a specific utilitarian purpose: to keep consumers cool and comfortable (pleasure). Prevention-focused adjustment ads emphasize cost (e.g., pain, loss, regret) to encourage consumers to avoid competing brands and purchase the advertised brand. Products like pain relievers, antacids, and laxatives are advertised most effectively using this type of appeal. These products do not promote good health or longevity, but they make unpleasant symptoms such as pain and discomfort go away.

In summary, when consumers see or hear an advertisement that uses a persuasive technique that fails to match the function of their attitudes toward the advertised brand, consumers pay little or no attention to the ad. On the other hand, when consumers see or hear an ad that uses a technique that matches the function of their attitudes and their regulatory focus, consumers attend to the ad more carefully and think about the implications of the advertiser's message, and this increases ad effectiveness.

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AESTHETICS

Aesthetics is the study of how human beings react in sensory and emotional fashion to the things we encounter in life, especially as being appealing or not appealing. Is a person beautiful? Is this dessert delicious? Is that work of art particularly moving? Researchers who study taste or beauty in humans are engaged in work in aesthetics, but in recent years the field has focused more on how people react to works of art, broadly defined (fine arts, music, architecture, film, and so on). Although the field evolved from and still has close ties to philosophy, aesthetics from the perspective of how people actually perceive and react to works of art can be seen as a logical branch of the study of psychology. This is sometimes referred to as the psychology of aesthetics or empirical aesthetics, to differentiate it from its philosophical cousin. This line is not always clear, however, and some scholars, notably Dewey, move with facility between philosophy and psychology. Aesthetics can be contrasted to the related term, art, in that aesthetics concerns the reception of stimuli rather than their production.

The question arises as to whether aesthetics is more properly considered to be the study of beauty or the study of art? Clearly one can see beauty in objects that are not art (e.g., the things of nature), and equally clearly, not all art would be classified as beautiful. So, what is this field about? It is probably most accurate to say that the field evolved from contemplation of things beautiful and pleasing to encompass art very broadly defined, without losing its original interests in things that appeal to our senses. The psychological approach to exploring these issues involves empirical study and the generation of models and theories based in psychology to explain and understand what we experience in life. Thus, aesthetics from a psychological perspective is the study of all things beautiful whether art or not, and all things art whether beautiful or not.

History of the Field

It is almost always possible to trace the origins of a scientific discipline to antiquity, and aesthetics is no exception. We can see a concern for aesthetics in ancient biblical, Chinese, Islamic, Talmudic, and philosophical writings. Plato, Aristotle, Confucius, Hegel, Schopenhauer, Kant, Marx, and Freud all wrote about aesthetics. It is not surprising that the great thinkers have contemplated the issue of what is art and what is beautiful. Art is universal, and it follows logically that the perception of art and beauty are universal as well. Thus, an interest in how humans perceive beauty and art can be seen to be almost as natural, indeed inextricably entwined, with art itself. It would not be possible in this discussion to mention all the notable figures in the field of aesthetics, so we concentrate on three essential scholars.

Gustav Fechner

Just as psychology grew out of philosophy in general, so did the psychology of aesthetics grow out of philosophical approaches to aesthetics. And so a logical place to begin looking at the history of aesthetics from a psychological perspective would be with one of the founders of the field of psychology, Gustav Fechner. In the 1870s, Fechner took the prevailing philosophical approaches to aesthetics and turned them literally upside down (Fechner, 1978). He argued that philosophical approaches to aesthetics took a top-down approach, beginning by defining beauty from philosophical principles and then working toward a theory of aesthetics from that starting point. Fechner took a bottom-up approach by trying to determine the basic aspects and conditions of how and why people like things. His goal was to supplant Aristotelian and Kantian theories by building a theory up from these basic understandings (Allesch, 2001).

Fechner's methodological approach helped to develop the entire field of experimental psychology. He developed three complementary approaches to measuring aesthetic preference: (1) choice, in which the participant chooses a preferred object or rank orders more than two objects; (2) production, in which the participant modifies an object until a preferred state is obtained; and (3) constant stimuli (or single stimuli), in which a response is given to a single object (as contrasted with the choice approach). These methods are still used in a wide variety of sub-disciplines within psychology.

Daniel Berlyne

It would be an overstatement to say that the psychology of aesthetics basically remained dormant from the time of Fechner to the work of Daniel Berlyne in the 1950s, but one might say the field experienced a renaissance through Berlyne's efforts, summarized in *Art and Visual Perception: The Psychology of the Creative Eye* (Berlyne, 1971). Working from a psychobiological perspective, Berlyne was particularly interested in the arousal that objects produced in individuals. Although this presentation greatly simplifies his theory, his basic argument was that arousal was strongly influenced by the complexity and novelty of an object. Furthermore, humans typically find a moderate level of arousal to be most pleasing. Berlyne's model also included variables such as the meaning of the object and its intensity, ambiguity, brightness, and size. Recent research in the psychology of aesthetics (e.g., Martindale, 1991) has questioned Berlyne's model; philosophical approaches to aesthetics have questioned whether Berlyne was actually asking the most important questions.

Rudolf Arnheim

In *Art and Visual Perception,* along with other seminal works, Rudolph Arnheim (1971) brought Gestalt psychology to the study of aesthetics, in particular to painting and film. Arnheim emphasized the importance of the individual who is viewing a work of art, the relationship of the parts to the whole of artistic creation, working from the whole to the parts, and what he termed *the power of the center* in art. His approach focused on how viewers bring together what he called forces or fields that influence the perception of a work. Arnheim (1971) argued that vision is "not a mechanical recording of elements but rather the apprehension of significant structural patterns" (p. 6). Arnheim's model is less concerned with the culture or context of a work of art than its structural aspects and how the viewer responds to them. An excellent summary of Arnheim's contributions to aesthetics can be found in Cupchik (2007).

Aesthetics Research Today

The field of the psychology of aesthetics, although small in the overall structure of the discipline of psychology, is nonetheless thriving today. Some areas of research focus on those issues first discussed in work by Berlyne, Arnheim, and other pioneers, while others are asking new and different questions. For example, Locher, Gray, and Nodine (1996) have used experimental approaches and eye movement cameras to examine issues related to balance, symmetry, and the center of artistic works. Based on extensive interviews with more than 300 individuals, Parsons (1987) presented a cognitive-developmental perspective on how people experience aesthetic encounters. Leder, Belke, Oeberst, and Augustin (2004) have developed an information-processing model of the process through which people make sense out of abstract art. These and other research paradigms exemplify the vibrancy of the field of the psychology of aesthetics as it exists today.

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See also: **Society for the Psychology of Aesthetics, Creativity, and the Arts**

AFFECT (See Emotions)

AFFECTIVE DEVELOPMENT

Affect, as a feature or type of behavior, and hence a focus of psychology, is one of the least understood and most challenging problems in the field. "Affect" relates to and/or encompasses a wide range of concepts and phenomena including feelings, emotions, moods, motivation, and certain drives and instincts. It is often used as a synonym of "emotion"; however, others have used it to describe external manifestations of emotion or mood. Anger, joy, fear, laughter, sadness, anxiety, pride, love, hate, and so on—are all so central to human experience, yet so little understood by psychology. Theorists and researchers have approached affect in numerous ways, often using idiosyncratic, contradictory, or mutually exclusive conceptualizations and operational definitions, thus resulting in confusion and limited progress in our understanding of affect or any of these other related or synonymous constructs.

The psychology of *affective development* seeks to describe, map, and explain the processes, continuities, and changes in the experience, differentiation, and expression of affect over the life course. Traditionally, affective development has been placed in dichotomy, or even counterpoint, with cognitive development, reflecting an age-old concern with mind-body dualism, thinking versus feeling. Much of the current discussion centers around the interaction or mutual influence of emotion, cognition, and behavior.

Emotions play an important role in the lives of people. As a state of feeling, emotions have physiological and cognitive components. Various stimuli trigger a physiological response (e.g., as evidenced by heart-rate measures or fMRI indices) referred to as arousal. The individual's cognitive appraisal of the event includes assessing the personal relevance of the arousing stimuli, as well as coping options available to the individual, thus determining the emotion aroused (see Lazarus & Folkman, 1987; Smith & Lazarus, 1993). Individuals differ as to the intensity of their affective responsiveness across specific emotion categories (Larsen & Diener, 1987), which suggests that temperament plays an important role in people's affectivity. Aside from affective experience, affect regulation has received increasing attention from researchers across several disciplines. Affect regulation refers to maintaining self-control in the face of highly arousing stimuli. The ability to regulate affect is a mechanism that underlies mood and anxiety disorders; it is sometimes referred to as the affective illnesses.

Models of affective development vary in the degree to which they emphasize biological elements or socialization elements. Traditional Freudian and Eriksonian theories of psychosexual and psychosocial development present stage theories of affective development. Piaget noted a parallel system of the development of affectivity but emphasized cognitive features of development. Darwinian and ethological models are especially interested in unlearned complex behavior; they often posit central nervous system specificity, as well as correspondence between stimulus or elicitors and an individual's affective response. Socialization models emphasize learning processes, especially in the infant-caregiver attachment and interaction as well as situational or environmental influences on the affective experience or expression. Reliance on one or the other model type, of course, influences the manner in which affective development is understood or studied. For instance, biological researchers might be more likely to measure electrophysiological responsiveness or neurophysiological correlates of specific emotions, whereas socialization researchers might be more interested in observing the quality of parent-child attachment and separation reactions over time. It is likely that integration of multiple models and perspectives will be essential to furthering our understanding of affective development. Indeed, such comprehensive and integrative bio-ecological approaches are evident in current theories of affective development such as Sroufe's organizational perspective, Tomkins and Izard's differential emotions theory, and Davidson's affective neuroscience.

Humans learn to regulate emotions in infancy. A growing number of studies (e.g., Gunnar et al., 2006) show compelling evidence for the need to consider both biological and contextual elements of affective development. The basic neural mechanisms of emotions develop in the context of caregiver-child relationships. Infants and their caregivers

interactively co-construct the environment needed for maturation of a control system in the right brain of the infant, which plays a key role in emotional development (Schore, 2001). Infants are equipped to play a primitive role in their own regulation (e.g., by sending "signals" of distress), however they are not capable of self-regulation, only "co-regulation," which requires ample assistance from caregivers (Sroufe, 2000). In daily exchanges of signals with responsive caregivers, children learn to turn extreme emotional reactions into more regulated emotions and maintain calm levels of arousal (Greenspan & Shanker, 2004). The infant's growing ability to regulate emotions, in turn, affects the caregiver's emotional state and the ability to provide continuous stimulation and emotionally appropriate sensations.

A divergence from narrow models affords a far more inclusive and nonlinear approach to studying affective development. Recognizing the capacity of both the child and the environment for self-organizing, inherent in the notion of the transactional (circular) nature of person-context interactions allows us to look at the neurobiology of affective development, *temperament*, cognitive development, parent-child relations in mutually interactive nonlinear ways. While traditional inquiry emphasized the development and impact of negative affects such as depression and anxiety, recent focus on processes involving positive affects—joy, hope, contentment, interest, excitement—promise a more complete and useful emergent understanding.

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See also: **Emotional Development**

AFFECTIVE DISORDER (See Mood Disorders)

AFFILIATION NEED

Theorists of personality and social psychology have long speculated about the processes involved in motivating individuals toward relationships with others. In the 1930s Henry Murray (1893–1988) and his multidisciplinary team at Harvard University studied the personality traits of 51 young men and produced one of the first major systematic studies of human personality. Stemming from this research was the landmark *Explorations in Personality* (Murray, 1938), which cataloged more than 20 human motives or "needs," one of which was the need for affiliation (*n*Aff). Murray's research program in personality formed the basis for several early personality tests, including the Thematic Apperception Test (TAT; Morgan & Murray, 1935), which assesses a dimension of need affiliation.

Out of his list of human motivation, Murray identified affiliation motivation as being the tendency to "form friendships and associations; to greet, join, and live with others; to co-operate and converse sociably with others; to love; to join groups" (Murray, 1938, p. 83). Murray believed that affiliation motivation was related to other social needs, and he grouped need for affiliation with three other social affect needs—rejection, nurturance, and succorance (the seeking out of emotional support). In this regard, Murray saw need for affiliation being strongly related to the needs for nurturance and succorance, whereas need for rejection was the "flip side" or alterego form of affiliative need.

McClelland (1951, 1953), along with his team of research assistants, drew on Murray's list of motives in developing his acquired needs theory (also referred to as the three-need theory or the learned-needs theory). In this theory, McClelland proposed that human needs are acquired over time and shaped by our individual early life experiences and our particular cultural background. A key premise of this theory is that most human motivation comprises three dominant needs: (1) the need for achievement (*n*Ach); (2) the need for power (*n*Pow); and (3) the need for affiliation (*n*Aff). McClelland proposed that the importance of each of these three needs varies from individual to individual, and that the level of people's motivation and effectiveness in different situations such as work and family life will differ depending upon their personal need orientation.

McClelland asserted further that individuals with high-power needs are motivated to either control others or to influence social and organizational situations, whereas individuals with high-achievement needs are characterized by a desire to do well and achieve. In contrast, individuals high in affiliative need desire to feel related to others in positive ways. Highly affiliative individuals wish to maintain others' affections and are motivated to seek out interpersonal relationships and friendships. In work environments, highly affiliative individuals generally feel rewarded by being involved in work that involves a high level of interaction with others. In this regard, they tend to be employees who are successful in the fields of human service and in work that involves teamwork and group collaboration.

In terms of measurement, McClelland used a version of the TAT to investigate the saliency of power, achievement, and affiliative needs in individuals. While he focused particularly on developing scoring techniques for assessment of achievement need, Shipley and Veroff (1952) developed a reliable system for scoring need affiliation.

Based on the early work of Murray (1938) and McClelland (1951, 1953) and his colleagues, among others, Hill (1987) further developed the concept of need for affiliation by specifying four different incentive motivators that can serve to move individuals towards affiliative behavior with others. These motivators include (1) positive stimulation, or the ability of affiliation to provide opportunities for enjoyable affective and cognitive stimulation; (2) attention or praise, which offers the possibility of enhancement of feelings of self-worth and importance; (3) social comparison, which allows for the reduction of ambiguity about one's personal position through comparison with others; and (4) emotional support or sympathy, which offers the potential for reduction of negative feelings through social contact. Using factor analysis, Hill designed the Interpersonal Orientation Scale (IOS), which was the first personality measure designed to assess these four underlying dimensions of motivation for affiliation.

Based on his own work, as well as the earlier work of Shipley and Veroff (1952), Hill (1987) proposed that the reason certain individuals are more highly affiliative than others is because they have a heightened sensitivity toward the availability of these four types of social rewards and because they also experience highly positive emotional reactions to these rewards. Hill also found that the types of affiliative behavior people engage in may be expected to change depending on the type of rewards offered across different social situations. For example, individuals are generally more likely to report a motivation to engage with others in a party situation for the rewards of positive social stimulation, whereas they tend to seek out positive attention and recognition in a work-project situation.

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See also: **Achievement Need; Altruism**

AGE REGRESSION

Age regression, as a clinical hypnotic technique, leads clients in trance back through time to re-experience past events from their lives. Clinically, hypnotic age regression has been useful in uncovering information important to therapy. Classically, this technique has been used to uncover earlier traumatic experiences with the belief that the catharsis of reliving the experience is healing. Other therapies such as psychoanalysis also find the examination of earlier life experiences useful, but when hypnotic age regression is used, the emotions of the experience can be relived more vividly and efficiently.

Age regression has also been used in uncovering memories for use in forensic investigations and testimony. Such uncovered information may be of use at times, but the veracity of these recovered memories is rightfully questioned, and the recovery techniques must be used with extreme care to avoid any leading suggestions.

In the clinical setting, a client comes to therapy with specific complaints, symptoms, or problems. Sometimes, as therapy progresses, issues arise related to experiences earlier in life. Sometimes memories may be vague and need to be uncovered or clarified in order to be faced more directly. The veracity of these memories may not be certain, yet the emotional and somatic experiences they elicit are significant. At other times, clients' emotional or somatic complaints may not seem to be related to anything specific in their past and are described with unknown etiology. In each of these situations the use of age regression will likely facilitate greater understanding.

Hypnotic age regression is performed by first inducing a hypnotic trance in the client or subject. Many techniques of trance induction can be found in numerous books on hypnosis (e.g., Hammond, 1990). After a basic trance has been induced, the language to induce age regression includes such phrases as, "As you go back through time, watch the years go by, watch the events of your life, places, people, situations pass by . . . " If the issue of concern is already known to be a specific earlier life experience, the suggestion is made that the client go back to that specific time. If the past situation is not specifically known, age regression is used in conjunction with the technique of the affect or somatic bridge (Watkins, 1992, p. 60–64). The bridge is an affective or somatic complaint as described by the client in psychotherapy. As trance induction proceeds, the suggestion is added that the client carry back through time the emotion or somatic complaint, for example, the client's symptoms of anxiety or heartburn. Ideomotor signaling (Hammond, 1990, p. 518) is also useful in this situation, in which the client is instructed to lift a finger to signal to the therapist when something relevant or important is experienced during the regression.

The client is then asked to describe the experience and is led by the therapist's questions to elaborate on the experience while remaining in trance. Often this experience leads to an abreactive emotional release. These procedures are often referred to as analytical hypnotherapy or hypnoanalysis (Barnett, 1981; Watkins, 1992). Without such an emotional release, the suggestion may be made that the client go further back in time, while again using the affect bridge. Depending upon the nature of what is uncovered, comparing three or more past experiences may reveal a pattern of behavior or cognition that makes the experiences significant.

Sometimes anxiety or fear is experienced when a severe trauma is hypnotically re-experienced. If such fear or anxiety is severe, having defined earlier in therapy a safe place to which the client can retreat is useful, but initially offering a cautionary suggestion that the client will face only that which he or she is emotionally ready to face generally diminishes such anxiety. Hypnotically re-experiencing traumatic experiences may not always be cathartic but may intensify the trauma, especially when the client does not have available alternative or healthier behaviors or responses to the trauma. Besides first uncovering the traumatic experience(s) and second, supporting the emotions released by the experience, two additional steps in the therapeutic process may be necessary. Brink (2002, pp. 158–160) identifies the third step: While considering the traumatic experience, the client can be asked to answer the question "What do I need?" For example, what is needed from an abusive parent could be stated "I need my father to be gentle and patient with me. I need him to understand that I am only a child," or, "I need a strong mother who can protect me." The client is encouraged to identify as many such positive alternatives and phrases as possible. The fourth step (pp. 160–161) is then to lead the client to practice filling this need for others in his or her life by being gentle, patient, and strong.

Although cognitive behavior therapists tend to deny the importance of early life experiences and unconscious processes, these techniques of hypnotic age regression can be very useful in cognitive therapy (Brink, 2004–2005, pp. 281–292; Zarren & Eimer, 2002, pp. 227–231). Several reasons seem evident as to why a memory is forgotten. It may be suppressed because of the pain of the trauma. The experience may have been preverbal and experienced only emotionally without a cognitive component, or it may have been denied as important by a parental figure and thus denied by the client through learning. Yet the memory is retained at an unconscious level. For example, while in trance one client recalled that when his father came into the room when he, as a young boy, was playing with pots and pans from the kitchen cupboard, the father "sighed." This "sigh," a sign that communicated disappointment, disgust, or a lack of approval, led the child as a young adult to feel inadequate and eventually to fail in college. Only in therapy were words finally put to this young man's feelings. As the memory is uncovered and words are put to it, these cognitions may be modified, and such modification can be greatly facilitated through the therapeutic techniques described above.

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See also: **Abreaction; Recovered Memories; Trauma Psychology**

AGGRESSION

The most widely accepted definitions of aggression define it as behavior that is intended to injure another individual, physically or psychologically. Within this definition, a number of important subtypes are identified. First, a distinction is made between hostile or reactive aggression, which is aggression arising from feelings of anger or hostility, and instrumental aggression, which is aggression that arises in service of goal attainment (e.g., armed robbery).

Second, physical aggression and relational aggression can be differentiated. Relational aggression is characterized by the use of verbal acts (including gossip and taunts) and social exclusion to cause psychological harm. Females engage in relational aggression at higher rates than they engage in physical aggression. However, the overall gender difference in relational aggression is small. Many males also exhibit relational aggression.

A third distinction can be made between interpersonal aggression and institutional aggression (e.g., war, genocide). Although this is an interesting and potentially useful distinction, most aggression research focuses on interpersonal aggression.

Given this heterogeneity in defining aggression, summarizing rates of aggression is a difficult task. The most readily available data are for criminal-level violence. According to the United Nations Statistics Division, the worldwide homicide rates per 100,000 inhabitants in 1996 ranged from 0.3 in Guyana to 80 in Colombia. Other violent criminal offenses can also be considered. In 2005, the U.S. Bureau of Justice Statistics recorded 15,495 occurrences of murder and nonnegligent manslaughter (5.9 per 100,000 inhabitants) and 791,988 cases of aggravated assault (301.6 per 100,000 inhabitants). These statistics help to clarify the scope of violent interpersonal aggression, but they do not provide any information regarding noncriminal or unreported aggression.

Studies show that aggressive behavior is exhibited across the life span. Studies of children age 12–18 months show that approximately half of children's interpersonal exchanges can be defined as conflict-based or disruptive. For most children, levels of physical aggression decrease over time, although a minority demonstrate consistently high levels of physical aggression throughout childhood. This decrease in physical aggression appears to be greater for girls than for boys (Côté, Vaillancourt, & Barker, 2007). Indirect aggression follows a different pattern, appearing in low rates consistently throughout childhood for the majority of children and increasing over the course of childhood for a minority of children.

Data tend to show a gender disparity in physical aggression, although there may be specific situations in which women are as aggressive as or more aggressive than men. Meta-analysis of physical aggression research reveals a gender difference that is moderate in size ($d = .5$). A smaller effect size is found for gender differences in verbal aggression ($d = .09$) (Archer, 2004). In the United States between 1961 and 1999, 85% to 91% of homicides were committed by males. These data are consistent with homicide data across several countries (e.g., Canada, England, and Australia). However, research on domestic violence has shown that there may not be a significant gender difference in the number of physically aggressive acts committed within a relationship (Straus & Ramirez, 2007). This research also showed that when only one partner in the relationship engaged in aggression, it was twice as likely to be the female partner.

Regional differences in rates of aggression also exist. Homicide rates vary widely across the globe. Even within a single country, differences in aggression may emerge between regions. In the southern United States, rates of homicide, self-reported violence, and executions are all higher than in the northern United States.

Factors that influence group and individual variation in aggression can be identified at the biological, sociological, and psychological levels. There appears to be a genetic vulnerability to aggression. Studies of childhood and juvenile antisocial behavior have shown higher concordance rates for self-reported aggressiveness, delinquency, and conduct disorder symptoms for identical (monozygotic) than for nonidentical (dizygotic) twins, suggesting a significant contribution of genetics (Carey, 1996). In studies of adult antisocial behavior, the findings have been similar. Adoption studies also suggest that the adopted-out children of mothers and fathers with a criminal conviction are more likely to have an arrest or conviction than the adopted-out children of noncriminal mothers and fathers.

Biological approaches to aggression focus on the role of the hormone testosterone. Testosterone is present in higher levels in males than in females, it is tied to masculine physical development, and it is associated with masculine-typed social behaviors, including aggressiveness. Consistent with this association, Dabbs (2000) and

colleagues have found that prison inmates with higher testosterone levels commit more violent crimes, on average, than inmates with lower testosterone levels. Further, in nonincarcerated samples, higher testosterone levels are associated with higher rates of delinquency, a greater history of violent behaviors, and more trouble with the law. Finally, individuals given increasing doses of testosterone, either as part of an experiment or as the result of medical sex-change procedures, show associated increases in aggressive behavior.

According to evolutionary psychology theories, human aggression results from the competition for mates. Specifically, males compete—often aggressively—for status and resources as a means of improving their reproductive odds. Consistent with this proposal, males tend to show higher levels of aggression at those ages when competition for mates is most important (i.e., late teens and early 20s).

Sociological theories also emphasize motivations for status and dominance as explanations for aggressive behavior. According to this approach, aggression is a tool that individuals use to gain resources and status when poverty or deprivation has limited other options (Hovland & Sears, 1940). Consistent with this proposal, Dabbs (2000) and colleagues have shown that although high testosterone levels are strongly associated with aggressive behavior among low-status men, among men of higher status, testosterone levels do not reliably relate to adult antisocial behavior.

Regional differences in aggression in the United States are also explained on the basis of status and dominance theories. According to Cohen and Nisbett (1997), the differences in aggression between the northern and southern States reflect the presence of a southern "culture of honor," wherein perceived disrespect must be answered with aggression. Such aggression is meant to preserve social status. In support of this model, it has been shown that homicide rates are higher in the South only for cases involving argument or insult (i.e., homicides committed in the course of a robbery are not elevated). In an experimental situation, southern participants who were insulted showed higher levels of anger and higher levels of testosterone following the insult than northern participants. The proposal that perceived disrespect will increase the likelihood of aggressive behavior is also consistent with work by Dodge (1986) and colleagues showing that children with severe conduct problems are more likely than other children to view an ambiguous provocation as an act of hostility and to retaliate aggressively.

This latter finding emphasizes the role of social information processing in aggression. The social information processing approach emphasizes the role of aggressive schemas and scripts in aggression and proposes that aggression is more common when nonaggressive responses are less well learned, less accessible, and viewed as less likely to be effective. The cognitive-neoassociation theory (Berkowitz, 1993) focuses on the importance of the accessibility of aggressive cognitions. According to this model, anything in the environment that increases the accessibility of aggressive thoughts will increase the likelihood of aggressive behavior. Consistent with this theory, the presence of a weapon has been shown to significantly increase the likelihood that research participants will engage in aggressive retaliation against an individual who has angered them.

Social psychological research has also provided evidence for a link between exposure to media violence and aggressive behavior. Correlational studies reveal an association between exposure to violent media in childhood and criminal (including violent) behavior in adulthood. This relationship has also been demonstrated in the laboratory, where exposure to violent media (film clips and video game play) results in short-term increases in aggression. These effects are strongest when the viewer identifies with the aggressor portrayed in the clip and when the aggression is portrayed as justified.

Other situational factors can increase aggression. Heat is correlated with aggression. There are higher rates of violent (but not nonviolent) crime in cities with hotter climates, and rates of violence tend to peak in summer months. This effect of heat may exemplify a broader category of causal factors. Any situation that increases discomfort may increase the likelihood of aggression. For example, individuals are also more likely to aggress when exposed to physical pain, hunger, overcrowding, noxious smells, and insults.

Personality theorists account for differences in aggression at the trait level. For example, the psychopathic personality, which is characterized by callousness, lack of empathy, fearlessness, and impulsivity, is also associated with elevated rates of both instrumental and hostile aggression (Hare, 2003). Given the heterogeneity of aggressive behavior, it is unlikely that any single perspective will address all forms of aggression. Thus, prevention and treatment efforts must be developed at the biological, sociological, and psychological levels.

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See also: **Anger**

AGING AND INTELLIGENCE

Phenomena of aging effects on intellectual and cognitive functioning are investigated by research approaches at the psychometric, information-processing, and biological levels. Evidence from these approaches complements each other and should be considered conjointly for a comprehensive overview of aging and intelligence. Recent neurcomputational approaches help to integrate theory and data across these levels.

The Behavioral Psychometric Approach

Extant psychometric data on aging and intelligence indicate three major phenomena. First, intellectual aging is multifaceted. Multifactorial models of intelligence (e.g., the Cattell-Horn *Gf-Gc theory* or the dual-process model of lifespan intellectual development) suggest that abilities in

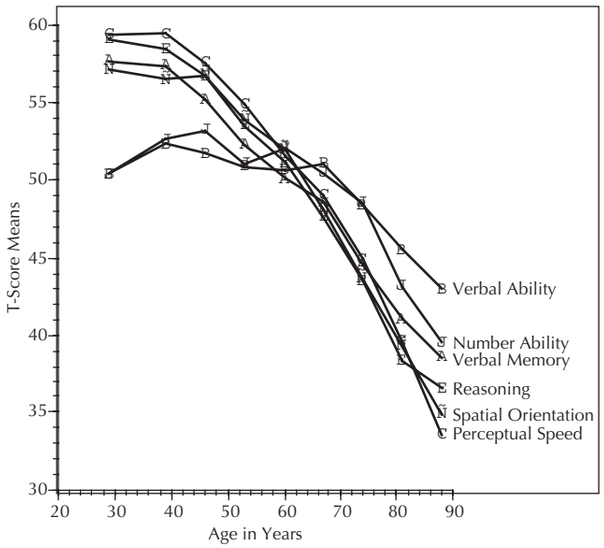


Figure 1. Cross-sectional age gradients in six primary mental abilities (N = 1628). Abilities were assessed with three to four different tests, and are scaled in a T-score metric. (Data source based on Schaie & Willis, 1993; figure adapted from Lindenberger & Baltes, 1994).

the fluid-mechanics (*Gf*) domain, reflecting an individual's capacity for problem solving, information organization, and concentration, are more biology-based. In contrast, abilities in the crystallized-pragmatic (*Gc*) domain reflect the acquisition and use of culture-based information (see Baltes, Staudinger, & Lindenberger, 1999, for review). Figure 1 shows that cross-sectional age gradients of primary mental abilities in the fluid-mechanics domain (i.e., verbal memory, reasoning, spatial orientation, and perceptual speed) decline linearly beginning in the 40s. However, abilities in the crystallized-pragmatics domain (i.e., verbal and numeric abilities) remain stable up to the 60s or 70s (Schaie & Willis, 1993).

Second, cross-sectional age differences are generally more pronounced than longitudinal age changes. While modest cross-sectional negative age differences are found by the 40s for some and by the 60s for most abilities, moderate longitudinal negative age changes in most abilities are usually not evident until the mid-70s or early 80s (e.g., Schaie, 1996). Discrepancies between cross-sectional and longitudinal age gradients are due to cohort effects, practice effects, and selective attrition in longitudinal studies (see Baltes & Mayer, 1998; Lindenberger & Baltes, 1994, for reviews). After controlling for cohort and historical time effects, discrepancies between cross-sectional age differences and longitudinal age changes are reduced (Schaie, 1996).

Third**,** aging contracts the factor space of intellectual abilities. Ample cross-sectional data show that correlations among subscales are generally larger in older samples, indicating an increasing degree of ability dedifferentiation

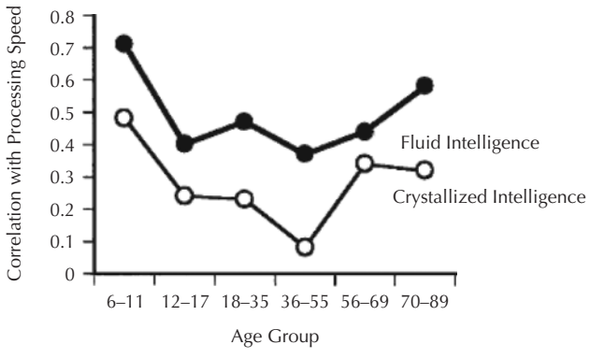


Figure 2. Less differentiated intelligence structure at both ends of the lifespan (adapted from Li et al., 2004).

(see Figure 2; see Li, Lindenberger, Hommel, Aschersleben, Prinz, & Baltes, 2004 for recent findings and historical review). Furthermore, ability dedifferentiation generalizes beyond the intellectual domain. A series of recent studies using simple measures of sensory acuity, contrast sensitivity, and muscle strength report an increase in the sensory-cognitive correlation with advancing age in age-heterogeneous samples. The strengthening of the sensory-cognitive link in old age has been interpreted as an indication of general neurological decline affecting both domains of functioning. The nature of the sensory-cognitive link is, however, still under debate. A few recent studies have taken an experimental, instead of a correlational, approach to study the sensory-cognitive link. Findings from experimental dual-task studies suggest that as people grow older, they seem to allocate an increasing amount of attention to tasks that require maintaining balance in an upright posture or walking (e.g., see Li & Lindenberger, 2002, for a review).

The Behavioral Information-Processing Approach

In formulating theories of intelligence, researchers have examined several information-processing mechanisms or resources that may mediate age-related differences in intelligence. A common hypothesis of cognitive aging is that aging constrains general cognitive resources (*GCRs*). Three related types of GCRs—working memory, processing speed, and executive control functions—have been investigated most extensively in relation to the fluid-mechanics domain of intelligence.

Working Memory. Working memory (WM) refers to the ability to simultaneously hold information in immediate memory while transforming the same or other information. Associated with higher-level cognition, WM is involved in language processing, problem solving, and concurrent task performance. Age-related declines in WM performance have been well documented. Furthermore, large-scale studies show that a substantial portion of age-related variance in *Gf* abilities is shared with age-related differences in WM (see Craik & Salthouse, 2007, for a review).

Processing Speed. Age-related intellectual declines have biological underpinnings such as neuronal slowing, which lead to the slowing of basic cognitive operations and exacerbated effects in complex tasks. Correlational analyses show that the observed age-associated variance in *Gf* abilities is greatly reduced or eliminated after controlling for individual differences in processing speed (see Craik & Salthouse, 2007, for reviews). In addition to slowed information processing, trial-to-trial reaction time variability, an indicator of processing fluctuation (e.g., Li et al., 2004), increases during aging.

Executive Control Functions. It has also been proposed that aging impairs executive control functions such as selective attention, dividing attention across concurrent tasks, and task switching (Verhaeghen & Cerella, 2002). Nested within this category are general accounts of age-related decline in attention and inhibitory processes, leading to greater interference and difficulty in suppressing previously relevant information and habitual responses. Measures of interference proneness have accounted for significant proportions of age-related variance in cognitive performance (see Craik & Salthouse, 2007, for review). More recent work implicates the anterior cingulate cortex in conflict monitoring situations (e.g., overcoming competing sources of information) and in outcome evaluation (e.g., negative feedback, error detection), thus providing a neuroanatomical account of a variety of executive functions (e.g., Botvinick, Cohen, & Carter, 2004). Taken together, strong theoretical and empirical links appear to exist among all three GCRs, which may be best conceptualized as basic mechanisms (e.g., speed, conflict monitoring) nested within more complex cognitive functions (WM).

The Cognitive and Computational Neuroscience Approaches

Recent developments in cognitive neuroscience have motivated researchers to investigate functional relationships between aging deficits in basic cognitive mechanisms and their biological underpinnings (see Figure 3). The biological correlates of aging effects on intelligence examined so far involve molecular and neuronal mechanisms.

Molecular Correlates. ApoE is a plasma protein involved in cholesterol transportation. There is recent consensus that the ε_4 variant of ApoE is a risk factor for developing Alzheimer's disease. It may also relate to milder forms of nonclinical cognitive impairment (see Deary et al., 2004, for a review).

Neuronal Correlates. Besides anatomical changes (Raz et al., 2005), there is consensus that during the course of normal aging the concentration of neurotransmitters—for instance, dopamine in the frontal cortex, striatum, and basal ganglia—decreases by 5–10% in each decade of life. Functional relationships between aging-related deficits in the dopaminergic system and age-related decrements

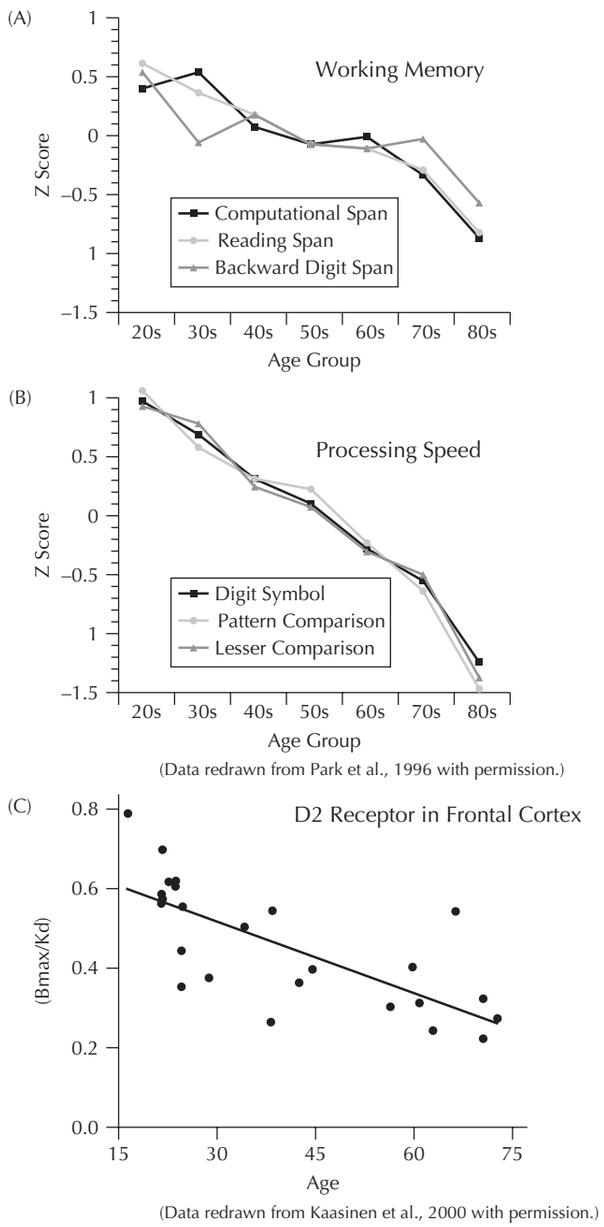


Figure 3. Aging-related declines in information processing and neurotransmitter density. Negative adult age differences in working memory (A), processing speed (B), and dopamine D2-like receptor availability in the frontal cortex. (Data source based on Park et al., 1996, and Kaasinen et al., 2000; figure adapted from Li, Lindenberger, & Sikström, 2001).

in various aspects of information processing have also been documented. For instance, the density of dopamine receptors in the nigrostriatum associates negatively with reaction time (RT) and positively with RT variance. Other studies have demonstrated that aging-related decline in WM function is, in part, due to attenuated dopaminergic function (e.g., Bäckman et al., 2006, for a review).

Emerging Research Trends

Research on aging and intelligence has traditionally been investigated with the above three approaches. During the last decade, much effort has been devoted towards cross-level integrations of these approaches. For instance, recent neurocomputational approaches provide computational explications for linking aging-related decline in neuromodulation and cognitive deficits. Simulations show that declines in dopaminergic modulation could be related to reduced neural information processing fidelity, cortical representation distinctiveness, and various aspects of cognitive aging deficits. Other models relate deficits in dopamine modulation more specifically to aging effects on memory context representation and maintenance, and on error processing (see Li et al., 2001, for a review). Functional neuroimaging experiments in combination with individual difference approaches are also now more commonly applied to understanding the relations between cognitive and brain aging (Cabeza, Nyberg, & Park, 2005).

Furthermore, another new development is to consider the aging neurocognitive system as an embodied brain that is situated in the environmental and sociocultual context (see Baltes, Reuter-Lorenz, & Rösler, 2006, for a review). As such, within-person variability as indicators of the fidelity (e.g., Li et al., 2004) of information processing as well as cognitive intervention studies for tapping into the reserve of neurocognitive plasticity are the foci of vibrant areas of new research (Kramer & Erickson, 2007; Nyberg et al., 2003). Furthermore, studies that directly compare and contrast patterns of senescence and maturation to understand the shared and distinct mechanisms of cognitive aging and child cognitive development are also very much a part of the current research trends (e.g., Brehmer, S.-C. Li, Müller, von Oertzen, & Lindenberger, 2007; Bialystok & Craik, 2006; Figure 4).

In conclusion, psychometric studies conducted since the 1920s indicate that intellectual aging is not a unitary process. Culture-based intelligence is maintained into the 70s; whereas biology-based intellectual abilities begin declining in the 40s. There is growing interest in understanding cognitive and neurobiological mechanisms that may underlie age-related declines in *Gf* abilities. At the information-processing level, factors such as working memory, processing speed, and executive control processes, are correlated with age differences in intelligence. Furthermore, there is emerging consensus that the prefrontal cortex and its supporting neuromodulation mechanisms underlie such cognitive functions. At present, the cross-level link from brain aging to intellectual aging continues to be refined and expanded. Emerging research investigates reciprocal co-constructive dynamics between social-culturally based environmental interventions and neurobiological processes in order to harvest the

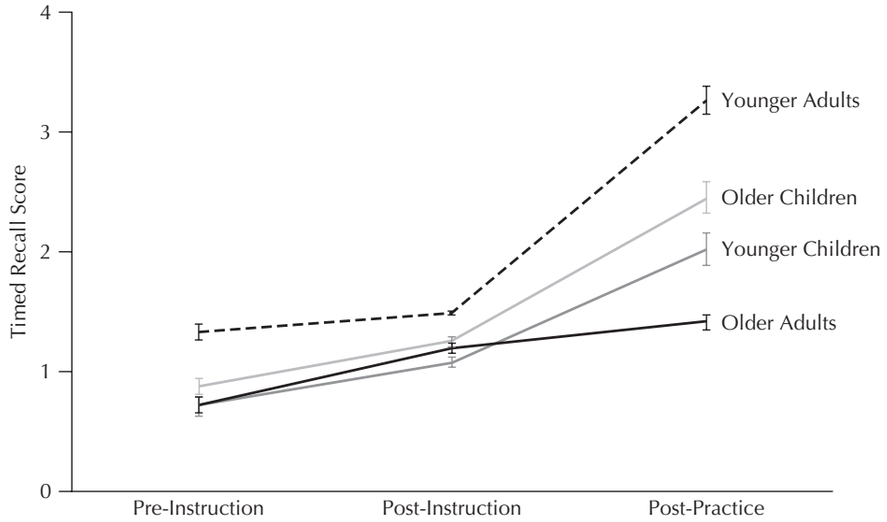


Figure 4. Lifespan age differences in memory plasticity. Relative to children and adults, older adults show more limited memory plasticity (adapted from Brehmer et al., 2007).

benefit of still available cognitive and brain plasticity in old age.

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AGING, PHYSIOLOGICAL AND BEHAVIORAL CONCOMITANTS OF

Aging is accompanied by many physiological changes, with behavioral and psychological concomitants. To illustrate, we describe selected age-related physiological changes in two sensory systems (vision and hearing) and in the cardiovascular and musculoskeletal systems, and we review the resulting effects of these changes on behavioral and psychological phenomena. Readers should note that many of these changes are not inevitable consequences of aging.

Hearing

Approximately one of every three adults between the ages of 65 and 75 has a hearing loss, and approximately 40–50% of adults aged 75 and older have a hearing loss (National Institute on Deafness and Other Communication Disorders, 2008). Aging leads to histological, electrophysiological, and molecular changes in the structures involved in hearing. Age-related hearing loss, presbycusis, occurs gradually and usually involves loss of hearing for the higher frequencies. Causes of presbycusis may include changes in the blood supply (e.g., diabetes, hypertension, cardiovascular disease), repeated exposure to loud noises, loss of hair cells, side effects of medications (e.g., aspirin, antibiotics), and abnormalities of the outer and/or middle ear (NIDCD, 2008).

There are several potential consequences of presbycusis. First, older adults may experience difficulty hearing high-frequency sounds (e.g., children's and women's voices, squeaking brakes). Second, older adults may have difficulty hearing speech embedded in background noise (e.g., in conversations in loud environments). Third, older adults may have more difficulty recognizing consonant sounds of shorter durations at lower decibel levels. Therefore, when conversing, older adults may ask speakers to talk louder. Similarly, older adults may increase the volume on radios or television sets. Fourth, older adults may experience more difficulty hearing rapidly presented speech with a low degree of context. Therefore, whenever novel information is orally presented rapidly (e.g., messages over public announcement systems), older adults may miss important details. Fifth, older adults may experience difficulty hearing and understanding speech that lacks normal fluctuations in tone and rhythm (e.g., hearing unwavering speech or undifferentiated computer-generated speech).

The behavioral and psychological consequences of hearing impairment can be significant. Individuals may participate in fewer leisure activities and become more socially isolated. They may become irritated with their hearing impairment and the speech characteristics that interfere with auditory perception. Individuals may experience depression, or paranoia. The paranoia may arise from individuals believing that others are speaking about them, perceiving others as "mumbling" or speaking softly to purposefully exclude the older listener.

Vision

Several age-related changes occur in the visual system that can have psychological and behavioral consequences. First, older adults require more light to see because of the increased density and opacity of their lenses, and the decreased number of photo receptors (Whitbourne, 2002). Second, older adults are more likely to experience glare when viewing bright objects, due to the scattering of light within the lens resulting from the increased density. Third, older adults are more likely to experience difficulty with accommodation due to the increased lens density and loss in flexibility of the eye capsule. Fourth, depth perception decreases with age, caused by the increased density of the lens. Fifth, age-related problems with color discrimination are caused by the increased yellowing of the lens and pigmentation of the vitreous humor. Finally, an age-related decrease in the visual field can be caused by macular degeneration. Age-related macular degeneration is the most common cause of blindness and vision impairment in older adults in the United States, with over 1.6 million having advanced macular degeneration (National Eye Institute, 2002).

The behavioral consequences of impaired vision can be quite significant. The increased difficulty in seeing objects in reduced light and greater susceptibility to glare can lead individuals to increasingly restrict their evening driving and walking. These vision changes can also lead to increased accidents and falls resulting from failure to see hazardous objects, and diminished self-esteem resulting from such accidents and restrictions incurred from low vision. Changes in color perception can create difficulties in correctly matching clothing and facial makeup, and sometimes cause others to question the individual's aesthetic sensibilities (Whitbourne, 2002). These changes

also can diminish one's understanding of color-coded information and diminish one's appreciation of artwork, movies, and scenery. The diminished visual acuity can lead to difficulty reading, watching television, recognizing friends, and learning and remembering the distinctive features of the faces of new acquaintances. Finally, the embarrassment associated with these problems can lead to increased social isolation and decreased social activities.

Cardiovascular and Respiratory System

Age-related changes in the cardiovascular and respiratory systems can have significant behavioral and psychological consequences. However, not all older adults experience the same levels of decline of these systems. Exercise, disease, and genetic predisposition are important, in addition to the effects of aging, in the determination of cardiorespiratory fitness.

Aging is associated with reduced elasticity and compliance of the aorta and arteries, resulting in higher systolic arterial pressure, increased resistance to left ventricular ejection, and subsequent left ventricular hypertrophy and interstitial fibrosis (Mangoni & Jackson, 2004). The left ventricle takes longer to fill and relax. Heart rate decreases with age, and heart rate response is reduced during exercise. The sensitivity of the heart to neural stimulation, which controls the timing and rate of heart contractions, decreases with age. Aging results in structural changes of the lungs (e.g., decreased elastic recoil and increased rigidity of chest wall) that limit lung capacity and the efficiency of the gas exchange.

The consequences of cardiovascular and respiratory changes may include a decreased ability to cope with physical stress. The older adult may become more easily fatigued and experience shortness of breath more quickly compared to younger adults. Consequently, the older adult may become fearful of activities associated with physical exertion. Likewise, older adults may demonstrate frustration with the limitations associated with cardiovascular and respiratory changes and become more fearful of activities that cause physical exertion, and therefore pursue activities that are more sedentary. All of these limitations can also lead to lowered self-esteem.

Musculoskeletal System

Age-related musculoskeletal changes have important implications for the daily lives of older adults. Muscle mass decreases with age and can lead to increased weakness. Muscle endurance also diminishes with age. Bone mass and porosity decreases, increasing susceptibility to fractures. The joint cartilage also degenerates with age, resulting in increased joint pain and stiffening. Musculoskeletal changes can be reduced (e.g., increased muscle strength and endurance) in both younger and older adults via exercise.

Age-related musculoskeletal changes may result in older adults restricting movements and being less willing to undertake physically demanding tasks. Older adults may become more easily fatigued and more cautious in their movements, particularly on slippery surfaces. They may experience difficulty climbing stairs or rising from a sitting position. Fear of falling may develop because of leg weakness or fear of breaking bones when ambulating. These musculoskeletal changes may restrict participation in enjoyable and leisure activities and diminish self-esteem. The chronic pain sometimes associated with musculoskeletal changes can also lead to depression.

In summary, numerous changes occur in the aging body that can have substantial behavioral and psychological effects. Fortunately, the human body exhibits amazing resilience, accommodation, and adaptation to the aging process.

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AGORAPHOBIA

Although the Greek word agoraphobia means fear of large open spaces, our current conceptualization of agoraphobia is far more situationally encompassing. The term was introduced by Westphal in 1871 in a case series of four men who presented with fears of large open spaces (Boyd & Crump, 1991). In the fourth edition of the American

Table 1. Common Situations that are Feared in Agoraphobia

Being home alone
Crowded places
Grocery stores, shops, large stores, and shopping malls
Traveling on buses, airplanes or trains
Driving in heavy traffic, on highways, through tunnels, or over bridges
Waiting in line
Movie theaters and arenas
Restaurants
Talking walks
Wide open spaces such as parks
Enclosed places such as elevators or small rooms
Public places
Traveling away from home

Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2000) agoraphobia is defined as anxiety about, or avoidance of, situations where help may not be available or where it may be difficult or embarrassing to escape the situation in the event of panic-like symptoms or a full-blown panic attack. Patterns of agoraphobic avoidance are variable with levels of avoidance ranging from just a few situations to an extensive range of situations. Commonly feared situations are listed in Table 1.

Individuals with moderate to severe agoraphobia often report having a "safe zone" or specific geographic area within which they feel comfortable. Traveling outside of this safe zone is either completely avoided, particularly if unaccompanied, or else endured with significant distress. In the most severe cases, the individual is housebound. Individuals with agoraphobia also vary in their reliance on safety cues, which are used to reduce anxiety in a specific situation. Examples of safety cues may include the presence of a familiar person, carrying a cell phone, medication or water bottle, and sitting in a seat that is close to a door or exit.

Descriptive Characteristics of Agoraphobia

Agoraphobia is not a specific disorder in its own right but occurs within the context of either panic disorder with agoraphobia or agoraphobia without history of panic disorder. The lifetime prevalence rates of these two disorders is 1.1% and 0.8%, respectively (Kessler et al., 2006). The presence of agoraphobia is more common in women than men and has been associated with increased role impairment, greater panic disorder symptom severity, and increased comorbidity with other Axis I disorders compared to panic disorder without agoraphobia (Kessler et al., 2006).

Treatment of Agoraphobia

Evidenced-based treatments for agoraphobia include both cognitive behavior therapy (CBT) and pharmacotherapy, based on randomized controlled trials conducted in individuals with panic disorder with agoraphobia. Effective medication treatments include selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, other antidepressants (e.g., venlafaxine), and high-potency benzodiazepines. CBT approaches target agoraphobic avoidance through the use of gradual, systematic exposure to feared situations (*in vivo* exposure), exposure to feared physical sensations such as shortness of breath, palpitations, dizziness, and feelings of unreality (interoceptive exposure), and cognitive restructuring of catastrophic beliefs regarding feared physical sensations and feared situations.

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AINSWORTH, MARY D. SALTER (1913–1999)

Mary Ainsworth received a B.A., M.A., and Ph.D. (1939) from the University of Toronto. She was appointed Assistant Professor at University of Toronto (1946), Professor at Johns Hopkins University (1963), Commonwealth Professor at University of Virginia (1975), and was an Emeritus Professor after 1984. Ainsworth devoted a lifetime of

research to the study of infant-mother relationships. She introduced a 20-minute, controlled laboratory technique called the "strange situation," which provides a widely used measure of child-mother attachment.

At London's Tavistock Clinic, under John Bowlby's direction, she investigated the effects on personality of infant-mother separation (1950). This was the beginning of a 40-year productive scholarly association with Bowlby. They established a new field of scientific study by means of Bowlby's ethological theories of attachment, separation, and loss as well as Ainsworth's empirical longitudinal studies from home visits using the strange situation technique.

Ainsworth wrote numerous scientific articles and books. She also extended her research into attachment beyond infancy by examining other affectional bonds throughout the life cycle. Ainsworth was cited as one of the outstanding "Models of achievement . . . of eminent women in psychology" (O'Connell & Russo, 1983) and received the American Psychological Association award for Distinguished Scientific Contribution (1989) and its award for Distinguished Professional Contributions to Knowledge (1987), and she was elected a fellow of the American Academy of Arts and Sciences (1992).

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AKATHISIA

The term *akathisia* (literally "not to sit") was introduced by the Bohemian neuropsychiatrist Lad Haskovec in 1901 (Haskovec, 1901). Akathisia represents a complex psychomotor syndrome, comprising a subjective (emotional) and an objective (motor) component (Sachdev, 1995; Iqbal, Lambert, & Masand, 2007). The subjective symptoms of akathisia include inner restlessness, urge to move (tasikinesia), inability to remain still, general unease, discomfort, inability to relax, poor concentration, dysphoria, anxiety, fear, terror, rage, suicidal ideation, and aggressive thoughts.

The objective signs of akathisia include several in the sitting position and several in the standing position. In the sitting position, these are fidgetiness of arms and hands; face rubbing; rubbing, caressing, or shaking of arms or hands; rubbing or massaging of legs; tapping or picking on clothes; crossing and uncrossing of arms; crossing and uncrossing of legs; swinging or kicking crossed legs; toe tapping; frequently squirming in chair and straightening motions; and rocking or twisting of the body. In the standing position, these are marching in place; changing stance; flexing and extending knees; rocking from foot to foot; and pacing and repetitive walking.

Subjectively distressing inner restlessness and repetitive movements of the legs are the most frequently observed signs and symptoms. These signs and symptoms predominantly emerge when the patient is requested to sit or stand still in one spot, with there being some relief when lying down or walking around. As none of the signs and symptoms is pathognomonic for akathisia, it can be extremely difficult to distinguish akathisia from other causes of restlessness as well as from other movement disorders (Sachdev 1995; Weiden, 2007). Other possible causes of restlessness include psychotic agitation, anxiety, agitation due to affective disorder, drug withdrawal syndromes, antipsychotic-induced dysphoric mood, and agitation due to organic disorders (e.g., dementia, hypoglycemia). Other movement disorders from which akathisia may be difficult to distinguish include restless-legs syndrome, tardive dyskinesia, steriotypies, tremor, myoclonus, and restless repetitive movements due to organic disorder (e.g., pacing in dementia, hyperactivity in Tourette's syndrome or ADHD).

Prevalence of Akathisia and Clinical Relevance

Even though akathisia was first mentioned in postencephalitic parkinsonism and in idiopathic Parkinson's disease long before antipsychotic drugs became available, akathisia is nowadays mostly associated with the administration of antipsychotic drugs (Iqbal et al., 2007). The first generation of antipsychotic substances (FGA) are much more likely to produce akathisia compared to second-generation antipsychotics (SGA), due to the higher affinity of the former to block dopamine D2 receptors (Van Putten, May, & Marder, 1984; Iqbal et al., 2007).

However, this does not mean that SGA are free of producing extrapyramidal side effects, including akathisia. Depending on their affinity to pre- and postsynaptic dopamine receptors, the SGAs may well cause akathisia in clinically relevant numbers (Pierre, 2005; Weiden, 2007). Many clinicians also tend to disregard the fact that antiemetic drugs can produce akathisia dose-dependently, which may be of considerable importance for the treatment of cancer patients (Kawanishi et al., 2007). Moreover, agents targeting serotonin receptors are also suspected of causing an akathisia-like syndrome (Sachdev, 1995).In psychiatric populations akathisia is of specific clinical relevance because it may complicate the treatment by aggravating noncompliance or impulsivity, which can

Table 1. Subtypes of Drug-Induced Akathisia (Modified after Sachdev, 1995)

Acute akathisia: Onset within six weeks after initiation of treatment, dose increment, or change of drug-type; concurrent medication not decreased or discontinued.
Chronic akathisia: Symptoms persist for over three months; specify acute, tardive, or withdrawal onset.
Tardive akathisia: Onset at least three months after initiation of treatment, dose increment, or change of drug-type; no dose increment or change of drug within six weeks prior to onset; concurrent medication not decreased or discontinued.
Withdrawal akathisia: Onset within six weeks after discontinuing or marked reduction of dose; prior to onset, duration of treatment at least three months; concurrent medication not decreased or discontinued.
Pseudoakathisia: Typical objective symptoms without subjective distress.

include assaultive or suicidal behaviors (Van Putten, 1975). Moreover, akathisia is sometimes mistaken as psychotic agitation or can be overlooked, particularly because the focus of undesirable effects of antipsychotic treatment has shifted to metabolic problems and weight gain associated with the administration of SGA (Weiden, 2007).

Akathisia generally has an acute beginning within hours or days after initiation of antipsychotic treatment. High initial dosages and rapid dose increment are predisposing factors to produce acute akathisia (Iqbal et al., 2007). Other subtypes of akathisia have been described according to the time of onset during antipsychotic treatment with more ambiguous risk factors (see Table 1).

When taking a chronic course, subjective distress may decrease, and the movement patterns may look more like stereotypies, suggesting an overlap with tardive dyskinesia (Sachdev, 1995).

Pathophysiological Mechanisms and Clinical Management of Akathisia

The pathophysiology of akathisia is not entirely understood. Akathisia may best be viewed as resulting from the interaction of dopaminergic neurones with noradrenergic, serotonergic, cholinergic, GABAergic, glutamatergic, and opioid systems in mesolimbic and mesocortical pathways, where dopamine antagonism is assumed to play the most important role in producing the syndrome (Sachdev, 1995; Iqbal et al., 2007).

One of the most relevant problems in clinical practice is that clinicians may fail to recognize akathisia (Weiden, 2007). Establishing an early diagnosis is critical, however, due not only to the possible complications associated with akathisia but also to the impending dilemma of insufficient or delayed treatment response. Thus, preventive measures such as choosing the lowest effective dose of antipsychotics, and stepwise increment of dose are warranted (Sachdev, 1995). Moreover, a routine clinical check for extrapyramidal side effects is recommended for which several clinically useful rating scales have become available (details in Sachdev, 1995).

If akathisia is present, stopping the offending drug or at least reducing the dose is considered to be the best option (Sachdev, 1995; Iqbal et al., 2007). However, in highly agitated patients, waiting for a spontaneous wearing-off may be impracticable. Anticholinergic drugs, beta-adrenergic drugs, and benzodiazepines are effective for acute treatment, yet response rates are variable. If onset of akathisia is less acute, change of antipsychotic class or administration of modern agents is proposed. Treating chronic or tardive akathisia has often been problematic (Sachdev, 1995), but is now rarely seen in patients on SGA.

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See also: **Motor Control**

ALCOHOL USE DISORDERS

Within the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000), alcohol use disorders (AUDs) can be subdivided into two major diagnoses: alcohol abuse and alcohol dependence. *Alcohol abuse* refers to a pathological pattern of drinking marked by one or more of four domains of problems—specifically recurrent using of alcohol in

physically hazardous situations, legal problems, problems in fulfilling role obligations, and interpersonal problems. *Alcohol dependence* refers to a presumed more severe condition marked by three or more of seven criteria—tolerance, withdrawal, impaired control of drinking, inability to cut down or abstain, a great deal of time spent drinking or recovering from alcohol's effects, important activities given up because of drinking, and drinking despite knowledge that it is having adverse effects on one's mental and/or physical health.

Although the abuse/dependence distinction has its roots in earlier taxonomies that distinguish the alcohol dependence syndrome from alcohol-related consequences, it has been coming under increasing criticism on several grounds. Statistically, for example, abuse symptoms such as legal problems are very rare and thus psychometrically "severe," whereas some dependence symptoms such as tolerance are common and psychometrically "mild." Individuals with just one or two dependence symptoms are diagnostic "orphans" who do not qualify for an AUD diagnosis. In addition, a challenge has been raised to the categorical approach to diagnosis as opposed to a dimensional approach (Martin, Chung, & Langenbucher, 2008). Despite these problems, however, alcohol abuse and alcohol dependence continue to be the major diagnostic categories for classifying alcohol-related mental disorders.

Epidemiology

AUDs are among the most prevalent mental disorders in the general population of the United States, with nationally representative samples of the adult population showing that 8.5% of adults meet criteria for having had an AUD in the past 12 months (4.7% for abuse, 3.8% for dependence) and 30.3% over their lifetime (17.8% for abuse, 12.5% for dependence; Hasin, Stinson, Ogburn, & Grant, 2007). These overall statistics obscure the fact that the distribution of these disorders varies widely in demographically defined subpopulations. Specifically, men meet criteria for AUDs much more frequently than women in the United States and most other countries. Moreover, the prevalence varies dramatically over the life course, with the peak risk for onset for the disorder occurring in the late teen years and the peak 12-month prevalence occurring at about age 21. Of note, however, the average age for entrance into treatment and the average age of patients in treatment are approximately 10 to 15 years later in life (Weisner, Matzger, Tam, & Schmidt, 2002).

Comorbidity

AUDs frequently co-occur with other mental disorders including anxiety disorders, mood disorders, psychotic disorders, other substance use disorders (i.e., drug use disorder and tobacco dependence), and personality disorders (especially antisocial personality disorder and borderline personality disorder) (Kessler, Chiu, Demler, & Walters, 2005; Sher et al., 1999). Depending on the nature of the co-occurring disorder, the AUD might have an onset prior to, at approximately the same time as, or subsequent to the other disorder. The temporal ordering of the onsets of AUDs and co-occurring disorders have sometimes led experts to distinguish between primary AUDs (those having an onset prior to the co-occurring condition) or secondary AUDs (those having an onset subsequent to the co-occurring condition).

However, in practice it is often difficult to stage sequence onsets. Moreover, even when onsets can be confidently ordered, it is usually difficult to determine whether the so-called primary condition has caused the secondary condition, whether some third factor (e.g., personality traits such as neuroticism) have contributed to the onset of both disorders, or whether these two disorders are co-occurring by chance (since both AUDs and many of its frequent comorbidities are relatively common). This is not to say that there are no clear-cut examples of alcohol dependence being secondary to another disorder. It is a reasonable supposition to say that, when an AUD only occurs during the context of a manic episode in a person with bipolar disorder (and a "normal" drinker at other times), that the AUD is secondary to the bipolar disorder. It is also the case that extended periods of alcohol consumption can induce short-term mental disorders, called alcohol-induced disorders (e.g., a mood or anxiety disorder; Schuckit, 2006) that will remit after a period of abstinence. Thus, in assessing an individual with both an AUD and a co-occurring mental disorder, it is important to determine whether the co-occurring condition only occurs during periods of heavy drinking and its immediate aftermath.

Etiological Factors

Systematic research over the past 50 years has documented a number of factors that contribute to the development of AUDs. Although these factors are conceptually distinct, it is important to highlight that they may overlap and involve related processes.

Genetics

In the 1970s and 1980s, twin and adoption studies clearly documented that a substantial amount of the risk for AUDs can be attributed to genetic factors. More recently, molecular genetic studies have begun identifying specific genes associated with risk for AUDs (Dick & Foroud, 2003). One class of genes that have been identified is related to individual differences in how a drinker metabolizes alcohol. There are two major metabolizing enzymes: (1) alcohol dehydrogenase (ADH), which breaks down alcohol into acetaldehyde, and (2) aldehyde dehydrogenase (ALDH), which breaks down alcohol into acetate and water. The

immediate metabolite of alcohol, acetaldehyde, is toxic and causes flushing (turning the skin red) and feelings of discomfort. Because acetaldehyde is rapidly metabolized by ALDH, it usually does not build up in the body. Consequently, most people do not experience this aversive reaction. However, in Asian populations, there is considerable variation in the genes that code for both ADH and ALDH. One of these variants of ADH is associated with rapid metabolism of alcohol into acetaldehyde, and one of these variants is associated with slow metabolism of acetaldehyde (and therefore flushing and discomfort). Individuals with these variants of ADH and ALDH genes are much less likely to drink and develop an AUD (Luczak, Glatt, & Wall, 2006).

However, most of the genetic influence in North Americans of European descent appears attributable to other and, at present, largely unknown genetic factors. Several genes have now been identified in multiple studies that are associated with the major neurotransmitter systems in the brain, such as GABA, dopamine, and serotonin. The large-scale genome-wide association studies now being conducted in populations worldwide will provide a clearer view of the specific nature of genetic influence.

Personality

Although there clearly is no single "alcoholic personality," a number of prospective studies have demonstrated that major personality traits such as neuroticism (i.e., negative emotionality), impulsivity, and sensation-seeking are associated with risk for alcoholism. Moreover, a number of studies have documented the intervening processes between broad-based dispositional tendencies and drinking outcomes. Specifically, different personality traits appear to be associated with risk for AUDs for different reasons.

For example, individuals with high levels of neuroticism tend to drink to cope with negative emotions; individuals with sensation-seeking tendencies who are also high in impulsivity tend to drink to "enhance" their current state (e.g., "get buzzed"). While both the coping and enhancement pathways can lead to AUDs, they appear to do so in somewhat different ways. For the enhancement pathway, risk for AUDs (or related problems) appears to be completely explained by their higher levels of consumption. For the coping pathway, the amount of alcohol consumed does not appear to fully explain the increased risk, which suggests that, when individuals drink to cope, they are doing it in ways that tend to magnify risk behind pure drinking levels, perhaps by drinking at inappropriate times or in hazardous situations (Sher et al., 1999).

Social Influence Processes

Most individuals begin drinking in adolescence, and the strongest correlate of drinking in this age group is the level of peer-group drinking. Peer drinking norms appear to be a potent risk factor and to have a causal influence in socializing individuals into drinking. However, as individuals progress through adolescence and into adulthood, the selection of specific peer groups and social settings appears to become increasingly important. Thus, with respect to drinking, social influence works both ways: Individuals are influenced by their peer group but are also active selectors and creators of their peer groups, not just passive recipients of peer influence (Borsari & Carey, 2001).

The Macro Environment

In the United States, indeed throughout the world, there is considerable variation in the rates of drinking and AUDs. Although genetic factors may play some role in this (e.g., the previously mentioned genotypic variation in ALDH genes in Asians), without question the larger influence comes from cultural and religious factors surrounding how alcohol use and drunken comportment are viewed and the policies that governmental entities put into place to control the sale and distribution of alcoholic beverages and alcohol-related behavior. There is now little doubt that controlling the price and distribution of alcohol affects consumption levels and rates of AUDs. Thus, although national prohibition in the United States from 1919 to 1933 is widely regarded as a social failure, it was not a failure from the standpoint of reducing alcohol consumption and alcohol-related diseases (Dills & Miron, 2004). Consequently, when we consider etiological risk factors at the individual (e.g., genetics, personality) level or the near-environment (e.g., peer group) level, it needs to be in the context of the larger, sociocultural policy environment in which these are embedded.

Treatment

A variety of treatments for AUDs currently exist. These treatments range from brief interventions by physicians or other health providers intended to motivate behavior change to outpatient treatment (either weekly or intensive) using a range of cognitive behavioral techniques, marital and family therapy approaches, and group treatment approaches (both professionally led and consisting of self-help groups like Alcoholics Anonymous), and they also include day hospital and inpatient residential treatments that typically involve a variety of approaches. Although treatment generally has been believed to be moderately effective, there is no clear evidence for the superiority of one treatment approach over another and little evidence that certain patients are particularly likely to benefit more from one treatment than another. Additionally, alcohol dependence is often a chronic, relapsing disorder, and many individuals who recover from alcohol dependence relapse after a period of abstinence.

There is an increasing number of medications that are being used to treat AUDs. Disulfiram has been approved for more than 50 years by the FDA and acts by blocking ALDH (the effects of which were noted previously) and leading to an aversive reaction when alcohol is consumed. Although it has not been found to be effective by itself, it is often used as part of multicomponent interventions (e.g., behavioral contracting). Two additional drugs, naltrexone (which blocks opiate receptors in the brain) and acamprosate (which acts on glutamate receptors in the brain) have been FDA approved in the past 15 years, and other drugs (e.g., topiramate) have been empirically supported to have salutary effects on alcohol dependence. A number of existing medications and novel drugs are being evaluated to expand the range of drug treatment options for AUDs (Berglund et al., 2003).

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See also: **Addiction; Antabuse and Other Drugs for Treating Alcoholism**

ALEXIA/DYSLEXIA

In an increasingly literate world, the inability to read is a significant disability that may affect academic success, employment, and self-concept. Because widespread literacy is a relatively recent historical development, it should not be surprising that it was only about 100 years ago that the first case of alexia or "word blindness" was described. By definition, the term *alexia* describes a condition in which reading ability is lost as a result of some neurological insult, such as head injury or stroke. With alexia, it is assumed that the individual had adequate reading achievement prior to the neurological insult, and therefore, the disability is not developmental in nature.

The term *dyslexia* refers to an inborn or congenital inability to learn to read. The term rose out of the medical literature and is not completely accepted by many educators who work with children with reading problems. Many educators or psychologists prefer the terms *developmental reading disorder* or *reading disability*, because these terms avoid the implication that the etiology of the reading disorder is due to neurological deficits. Consequently, the term *dyslexia* is most appropriate when it describes a severe reading disorder presumed to be neurological in origin. Although prevalence estimates vary across studies, the incidence of dyslexia has been estimated at approximately 7% of the school-aged population (Shaywitz, Morris, & Shaywitz, 2008).

There is significant and ongoing controversy in the research and clinical communities about the definition of

dyslexia. There are two competing definitions. One definition is based on significant discrepancy between reading achievement and a measure of general cognitive ability or intellectual functioning. The second is a cut-score model, wherein any individual with reading achievement scores below a minimum criterion is diagnosed with dyslexia. Related to the latter model is the response-to-treatment (RTI) movement, wherein children are made eligible for special education services under the label of learning disabilities based on the outcome of highly focused intervention. This definition of reading disability has become widely accepted and is the basis for the provision of special education services to many children in the United States.

The biological bases of dyslexia have gained significant research attention since the early 1990s. Many researchers have targeted the left hemisphere's perisylvian region, or the area surrounding the Sylvan fissure on the lateral surface of the cortex (Phinney, Pennington, Olson, Filley, & Filipek, 2007). Symmetry or rightward asymmetry in the length or volume of the planum temporale has been associated with dyslexia. Subtle differences in perisylvian morphology have also been noted in some individuals with dyslexia. Recent studies using diffusion tensor imaging have documented disturbances in the white matter tracts in the perisylvian region. Many of the studies of the biological basis of dyslexia were founded on early work by Geschwind and Galaburda documenting polymicrogyri and heterotopias in this region in postmortem studies of individuals known to have dyslexia.

Although significant research attention has been focused on the biological bases of dyslexia, it is not entirely clear why brains with perisylvian atypicalities are more likely to be found in individuals with dyslexia. The symmetry or reduced asymmetry noted in these brains may result from neuronal migrations errors or poor pruning of redundant pathways. Because the individual has fewer functionally connected cells, those that are functional may be less able to compensate for these atypicalities.

Although research findings have largely focused on the perisylvian region, there have been a limited number of studies that have documented neurological abnormalities in other areas of the brain (Peterson, McGrath, Smith, & Pennington, 2007). For example, there are studies showing reduced leftward asymmetry of the inferior frontal gyrus, with abnormal activation patterns in this same area, associated with dyslexia. Other studies have shown atypicalities in structure and/or function in the cerebellum and the corpus callosum.

Reading is a complex cognitive task that combines numerous skills, including attention, memory, phonological processing, and rapid naming. Consequently, any findings related to individual chromosomal involvement in the development of dyslexia might actually pertain to language tasks in general. Despite this caveat, research has implicated a number of quantitative trait loci (QTLs) and candidate genes involved in dyslexia (Peterson et al., 2007). Frequently cited studies suggest the involvement of the following QTLs: 1p34-p36, 2p11-16, 3p12-q13, 6p21.3-22, 15q15-21, 18p11, and Xq27.3. Candidate gene research has been somewhat more equivocal, but several possible genes have been implicated, including DYX1C1, DCDC2, K1AA0319, and ROBO1.

Although there is significant evidence to support genetic involvement in dyslexia, environmental factors also play a role. Behavioral genetics research has suggested that slightly more than 50% of the variance in reading performance is the result of the differences in genetic heritability. Thus, environmental factors clearly have a role in dyslexia. Factors identified as contributing to reading difficulties include reading exposure, socioeconomic status, parental education, and home literacy environment (Harlaar, Dale, & Plomin, 2007).

Although research supports the involvement of genetics and differences in the brain as being risk factors for the dyslexia, these studies do not answer questions about the underlying cognitive processes that are involved in reading and that are aberrant in dyslexia. Research on dyslexia suggests that phonological processing and orthographic coding are two cognitive processes that play significant roles in reading ability and dyslexia (Boets, Wouters, van Wieringen, De Smedt, & Ghesquiere, in press). Furthermore, these processes interact with each other and other cognitive processes to promote reading acquisition.

Phonological processing allows an individual to hear and manipulate individual sounds in spoken language. Although there are only 26 letters in the English language, there are 44 phonemes. Phonological processing is part of the larger skill of auditory perception and discrimination, but it is involved only with sounds used in speech. Rather than being one unitary skill demonstrable in a single behavior, phonological processing is actually a group of skills, including letter-sound association, rhyming, blending, segmenting, and sound replacement. Phonological processing skills are developing in children before they enter school, and these early skills appear to predict future reading achievement. Furthermore, these skills continue to develop as children learn to read, such that the relationship between phonological processing and reading is symbiotic. Research with dyslexic children suggests that phonological deficits may be the core deficits impeding their reading acquisition (Vukovic & Siegel, 2006). Furthermore, there is evidence to suggest that these skills are influenced by genetics and underlying brain structures in the perisylvian region.

Orthographic processing is a second and related area of research investigation (King, Lombardino, & Ahmed, 2005). It involves the interpretation of abstract representation, specifically series of letters that form words during the reading process. Orthographic processing is most closely related to sight word reading, in which the individual does not use decoding strategies to read words

but rather recognizes the entire word on sight. It appears to be influenced mostly by environmental factors, rather than genetic heritability. Findings from these studies suggest that individuals with dyslexia, as children and into adulthood, are significantly slower and less accurate than individuals without dyslexia across orthographic tasks.

Numerous studies suggest a strong link between dyslexia and comorbid disorders. Specifically, there is significant evidence for high rates of dyslexia's comorbidity with Attention-deficit/Hyperactivity Disorder (ADHD) and specific language impairment (Willcutt, Pennington, Olson, Chhabildas, & Hulslander, 2005). Studies suggest that these comorbidities may be the result of underlying shared risk factors or reciprocal interaction between overlapping skills. Findings are more equivocal for a link with dyslexia and internalizing disorders, such as depressive and anxiety disorders (Miller, Hynd, & Miller, 2005). Although there are anecdotal reports for other comorbidities, empirical data has not generally supported these hypotheses.

Intervention for dyslexia typically consists of remediation and compensation strategies. When children are diagnosed with dyslexia during the early school years, the emphasis is on teaching them phonetic skills to improve their decoding ability and teaching them to recognize sight words to increase reading speed. The results of these reading intervention programs, including Reading Recovery and Reading First, are not universally good. For many but not all children, their reading improves and shows normal developmental outcomes, such as employment and, in some cases, higher-level education. For those individuals who do not develop adequate reading ability by adolescence and adulthood, the emphasis changes to include compensatory strategies. As adults, dyslexic individuals typically have access to books on tape and other compensatory approaches. Individuals who do not develop adequate literacy skills by the time they leave school face difficulties with further training, employment, and functional outcomes.

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See also: **Learning Disabilities; Reading Disability**

ALEXITHYMIA

All individuals experience emotions and feelings, two terms that are often used interchangeably in everyday language. However, contemporary specialists in the area of affect concur that emotions are multifaceted phenomena characterized by more or less coordinated changes in three components: a cognitive-experiential component (subjective conscious experience, such as feeling happy), a behavioral-expressive component (characteristic overt expression, such as frowning), and a physiological component (autonomic arousal, such an increase in heart rate or blood pressure). With particular respect to the cognitive component, people differ considerably in the degree to

which they pay attention to their emotional experiences, as well as in their abilities to differentiate between their feelings and share them with others. The alexithymia construct has been proposed to account for this variability.

The concept of alexithymia—which means, literally, "without word for emotions" (from the Greek *a* for "lack," *lexis* for "word," and *thymos* for "emotion")—is based on observations of psychosomatic patients and was first proposed in the early 1970s by Sifneos (1973). Alexithymia is characterized by a cluster of cognitive and affective features that includes difficulty in identifying and expressing feelings, a striking paucity of fantasies, difficulty in distinguishing between feelings and physical sensations, and a cognitive style that is utilitarian and externally oriented (closely related to the *pensée opératoire* of the French psychoanalysts Marty and de M'Uzan). In combination, these characteristics are conceptualized as a deficit in the cognitive processing and regulation of emotional states, which in turn provides potential explanations to account for individual differences in vulnerability to various mental health and physical problems.

First studied in classical psychosomatic or somatic disorders, alexithymia is known today as a personality trait that is normally distributed in the general population, and a high level of alexithymia is considered a risk factor for a variety of common medical and psychiatric disorders. A leading theory holds that the limited cognitive processing and subjective awareness of emotion in alexithymia lead to an amplification of somatic sensations and an increased emotional response at the physiological level accompanying emotional arousal, thereby producing vulnerability to the development of disorders (Taylor, Bagby, & Parker, 1997). On the one hand, misinterpretation of the bodily sensations could foster functional somatic complaints and lead to hypochondria or other types of somatoform disorder. On the other hand, individuals could alternatively alleviate unpleasant somatic tension through uncontrollable and possibly violent behaviors, such as substance abuse, eating disorders, or antisocial conduct. In addition, sustained or hyperphysiological arousal could also contribute to the development of certain types of somatic disorder (e.g., essential hypertension, inflammatory bowel disease, or functional gastrointestinal disorders).

The validity of alexithymia has for a long time been supported mainly by correlational and measurement-based research. Some studies have examined, in particular, the relationships between alexithymia and basic dimensions of personality. As expected, alexithymia overlaps with various dimensions of the Five-Factor Model (it correlates positively with Neuroticism and negatively with Openness to Experience and Extraversion), with Cloninger's psychobiological model of personality, and with such other personality dimensions as external locus of control and irrational beliefs. Globally, these results indicate that alexithymia (1) constitutes a unique cluster of traits across several dimensions of personality and (2) is a cognitive state of externally oriented thinking associated with emotional instability and limited ability to cope with stressful situations (Zimmermann, Rossier, Meyer de Stadelhofen, & Gaillard, 2005).

Recently, the validity of alexithymia as a personality trait is receiving increasing support from experimental laboratory research. For example, there is some evidence from psychophysiological studies (e.g., Luminet, Rimé, Bagby, & Taylor, 2004) that failure to regulate distressing emotions through cognitive processes can result in prolonged states of sympathetic nervous system arousal that could potentially alter the body's autonomic, endocrine, and/or immune systems. With reference to neurobiological models, a structural cerebral deficit was hypothesized in alexithymia as early as the end of the 1970s. Most of the early research in this area suggested that alexithymia results from a dysfunction either in interhemispheric communication or in the right cerebral hemisphere. Evidence from modern imaging techniques that make it possible to observe brain functions during the elicitation and processing of emotional states has shown that reduced activities in the cingulate cortex might play an important role in alexithymic disturbances (Allen, 2005).

Although of interest, such neurobiological findings do not provide information about the sources of variations in the patterns of neural activity that are associated with alexithymia. It is reasonable to hypothesize that the etiology of alexithymia is determined by a complex interaction of some genetically induced neurobiological deviations and certain childhood rearing conditions or other environmental circumstances. The results from a large population-based sample of twins suggest that alexithymia is influenced primarily by genetic and nonshared environmental factors and to a lesser extent by shared familial factors (Jørgensen, Zachariae, Skytthe, & Kyvik, 2007). Nevertheless, there is some evidence in the literature that attachment experiences in early childhood play a central role in the development of emotion regulation, and these findings support the likelihood that attachment quality may play an essential role in the intergenerational transmission of alexithymia.

A few clinical and empirical studies have suggested further that alexithymia in adulthood may be associated with the parenting style of the caregivers, climate in the family, and experiences of sexual and physical abuse during childhood. This possibility has been partially confirmed in a study of relationships between alexithymia, perceived parenting, and physical and sexual abuse in a clinical population (Kooiman et al., 2004). However, these associations are fairly modest and do not support the idea that parental care and physical or sexual abuse during childhood exert a strong influence on the development of alexithymia (Kooiman et al., 2004). Other possibly significant factors include relationships with people other than parents who also play an important role in the emotional

development of children, such as their siblings, peers, and teachers.

Clinically, the original observations of the 1970s indicate that people who are high in alexithymia respond poorly to traditional psychotherapies. Alexithymic clients can be expected to have difficulty with identifying and describing to their therapist the nature of their internal experience, thereby limiting their ability to participate effectively in psychotherapy and respond to it. Researchers have begun to focus attention on the impact of pretreatment alexithymia on the prognosis in psychological and somatic treatments. On the whole, empirical findings do confirm that alexithymia predicts relatively poor treatment outcomes. For example, Ogrodniczuk, Piper, and Joyce (2004) found that alexithymia—and particularly the difficulty in identifying feelings—is predictive of residual symptoms in patients with major depression who respond to short-term psychotherapy.

Interestingly, findings from a companion study of the same group of patients suggested that negative reactions on the part of the therapist to alexithymic patients mediates the relationship between alexithymia and outcome (Ogrodniczuk, Piper, & Joyce, 2005). Finally, although alexithymia has been considered a relatively stable personality trait, some clinical reports and preliminary empirical results suggest that modified psychotherapeutic techniques (e.g., art therapy, hypnosis, meditation), applied mainly in a group setting, can contribute to the alteration of the alexithymic characteristics.

More than 30 years after its introduction and despite criticisms of it, the alexithymia construct continues to give rise to a growing body of research and interest. In the course of becoming more widely known, it has been examined from different perspectives, including personality psychology, cognitive psychology, developmental psychology, clinical psychology, psychophysiology, and neurobiology. Currently integrated into the wide field of affective sciences, the extensive literature on the concept of alexithymia adds to our understanding of human emotions, emotion regulation, and the etiology of somatic and psychological disorders.

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See also: **Emotion Regulation; Somatoform Disorders**

ALL-OR-NONE LAW

The major parts of a neuron or nerve cell include the dendrites, the cell body, and the axon, which is a single, relatively long process extending away from the cell body. The neuron typically receives information from neighboring neurons through chemical substances called neurotransmitters that are released near the dendrites and cell body. The neuron may relay this information to other neurons by the nerve impulse, which is a characteristic of the axon.

The axon generally operates according to the all-or-none law, which states that transmission of a nerve impulse occurs either all the way or not at all. If the changes that produce the nerve impulse—that is, the movement of positively charged sodium ions—cause a certain threshold level to be reached, then the impulse (also called the action

potential or spike potential) is conducted at a constant level from its origin to the end of the axon.

Thus, axonal transmission is independent of the intensity of the stimulus that produces it. As long as the stimulus causes enough ionic movement to exceed a threshold, the nerve impulse occurs all the way, without decreasing as it travels the length of the axon. A mild stimulus that surpasses the threshold produces the same nerve impulse as an intense stimulus.

Stimulus intensity is coded by the rate of generation of action potentials, not by whether they occur, and also by the number of neurons activated in a given area. The greater the intensity of a stimulus, the more neurons are activated and the more rapidly they generate action potentials. A neuron's action potentials are analogous to signals from a telegraph key; a neuron cannot send bigger or faster action potentials any more than a telegraph operator can send bigger or faster signals with the telegraph key.

The all-or-none concept applies to other tissue as well, and the principle was first demonstrated in 1871 in heart muscle by American physiologist Henry P. Bowditch. In 1902, English physiologist F. Gotch discovered evidence for an all-or-none effect in nerves, but the effect was not convincingly proven until Edgar Douglas Adrian's work, for which he received a Nobel Prize in physiology in 1932. Adrian's research was preceded by studies performed by K. Lucas, who actually named the all-or-none law in a 1909 article.

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ALLPORT, GORDON WILLARD (1897–1967)

Gordon Willard Allport grew up in the Midwest and earned his bachelor's, master's, and doctoral degrees (1922) at Harvard University. His Ph.D. thesis foreshadowed his life's work, because it dealt with the psychology of personality and assessment. For two years he traveled and studied in Turkey, Germany, and England. He returned to Harvard to serve as an instructor from 1924 to 1926; he was then appointed Assistant Professor of Psychology at Dartmouth College in 1927. He came back to Harvard in 1930 and remained on the Harvard faculty until his retirement, serving for several years as chairman of the psychology department. He was president of the American Psychological Association in 1939 and received numerous honorary doctorates. His outstanding position in the psychology of personality attracted many students who have held posts of distinction in American and other universities.

He regarded personality as the natural subject matter of psychology and believed that other standard topics, such as human learning, could not be studied adequately without taking into account the self or ego who wanted to learn. His approach was eclectic, drawing on a wide variety of sources, including McDougall's theory of motives and experimental and social psychodynamic theories. However, he was strongly opposed to Freudian views of the unconscious; his position was much closer to that of Adler. He rejected any reductionist theory that attributed human behavior to innate instincts, childhood conditioning, or repressed complexes. Personality is an organized whole, not a bundle of habits and fixations. It is present now, and it looks to the future rather than to the past. Thus, in his book *Becoming* (1955) he argued that the self can make choices and to some extent influence the development of its own personality. A fundamental part in personality growth is played by what Allport called the functional autonomy of motives, i.e., the emergence of new motivation systems. For example, a son may take up medicine because his father is a doctor; but gradually his interests develop and medicine becomes a goal in its own right, independent of the initial drive.

Allport was not given to extreme views. He avoided writing dogmatically or provocatively and preferred courtesy to controversy. He could aptly be called one of the first humanists in psychology, but he did not allow his humanitarian sentiments to interfere with scientific integrity and logical thinking in his writings. He realized, however, that there is a fundamental contradiction between scientific and intuitive views of man. These are referred to as the nomothetic and idiographic standpoints. The nomothetist tries to arrive at general laws that apply to all human kind, and one's procedures are based on accurate measurements of behavior. Inevitably this involves fragmentation of the individual into measurable variables. But the idiographic view sees each particular individual as a unique whole and relies largely on intuitive understanding. Allport believed that the two should be combined. Nomothetic characteristics can be measured, for example, by personality questionnaires that measure extraversion, dominance, anxiety, etc. Idiographic description must be based on case study data, or inferred from personal documents such as diaries or imaginative writing. He rejected the usefulness of projective techniques for understanding normal people as distinct from neurotics. He himself did devise certain tests of personality traits, attitudes, and values, but saw little point in factorial studies of personality.

Allport's personality theory put him at odds with the vast majority of American psychologists, who were behavioristic empiricists. Nevertheless, he was widely respected for his ideas. He dealt with the bewildering complexity of personality by posting personality traits as the basic units or components. A trait is a generalized type of behavior that characterizes each individual and distinguishes that person from others. It is a real and causal neuropsychic structure, not merely biosocial—that is, derived from the impressions of people who observe the individual. This concept has been attacked by later writers who point out the frequent inconsistency, rather than the generality, of people's behaviors in different situations. Unfortunately, Allport did not live long enough to answer such critics as Walter Mischel, who regarded personal behavior as determined more by the situation than by internal traits. But he did allow for the uniqueness of each individual personality by distinguishing common traits—variables that occur in different strengths in all persons—from unique traits or personal dispositions peculiar to the particular person.

Although Allport's main work was the development of a comprehensive theory of personality, he had wide-ranging interests, including eidetic imagery, religion, social attitudes, rumor, and radio. The book that probably has the greatest practical and social value was his analysis of *The Nature of Prejudice* (1954). His major work was *Pattern and Growth in Personality*.

The following citation was presented when Allport was awarded the Gold Medal of the American Psychological Foundation in 1963: "To Gordon Willard Allport, outstanding teacher and scholar. He has brought warmth, wit, humanistic knowledge, and rigorous inquiry to the study of human individuality and social process."

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ALLPORT-VERNON STUDY OF VALUES

The Allport-Vernon Study of Values (SOV) is one of the earliest, theoretically well-grounded questionnaires measuring personal values on the basis of declared behavioral preferences. The SOV was first published in 1931 by G. W. Allport and P. E. Vernon (1931) and later revised in 1970 by Allport, Vernon, and G. Lindzey (1970). It is a psychological tool designed to measure personal preferences of six types of values: theoretical, economic, aesthetic, social, political, and religious. The method is rooted in a philosophy of values by E. Spranger, who postulated six ideal types of people corresponding to their most important and general beliefs, ways of thinking, and preferred patterns of living. Each one is oriented toward a basic value: (1) Theoretical: truth; (2) Economic: usefulness; (3) Aesthetic: harmony and beauty; (4) Social: love for people; (5) Political: power and leadership; (6) Religious: unity or moral excellence. The idea was developed by G. W. Allport (1961), who argued that personal philosophy of life related to values is a core feature of personality implying direction of motivation, future goals, and current choices.

The psychological meaning of the six value orientations are assessed by the SOV as follows: (1) Theoretical: dominant value is discovery of truth with interests that are empirical, critical, and rational; (2) Economic: dominant value is usefulness with a tendency to be practical, seeing unapplied knowledge as being wasteful; (3) Aesthetic: dominant value is form and harmony, with interests in the artistic side of life, and a tendency toward individualism and self-sufficiency; (4) Social: dominant value is the altruistic and philanthropic love of others with a tendency to be kind, sympathetic, and unselfish; (5) Political: dominant value is power with a tendency to desire power, influence, and renown, and with likelihood of becoming a leader of society; (6) Religious: dominant value is unity with a tendency to seek to comprehend the cosmos as a whole, attempt to relate it to themselves, and embrace its totality (Lublinski, Schmidt, & Benbow, 1996, p. 445).

The SOV contains six scales corresponding to the aforementioned types of values. The method is designed to measure basic preferences, so it concerns alternative forms of activity introduced as behavioral scenarios and related to different values. The answers, which imply a choice, cover potential and realistic everyday experiences. The method consists of 45 questions across two sections with different formats of questions and answers. Part I consists of 30 questions with two alternative answers concerning preferences; respondents indicate their preferences by distributing three points between two answers (giving 3 and 0, or 2 and 1). Part II contains 15 questions with four possible answers concerning choice of preferable activity; respondents rank these possibilities from the most preferred (4) to the least preferred (1), so they distribute 10 points (according to pattern 4-3-2-1). Examples of the items: Part I. 4. Assuming that you have sufficient ability, would you prefer to be (1) a banker; (2) a politician. Part II. 13. To what extent do the following famous persons interest you: (1) Mother Theresa; (2) General Colin Powell; (3) Bill Gates; (4) Marie Curie.

Each value enters into comparisons with the others 20 times all together, 10 times in each part of the method. A total score for a given value is the sum obtained in

two parts. Total score in each scale of the SOV ranges from 10 to 70. The method is ipsative, so a choice of one value is more preferred than another at the expense of this second value—which fits the nature of the valuing process, implying a choice and preference of one goal directed behavior over another. The sum of scores in all six scales is always 240.

For almost 50 years the SOV was one of the most cited questionnaires of personality. Since the 1980s the method was cited more rarely, due to (1) decreased interest of values in the field of personality; (2) development of new simple tools for direct measurement of preferences in the field of social psychology; and (3) archaic content of the SOV and dated language. In 1995 R. E. Kopelman, J. L. Rovenport, and M. Guan (2003) revised the SOV, updating language, modifying behavioral indices of values according to current culture, and broadening the concept of religiosity. They modified 15 items by replacing dated pronouns, including gender-inclusive wording, by broadening examples of religiosity originated from different religions, and by updating cultural conventions through incorporation of current referents and mores.

The comparison of mean scores in the original and revised versions of the method does not reveal any significant differences. Correlation between old and updated scales were also pretty high (mean coefficient was r = 0, 74). Internal consistency of the scales is also similar and acceptable with the following Cronbach alpha scores for revised scales: Theoretical (0, 59), Economic (0, 72), Aesthetic (0, 68), Social (0, 66), Political (0, 55), and Religious (0, 80). The revised version is substantially and psychometrically equivalent to the original one. The greatest advantage of the SOV is the diagnostic validity of the scale. In comparison to the Rokeach Value Survey (RVS), which is based on values ranking, and the Schwartz Value Survey (SVS), which is based on values rating, the SOV is based on an indirect assessment of values, through a choice between behavioral scenarios so it concerns preferred not preferable values. Moreover, the validity of the types of values was confirmed by different personal meanings as well as patterns of feelings obtained for the six notions of values (Hermans & Oles, 1994). A unique study about intellectually gifted adolescents, repeated 20 years later, showed 20-year relative stability of the SOV. This stability was comparable to the stability of personality traits, which confirms importance of value preferences as crucial personality feature (Lublinski, Schmidt, & Benbow, 1996).

According to the authors of the SOV, the six types of values are equal in that each may underlie a personal philosophy of life or may be connected to personality maturity. However, empirical results brought inspiring conclusions. There are some gender differences. Aesthetic, Social, and Religious values are preferred by females, whereas Theoretical, Economic, and Political values are preferred by males. A common and core feature of the former is communion, while that of the latter is agency. Intercorrelations of the scales have found a negative correlation between Religious, Social, and Aesthetic values and Economic and Political values. Such a structure of intercorrelations brings indirect support for a philosophical division of higher or final values and instrumental values with one exception: theoretical values represented by truth belong to higher values according to a philosophical standpoint (Lublinski, Schmidt, & Benbow, 1996).

Summing up, the psychometric properties of the SOV are acceptable, and the method has been used in scientific research as well as for psychological counseling, occupational and educational guidance, and psychoeducational purposes. The method can also be used in career planning, measurement of vocational interest, and assessment of individual preferences of style of life.

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See also: **Career Counseling; Vocational Counseling**

ALPHA COEFFICIENT (See Coefficient Alpha)

ALPHA RHYTHMS

Ensembles of synchronously active cortical neurons generate electromagnetic field potentials that can be measured by electroencephalography (EEG) or magnetoencephalography (MEG). The alpha frequency band is defined to be between 8 and 13 Hz (Berger, 1929). The classical alpha rhythm is prominent at electrodes overlying the occipital (visual) cortex and to a lesser extent over the posterior temporal and parietal areas. Alpha rhythm occurs in a condition of relaxed wakefulness with eyes closed. The alpha rhythm disappears gradually during drowsiness, and different types of alpha activity appear in rapid eye movement (REM) sleep.

Blind children do not develop the alpha rhythm. The alpha frequency maturates and reaches the approximate average values of 8 Hz at age 3 years, 9 Hz at age 9 years and 10 Hz at age 15 years. The interindividual variability is quite large. About 6% to 10 % of healthy subjects have "low voltage alpha activity," below 20 μV. Consistent amplitude asymmetries exceeding 2:1 are usually considered to be abnormal. Alpha variant rhythms with frequency of half or double the normal frequency may occur in some healthy subjects (Markand, 1990).

Alpha rhythm peak frequency correlates with cerebral blood flow and metabolism, and low frequency is found in metabolic, infectious, and degenerative disorders, including dementia of the Alzheimer's type. Unilateral slowing or loss of alpha rhythm occurs in the presence of traumatic, neoplastic, infectious, or vascular lesions of one occipital lobe. Abnormal "alpha coma pattern" occurs in some comatose patients. The outcome is variable, depending on the underlying condition, but it is most often poor.

Other physiological rhythms within the alpha frequency band are the mu rhythm (9–11 Hz) recorded over the sensorimotor cortex and the tau rhythm (Hari, 1999). Mu may be the only routinely recorded alpha-band rhythm in EEG of infants and small children. In order to see the proper alpha rhythm, passive eye closure or recording in darkness should be performed.

Subdural and intracortical recordings, as well as source localization studies, have shown that the alpha rhythm has multiple generators within the cerebral cortex. Although early studies suggested that the alpha rhythm was driven by feedback inhibition of thalamic relé cells, more recent studies suggest that both cortico-cortical and thalamo-cortical connections are of importance. It has been suggested that both intrinsic membrane ion channel properties and local neuron network properties determine rhythmic behavior (Lopes da Silva, 1991). Recent studies have identified specific thalamocortical neurons with high-threshold burst properties that seem to drive the classical alpha rhythm in dogs and cats (Hughes & Crunelli, 2005). Alpha phase and rhythmicity may indeed play an important part in attention, memory and consciousness (Palva & Palva, 2007).

The coherence-function has become a popular tool because it reveals information about functional connectivity between different parts of the brain during various tasks and states (Gevins, 1995). Volume conduction and the EEG-reference montage must be considered during interpretation. Event-related desynchronization (ERD) of central and occipital alpha rhythms represents activation of those cortical areas that are active in vision, motor preparation, or selective attention (Pfurtscheller, Stancák, & Neuper, 1996). Event-related alpha-oscillations in visual and auditory cortex following visual and auditory stimuli respectively have been described (Basar, Basar-Eroglu, Karakas, & Schürmann, 1999). Conflicting results have been published regarding the possible relationship between alpha frequency and cognitive performance (Markand, 1990; Klimesch, 1999). The proposed relationship between depression and frontal alpha asymmetry has been challenged (Debener et al., 2000).

Considerable progress has been made toward a better understanding of the basic mechanisms behind alpha rhythms and brain function during recent years. Data regarding alpha coherence seems to challenge the concept that cognitive events only are associated with gamma (30–100 Hz) activity (Nunez, Wingeier, & Silberstein, 2001). High-resolution EEG and MEG combined with mathematical methods and magnetic resonance imaging are exciting tools for human brain research.

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See also: **Electroencephalography; Magnetic Resonance Imaging**

ALTRUISM

Altruism refers to a specific form of motivation for benefiting another. Some biologists, economists, and psychologists speak of altruism as a form of behavior (e.g., costly helping or helping with no external reward). However, such use fails to consider the motivation for the behavior, which has historically been crucial for altruism.

Comte (1851/1875) coined the term altruism in juxtaposition to egoism, and, soon thereafter, it became prominent in philosophy. To the degree that one's ultimate goal in benefiting another is to increase the other's welfare, the motivation is altruistic. To the degree that the ultimate goal is to increase one's own welfare, with increasing the other's welfare being an instrumental means to reach this goal, the motivation is egoistic. Accordingly, altruism may be defined as a motivational state with the ultimate goal of increasing another's welfare. Egoism may be defined as a motivational state with the ultimate goal of increasing one's own welfare. In these definitions, "ultimate goal" refers to a state one is seeking in a given situation, not to a metaphysical first for final cause. A person can have multiple ultimate goals, so altruistic and egoistic motives can co-occur.

Dictionary definitions of altruism reflect this motivational focus. They typically define altruism as "unselfish concern for the welfare of others" (e.g., *Webster's*, 1990). However, for scientific use it seems best to avoid the term "unselfish" for two reasons. First, unselfish has clear evaluative connotations because of its juxtaposition to selfish, a term that implies undue or immoral attention to one's own welfare. Altruism, as defined, is not necessarily moral; indeed, it may lead one to violate one's own moral standards if doing so increases the welfare of the other toward whom one is altruistically motivated (see Batson, Kline, Highberger, & Shaw, 1995). Second, to speak of "unselfish concern" can lead to the assumption that self-sacrifice or net cost to self is a necessary component of altruism. This is not the case. Increasing the other's welfare, not decreasing one's own, is the focus of altruism.

Over the past 50 years, the term altruism has been widely used in biology, where it has at times been suggested that altruism is contrary to natural selection and therefore cannot exist. Making a useful distinction, Sober and Wilson (1998) point out that these biologists are referring to evolutionary altruism—behavior by one organism that reduces its reproductive fitness relative to the reproductive fitness of others. Evolutionary altruism is quite different from what is normally meant by altruism as just defined, which Sober and Wilson call psychological altruism. The existence of psychological altruism does not depend on the existence of evolutionary altruism.

The Egoism-Altruism Debate

Clearly, humans devote much time and energy to helping others. Is this evidence of psychological altruism? Most proponents of altruism say, not necessarily. Proponents of universal egoism go further. They say, necessarily not—that everything we do, no matter how noble and beneficial to others, is directed toward the ultimate goal of self-benefit. They point out that even when helping involves material or physical cost, we may benefit by getting social and self-rewards (praise, esteem) and avoiding social and self-punishment (censure, guilt). Proponents of altruism do not deny these self-benefits, nor do they deny that the motivation for helping is often egoistic. However, they claim that at least some of us, to some degree, under some circumstances, help with an ultimate goal of benefiting the person in need. They point out that even though we get self-benefits from helping, these benefits may not be the reason we helped. Rather than an ultimate goal, the self-benefits may be unintended consequences.

Helping another person—even at great cost to oneself—may be altruistically motivated, egoistically motivated, or both. To know which it is, we must determine whether benefit to the other is (1) an ultimate goal and any self-benefits are unintended consequences (altruism) or (2) an instrumental means to reach the ultimate goal of benefiting oneself (egoism). To do this, we first need to identify a likely source of altruistic motivation.

The Empathy-Altruism Hypothesis

In both earlier philosophical writings and in more recent psychological work, the most frequently mentioned likely source of psychological altruism is an other-oriented emotional reaction to seeing another person in need. This emotional reaction has variously been called compassion, empathy, empathic concern, pity, sympathy, and tenderness. It is other-oriented in the sense that it involves feeling for the other—feeling sorry for, distressed for, concerned for the other. We can also feel direct, self-oriented sorrow, distress, or concern when we are faced with a distressing situation, including seeing someone in need. The direct distress experienced at witnessing another person in distress—sometimes called "personal distress"—is distinct from other-oriented empathic concern for that person (Batson, 1991). To use the same terms for both other-oriented and self-oriented emotional reactions to seeing another in distress invites confusion. The relevant psychological distinction must be based not on whether terms like "sad" or "distressed" are used but on whose welfare is the focus of the emotional response—the other person's welfare or one's own.

The proposal that empathic concern felt for someone in need produces altruistic motivation to relieve that need has been called the empathy-altruism hypothesis (Batson, 1991). In the past several decades, more than 30 experiments have tested this hypothesis against various egoistic alternatives (see Batson, 1991, for a partial review and Batson, in preparation, for a more complete review). Although still controversial, results have been remarkably supportive of the empathy-altruism hypothesis, suggesting that psychological altruism—motivation with the ultimate goal of increasing another's welfare—is within the motivational repertoire of most humans.

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See also: **Affiliation Need; Morality; Prosocial Behavior**

ALZHEIMER'S DISEASE

Alzheimer's disease (AD) is a progressive neurodegenerative disease, affecting memory, intellectual functions, and behavior. The prevalence of Alzheimer's disease is increasing with the growing percentage of the population over age 65. Two to three percent of those aged 65–69 have AD. This percentage doubles every five years until almost 1 out of 2 or 3 individuals over the age of 85 are reported to have AD (Kukull et al., 2002). Approximately 14–16 million persons are expected to have AD in the United States alone by mid-century.

The clinical presentation of AD usually begins with memory loss, which slowly worsens over years and progresses to include impairment in additional cognitive domains such as language, executive function, or visuospatial skills. Early on in AD when memory loss is the only issue, or the cognitive difficulties do not yet significantly impair daily functioning, many of these individuals will be classified as having Mild Cognitive Impairment. While still a controversial topic, many view Mild Cognitive Impairment as a transition stage between normal aging and Alzheimer's disease.

In the early stages of AD, there is frequent repetition of stories/questions, misplacing of belongings, geographic disorientation, dysnomia, and difficulty managing finances or handling complex tasks. Sleep disturbances, depression, psychosis (hallucinations and paranoia), and other neuropsychiatric problems commonly evolve as the disease progresses. Assistance is eventually needed for dressing, bathing, meals, and other activities. Individuals often become lost in familiar surroundings and have reduced comprehension. Late stages often bring agitation and aggression, profound cognitive impairment, and loss of control of bodily functions. These disabilities often lead to institutionalization, increased risk of decubitus ulcers, aspiration pneumonia, and urosepsis from indwelling catheters.

Diagnosis of AD is based on the clinical features and the exclusion of other etiologies. Two commonly used diagnostic criteria are listed in Table 1. Confirmation of

Table 1. Current Diagnostic Criteria for Alzheimer's Disease

NINCDS-ADRDA Criteria for Probable Alzheimer's Disease (McKhann et al., 1984)

A. Include the following:
   1. Dementia established by clinical examination and documented by the Mini-Mental Test, Blessed Dementia Scale, or some similar examination, and confirmed by neuropsychological tests.
   2. Deficits in two or more areas of cognition.
   3. Progressive worsening of memory and other cognitive functions.
   4. No disturbance of consciousness.
   5. Onset between ages 40 and 90, most often after age 65.
   6. Absence of systemic disorders or other brain diseases that in and of themselves could account for the progressive deficits in memory and cognition.
B. The diagnosis is supported by the following:
   1. Progressive deterioration of specific cognitive functions, such as language (aphasia), motor skills (apraxia), and perception (agnosia).
   2. Impaired activities of daily living and altered patterns of behavior.
   3. Family history of similar disorders, especially if confirmed neurohistopathologically.

DSM-IV Criteria for Dementia of the Alzheimer's Type

A. The development of multiple cognitive deficits manifested by both:
   1. memory impairment (impaired ability to learn new information or to recall previously learned information) and
   2. one (or more) of the following cognitive disturbances:
      a. aphasia (language disturbance)
      b. apraxia (impaired ability to carry out motor activities despite intact motor function)
      c. agnosia (failure to recognize or identify objects despite intact sensory function)
      d. disturbance in executive functioning (i.e., planning, organizing, sequencing, abstracting)
B. The cognitive deficits in Criteria A1and A2 each cause significant impairment in social or occupational functioning and represent a decline from a previous level of functioning.
C. The course is characterized by gradual onset and continuing cognitive decline.
D. The cognitive deficits in Criteria A1 and A2 are not due to any of the following:
   1. other central nervous system conditions that cause progressive deficits in memory and cognition (e.g., cerebrovascular disease, Parkinson's disease, Huntington's disease, subdural hematoma, normal pressure hydrocephalus, brain tumor)
   2. systemic conditions that are known to cause dementia (e.g., hypothyroidism, vitamin B12 or folic acid deficiency, hypercalcemia, neurosyphilis, HIV infection)
   3. substance induced conditions
E. The deficits do not occur exclusively during the course of a delirium.
F. The disturbance is not better accounted for by another Axis I disorder (e.g., Major Depressive Disorder, Schizophrenia)

Table 2. Disease Processes that Should be Considered in the Differential Diagnosis of Dementia and their Principle Method of Evaluation

Treatable causes of dementia, which must be excluded primarily by serologic studies:
- Hypothyroidism
- Vitamin B12 deficiency
- Folate deficiency
- Neurosyphilis
- Hypercalcemia
- Hypo- or hypernatremia
- Renal dysfunction
- Liver dysfunction
- Chronic drug intoxication
- HIV infection

Treatable causes of dementia, which must be excluded primarily by neuroimaging studies:
- Normal pressure hydrocephalus
- Subdural hematoma
- Multi-infarct dementia
- Subcortical arteriosclerotic encephalopathy (Binswanger's disease)
- Space occupying lesions (tumor, abscess, etc.)
- Demyelinating diseases (multiple sclerosis, PML)

Other causes of dementia, which may be excluded by EEG:
- Subclinical seizures
- Creutzfeld-Jakob disease (CSF 14-3-3 protein also diagnostic)

Other causes of dementia, which must be excluded primarily by clinical features:
- Pseudodementia (depression)
- Pick's disease and Frontotemporal dementias
- Parkinson's disease
- Progressive Supranuclear Palsy
- Diffuse Lewy Body disease
- Cortical-basal-ganglionic degeneration
- Huntington's disease

cognitive impairment is important. Common screening tools for dementia include the Mini-Mental State Exam (Folstein & Folstein, 1975), the Dementia Rating Scale, 2nd edition (Jurica, Leitten, & Mattis, 2001), and a clock-drawing test. Often, more detailed neuropsychological testing is needed to confirm the cognitive difficulties associated with AD and to differentiate AD from normal aging and other types of dementia.

Laboratory testing is important in the evaluation of cognitively impaired individuals to identify reversible causes of dementia (Table 2). Blood tests evaluate metabolic, hormonal, and nutritional derangements. Neuroimaging is essential to detect subdural hematomas, hydrocephalus, stroke, and space occupying lesions. Noncontrast CT or MRI are suitable for most cases. PET and SPECT scanning of patients with AD characteristically reveal hypometabolism in the parietotemporal region, even in preclinical individuals at high genetic risk for disease. However, these studies are expensive and are not

widely available. They are most useful when attempting to discriminate AD from other neurodegenerative conditions that show distinct regional patterns of hypometabolism. Measurement of Barcode of Life Data (BOLD) response in mesial temporal lobe structures using functional MRI have been shown to be sensitive to detecting early AD in some individuals (Wierenga and Bondi, 2007). *In vivo* PET imagining using the Pittsburgh Compound B has also shown promise in visualizing Alzheimer's pathology (Klunk, Engler, and Nordberg, 2004). Currently, neuroimaging alone is not diagnostic of AD. That being said, imaging research is evolving rapidly, promising more sensitive and specific tools for future clinical use.

The pathology of AD involves the degeneration of neurons in select cortical regions and ascending brainstem systems, including the cholinergic basal forebrain. These regions exhibit pathological hallmarks of the disease, including neurofibrillary tangles within neurons and extracellular senile plaques containing Aβ40 and Aβ42. There are other pathological changes, however, including synaptic and neuronal loss, vascular changes, granulovacuolar degeneration, alterations to endosomal/lysosomal systems, and inflammation and oxidative stress (Terry, 1994).

Genetic research has provided key insights into the biology of AD. Early onset familial AD is linked to autosomal dominant mutations in the β amyloid precursor protein (APP), presenilin 1, and presenilin 2 (Hardy & Selkoe, 2002). Late onset familial and sporadic AD risk is associated with Apo E. Increased amounts of Aβ42, derived from APP and resulting from mutations in APP and presenilins alike, may enhance Aβ aggregation. Apo E genotype influences AD susceptibility, perhaps via increased Aβ deposition. Numerous studies confirm that the ε4 allele increases AD risk and decreases age of onset (e.g., Farrer et al., 1997). Genetic testing for Apo E and presenilin is commercially available but its role in AD diagnosis is often misunderstood. Apo E genotyping is not indicated for AD diagnostic testing, and adds little to the sensitivity and specificity of clinical judgment. Presenilin testing should only be performed with appropriate genetic counseling.

Current pharmacological therapies for AD are primarily based on augmenting the central cholinergic system (Doody, 2001). Available acetylcholinesterase inhibitor drugs have similar efficacy. Donepezil, rivastigmine, and galantamine have been shown to be effective in several large double-blind placebo-controlled clinical trials. Many patients may not show immediate clinical benefit, but over time (e.g., 6–12 months), tend to show less decline than untreated subjects. These drugs have efficacy for cognitive symptoms as well as for behavioral problems, they delay the need for institutionalization, and also reduce the overall economic burden. Memantine, an *N*-methyl-D-aspartate receptor antagonist, also has proven efficacy and is approved for late-stage AD in the United States.

Epidemiological studies have provided indirect evidence that other medications are associated with AD risk, including estrogen, nonsteroidal anti-inflammatory drugs, statins (NSAIDS), folic acid, and vitamin supplementation (e.g., Kukull & Bowen, 2002). However, prospective clinical studies are essential to determine if these treatments are effective and safe. Unfortunately, prospective double-blind studies have failed to show efficacy of estrogen replacement or NSAIDs; further study is necessary. Vitamin E, an antioxidant, which appeared to delay progression of the disease, was frequently prescribed in the past; however, this practice has declined after evidence arose of increased risk of mortality in large clinical trials (Miller et al, 2005). Until safety and efficacy issues are addressed with prospective studies, precautions against use of any unproven agents for AD should be heeded because of the risk of serious adverse events.

Health and environmental factors have also been found in epidemiology studies to relate to Alzheimer's risk (Qui, DeRonchi, & Fratiglioni, 2007). Specifically, high blood pressure, high cholesterol, and obesity in middle adult hood; diabetes; excessive alcohol intake, and cigarette smoking all have been related to a higher risk of AD. Lifestyle and social factors such as low education, reduced social network, lower engagement in mentally stimulating activity, and sedentary lifestyle have been linked to higher risk of AD. As with the medication and supplement links mentioned above, prospective studies into the benefits of altering these environmental/health factors have not yet been carried out.

Nonpharmacological or behavioral therapies for improving memory and cognition in AD have shown mixed results of effectiveness (Clare, Woods, Moniz Cook, Orrell, & Spector, 2003). The most support exists for spaced retrieval techniques and enriching the meaningfulness and organization of information to be learned and remembered. Research into these techniques, however, often fail to provide randomized trials, and the results are not found to be lasting or generalize beyond the specific task the individual was trained on. When the behavioral therapy focuses on compensation strategies for memory loss rather than attempts to "rebuild" memory, some success has been reported. As examples, placing an individual's name on the door of their nursing home room or providing them with personal notebooks with nursing home schedules and pictures of staff and loved ones have demonstrated some effectiveness (e.g., Bourgeois et al., 1997). Psychologists can also play an important role with families or in nursing care facilities by formulating and implementing behavioral management plans when behavioral problems arise in individuals with AD.

Finally, psychotherapy and education are often needed as families come to terms with a patient's changing abilities, experience the grief associated with perceived loss, and to provide more effective care. While the diagnosis may be perceived by some as catastrophic

news, education and contact with community support such as the Alzheimer's Association and others may help lessen the anxiety and fear of the unknown, and enable individuals to function better and longer within their families and in their own homes.

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See also: **Late-Life Forgetting; Memory Functions**

AMBIVALENCE

The quest for unified thought is a consistent theme in philosophical and psychological traditions. Ancient Greeks from Pythagoras to Plato equated optimal well-being with absence of psychological conflict. Plato famously depicted virtue as arising from reason's skill at harnessing the potentially opposing "horses" of the will (spiritual versus sensual). Classic psychological theory and research on ambivalence emphasizes the neuroses that can arise from being of two minds and feeling torn between opposing inclinations. For example, Freud claimed that ambivalent feelings about sex or aggression caused neurotic feelings and reactions, and his contemporary, Eugen Bleuler, extended this view to position ambivalence as the primary basis for mental disorders.

As Freud's psychoanalytic ideas evolved, neoanalytic theorists increasingly emphasized ambivalence about the self as a key cause of unhappiness and dysfunctional behavior. In Erik Erikson's developmental theory, earnest and unambivalent identity commitment is the basis for adult maturity. In contrast, Karen Horney described the

neurotically ambivalent tendency to focus defensively on a proudly idealized view of self as a means of masking awareness of a despised self. Carl Jung, who had been Bleuler's assistant, similarly noted that some people over-identify with a socially acceptable persona as a way to mask socially unacceptable shadow aspects of self. Carl Rogers' influential client-centered theory contended that psychosis results when the idealized self becomes morbidly disparate from the real self. Each of these views is grounded in Freud's very early, general observation that people repress unfavorable self-views by a defense mechanism that came to be known as reaction formation. Freud observed that repression was usually accomplished by immersing oneself in excessively intense, reactive thoughts about oneself that oppose the unwanted thoughts. As such, reaction formation can be a way of coping with ambivalent impulses and self-views. These classic theories share a common assumption that ambivalence about the self is highly aversive. Why should it be so?

At around the same time as these classic clinical theories of ambivalence were being developed, early laboratory investigations of motivational ambivalence were underway. Pavlov (1927) found that experimentally induced motivational ambivalence caused his dogs to have extreme reactions. In one study, for example, he conditioned his hungry dogs reliably to associate a painful electric shock to a specific leg site with the onset of food. Accordingly, when the shock was applied to that site, dogs had been conditioned to ignore the pain and eagerly focus on the expectation of food, drooling in confident anticipation. If the shock was applied to a different leg site, however, the shock introduced motivational ambivalence about whether to eagerly approach food or avoid the painful shock. In response to this kind of motivational conflict, the dogs howled, frothed, struggled, bit off their experimental apparatus, and became uncooperative and incapable of learning for the rest of the day.

At around the same time, Kurt Lewin conducted related research with toddlers to provide experimental evidence for Freud's views on the consequences of motivational ambivalence. He induced (and coined the term) approach-avoidance conflict in toddlers by motivating them to approach a goal that became compromised by danger just before goal completion. At that very approach-goal/avoid-danger moment, like Pavlov's ambivalent dogs, the toddlers reacted with tantrums and became stubborn and unruly.

Contemporary research on the neuroscience of goal conflict provides a deeper understanding of why motivational ambivalence should be so distressing. Behavioral, pharmacological, and brain lesion studies have identified an evolutionarily old module in the brains of humans and other vertebrates—the behavioral inhibition system—that releases anxiety when individuals are confronted with ambivalent situations that arouse approach-avoidance conflicts (Gray & McNaughton, 2000). The anxiety is adaptive because it motivates the animal to disengage from the conflicted goal and scan for a more tenable alternative. For humans, this module has neural projections to and from the prefrontal cortex. This means that, for humans, even merely ambivalent thoughts can activate the anxiety of the behavioral inhibition system.

Lewin's student, Leon Festinger, popularized this insight with his work on the aversive arousal associated with "non-fitting cognitions," which he referred to as cognitive dissonance. According to Festinger (1957), an aversive motivational state of cognitive dissonance is aroused when individuals find themselves confronted with ambivalent attitudes about an attitude object. Performing a clearly boring task with little justification, then being subtly tricked into freely recommending it to another person as fun creates ambivalent feelings about a task. Ambivalent thoughts about a boring task and one's apparently positive attitude toward it leads to discomfort and defensive distortions that are aimed at unifying one's apparently ambivalent orientation toward the task (Festinger & Carlsmith, 1959). In another study Festinger and colleagues observed the despair of doomsday cult members who had been devoted to their cult, but who then experienced the dissonance of seeing that the world did not end on the day that their cult-leader had predicted. To cope with the resulting ambivalence, cult-members became all the more extremely committed to the cult, and they explained away the failed prophecy with dubious rationalizations.

Contemporary social psychological research on ambivalence focuses on the psychological consequences and discomfort of holding simultaneously favorable and unfavorable attitudes about an attitude object. One consequence is referred to as ambivalence amplification (Bell & Esses, 1997). This refers to the tendency to avoid ambivalence by cleaving to one-sided views. The tendency toward ambivalence amplification resembles the Freudian defense mechanism of reaction formation. It relieves distress because distress is experienced to the extent that an individual holds strong and equally strong views that have opposing valences. For example, one would experience distress to the extent that one strongly valued both the favorable aspects of capital punishment (e.g., perceived justice) as well as the unfavorable aspects (e.g., discomfort at the idea of hurting another human). The mathematical formula that best predicts the amount of felt discomfort is the square of the valence of the weaker of the ambivalent elements divided by the stronger of the ambivalent elements (Newby-Clark, McGregor, & Zanna, 2002). This formula helps clarify one of the reasons that extreme reactions to ambivalence are rewarding for individuals. Amplifying an extreme position in either direction increases the denominator of the ambivalence formula and accordingly decreases distress.

A further contributor to the discomfort of ambivalent thoughts is the extent to which the opposing thoughts are simultaneously accessible to awareness (Newby-Clark, McGregor, & Zanna, 2002). Discomfort is particularly high, for example, when both strong negative and positive thoughts about capital punishment come to mind equally quickly. This simultaneous accessibility finding further helps explain why people tend to react to ambivalence by strongly identifying with extremely one-sided views. Such extreme identifications may help commit the self to one side of the cognitive conflict, and self-relevant thoughts are particularly accessible to awareness. Accordingly, extremism may decrease simultaneous accessibility of conflicting elements by making the self-related element come to mind much more quickly than the opposing element.

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See also: **Behavioral Inhibition; Cognitive Dissonance; Conflict Resolution**

AMBULATORY ASSESSMENT

Ambulatory assessment can be defined as the use of computer-assisted methodology for self-reports, behavior records, or physiological measurements, while the assessee undergoes normal daily activities. Ambulatory assessment is characterized by the following features: the recording takes place in real-life situations; computer-assisted methodology is widely used; and the assessor attempts to minimize method-dependent reactivity and strives to achieve a high degree of ecological validity. Ambulatory assessment has outstanding practical utility for various objectives such as monitoring and self-monitoring, screening, classification and selection, clinical diagnosis, and evaluation. It can be applied in various areas of psychology and other behavioral sciences, and there already are many successful applications in psychophysiology, personality psychology, health psychology, and clinical psychology. For more detailed information see Fahrenberg and Myrtek (1996, 2001) or the Web site of the European Network for Ambulatory Assessment (http://www.ambulatory-assessment.org).

Precursors of Ambulatory Assessment

Ambulatory assessment is not a completely new development. Self-monitoring procedures, electronic diaries, systematic behavior observation devices, and computer-assisted testing, to name only a few elements of the broad spectrum of methods applied in ambulatory assessment, have been with us for several decades. But the ambulatory assessment approach brought these diverse and often separate developments together and is on its way to becoming an influential movement in the field of psychological assessment that challenges traditional ideas, methods, and procedures (see Westmeyer, 2007).

Advantages of Ambulatory Assessment

It is still common practice in psychological assessment to assess a person's experience or behavior by applying questionnaires in a test laboratory or some other specifically designed situation that is far away and very different from the various contexts in which the experience or behavior of interest actually occurs. Therefore, traditional questionnaires have limited ecological validity and can assess the respective experience or behavior only retrospectively, whereas an ambulatory assessment procedure assesses that experience or behavior at the time and place of its actual occurrence. Such an assessment strategy has important advantages, because it avoids most of the errors and distortions characteristic of retrospective reports that rely on recall. Hufford, Shiffman, Paty, and Stone (2001), among others, mention incomplete and imperfect encoding, biased retrieval, and inadequate aggregation of information about events as well-documented sources of inaccuracy of retrospective recall.

Modes of Data Collection

There are two different types of data collection in ambulatory assessment: the event-controlled (or event–contingent)

and the time-controlled (or time–contingent) mode. In the event-controlled mode, the subject must self-monitor the occurrence of certain events and perform an assessment whenever they occur. Examples are the self-observation and self-registration of target behaviors by a patient or the recording of the intensity of anxiety experienced by a person whenever confronted with fear-arousing stimuli. In the time-controlled mode, the subject has to follow a time-sampling schedule. Whenever the subject gets, in accord with the schedule, a signal by a prompting device (e.g., a handheld computer), he or she has to perform an assessment. Examples are the signal-contingent application of a computer-assisted self-report instrument to assess mood states and daily health following a variable time-interval schedule or the monitoring of blood pressure in hypertensive individuals at fixed time intervals. For more examples see Fahrenberg and Myrtek (2001) and Stone, Shiffman, Atienza, and Nebeling (2007).

Devices, Instruments, and Programs

The practice of ambulatory assessment depends heavily on the availability of suitable devices to record assessment data and programs for analyzing these data. For psychophysiological ambulatory assessment, one can choose between various recording and analyzing systems. There are specialized and multipurpose devices that assess a vast range of physiological parameters as, for example, blood pressure, skin or body temperature, and data from EEG, ECG, or EMG. Ambulatory assessment of experience and behavior makes use in most cases of handheld computers for which various software packages are available to assess, for example, personality variables, mood states, state of health, problem behaviors, or situational variables. For a state-of-the-art overview of available hardware and software solutions see Ebner-Priemer and Kubiak (2007). Appropriate methods for analyzing monitoring data may go well beyond what is common knowledge in the methodology of psychology. One example is circular statistics, a field of statistics that is well known in biology but unfamiliar to most psychological researchers. Under certain circumstances, it can be used as a superior alternative to traditional time-series analyses (Kubiak & Jonas, 2007).

Related Approaches

Apart from the ambulatory assessment movement, there is another group of researchers who pursue very similar goals but use other terms. Hufford, Shiffman, Paty, and Stone (2001) prefer the term Ecological Momentary Assessment (EMA). They are primarily interested in gathering self-reported health information in real time in the real world. EMA focuses on the collection of data on momentary states in the real world with a high degree of temporal resolution. This enables researchers to avoid the biases of retrospective recall, to achieve a high degree of ecological validity, and to analyze dynamic processes over time. In their most recent book, Stone et al. (2007) put EMA in the context of a more comprehensive *science of real-time data capture* (RTDC). "RTDC" and "ambulatory assessment" are terms with basically identical meanings, whereas EMA with its emphasis on self-reports can be conceived of as one of the three branches of ambulatory assessment. The other two branches focus on behavior records and physiological measurements, respectively.

Prospects

As far as behavior records and psychophysiological measurements are concerned, there is no real alternative to ambulatory assessment procedures, if one is interested in ecologically valid data. Therefore, we will see increasing applications of these procedures in, for example, health care, telemedicine, ergonomics, and occupational psychophysiology. But it is also to be expected that a growing number of researchers will be convinced by the obvious advantages that concurrent self-reports offer over traditional retrospective self-reports. This will foster the dissemination of this branch of ambulatory assessment, even if these data collection strategies are much more expensive and time-consuming than the simple application of traditional questionnaires to a large number of persons.

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AMERICAN BOARD OF PROFESSIONAL PSYCHOLOGY

The American Board of Professional Psychology (ABPP; http://www.abpp.org) was originally established as the American Board of Professional Examiners in Psychology (ABEPP) in 1947. This followed recognition by the American Psychological Association (APA) of a need for assessing competency in professional psychology (Brent, Packard, & Goldberg, 1999). APA provided some initial funding for the establishment of the ABPP. Brent et al. (1999) provide a thorough history of ABPP through the late 1990s, and they detail the organizational evolution of ABPP.

Initially, the ABPP comprised two specialty areas: Clinical Psychology and Counseling Psychology. As of 2008, 13 specialty boards represent the following specialty areas: Cinical Child and Adolescent Psychology; Clinical Health Psychology; Clinical Neuropsychology; Clinical Psychology; Cognitive and Behavioral Psychology; Counseling Psychology; Couples and Family Psychology; Forensic Psychology; Group Psychology; Organizational and Business Consulting Psychology; Psychoanalysis in Psychology; Rehabilitation Psychology; and School Psychology.

Each specialty board is a member board of the ABPP, maintains its own governance, and it is responsible for establishing the ABPP definition of the specialty and its competencies, reviewing applicants, and examining candidates. Specialty boards may have an Academy that provides information about its specialty board certification process, continuing education, and other related specialty-specific activities. ABPP boards are individually subject to comparison with ABPP and non-ABPP boards. Quality and standards are reviewed within and across the ABPP boards on a regular basis.

Psychologists who become board certified may benefit professionally in a variety of ways. ABPP board certification is expected of psychologists joining the faculty of many universities and medical centers. Psychologists who are board certified through the ABPP may be eligible for pay increases and/or other benefits within the Department of Veterans Affairs, other governmental agencies, universities, hospitals and medical centers. ABPP board certification also facilitates mobility for psychologists who desire to relocate with many states recognizing ABPP in their licensing acts.

ABPP is an active participant, formal liaison, and/or observer to numerous national and international organizations. Examples within APA are the Committee for the Advancement of Professional Psychology (CAPP), Board of Professional Affairs (BPA), Board of Educational Affairs (BEA), and the Taxonomy Work Group. ABPP is a member organization of the Council of Credentialing Organizations in Professional Psychology (CCOPP) and has a liaison relationship with the Association of States and Provincial Psychology Boards (ASPPB) and the Council of Specialties in Professional Psychology (COS). Through these, ABPP is engaged in intra- and interorganizational quality improvement efforts. Within this context, ABPP continues to focus on the issues of *competency* and *competency assessment*. These are considered a vital part of ABPP's commitment to consumer protection and improving professional psychology.

ABPP has a long tradition of setting the standard for board certification within psychology. ABPP's ranking scope, multiple boards, and active relationships with other professional psychology organizations has led to its wide recognition and acceptance within the field of psychology.

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AMERICAN PSYCHOLOGICAL ASSOCIATION

In July 1892, G. Stanley Hall (1844–1924) met with a small group of men to discuss the possibility of organizing a psychological association. Hall and the group elected 31 individuals, including themselves, to membership, naming Hall as the first president. In organizing a disciplinary society, psychologists were following the lead of new scholarly and scientific disciplines like physiology, political science, and history. This was the time in America's history when many of the disciplines were establishing their identity and defining themselves. This was part of a reorganization of American knowledge production, reflecting a division of intellectual labor similar to the division of manufactory labor. Like its fellow disciplines, the new psychology grew and prospered as it responded to the needs of American society.

American higher education was reorganized in the last quarter of the nineteenth century, with the development of graduate education similar to the German university approach. Psychology, like the other new disciplines, soon developed advanced degrees providing credentials that served to validate the discipline's members as experts in their special field. This occurred in parallel with the progressive movement in politics, which called for a more efficient and less corrupt social order. The synergism of these two developments, specialized expertise and rationalized government, helped create the demand for trained personnel to fill the new professional niches created by the demands for a more efficient society. Psychology was one

of the most successful of the new disciplines in making itself useful for the social management of an increasingly complex and diversified society.

The first meeting of the new American Psychological Association (APA) was held in December, 1892, at the University of Pennsylvania. The basic governance of the APA at this time consisted of a small Council with an Executive Committee. This plan remained in effect until the reorganization of APA during World War II.

Membership growth of the APA was modest over the first 50 years of its existence. From 31 members in 1892, there were 125 members in 1899, 308 in 1916, 530 in 1930, and 664 in 1940. In 1926 a new class of nonvoting membership was formed, the Associate class, and by 1940 the number of Associate members in APA had grown to 2,079. Many of these associates were individuals who were doing practical or applied work in psychology and also belonged to one of the applied associations that emerged at this time. Realizing that the growth of applied psychology represented a potential threat to its preeminence, the leaders of APA sought to reorganize the Association during World War II. Under this reorganization plan, the APA merged with other psychological organizations and created divisions to represent special fields of interest. There were initially 17 divisions (19 were proposed). The result was an association that was much more broadly based than previously and that was organized around an increasingly diffuse conceptualization of psychology. Now the Association's scope included professional practice and the promotion of human welfare, as well as the practice of the science of psychology. This flexibility in scope has remained to the present time, as new challenges and demands have arisen.

Psychology boomed after the end of World War II, with the greatest increase in membership coming between 1945 and 1970. This was due to intense interest in the field, especially in the domains of clinical and applied psychology and particularly among returning servicemen, many of whom saw the great need for better psychological services firsthand during the war. Institutional and structural factors that facilitated this growth included the GI Bill, the new Veterans Administration Clinical Psychology training program, and the creation of the National Institute of Mental Health. For the first time, psychology was a field of both science and practice that was richly funded for training and research. This was, as one scholar termed it, the Golden Age of Psychology. The rapid and incredible growth in APA's membership reflected this trend, as membership grew from 4,183 members in 1945 to 30,839 in 1970, an increase of 630%: By comparison, from 1970 to 2000, APA membership grew to 88,500, with an additional 70,500 affiliates.

Part of what facilitated this growth was the new divisional structure of the APA that grew out of the reorganization plan during World War II. Now members could join a special interest group within APA and find other like-minded members. Of course, this also facilitated the fractionation of psychology and pushed the field away from any sense of unity that it may have held prior to the war. Nineteen divisions were approved in 1944, with the two most numerous being clinical and personnel (now counseling). This reflected the sectional structure of the American Association of Applied Psychology (AAAP), which had emerged in 1937 as the chief rival to the APA and had been the chief reason for the reorganization. Because the Psychometric Society (Division 4) decided not to join, and after Division 11, Abnormal Psychology and Psychotherapy, merged with Division 12, Clinical Psychology, the number of active divisions was reduced to 17.

Growth in the number of divisions was slow until the 1960s, with only three more being added, in part because many of the older members, then in leadership positions, were quite resistant to increasing the number of divisions. From 1960 to 2007, 34 more divisions were formed to bring the total to 54. Many of the newer divisions reflect the growth of particular practice areas, such as Division 50, Addictions. However, there has also been growth in special interest areas that belie any simple science/practice dichotomy, including the Society for the Psychology of Women (Division 35), the Society for the History of Psychology (Division 26), International Psychology (Division 52), Media Psychology (Division 46), and the Society for the Psychological Study of Men and Masculinity (Division 51).

The effect on APA governance of the divisional structure and the growth of state and provincial psychological organizations has been marked. As mentioned, prior to World War II, APA's governance structure was a small Council with an Executive Committee. Since the reorganization and the end of the war, the Council of Representatives has grown in number to accommodate representation from each Division and from state and provincial psychological associations, thus making governance somewhat unwieldy. Various plans have been tried over the years to ensure a voice for each of the areas and interest groups in psychology on the Council, and it remains a dynamic situation. One governance result of the growth of professional psychology, especially clinical and counseling psychology, has been the increase in the representation of professional interests, such as licensing and specialization, in the deliberations of the Council. At times, this has led to tension between the representatives of psychological science and those whose main commitment is to advancing professional practice. In historical retrospect, it seems clear that this tension was inherent in the reorganization of APA, as the Association reflected developments in the field.

As a membership organization, APA has often been perceived as inadequately representing one or more of its constituencies. It has been the case, more often than not, that the resulting tension was resolved and the

unhappy parties remained within the association. However, there have also been more serious disagreements that have resulted in new organizations being formed. In the late 1950s, a group of experimental psychologists grew unhappy with what they perceived as APA's drift from scientific psychology. By the end of 1959, this group had formed the Psychonomic Society in order, they asserted, to foster psychology as a science without a need to attend to professional issues. The Psychonomic Society remains a viable and valuable organization of scientists to the present moment; many of its members remained APA members, as well. A more serious division occurred in the mid- to late 1980s, as tensions between those who wanted APA to remain a primarily scientific organization and those who sought a greater emphasis by the association on professional practice rose to a boil. A proposed reorganization plan was defeated by a vote of the membership, and almost immediately thereafter a large group of dissident psychological scientists, including some former APA presidents, left the APA to form what is now the Association for Psychological Science (APS). Still, after a period of struggle, both organizations are strong, stable representatives of psychology, with many psychologists belonging to both associations.

One result of the split that led to the formation of APS is that professional interests have grown stronger within APA. Even so, APA has maintained a commitment to the promotion of psychological science. Internally, in the APA Central Office, this commitment is represented by the Science Directorate. Since the late 1980s, the Central Office has been reorganized to better represent the diverse constituencies of the membership. Beginning with the formation of the Practice Directorate in the late 1980s, other Directorates were formed in the hope that the interests of all the membership would be better represented. As of 2008, there are in addition to the Practice Directorate the Education, Science, and Public Interest Directorates. From a historical perspective, it is too soon to determine whether this approach represents an advance for the Association or a further balkanization of the field.

APA remains the world's largest membership organization of psychologists. It has a fascinating past, marked by growth, conflict, and increasing diversification.

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AMERICAN PSYCHOLOGICAL ASSOCIATION CODE OF ETHICS

The American Psychological Association (APA) promulgated the first Code of Ethics for psychologists in 1953. This publication, however, had been preceded by a committee devoted to ethical concerns that had been formed in 1938, and was based on the work of a committee organized in 1947 (Canter, Bennett, Jones, & Nagy, 1994). The formalization and codification of ethical standards was a response to the increasing professionalization of psychology, a development that began during World War II.

The first Code of Ethics (American Psychological Association, 1953) was developed using an empirical, critical-incident methodology (Hobbs, 1948) that had been unprecedented among associations. Rather than using an a priori method to determine ethical principles, the membership of the association was surveyed and asked to report incidents in which a decision had been made with ethical implications, including a discussion of the ethical issues involved. This material then formed the basis for many drafts of the first Code of Ethics, each of which was distributed to the membership for commentary before the final version was adopted.

Since the introduction of the original Code of Ethics, revisions, either minor or major, have been adopted a great many times. These changes, regardless of scope, serve to keep the Code current and to respond to new issues, to changing views on traditional issues, and to legal imperatives that influence ethical behavior. Thus, it would be correct to describe the Code of Ethics as a living document and, as such, it is clear that it embraces an approach to ethics that is influenced by current events rather than based on universal ethical principles. In each revision, the Code of Ethics contains a set of ethical principles (or standards) without the inclusion of illustrative incidents.

The Code of Ethics in force presently was published in 2003 (American Psychological Association, 2002). Although the critical-incident methodology was not employed, the revision was informed by the history of ethical complaints that had been filed, so that an empirical basis was built in to the revision process. The alterations in the Code took 11 years after the publication of the 1992 Code (American Psychological Association, 1992),

and involved many iterations involving the membership of APA, the Ethics Committee, the Revision Comments Subcommittee, and finally the Council of Representatives of APA. The document that was produced was intended to be accessible to psychologists and to consumers of psychological services, and to provide guidelines that would increase the quality of psychological services and also reduce the risk of harm to the consumers.

The Code of Ethics of a professional association is enforceable only with regard to members of the association, but it also forms the basis of the conception of ethics by many State Boards, who themselves are asked to make judgments of the professional conduct of licensed professionals. In addition, it is the foundation of the instruction in ethics that is mandated by accreditation for students in psychology. Thus, the influence of the Code is far broader than its scope of enforceability. Similarly, the maximum penalty that can be exacted for a serious violation of the Code is expulsion from the organization, but this expulsion is publicly noted, other relevant groups are informed (and may take independent action), and there are implications for matters such as insurability, so that the penalty is much more severe than simple expulsion by itself.

The 2003 Code of Ethics has two major sections, as well as introductory material that includes clarification that the Code applies only to psychologists' work-related activities, a point reiterated in the first enforceable standard. The first section of the Code consists of five General Principles. These Principles are aspirational rather than enforceable, but they can be used to interpret the enforceable standards that follow. The Principles represent standards for ethical behavior, as opposed to the areas of function that were embodied in the previous Code. The principles are Beneficence and Nonmaleficence, Fidelity and Responsibility, Integrity, Justice, and Respect for People's Rights and Dignity. The approach to ethics embodied herein is called principle-based ethics and refers to general principles that should guide moral behavior. There are no set and agreed upon set of principles, but the ones in this document are among those that have been suggested in the ethics literature (Kitchener, 2000). The Principles are operationalized in the more specific standards that make up the largest portion of the document.

The Ethical Standards are the specific and directly enforceable translation of the General Principles. There are a total of 89 standards, but they are most easily summarized by referring to the 10 sections that contain them. The first section, Resolving Ethical Issues, indicates the affirmative responsibility of psychologists to be familiar with and to help to uphold the ethical standards of the discipline. It indicates, among other things, that when the Code conflicts with the law, the psychologist may, but not must, act in conformity with the law, and must attempt to resolve the conflict consistent with the Code.

The second standard concerns Competence, emphasizing the need for psychologists to maintain competence and to practice within the areas of competence, informed by the most current knowledge base. Human Relations is concerned with the avoidance of exploitative relationships of many different types. Privacy and Confidentiality goes beyond the clinical activities of psychologists and indicates the nature of confidentiality and how it can be established and honored. Advertising and Other Public Standards has become more permissive since rulings of the Federal Trade Commission indicated the illegality of banning professional advertising. Standard six concerns Record Keeping and Fees, indicating the need to maintain proper records and to make fees clear and fair. Education and Training is specific to educational sites and discusses the design of training programs and the treatment of students. Research and Publication, along with several of the previous Standards, makes clear that the Code of Ethics is not restricted in its scope to professional practice, but is intended to be applicable to the activities of all psychologists.

Standard nine, Assessment, is predominantly, but not exclusively, applicable to clinical activities. It ranges from test construction to the use and basis of psychological tests. Finally, the last standard concerns Therapy and may be the area of major concern to most practitioners. It concerns the practice and delivery of therapeutic services, including all modalities, and includes the prohibition of sexual relationships with patients. It is only through the commitment of the individual psychologist to the Code of Ethics that psychology can progress toward a firm foundation in ethical and responsible conduct.

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See also: **Ethical Issues in Psychology; Ethical Treatment of Animals**

AMERICAN PSYCHOLOGICAL ASSOCIATION OF GRADUATE STUDENTS

The American Psychological Association of Graduate Students (APAGS) is a continuing committee within the American Psychological Association (APA) that advocates for the unique needs and concerns of graduate students. APAGS consists of approximately 40,000 student affiliate members and is one of the largest constituency groups within the APA. APAGS is the largest group of organized psychology graduate students in the world (APAGS, 2008).

History

APAGS was founded in 1988 by two Canadian graduate students, Scott Mesh and David Pilon. Scott and David worked with then APA CEO, Raymond Fowler, to persuade the APA Council of Representatives to approve the formation of the APAGS Committee. This was the first successful attempt to create an organization within the APA to address the unique needs and concerns of graduate students. The new committee provided a much needed home for psychology graduates students within APA.

APAGS continues to grow and advance its influence and advocacy efforts on behalf of graduate students. For instance, APAGS liaisons with key boards and committees both within and affiliated with the APA, including the Committee for the Advancement of Professional Practice, the Board of Scientific Affairs, the Board of Educational Affairs, the Board of Professional Affairs, the Association of Psychology Postdoctoral and Internship Centers (APPIC), and many others (APAGS, 2008). APAGS has representation on the APA Committee on Accreditation, the APA Board of Directors, the APA Council of Representatives, and the Psychology Executives Roundtable (APAGS, 2008). APAGS currently holds voting privileges on the APA Committee on Accreditation and the APA Council of Representatives, and it is in the process of advocating for the APAGS membership on the APA Board of Directors to become a voting position. These relationships and representations demonstrate APAGS' integration and advocacy efforts within and outside of APA. This year marks APAGS' 20th anniversary of representing, advocating, and addressing the needs of psychology graduate students.

Mission and Purpose

APAGS is the voice of psychology students within the APA and community at large. The mission of APAGS is (1) to promote high standards in the research, teaching, and practice of psychology, (2) to represent and facilitate information exchange between all graduate study specialties of psychology, (3) to promote graduate student leadership development, and (4) to establish and maintain channels of communication between APAGS and schools, universities, training centers, institutions, and other members of the psychological community (APAGS, 2008). This mission helps to guide the work and goals of the APAGS committee.

Membership Composition

APAGS members include all graduate student affiliate members of the APA and any undergraduate students who elect to upgrade their membership to APAGS status for an additional fee. Members enjoy a host of benefits that include (1) subscriptions to the *American Psychologist*, the *Monitor on Psychology*, and the APAGS magazine, *gradPSYCH*; (2) a $10 credit for subscriptions to APA journals; (3) the right to purchase access to APA's online databases like PsycINFO; (4) access to listservs targeted to a variety of student interests; (5) internship and career resources; (6) scholarship and award eligibility; and (7) access to professional liability insurance (APAGS, 2008).

Members also receive access to information resources created by and for graduate students, such as the APAGS Practice Resource Guide; the APAGS Resource Guide for Lesbian, Gay, Bisexual, and Transgender Individuals; the APAGS Survival Guide for Ethnic Minority Graduate Students; Resource Guide for Psychology Graduate Students with Disabilities; the Networking Guide for Students within State, Provincial, and Territorial Psychological Associations; and the Mentoring, Balance and Self-Care–Especially for Women: A Collection of Articles and Resources (APAGS, 2008).

APAGS Governance Structure

Members who choose to run for elected office or apply for an appointed subcommittee position are able to become involved in APAGS governance. The APAGS governance comprises nine officers elected by APAGS members and five specialized subcommittees. The volunteer work is supported by an associate executive director and professional staff at the APA headquarters in Washington, D.C. The elected positions are the Chair, the Past-Chair, the Chair-Elect, and six Members at Large who focus on the specific areas of practice, science, education, diversity, communications, and membership. The APAGS governance structure is modeled after the structure of the APA governance system.

In addition, APAGS has four subcommittees: the Committee on Ethnic Minority Affairs (CEMA), the Advocacy Coordinating Team (ACT), the Committee on Lesbian, Gay, Bisexual, and Transgender Concerns (CLGBTC), and the Convention Committee (APAGS, 2008). CEMA represents and advocates for the perspectives and concerns of ethnic minority graduate students within the discipline of psychology. ACT is composed of psychology graduate students who primarily engage in legislative advocacy

work on behalf of the science and profession of psychology (APAGS, 2008). ACT members promote the welfare of graduate students and the profession by engaging in legislative advocacy efforts. CLGBTC facilitates communication among gay, lesbian, bisexual, and transgender graduate students in psychology and it helps to educate psychologists, faculty, and students of the concerns and needs of lesbian, gay, bisexual, and transgender students. The APAGS Convention Committee works with APAGS staff to plan student programs and events for the annual APA Convention, which provides APAGS members with the opportunity to present their research, ideas, and work at the annual convention (APAGS, 2008).

Activities

APAGS governance members and staff work collaboratively to create and distribute information on education and training issues, legislative positions and developments, and current and future directions within the field through printed resources and the APAGS web site (APAGS, 2008). APAGS also provides opportunities for graduate students in the form of scholarships and awards, members support, resource development, leadership opportunities, and special convention programming. Further information about APAGS is available on its web site at http://www.apa.org/apags/.

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AMERICAN PSYCHOLOGY-LAW SOCIETY

The American Psychology-Law Society (APLS), which is Division 41 of the American Psychological Association (APA), is a professional organization dedicated to the advancement of scholarship, education, public service, and practice in the field of psychology and law. The Society was founded in 1969 by several APA members, including Eric Dreikurs and Jay Ziskin, who had specific interests in psychology and law. Ziskin became the first president of APLS. The goals of the original members included advancing the professional practice of psychology in the legal field, using research to improve the quality of psychological expert testimony to the courts, and developing a community for researchers interested in the application of psychological methods and theory to the legal context (Grisso, 1991; Fulero, 1999). Most of the original members of the Society were trained in clinical psychology and were academicians or clinical practitioners (Grisso, 1991). Early members of the Society were interested in issues such as expert testimony, competency to stand trial, the insanity defense, jury decision making, and eyewitness testimony (Fulero, 1999). APLS established a conference in 1974. These conferences began as biennial meetings and became annual meetings in 2002.

In a separate organizational process, an APA committee convened in 1979 with the goal of forming a division to represent APA members interested in psychology and law (Grisso, 1991; Fulero, 1999). Division 41 of the APA was founded in 1981 with John Monahan serving as the first president. The APLS merged with Division 41 in 1984.

Although the Society and APA Division 41 are now a merged entity, APLS also remains a freestanding organization. APA membership is not required for membership in APLS. As of 2008, APLS has 1,955 registered members who are also members of APA, 409 members who are not APA members, and 731 student members. The Society's membership is diverse and includes academicians, clinical practitioners, attorneys, clinical researchers, scientists, and policy advocates (Fulero, 1999).

The Society and its members have made important contributions to the field of psychology and law. These include collaborating with APA on *amicus curie* briefs to provide guidance to the courts on psychological issues and developing ethical guidelines, currently undergoing revision, for the practice of forensic psychology (Committee on Ethical Guidelines for Forensic Psychologists, 1991). The Society's Scientific Review Paper Committee commissions scholars to review the research on a particular issue and provide recommendations for best practices in the area. The first of these review papers concerned the literature on eyewitness identifications (Wells et al., 1998) and the paper currently in preparation reviews the psychological literature on interrogation practices and the risk of false confessions.

The Society's official journal, *Law and Human Behavior*, was founded in 1977 and currently is published bimonthly. The Society also publishes an online newsletter three times per year. APLS formerly published a book series, *Perspectives in Law and Psychology*, with Kluwer Academic/Plenum Press, but since 2005 has partnered with Oxford University Press to produce a book series, with offerings addressing issues such as trial consulting, the death penalty, and psychological injuries. The web site for APLS is http://www.ap-ls.org. Current initiatives in the Society are to increase the diversity of the membership, to provide increased support to early career psychologists, and to maintain unity in the organization despite the diverse professional and research interests of APLS members.

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AMERICAN PSYCHOSOMATIC SOCIETY

Founded in 1942, the American Psychosomatic Society (APS) was one of the first medical societies to be dedicated to the integration of biology, psychology, and social factors in medicine. This integration grew out of an understanding that the state of the mind could influence the health of the body, as shown by twentieth-century physiologists, including Walter Cannon. Psychosomatic concepts also grew out of observations by psychoanalysts of patients who had physical symptoms that were not explained by purely medical causes. Drawing upon these insights, the APS was formed through the work of a New York Academy of Medicine committee headed by Dr. Helen Flanders Dunbar, a pioneer trained in medicine and religion, who compiled a bibliography of the "psychosomatic" medical literature, published in 1935 as "Emotions and Bodily Changes." In 1936, the Josiah Macy, Jr., Foundation began financial support for psychosomatic studies and, along with the National Health Council in 1939, underwrote the publication of a new journal, *Psychosomatic Medicine*. The APS was subsequently formed as a medical society and held its first Annual Meeting in New York in 1942.

The current mission of the APS remains focused on understanding health in relation to biological, psychological, and social factors. The APS has remained focused on problems of long-standing interest, including the bidirectional relationships between the mind and the body. The ultimate goal of this scientific work is to develop improvements in health and in medical care for patients.

The APS currently has approximately 900 members from 40 countries. APS membership is drawn from students and professionals in medicine, psychology, epidemiology, and other health-related disciplines. The Annual Meeting is held each spring and provides members and nonmembers with a forum to exchange recent research findings and to obtain specialized training in clinical and scientific topics bearing on psychosomatic questions. APS has an active student mentorship program at the Annual Meeting to promote contacts among scientists and professionals and professionals in training. Special programs are also available to assist persons from developing countries to attend meetings and develop contacts with members of APS.

The APS maintains a web site (http://www.psychosomatic.org) to disseminate information on membership and on events such as the Annual Meeting. The Society continues to publish its journal *Psychosomatic Medicine* nine times a year (http://www.psychosomaticmedicine.org) and also a quarterly newsletter.

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AMNESIA

Our current understanding of amnesia owes much to the study of the patient HM, who in 1953, at the age of 26, underwent bilateral removal of structures in the medial temporal lobe (MTL) for treatment of intractable epilepsy. The surgery was largely successful in controlling his seizures, and it did not affect his sense of personal identity, his general fund of knowledge, or his social skills, but it left him with a global amnesia—he had a profound impairment in the ability to form new memories for events

and information that he encountered after his surgery (Corkin, 1984). Thus, for example, he could not remember the plot of a movie he saw recently, could not recall what he ate at his last meal, and could not recognize the names or faces of new acquaintances. In the laboratory, HM showed profound impairments in recalling or recognizing recently presented lists of words, pictures, and other stimuli. He also showed impaired recall of events prior to his surgery, but could retrieve memories from his early life, prior to about age 16. With insights gleaned from studies of HM and subsequently from other amnesic individuals, we have achieved a more complete understanding not only of the amnesic syndrome, but also of the functional and neural architecture of normal human memory.

The cardinal feature of the amnesic syndrome is an impairment in new learning (anterograde amnesia), and this deficit is accompanied by a more variable impairment in the ability to retrieve memories formed prior to the onset of illness (retrograde amnesia). Amnesia occurs in the context of relatively preserved general intelligence and other cognitive abilities. Immediate or short-term memory is intact in amnesia. For example, an amnesic individual can hold in mind the current topic of conversation; can repeat a brief sequence of letters or numbers; and can address a new acquaintance by name upon initial introduction. After any distraction or delay, however, whether for minutes, days, or weeks, memory for this information is impaired. Thus, the anterograde memory impairment in amnesia characteristically affects long-term memory, rather than immediate or short-term memory.

Although amnesia can have a psychogenic origin, we focus here on organic amnesia, which results from structural brain damage. The impairment is typically associated with lesions of structures in the MTL (including the hippocampus and the adjacent entorhinal, perirhinal, and parahippocampal cortices), the diencephalon, and the basal forebrain. Amnesia has a variety of etiologies, including herpes simplex encephalitis, anoxia, Wernicke-Korsakoff syndrome, and cerebrovascular accidents (O'Connor, Verfaellie, & Cermak, 1995).

Anterograde Memory in Amnesia

The anterograde memory deficit in amnesia cuts across all types of materials (e.g., verbal and visuospatial) and perceptual modalities (e.g, auditory, visual), and it includes personally experienced events (episodic memory) as well as impersonal facts and concepts (semantic memory). One of the most important insights to emerge from studies of amnesia, however, is that the impairment is not uniform across all forms of long-term memory. For example, whereas amnesic patients show deficits on "explicit" or "declarative" memory tasks, which require deliberate reference to a prior experience, they often show normal performance on "implicit" or "nondeclarative" memory tasks, which do not require deliberate reference to a prior experience, but in which memory for that experience is "implicit" in task performance.

Examples of preserved implicit memory effects in amnesia include classical eyeblink conditioning (learning to make an eyeblink in response to a tone if that tone was previously paired with an air-puff to the eye); skill learning (improved task performance with practice); and repetition priming (improved accuracy in identifying perceptually degraded words or pictures as a result of recent exposure to those stimuli). These findings suggest that, whereas explicit memory processes depend on neural circuits that are damaged in amnesia, implicit memory processes depend on neural circuits (e.g., in the cerebellum, the basal ganglia, or the neocortex) that are spared in amnesia (Gabrieli, 1998).

Even within the domain of explicit memory, not all forms of memory appear to be equally impaired in amnesia. For example, there is evidence in amnesia that memory for associations between items (e.g., remembering that the word "sample" was paired with the word "carriage" in a recently presented list) is more impaired than is memory for single items (e.g., remembering that the word "carriage" appeared in a recently presented list) (Giovanello, Verfaellie, & Keane, 2003). This behavioral finding accords well with theories that assign to the hippocampus a critical role in binding together unrelated items in memory.

Another differential impairment in amnesia is revealed when one considers two qualitatively distinct processes that support explicit memory: recollection and familiarity. Recollection refers to intentional retrieval of the content of a prior experience, whereas familiarity refers to an ease of stimulus processing that creates the sense that one has encountered that stimulus previously. By way of illustration, if one has recently made a new acquaintance, one might recollect (i.e., intentionally retrieve) that person's name upon encountering that person again, or one might experience a sense of familiarity (ease of recognition) that confirms that one has indeed met this person before. There is some evidence to suggest that recollection is more impaired than familiarity in amnesia (Yonelinas et al., 2002). For example, some patients with damage limited to the hippocampus show impaired performance when asked to recall a recent event (a task that requires recollection), but show intact performance when asked to recognize whether a particular item was present in that event (a task that may be based on a sense of familiarity with that item).

Patients with more extensive MTL lesions show explicit memory impairments that are evident both in recall and in recognition tasks, but that are more severe in the former than in the latter instance, consistent with a greater deficit in recollection than in familiarity. Findings such as these have led to the view that recollection is mediated by the hippocampus (which is typically severely compromised in amnesia), and familiarity depends upon

extra-hippocampal MTL regions such as the perirhinal cortex that are more variably and less severely compromised in amnesia (Brown & Aggleton, 2001). This issue is controversial, however, because some amnesic patients—even those with damage restricted to the hippocampus—have shown equivalent impairments in recollection and familiarity (Manns, Hopkins, Reed, Kitchener, & Squire, 2003) supporting the alternative view that all MTL regions contribute equally to these two explicit memory processes.

Retrograde Memory in Amnesia

A classic finding in amnesia is that the retrograde memory impairment is temporally limited, such that very remote memories are spared, whereas memories from the time period closer to the onset of amnesia are compromised. This observation gave rise to an influential theory positing that the MTL is engaged in the consolidation (stabilization) of long-term memories (Squire, Cohen, & Nadel, 1984). Once the consolidation process is complete, memories no longer depend on the hippocampus, but are supported by neocortical brain regions that are not damaged in amnesia. This view provides a straightforward account of the pattern of retrograde memory loss in amnesia: Very remote memories are intact because they had already been consolidated in neocortex at the onset of amnesia, and more recent memories are lost because they were in the process of consolidation at the time of onset. By extension, the formation of new memories after the onset of amnesia is impaired due to the absence of a consolidation mechanism.

Recent studies, however, have called into question the view that very remote memories are entirely spared in amnesia. Although it seems clear that remote memory for semantic information (facts and concepts) is intact in amnesia, there is growing evidence that remote memory for episodic (autobiographical) information may be compromised. Detailed examinations of the quality and number of remote autobiographical memories in amnesia have revealed that there may be impairments that extend back in time for decades prior to the onset of amnesia. Such temporally extensive remote memory impairments cannot be explained easily by a consolidation view, because consolidation is unlikely to operate over such a lengthy time frame.

An alternative to consolidation theory known as the multiple memory trace view proposes that the hippocampus is engaged each time an autobiographical memory is retrieved (regardless of the age of that memory), and that each such retrieval establishes a novel memory trace in the hippocampus (Moscovitch, Nadel, Winocur, Gilboa, & Rosenbaum, 2006). By this view, autobiographical memories never become independent of the hippocampus and consequently are compromised in amnesia regardless of how remote they are. The degree of impairment may be smaller for very remote memories, because such memories have presumably been retrieved on numerous occasions over time, and are therefore associated with larger number of hippocampal traces and more resistant to partial hippocampal damage.

In summary, amnesia is a circumscribed memory impairment characterized by severe impairments in anterograde memory and more variable or limited impairments in retrograde memory. The functional impact of such deficits on activities of daily life is profound. In this context, the relative preservation of some forms of long-term memory (implicit memory, familiarity) takes on clinical importance, as these areas of preserved function may form the basis for the development of compensatory strategies or rehabilitative approaches in amnesia.

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See also: **Declarative Memory; Hippocampus; Memory Functions**

AMYGDALA

The amygdala is a collection of anatomically and functionally distinct nuclei buried deep within the temporal lobes of the brain. It has long been appreciated that the amygdala has a critical role in emotion and emotional memory. For instance, work in the 1930s by Kluver and Bucy revealed striking changes in the emotional responses of monkeys after temporal lobe lesions that included the amygdala (Kluver & Bucy, 1937). These changes in emotion were later shown to be reproduced by amygdala damage alone and linked to deficits in assigning emotional significance to biologically relevant stimuli (Weiskrantz, 1956). Indeed, humans with amygdala damage show similar deficits in emotional processing. For example, patient S.M., who has a rare illness that caused selective and complete bilateral damage to her amygdala, is impaired in recognizing facial expressions of emotion, particularly fear. Furthermore, when presented with fear-inducing stimuli, such as a movie clip, S.M. is unable to produce normal emotional responses, although she can explain that most people would feel afraid when watching these clips (Adolphs et al., 1999). Consistent with this, normal subjects who view facial expressions of fear exhibit increased regional cerebral blood flow in the amygdala.

One of the most fruitful behavioral paradigms for exploring the role of the amygdala in emotion is Pavlovian fear conditioning. In this form of learning, animals or humans are presented with an innocuous conditioned stimulus (CS), such as a tone, that is paired with an aversive unconditioned stimulus (US), such as a mild electric shock. After one or more pairings the subject learns that the CS predicts the US. As a consequence, CS presentations alone elicit a conditioned fear response (CR), which includes increases in heart rate, arterial blood pressure, hypoalgesia, potentiated acoustic startle, stress hormone release, and freezing behavior.

Many years of work have identified the amygdala as a candidate region in which fear memories are encoded and stored (Davis & Whalen, 2001; LeDoux, 2000; Maren, 2001). Within the amygdala there are two sub-regions that contribute to fear learning and the expression of learned fear responses. The basolateral amygdala complex (BLA; consisting of the lateral, basolateral, and basomedial nuclei) is where the CS and US information converge and become associated (yielding the fear memory), and the central nucleus of the amygdala (CEA) translates this information into behavioral fear responses. In support of this, many studies have shown that damage to either the BLA or CEA prevent acquisition and/or expression of fear memories. However, rats with pretraining BLA lesions can acquire fear CRs if given sufficient training. This suggests that another brain area is involved in forming fear associations in the absence of the BLA. Recent studies have pointed to the CEA in the acquisition and consolidation of fear memories and suggest that the CEA may mediate fear in the absence of the BLA (Zimmerman et al., 2007).

The amygdala is also involved in a different form of aversive learning, known as instrumental avoidance. In this task, animals are able to prevent the occurrence of an aversive US by making a particular behavioral response to the CS. For example, rats can be readily trained to jump from one side of a rectangular alley to the other side to avoid a footshock. Rats with damage to the BLA are unable to learn that performing a specific response will turn off the aversive US, but they are still capable of displaying unconditioned fear responses. In addition damage to the CEA does impair conditioned freezing responses, as seen in Pavlovian fear conditioning, however some CRs like conditioned avoidance responses persist with CEA damage (Aggleton, 2000).

The amgydala also encodes aversive experiences involving interoceptive stimuli. Conditioned taste aversion (CTA) occurs when an animal feels sick after eating a particular food. The animal forms an association between the taste of the food and sickness. Therefore, in the future the animal will avoid consuming that particular food in the hopes of avoiding illness. In this paradigm, like other forms of aversive learning, the amygdala is important for acquiring taste information, evaluating the hedonic properties of taste, associating taste and malaise, and expressing CTA. Specifically, the BLA is primarily involved in forming associations between the taste CS and the malaise-inducing US (Aggleton, 2000).

Animal models have shown that the amygdala is not only involved in aversive emotional processing, but also plays a role in appetitive conditioning. In these tasks, CSs gain motivational significance through their association with a positive reward, such as food. Although the amygdala is involved in both aversive and appetitive learning the role of the amygdala may differ between these two

learning paradigms. The amygdala is not necessary for animals to learn that a CS predicts a food US, however the BLA is necessary for the CS to gain access to the current value of a specific US with which it has been associated. For example, BLA lesions impair conditioned reinforcement, second-order conditioning, and US devaluation, all of which depend on the CS gaining access to the value of the US with which it has been paired (Holland & Gallagher, 2004).

On the other hand, the CEA appears to encode Pavlovian stimulus-response associations (S-R) that do not incorporate motivational values about the US and produces conditioned motivational responses (Aggleton, 2000; Murray, 2007). Forms of learning mediated by S-R associations that are disrupted by CEA lesions, but not BLA lesions, include conditioned suppression, conditioned locomotor approach, autoshaping, and Pavlovian-instrumental-transfer (Aggleton, 2000; Holland & Gallagher, 2004; Murray, 2007). In addition to its role in mediating S-R associations, the CEA is also important for increasing attentional performance when there is a shift from a predictive relationship between stimuli to a surprising relationship, but not when the predictive relationship is consistent. Rats with CEA lesions do not show effects of increased attentional performance and in fact display deficits in learning (Holland & Gallagher, 1999).

Although the role of the amygdala in emotional learning and memory has been well established in animal models for both aversive and appetitive learning, most studies in humans have largely concluded that the amygdala is involved in processing negative emotions, such as fear. However, there is emerging evidence that amygdala activity is also important for processing positive affect (Hamann et al., 2002; Murray, 2007). In one study human subjects were presented with positive, negative, and neutral emotional photographs during positron emission tomography (PET) scanning. Activity within the amygdala was greater when subjects were viewing positive and negative stimuli than neutral stimuli. Activation of the amgydala in response to positive emotional stimuli may reflect its role in other aspects of positive emotion demonstrated in rodent models, such as reward prediction, attentional processing, and goal-directed behaviors (Aggleton, 2000).

Whereas human studies support the view that the amygdala is important in negative and perhaps positive emotional processing, studies in non-human primates have shown that the amygdala is also necessary for social cognition. Recent neuroimaging data indicate that the amygdala integrated information about faces, such as facial expressions, postures, and gestures, in order to choose and adjust appropriate behavioral responses based on the current emotional and social context of a specific situation. Not only does the amygdala regulate social behavior, but it is also essential for regulating sexual behavior. Specifically, the medial amygdala in rodents has been to shown to control sexually dimorphic behaviors through connections with the medial hypothalamus. Lesions of the medial amygdala in rats abolish male-typical mating behavior, while most female sexual behaviors are spared (Aggleton, 2000). Moreover, amygdala activation accompanies orgasm in humans.

A major factor in determining how the amygdala contributes to different behavioral processes and responses is reflected in its connections with other brain structures (Aggleton, 2000). For example, the amygdala has projections to the brainstem that control the expression of fear responses, as well as areas of the cortex that are believed to mediate cognitive aspects of emotional processing, such as the experience of fear. In addition, amygdala connections with the prefrontal cortex are important for encoding predictive value of cues and the motivational properties of associated outcomes in order to guide goal-directed behavior. Projections from the BLA to the ventral striatum are important for processing incentive value of the Pavlovian CSs in instrumental learning tasks. CEA-dependent learning is primarily modulated by its connections with the mesolimbic and nigrostriatal dopaminergic pathways. Furthermore, the CEA has connections with cholinergic cells within the nucleus basalis and substantia innominata that mediate increased attentional processing during learning. In general, during learning the role of the amygdala is to mediate associative representations between the emotional significance and sensory properties of stimuli, which is used to help guide appropriate behavioral responses to emotional relevant cues. In this sense, the amygdala is a key emotional interface in the brain that endows sensory stimuli and the behavioral responses they generate with affective valence and value.

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See also: **Emotions; Instrumental Conditioning; Pavlovian Conditioning**

ANAL STAGE (See Psychosexual Stages)

ANALOG RESEARCH METHODS

Analog research measures phenomena of interest through an emulation of real-life events. "Analog" is derived from the same root as "analogy"—an analog is like something else. What is measured or studied in analog research is a stand-in for the actual behavior or phenomenon of interest.

Research methods in psychology exist on a continuum of naturalism. Naturalism is a key element in making inferences about the external validity of a study's methods. External validity is the extent to which findings using particular ways of measuring a phenomenon (i.e., "operationalizations"), particular settings to study the phenomenon, or particular sample can be applied to operationalizations, settings, and people more generally. The external validity of methods range from high (e.g., observations of behaviors of interest in settings in which they occur) to low (e.g., extremely artificial, but more easily seen or measured; behaviors that are a stand-in for the true behavior of interest).

On one end of the naturalism continuum is "simulation research," in which participants role play or imagine themselves in certain situations that are of interest to the researcher. On the other end of the continuum is naturalistic research in which no constraint is put on the participants; the researcher observers the target behavior, or patterns of behavior, in the setting in which it usually occurs. Analog research falls between simulation and naturalistic research; researchers simulate a real-world, naturalistic setting while controlling for extraneous variables.

Analogs are used as a hypothesis-testing tool for three purposes: (1) to observe otherwise difficult to observe behaviors; (2) to isolate the determinants of behavior; and (3) to observe qualities of social interaction that unfold over time (although naturalistic observation might be preferable because observers would not need to guess about how comparable the behaviors were to those in real life situations). The first two purposes require controlled experimentation, necessitating the use of simulation or analog designs. For the third purpose, analog designs are often preferable to naturalistic observation because they allow the observer to "stack the deck" to make it more likely that the behaviors and behavioral patterns of interest will occur when the assessor can see them.

Types of Studies Using Analog Methods

Studies that use analogs can be roughly divided into (1) those that study the effects of specific settings, events, or behavioral stimuli on individuals' behavior; and (2) those that observe behaviors in quasi-naturalistic social situations. The goals of the first type of study are to manipulate the setting and test individual differences in response; that is, the situation is set and variations in individuals' behavior are observed. This type of study is common in developmental psychology (e.g., visual cliff experiments; Gibson & Walk, 1960), social psychology (e.g., prosocial behavior experiments, emotion regulation experiments), and clinical psychology (e.g., social anxiety assessment; Roberts & Hope, 2001). An example of this type of design is the cold pressor task, an analog used in pain studies (e.g., Burns, Bruehl, & Caceres, 2004). In this task, participants are instructed to keep a hand in ice water until they can no longer endure doing so. The cold pressor task can be used in a variety of laboratory experiments that look to target the participant's pain tolerance or reaction to stressors.

The use of confederates often serves as an analog for research on prosocial behavior, social support, or group bias (e.g., Darley & Latane, 1968). Confederates help to create more generalizable and naturalistic settings, and, at the same time, researchers are able to highly control and manipulate participants' behaviors. For example, researchers use confederates to study how manipulation of the confederate's behavior interacts with participant's task compliance, social affiliation, problem solving behaviors, and recall of an event.

The second type of analog study—sometimes referred to as analog behavioral observation (ABO; Heyman & Slep, 2004)—addresses quasi-naturalistic observation of behavior. The setting is designed to be similar to those

that occur in the natural environment, and the researcher may use a protocol to elicit behavior for that situation. For example, in ABO studies of couples' communication (e.g., Heyman, 2001), researchers typically bring couples into the lab and give both partners questionnaires (or interviews) to find out what the biggest areas of conflict between them are. The observer then brings them into a room (equipped with cameras and microphones) and asks them to discuss a problem and try to resolve it as they might at home. They are then left alone for 10 to 15 minutes as the video records. This process is often repeated for additional conflicts or for similarly constructed social support tasks.

ABO is used mostly as a convenience. The goal of such assessment is typically to understand behavior and its determinants in situations in which participants influence each other while interacting (e.g., groups, families, and couples). Understanding generalizable factors that promote or maintain problem behaviors in such systems typically requires more naturalistic approaches than those used in controlled, manipulated situation studies.

In summary, the use of analogs can be a good theory-testing tool because, depending on exactly how it is employed, it minimizes the need for inferences to assess behavior. It can facilitate formal or informal analysis of cause and effect, it can provide the assessor with experimental control of situational factors, it can facilitate the observation of otherwise unobservable behaviors, and it can provide an additional source of useful information in a multimodal strategy (e.g., questionnaires, interviews, observation). Finally, because researchers can set up a situation that increases the probability that behaviors of interest will occur during the observation period, the use of analogs can be high in research efficiency. Like any tool, however, usefulness of analogs depends on its match to the resources and needs of the person considering using it. The conditional nature of validity may make it difficult to generalize observed behavior to the broad variety of real world settings; and the less naturalistic the analog, the more nagging the concerns about external validity (i.e., applicability to real-world situations).

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See also: **Behavioral Observation**

ANALYSIS OF COVARIANCE

Analysis of covariance (ANCOVA) is a statistical method that may be viewed as an extension of analysis of variance (ANOVA) when, in addition to one or more factors (discrete explanatory variables, typically group membership), it is required to account for possible differences due to a continuous variable(s), usually called covariate(s) or concomitant variable(s). The latter variable(s) co-varies with a dependent variable under consideration (response, outcome), and it is of interest to examine whether group differences on the latter may be related to group differences on the covariate(s). Typically, a covariate is highly correlated with a response variable; that is, the covariate contains information about the response variable and therefore possibly also about group differences on the outcome measure(s). Empirical settings in which ANCOVA is appropriate usually have at least one categorical factor and one or more continuous covariates.

Oftentimes in applications, evaluation of effects—such as main effects and interactions—occur in ANCOVA after a dependent variable is adjusted for potential preexisting group differences associated with the covariate(s) (Raykov & Marcoulides, 2008). The latter is commonly measured at the beginning of the study, for example, before the administration of a treatment, therapy, or intervention or the start of a program. In such settings, the formal ANCOVA question is whether the groups would differ

on the dependent variable(s) if they were equivalent on the covariate(s) to begin with. In those circumstances, an application of ANCOVA (under its specific assumptions, to be mentioned) aims to increase sensitivity, that is, to enhance the power of the tests of main effects and interactions by reducing the error term of the pertinent *F*-test statistics (*F*-ratios). In addition, ANCOVA permits the researcher to adjust the group means on a response variable to what they would have been if all subjects had scored the same on the covariate(s) in the first instance. Moreover, ANCOVA may also be applied after multiple analysis of variance (MANOVA) for the purpose of what is referred to as step-down analysis.

Another common application of ANCOVA is in nonexperimental situations in which, for various reasons, it is not possible to randomly assign the study participants to groups; for example, one cannot randomly assign patients to income level, gender, or education. In a case such as this, ANCOVA may be used to statistically make the studied groups somewhat more statistically comparable; however, it should be noted that the method cannot, in general, completely account for the lack of random assignment of subjects to groups. There could be other group differences on the outcome that are not related to the covariate(s) being considered, or the latter could be related in a nonlinear way to the response(s). Thus, ANCOVA cannot guarantee adjustment of prior existing differences between groups. Further, although ANCOVA is a method for statistical adjustment of groups, no conclusions about causality can be made from its results, because such an after-the-fact procedure cannot be a substitute for running an experiment (Maxwell & Delaney, 2004).

A third type of ANCOVA application is made in situations in which one is concerned with assessing the contribution of various dependent variables to significant group differences that have been found in a MANOVA. Then ANCOVA may be used to account for the linear impact of a subset of dependent variables upon group differences on the remaining outcome(s). This is achieved by using ANCOVA with covariates being some of the outcome variables from that MANOVA.

From a statistical viewpoint, the ANCOVA null hypothesis is

$$H_{0,\text{ANCOVA}}: \mu_{1,a} = \mu_{2,a} = \ldots = \mu_{g,a},$$

where the subindex "a" stands for "adjusted" (i.e., resulting after accounting for the linear relationship of covariates upon dependent variables), and g is the number of groups in a given study ($g > 1$). This hypothesis is distinct from the null hypothesis of ANOVA,

$$H_{0,\text{ANOVA}}: \mu_1 = \mu_2 = \ldots = \mu_g,$$

where only the unadjusted group differences are of interest (i.e., the differences between the unadjusted means across groups or, in other words, the differences in group means before the ANCOVA adjustment is made). Conversely, group differences without the adjustment, which are of concern in ANOVA, are not really of interest in ANCOVA. Using the general linear model form (GLM; Timm, 2002) for the dependent measures, $\underline{y}$,

$$\underline{y} = \mathrm{X}\,\underline{b} + \underline{\varepsilon}, \tag{1}$$

holds, where the individual predictor values are contained in the matrix X (at times referred to also as "design" matrix), $\underline{b}$ is a vector comprising pertinent unknown parameters, and, as usual, the error vector $\underline{\varepsilon}$ is assumed unrelated with the predictors and multinormally distributed, that is as $N_n(0, \sigma^2 \mathrm{I}_n)$ (n denoting sample size); no assumptions are made in Equation (1) about the predictors, so they could be group membership and/or continuous variables. In a factorial design setting with additional continuous covariates, the GLM can be postulated as

$$\underline{y} = \mathrm{X}_{(1)}\,\underline{b}_{(1)} + \mathrm{X}_{(2)}\,\underline{b}_{(2)} + \underline{\varepsilon}, \tag{2}$$

where the matrix $\mathrm{X}_{(1)}$ encompasses the individual data on all categorical predictors, the matrix $\mathrm{X}_{(2)}$ that data on all continuous predictors (i.e., covariates), and the vectors $\underline{b}_{(1)}$ and $\underline{b}_{(2)}$ are the regression coefficients associated correspondingly with the categorical and continuous predictors. Equation (2) is readily re-expressed in the form of (1) as follows:

$$\underline{y} = [\mathrm{X}_{(1)}\mathrm{X}_{(2)}] \begin{bmatrix} \underline{b}_{(1)} \\ \underline{b}_{(2)} \end{bmatrix} + \underline{\varepsilon} = \mathrm{X}\,\underline{b} + \underline{\varepsilon}, \tag{3}$$

where for compactness the notation $\mathrm{X} = [\mathrm{X}_{(1)} \,|\, \mathrm{X}_{(2)}]$ is used for the set of individual scores on all predictors. Equation (3) may be viewed as representing the ANCOVA model, which is thus a special case of the GLM. Hence, all statistical methods available within the GLM framework can be utilized in an application of ANCOVA.

A "classical" application of ANCOVA occurs in the context of a pretest/posttest design (repeated measure design with two occasions). An alternative then to ANCOVA with pretest being the covariate, is to conduct ANOVA on the "gain" scores, that is, the difference between posttest and pretest scores. The ANCOVA approach is generally preferable to the difference score analysis because the ANOVA procedure underlying the latter is in fact based on the strong assumption of unit slope in the regression of posttest upon pretest (Maxwell & Delaney, 2004). Only when this population assumption is fulfilled, which will likely be infrequently the case in empirical research, using ANOVA on difference scores will be a more

sensible approach to follow. This is because one will then not need to use sample information in order to evaluate this slope parameter as one would have to do if the above ANCOVA procedure were followed. However, because this assumption is frequently violated, that ANOVA method for change scores is typically going to be less powerful than the ANCOVA one, owing to the fact that the former method's application is tantamount to making the assumption of unitary posttest-on-pretest regression population slope. This assumption therefore generally misrepresents the underlying model (e.g., Maxwell & Delany, 2004).

Because ANCOVA is carried out formally within the framework of ANOVA, all the assumptions of ANOVA are also assumptions of ANCOVA (Huitema, 1980). The credibility of ANCOVA results also depends on additional assumptions: (1) the covariate(s) being perfectly measured; (2) the regression of the dependent variable on independent one(s) is linear and with the same slope(s) in all involved groups (often referred to as regression homogeneity; techniques generally known as hierarchical linear modeling and structural equation modeling allow different group-specific or random slopes); and (3) that there is no treatment by covariate interaction. Mild violations of assumption are not likely to have a profound effect upon the ANCOVA results. Assumption generally cannot be met in many behavioral and social studies that typically involve variables (covariates) measured with considerable error. In practical terms, one may "replace" this assumption with the requirement that whenever variables are to be used as covariates, they should exhibit high reliability (e.g., at least above .80 but preferably closer to or above .90). Otherwise, use of an alternative methodology, such as structural equation modeling, can be recommended; these procedures have also been developed to deal with such fallible predictors/covariates (Raykov & Marcoulides, 2006).

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See also: **Analysis of Variance; Multivariate Methods**

ANALYSIS OF VARIANCE

Analysis of variance (ANOVA) was initially developed by R. A. Fisher, beginning around 1918, and had early applications in agriculture. It is now a dominant and powerful statistical technique used extensively in psychology. In ANOVA, a dependent variable is predicted by a mathematical model comprising one or more predictor variables, which may be categorical (factors) or quantitative and continuous (covariates; regressors). The model's best prediction is calculated by minimizing the sum of the squared residuals (errors, or deviations from the model's prediction). Having done this, the proportion of variance in the dependent variable accounted for by each predictor is assessed statistically, testing the null hypotheses that the mean of the dependent variable does not vary with the predictor(s); good predictors account for a large proportion of the variance, compared to unpredicted (error) variance, and poor predictors account for a small proportion. ANOVA allows the effects of predictors to be assessed in isolation, but it also allows the assessment of interactions between predictors (effects of one predictor that depend on the values of other predictors).

Assumptions

ANOVA assumes (1) that for each condition represented by a combination of predictor values, the dependent variable is normally distributed about the mean for that condition, or equivalently that error is normally distributed in each condition; (2) that the variance is the same in all such conditions and is the same as the residual variance (known as the homogeneity of variance assumption); and (3) that the model accounts for all systematic influences on the data, such that the residual variability represents random error, and all errors or observations in each condition are independent of each other. Checking these assumptions involves consideration of the experimental design, exploratory data analysis prior to ANOVA, and analysis of the residuals afterward. Sometimes, the suitability of data for ANOVA may be improved by appropriate *transformations* prior to analysis. Additional homogeneity-of-variance assumptions applying to ANOVA include *within-subjects factors*, which is discussed later.

Logic of One-Way ANOVA

The basic logic of ANOVA is simply illustrated using a single categorical predictor (single-factor or one-way ANOVA). Suppose A is a factor that can take one of k values (representing, for example, k different experimental treatments), and n values of the dependent variable Y have been sampled for each of the conditions $A1 \ldots Ak$ (giving nk observations in total). The null hypothesis is that the dependent variable Y has the same mean for each of $A1 \ldots Ak$, that is, that A has no effect on the mean of Y. ANOVA

calculates a mean square for the predictor (MSA) and an error mean square (MSerror) and then compares them.

Mean Square for the Predictor

If the null hypothesis is true, then the k samples have been drawn from the same population, and by the Central Limit Theorem, the variance of the k sample means is an estimator of σ_e^2/n, where σ_e^2 is the population (and error) variance, so n times the variance of the sample means estimates σ_e^2. However, if the null hypothesis is false, the sample means have come from populations with different means, and n times the variance of the k sample means will exceed this value. The sum of squared deviations (abbreviated to *sum of squares*; SS) of each condition's mean from the grand mean ($\overline{Y}$) is calculated for the predictor, summing across all observations (in this example, $\mathrm{SS_A} = \sum_{i=1\ldots k}\sum_{j=1\ldots n}[\overline{Y}_{A_i} - \overline{Y}]^2 = \sum_{i=1\ldots k} n[\overline{Y}_{A_i} - \overline{Y}]^2$), and divided by the *degrees of freedom* (df) for the predictor (in this example, $df_\mathrm{A} = k - 1$) to give the *mean square* (MS) for the predictor ($\mathrm{MS_A} = \mathrm{SS_A}/df_\mathrm{A}$). If the null hypothesis is true, then the expected value of this number, $E(\mathrm{MS_A})$, is the error variance σ_e^2. If the null hypothesis is false, then the expected mean square will exceed σ_e^2, as it will contain contributions from the non-zero effect that A is having on Y.

Mean Square for Error

Whether or not the null hypothesis is true, the sample variances $S_{A_1}^2 \ldots S_{A_k}^2$ estimate the corresponding population variances $\sigma_{A_1}^2 \ldots \sigma_{A_k}^2$ and, by the homogeneity of variance assumption, also estimate the error variance σ_e^2. An estimate of σ_e^2 is therefore obtainable from the sample variances $S_{A_1}^2 \ldots S_{A_k}^2$. The sum of squared deviations of each observation from its group mean—that is, the summed squared residual deviations after the prediction has been made—is calculated (in this example, $\mathrm{SS_{error}} = \sum_{i=1\ldots k}\sum_{j=1\ldots n}[Y_{i,j} - \overline{Y}_{A_i}]^2$) and divided by the error degrees of freedom (in this example, $df_\mathrm{error} = df_\mathrm{total} - df_\mathrm{A} = [nk - 1] - [k - 1] = k[n - 1]$) to give $\mathrm{MS_{error}} = \mathrm{SS_{error}}/df_\mathrm{error}$. Whether the null hypothesis is true or not, $E(\mathrm{MS_{error}}) = \sigma_e^2$.

F Test

Comparison of $\mathrm{MS_A}$ to $\mathrm{MS_{error}}$ thus allows assessment of the null hypothesis. The ratio $F = \mathrm{MS_A}/\mathrm{MS_{error}}$ is assessed using an F test with (df_A, df_error) degrees of freedom. From the observed value of F, a p value may be calculated (the probability of obtaining an F this large or greater, given the null hypothesis). In conventional approaches, a sufficiently large F and small p leads to the rejection of the null hypothesis.

Interactions, Main Effects, and Simple Effects

When multiple factors are used in analysis, a key feature of ANOVA is its ability to test for interactions between factors, meaning effects of one factor that depend on the value or level of other factor(s). The terminology will be illustrated in the abstract, temporarily ignoring important statistical caveats such as homogeneity of variance. Suppose the maximum speeds of many scrap cars are analyzed using two factors: E (levels: E_0 engine broken, E_1 engine intact) and F (levels: F_0 no fuel, F_1 fuel present). There will be a main effect of Engine: on average, ignoring everything else, E_1 cars go faster than E_0 cars. Similarly, there will be a main effect of Fuel: ignoring everything else, cars go faster with fuel than without. Since speeds will be high in the E_1F_1 condition and very low otherwise, there will also be an interaction, meaning that the effect of Engine depends on the level of the Fuel factor, and vice versa (the effect of a working engine depends on whether there is fuel; the effect of fuel depends on whether there is a working engine).

One can also speak of simple effects: for example, the simple effect of Fuel at the E_1 level is large (fuel makes intact cars go), whereas the simple effect of Fuel factor at the E_0 level is small (fuel makes no difference to broken cars). Likewise, the Engine factor will have a large simple effect at F_1 but a small simple effect at F_0. Main effects may be irrelevant in the presence of an interaction, since they gloss over known interrelationships between the factors. ANOVA results are conventionally reported in the form shown in Table 1.

Post-Hoc Analysis of Interactions and Multilevel Factors

Effects of interest in an ANOVA that are found to be significant are frequently analyzed further. Interactions may be followed up by analyzing their component parts, for example, by restricting the analysis to a subset of the data (such as by examining simple effects or simpler component interactions within a complex interaction). Likewise, significant main effects of interest may require further analysis. For example, if a three-level factor A is found to have an effect, then the null hypothesis $\mu_{A_1} = \mu_{A_2} = \mu_{A_3}$ is rejected, but the experimenter may still have an interest in which of $\mu_{A_1} \neq \mu_{A_2} = \mu_{A_3}$, $\mu_{A_1} = \mu_{A_2} \neq \mu_{A_3}$, and $\mu_{A_1} \neq \mu_{A_2} \neq \mu_{A_3}$ is the case. A range of *post hoc* tests is available for this purpose. The most important feature of such tests is that they involve the potential for multiple comparisons and thus have the potential to inflate the Type I error rate, particularly as the number of levels of the factor increases. Appropriate tests control the maximum Type I error rate for a whole 'family' of comparisons.

Table 1. ANOVA of Fictional Data, Showing Conventional Table Style as Might Be Produced by Statistical Software

In general, a factor with k levels has $(k-1)$ degrees of freedom (df). A linear predictor has 1 df, as does a linear contrast. An interaction $A \times B$, where A has a df and B has b df, has ab df. In this example, there are two factors, each with two levels each. If there are N observations of the dependent variable in total, the total df is $(N-1)$. In this example, $N = 24$. The total line is not always shown. MS total is the variance of the dependent variable; SS is the sum of squares; MS is the mean square.

Term	DF	SS	MS	F	p
A	1	2,795.04	2,795.04	17.738	0.0004289
B	1	1,650.04	1,650.04	10.472	0.0041415
$A \times B$	1	2,147.04	2,147.04	13.626	0.0014463
Residual (error)	20	3,151.50	157.57		
Total	23	9,743.62	423.64		

ANOVA as a General Linear Model (GLM)

More generally, each observed value of Y can be modeled as a sum of predictors each multiplied by a regression coefficient (b), plus error not accounted for by the prediction (e):

$$\begin{bmatrix} y_1 \\ y_2 \\ \dots \\ y_n \end{bmatrix} = \begin{bmatrix} 1 & X_{1,1} & X_{1,2} & X1,\dots & X_{1,p} \\ 1 & X_{2,1} & X_{2,2} & X2,\dots & X_{2,p} \\ 1 & X_{\dots,1} & X_{\dots,2} & X\dots,\dots & X_{\dots,p} \\ 1 & X_{n,1} & X_{n,2} & Xn,\dots & X_{n,p} \end{bmatrix} \times \begin{bmatrix} b_0 \\ b_1 \\ b_2 \\ \dots \\ b_p \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ \dots \\ e_n \end{bmatrix}$$

In matrix notation, this may be written:

$$Y = Xb + e$$

Here, Y is a matrix containing values of the dependent variable. X is the *design matrix*, containing columns for p predictors plus a column of ones to represent the additional predictor of the 'overall mean' of Y. Each row of X encodes the predictors and which levels of those predictors (for categorical predictors), or values of the predictors (for continuous predictors), apply to a given value of Y. Appropriate choice of a design matrix allows arbitrary designs including factors with multiple levels, combinations of categorical and continuous predictors, and interactions to be encoded. The matrix b contains coefficients (in this example, b_0 is the value of the overall Y mean, $\overline{Y}$), and e contains errors. This equation may be solved for b so as to minimize the summed squared residuals ($\sum e^2$). Having done so, $\mathrm{SS}_{\mathrm{error}} = \sum_{i=1\dots n} e_i^2$, $\mathrm{SS}_{\mathrm{total}} = \mathrm{SS}_{\mathrm{Y}} = \sum_{i=1\dots n}(y_i - \overline{Y})$, and $\mathrm{SS}_{\mathrm{model}} = \mathrm{SS}_{\mathrm{total}} - \mathrm{SS}_{\mathrm{error}}$. The proportion of the variance in Y accounted for by the overall model is given by $R^2 = \mathrm{SS}_{\mathrm{model}}/\mathrm{SS}_{\mathrm{total}}$. The contribution of any given predictor may be assessed by comparing the predictive value of a 'full' model, containing all predictors, to a 'reduced' model containing all predictors except the one of interest:

$$F\left(df_{\mathrm{model[full]}} - df_{\mathrm{model[reduced]}}, df_{\mathrm{error[full]}}\right) = \frac{\left(\mathrm{SS}_{\mathrm{model[full]}} - \mathrm{SS}_{\mathrm{model[reduced]}}\right) \div \left(df_{\mathrm{model[full]}} - df_{\mathrm{model[reduced]}}\right)}{\mathrm{SS}_{\mathrm{error[full]}} \div df_{\mathrm{error[full]}}}$$

or, to make clear the equivalence to the logic discussed above,

$$F\left(df_{\mathrm{predictor}}, df_{\mathrm{error[full]}}\right) = \frac{\mathrm{SS}_{\mathrm{predictor}} \div df_{\mathrm{predictor}}}{\mathrm{SS}_{\mathrm{error[full]}} \div df_{\mathrm{error[full]}}} = \frac{\mathrm{MS}_{\mathrm{predictor}}}{\mathrm{MS}_{\mathrm{error[full]}}}$$

Effect sizes for individual predictors may be calculated in terms of R^2(the proportion of variance in Y explained) or in terms of b (the change in Y for a given change in the predictor).

Viewing ANOVA in terms of a GLM makes its relationship to other well-known analytical techniques clear. For example, ANOVA with a single two-level factor is equivalent to a two-group t test; ANOVA with a single continuous predictor is equivalent to linear regression (Figure 1c); and so on. GLMs also subsume techniques such as analysis of covariance (ANCOVA) and multiple and polynomial regression and can be extended to multiple dependent variables (multivariate ANOVA or MANOVA). General linear models may also be extended to dependent variables with non-normal (e.g., binomial) distributions via the generalized linear model.

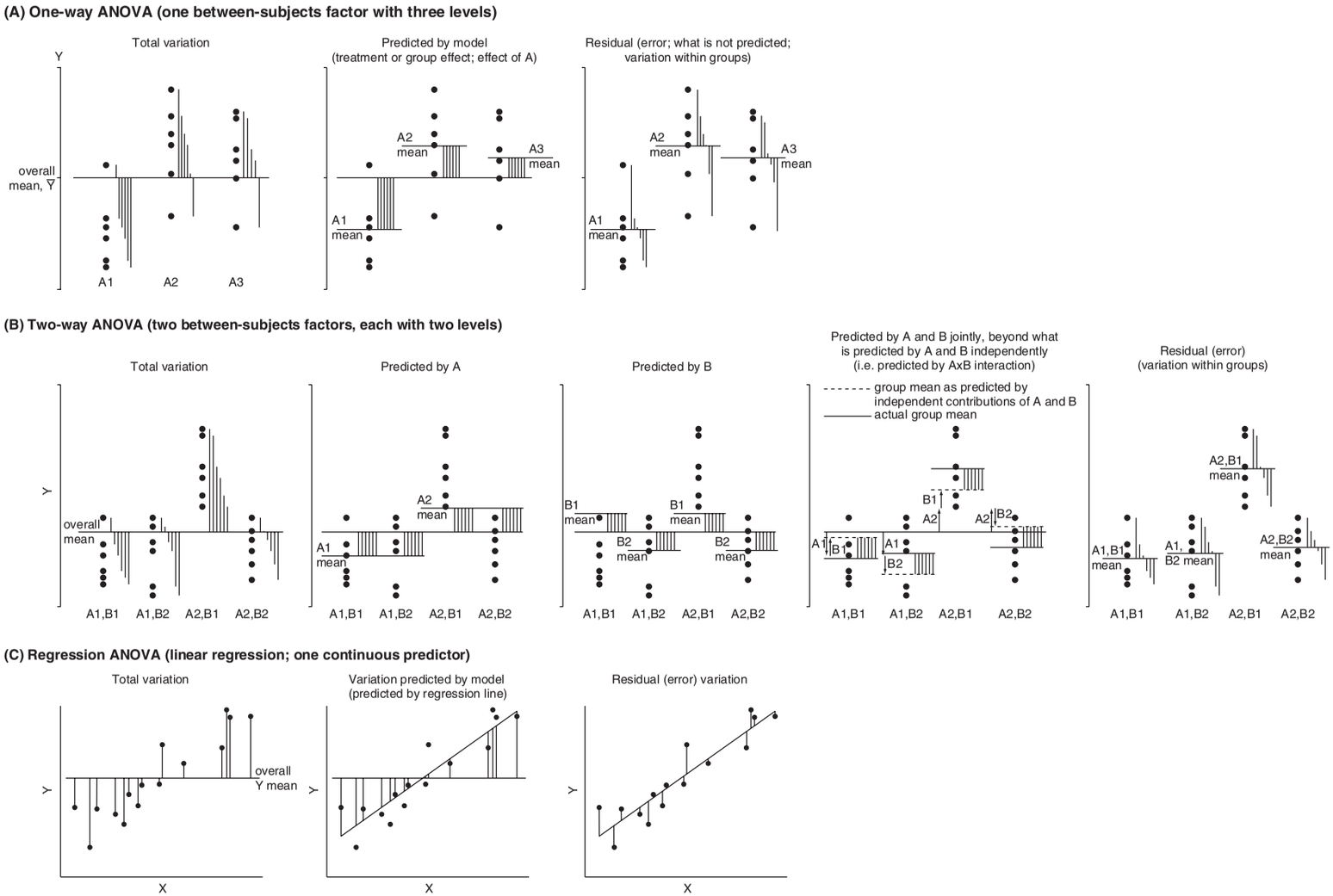


Figure 1. Illustration of simple ANOVA types. (A) One-way ANOVA, illustrated with a dependent variable *Y* and a single factor *A* having three levels (*A*1, *A*2, *A*3). In all figures, vertical lines indicate deviations that are squared and added to give a sum of squares (SS). The total sum of squares of *Y* (the summed squared deviation of each point from the grand mean; left panel) is divided into a component predicted by the factor *A* (the summed squared deviations of the A subgroup means from the grand mean, for each point; middle panel) plus residual or error variation (the summed squared deviation of each point from the prediction made using *A*; right panel). The SS are additive: $SS_{total} = SS_A + SS_{error}$. When SS_A and SS_{error} have been divided by their corresponding degrees of freedom (the number of independent pieces of information associated with the estimate), they may be compared statistically: if SS_A/df_A is large compared to SS_{error}/df_{error}, then *A* is a good predictor. (B) Two-way ANOVA. Here, two factors *A* and *B* are used, each with two levels. From left to right, panels illustrate the calculation of SS_{total}, SS_A, SS_B, the interaction term $SS_{A\times B}$, and SS_{error}. As before, the SS are additive ($SS_{total} = SS_A + SS_B + SS_{A\times B} + SS_{error}$) if the predictors are not correlated (see text). (C) Regression ANOVA, in which *Y* is predicted by a single continuous variable *X*. As before, the total SS (left panel) may be divided into a component predicted by the model (middle panel) and residual or error variation (right panel).

Contrasts and Trend Analysis

GLMs may also be used to perform *contrasts* to ask specific questions of the data. In this technique, a linear combination of weighted means is created that will have a value of zero under a given null hypothesis. For example, if a factor has 7 levels, one for each day of the week, then the linear contrast

$$L = 0.2\mu_{\text{Mon}} + 0.2\mu_{\text{Tue}} + 0.2\mu_{\text{Wed}} + 0.2\mu_{\text{Thu}} + 0.2\mu_{\text{Fri}} - 0.5\mu_{\text{Sat}} - 0.5\mu_{\text{Sun}}$$

(where μ_{day} indicates the day mean) may be used as a test of the null hypothesis that the dependent variable is equal on weekdays and weekends. In a GLM, these weights are encoded in a contrast matrix L. After solving $Y = Xb + e$, the contrast is calculated as $L = Lb$ and assessed statistically to test the null hypothesis $L = 0$.

Trend analysis involves the use of contrasts to ask questions about categorical predictors (factors) that may be treated quantitatively. For example, if subjects' reaction times are tested with visual stimuli of length 9 cm, 11 cm, 13 cm, and 15 cm, then it may be valid to treat the lengths as categories (do reaction times to the lengths differ?) and quantitatively (is there a linear or quadratic component to the relationship between reaction time and stimulus length?).

Correlations between Predictors and Unbalanced Designs

When an ANOVA design contains multiple predictors that are uncorrelated, assessment of their effects is relatively easy. However, it may be that predictors are themselves correlated. This may be because the predictors are correlated in the real world (for example, if age and blood pressure are used to predict some dependent variable, and blood pressure tends to rise with age). However, it may also occur if there are different sample sizes for different combinations of predictors. For example, if there are two factors, A (levels A_1 and A_2) and B (levels B_1 and B_2), then a *balanced* design would have the same number of observations of the dependent variable for each of the combinations $A_1B_1, A_1B_2, A_2B_1, A_2B_2$. If these numbers are unequal, the design is *unbalanced*, and this causes correlation between A and B. This problem also occurs in *incomplete factorial* designs, in which the dependent variable is not measured for all combinations of factors.

Whatever the reason for correlation between predictors, this causes a problem of interpreting their effects on the dependent variable (Figure 2). There are various approaches to this problem, and the best approach depends on the class of hypothesis preferred on theoretical grounds (do some predictors take precedence over others?) and on whether the design is unbalanced or incomplete.

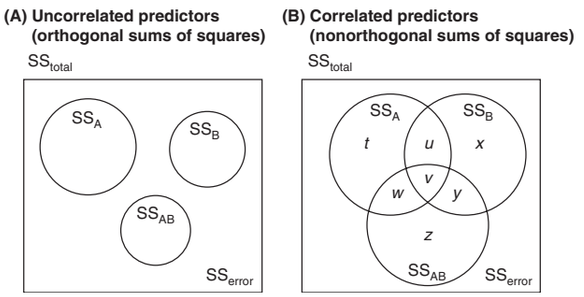


Figure 2. Assessing the effects of correlated predictors. Suppose a dependent variable Y is analyzed by two-way ANOVA, with predictors A, B, and their interaction ($A \times B$ or AB). The total variability in Y is represented by the sum of squares (SS) of Y, also written SS_{total} or SS_Y. This may be partitioned into SS attributable to A, to B, to the interaction AB, and to variability not predicted by the model (SS_{error}). (A) If the predictors are uncorrelated, then the SS are orthogonal, and are additive: $SS_{total} = SS_A + SS_B + SS_{AB} + SS_{error}$. ANOVA calculations are straightforward. (B) If the predictors are correlated, then the SS are not additive. There are various options for assessing the contribution of the predictors. For example, one possibility is to assess the contribution of each predictor over and above the contribution of all others; thus, the contribution used to assess the effect of A would be t, that for B would be x, and that for AB would be z (often termed 'marginal,' 'orthogonal,' or 'Type III' SS). A second possibility is to adjust the main effects for each other (i.e. not to include any portion of the variance that overlaps with other main effects), but not for the interaction (so SS_A is $t + w$, SS_B is $x + y$, and SS_{AB} is z, often known as 'hierarchical' or 'Type II' SS). Stated more generally, this approach adjusts terms for all other terms except higher-order terms that involve the same predictors. Alternatively, if there are reasons to treat the predictors as a hierarchy with A taking precedence, then one could assess the contribution of A ($t + u + v + w$), to assess the contribution of B above this ($x + y$), and then to assess the contribution of the interaction above these (z) (often termed 'sequential' or 'Type I' SS). These and other approaches to this problem have different advantages and disadvantages according to the type of design being analyzed. In practice, unless the sequential approach is desired, Type III SS are often used but the best approach is debated. All represent ways of comparing pairs of models of the data, as described in the text, to assess whether the difference between the models is significant; the experimental hypotheses determine the comparisons to be made.

Fixed and Random Effects

Up to this point, it has been assumed that factors have been *fixed effects*, meaning that the levels of the factor exhaust the population of interest and represent all possible values the experimenters would want to generalize their results to analytically; the *sampling fraction* (number of levels used ÷ number of levels in the population of interest) is 1. A simple example is sex: having studied male and female humans, all possible sexes have been studied. Experimental factors are usually fixed effects. It is also possible to consider *random effects*, in which the levels in the analysis are only a small, randomly selected sample from an infinite population of possible levels (sampling fraction = 0). For example, if an agronomist wanted to study the effect of fertilizers on wheat growth, it might be impractical to study all known varieties of wheat, so four might be selected at random to be representative of wheat

in general. Wheat variety would then represent a random factor.

The most common random effect in psychology is that of subjects. When subjects are selected for an experiment, they are typically selected at random in the expectation that they are representative of a wider population. Thus, in psychology, discussion of fixed and random effects overlaps with consideration of between-subjects and within-subjects designs, discussed below. An ANOVA model incorporating both fixed and random effects is called a *mixed-effects model*.

With random effects, not only is the dependent variable a random variable as usual, but so is a predictor, and this modifies the analysis. It does not affect the partitioning of SS, but it affects the $E(\text{MS})$ values, and thus the choice of error terms on which F ratios are based. Regardless of the model, testing an effect in an ANOVA requires comparison of the MS for the effect with the MS for an error term where $E(\text{MS}_{\text{effect}}) = E(\text{MS}_{\text{error}})$ if the effect size is zero, and $E(\text{MS}_{\text{effect}}) > E(\text{MS}_{\text{error}})$ if the effect size is non-zero. In fixed-effects models, the error term is the 'overall' residual unaccounted for by the full model; in random-effects models, this is not always the case, and sometimes the calculation of an error term is computationally complex.

Within-Subject and between-Subject Predictors, and More Complex Designs

Psychological experiments may be conducted with *between-subjects* factors, in which each subject is measured at just one level of the factor, or *within-subjects* factors, in which each subject is measured at every level of the factor, or a mixture. Within-subjects designs (also known as *repeated measures* designs) allow considerable power, since an individual at one time is likely to be similar to the same individual at other times, reducing variability. The main disadvantage is the sensitivity of within-subjects designs to *order effects*.

In a simple within-subjects design, a group of subjects might be measured on three doses of a drug each (within-subjects factor: D). It would be necessary to counterbalance the testing order of the dose to avoid order effects such as improvement due to practice, or decline due to fatigue, or lingering or learned effects of a previous dose. Having done so, then variability between observations may be due to differences between subjects (S), or to differences between observations within one subject; this latter variability may be due to D, or intra-subject error variability (which might also include variability due to subjects' responding differently to the different doses, written $D \times S$).

For a design involving both between- and within-subjects factors, suppose old subjects and young subjects are tested on three doses of a drug each. Age (A) is a between-subjects factor and dose (D) is a within-subjects factor. In this example, variability between subjects may be due to A, or to differences between subjects within age groups, often written S/A ('subjects within A') and thought of as the between-subjects error. Variability of observations *within* individual subjects may be due to D, or to a $D \times A$ interaction, or within-subject error that includes the possibility of subjects responding differently to the different doses (which, since subjects can only be measured within an age group, is written $D \times S/A$). This partitioning of total variability may be accomplished for SS and *df* and analyzed accordingly, with the caveat that as subject (S) represents a random factor, calculation of an appropriate error term may sometimes be complex, as described above.

Within-subjects designs also carry an additional assumption: that of *sphericity*, or homogeneity of variance of difference scores. For example, if subjects are measured at three levels of a within-subjects factor U, then three sets of difference scores can be calculated: $(U_1 - U_2)$, $(U_1 - U_3)$, and $(U_2 - U_3)$. Sphericity is the assumption that the variances of these three difference scores are the same. Violations of this assumption can inflate the Type I error rate. Violations may be tested for directly using Mauchly's test, but this may be over-conservative. Approaches to this problem include (1) using an F test as usual but correcting the *df* to allow for the extent of violation, such as with the Huynh–Feldt or Greenhouse–Geisser corrections; (2) transformation of the data to improve the fit to the assumptions, if this is possible and meaningful; (3) using MANOVA, which does not require sphericity; and (4) testing planned contrasts of interest, which have 1 *df* each and therefore cannot violate the assumption.

ANOVA designs may have arbitrary numbers of between- and within-subjects factors. In these designs, 'Subject' defines a type of relatedness between observations. More complex designs, involving multiple levels of 'relatedness,' are possible and indeed commonly reflect real-world experiments. For example, suppose schoolchildren (S) each perform four tests of four levels of difficulty (factor D). These children are taught in class groups (G), and sets of groups are taught according to different teaching methods (T). In this example, D is said to be *crossed* with S (since all subjects perform in all difficulty conditions), but S is *nested* within G (any given subject is only a member of one group), and groups are nested within T. This model may be written $DS/G/T$, and is an example of a *hierarchical* design involving two types of 'relatedness.' Such designs allow the analytical model to reflect correlations in the real world—such as observations that come from the same subject being likely to be more similar to each other than to randomly selected observations, or observations that come from different subjects who are in the same group being likely to be more similar to each other than to randomly selected observations. Ensuring a correct design is part of satisfying the assumption that the ANOVA model accounts for all systematic influences on the data.

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ANALYTICAL PSYCHOLOGY

Analytical Psychology is the name Swiss psychiatrist Carl Gustav Jung (1875–1961) gave to his theoretical and methodological approach to the psychology of the unconscious, following his break with Freud and classical psychoanalysis in 1913. Unlike psychoanalysis, analytical psychology does not regard the structure of the unconscious as limited to contents that were initially a part of consciousness. Although not denying the psychoanalytic view that the unconscious includes contents that were once conscious, it holds that the unconscious also includes contents not yet capable of becoming conscious (i.e., symptoms) and contents incapable of ever becoming fully conscious (i.e., the symbolic manifestation of the archetypes of the collective unconscious).

Moreover, analytical psychology maintains that the dynamics at issue in the formation of the unconscious are not exhausted by repression. Analytical psychology does not contest either the psychoanalytic account of the felt incompatibility between conscious and preconscious (as well as unconscious) contents, or the consequent mechanism of repression resulting in the dissociation of the latter contents from consciousness. However, it maintains that an additional dynamic, rooted in the inability of consciousness to apperceive psychic contents, also results in psychic contents having a subliminal and therefore an unconscious status. Apperception is defined by analytical psychology as the psychic process whereby new contents are assimilated into consciousness on the basis of their similarity to the contents already existing in consciousness.

Attitude Types and the Four Functions of Consciousness

Analytical psychology diverges from psychoanalysis in its theory of the qualitative factors at issue in the blocking of psychic contents whose energy is sufficient for conscious entrance from entering consciousness. According to analytical psychology, in addition to psychoanalytic theoretical formulation of this qualitative factor in terms of conflicts between the so-called ego instincts and sexually charged libido, there are also qualitative factors that involve the apperceptive conflict between the two basic attitudes that govern the flow of psychic energy (introversion and extroversion) and the apperceptive conflict between the four basic functions of consciousness—thinking, feeling, sensation, and intuition.

Theory of Complexes

The analytical psychology theory of complexes is rooted in comprehending apperception as the psychic process by which a new content is articulated with similar, already existing contents in such a way that it becomes understood, apprehended, and clear. As such, apperception is the "bridge" that connects the already existing constellated contents with the new one. According to analytical psychology, apperception is either active or passive. When apperception is active, the bridge between the already existing and new contents is fashioned by the association of similar contents. When apperception is passive, the conditions are lacking for an associative bridge based on the similarity of the already existing contents and new contents. This has as its result the "dissociation" between the former and latter contents that, paradoxically, functions apperceptively to link the two. The paradoxically apperceptive apprehension of new contents that occurs in dissociation manifests these contents as symptoms.

The absence of an associative link between ego-consciousness and unconscious contents (i.e., the symptoms) in passive apperception does not preclude for analytical psychology the existence of associations with respect to the latter contents. Rather, the theory of complexes maintains that the existence of associations that refer psychic contents to other such dissociated contents, and therefore not to the ego, can be both observed and investigated. By the term "complex," analytical

psychology understands the loose association of passively apperceived contents, which lack an associative link to ego-consciousness.

Personal and Collective Unconscious

Analytical psychology understands the personal character of the associations yielded by the symptomatic (i.e., dissociated) images of the complex to provide evidence for a "personal unconscious." It understands the transpersonal character of those associations yielded by the symptomatic images that refer not to ego consciousness but to other images, to provide evidence for a "collective unconscious." The methodical unfolding of the transpersonal context of the associations at issue in the collective unconscious involves what analytical psychology calls the "amplification" of the associations of images that refer not to ego consciousness, but to other images. Speaking of this method, Jung writes, "I adopt the method of the philologist, which is far from being free association, and apply a logical principle which is called *amplification*. It is simply the seeking of parallels" (Jung, 1935/1970). Proceeding in this manner, the initial appearance of associated images is guided by "parallel material" drawn from dreams, literature, myth, religion, and art. The point of departure for the amplification of associations is always the question, "How does the thing appear?" The guidance provided by the parallel material with respect to the initially appearing associated images functions to facilitate a conscious propensity to assimilate, and therefore to apperceive actively, hints or fragments of lightly toned unconscious complexes and, by associating them with parallel elements, to elaborate them in a clearly visual form.

Archetypes and Individuation

Analytical psychology unfolds a topology of the collective associative designs, termed *archetypes*, which surround the nucleus of the complex. The most basic archetypes identified by analytical psychology include the persona (the socially accepted mask assumed by the ego); the shadow (the undeveloped and therefore infantile aspects of the ego); the anima and animus (counter-sexual images in men and women, respectively, which apperceptively link their personal unconscious to the collective unconscious); and the self (the transpersonal basis of the ego and therefore of the conscious personality). The therapeutic goal of analytical psychology is the self-conscious differentiation of ego-consciousness from the various archetypes that become constellated in the course of the life of an individual. The process of striving to realize this goal is termed *individuation*. The crucial role of the analytical distinction between ego-consciousness and the archetypal contents of the collective unconscious in the process of individuation is signaled in the name Jung gave to his psychology in order to distinguish it from psychoanalysis: analytical psychology.

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See also: **Archetypes**

ANASTASI, ANNE (1908–2001)

Anne Anastasi is most closely associated with the development of differential psychology. She received her B.A. from Barnard and her Ph.D. from Columbia University, the latter at the age of 21. Although her long-standing plan had been to specialize in mathematics, a course using Pillsbury's *Essentials of Psychology* as the text aroused her interest in differential psychology. Then a course with Harry L. Hollingworth and an article by Charles Spearman clinched matters, the latter convincing her that psychology and mathematics could be combined. Her Columbia professors included Henry E. Garret (her dissertation advisor), Albert T. Poffenberger, Carl J. Warden, and Robert S. Woodworth, as well as visiting professors Richard M. Elliot and Clark L. Hull. Through her husband, John P. Folely Jr., who majored in psychology at Indiana University, she was exposed to the ideas of J. Robert Kantor. To all these influences she attributed her generalist orientation and her firm commitment to psychology as an objective science.

Anastasi taught at Barnard, Queens College (CUNY), and Fordham University. Her major books include *Differential Psychology, Fields of Applied Psychology,* and *Psychological Testing*. Her research centered chiefly on factor analysis and traits, problems of test construction, and the interpretation of test scores with special reference to the role of cultural factors in individual and group differences. Active in association affairs throughout her professional life, Anastasi was president of the American Psychological Association in 1972, the first woman to be elected to this office in 50 years. The holder of several honorary degrees, she received many awards including the APA Distinguished Scientific Award for the Application of Psychology (1981), the American Psychological Foundation Gold Medal (1984), and the National Medal of Science from the President of the United States (1987).

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ANGER

Aristotle, Seneca, Darwin, and Ekman, a modern emotion theorist, have considered anger as one of the basic human emotions. Psychologists often use the term anger interchangeably with other terms like aggression, hostility, hate, and irritability. This usage has led to many confusing definitions and theories of anger, as well as numerous misconceptions. The resulting confusion has impeded our efforts to integrate anger research findings into a viable understanding of anger. Anger is of great concern, because it often precedes aggression, conflict, and violence.

We define anger as a subjectively experienced emotion with high sympathetic autonomic arousal. It is elicited by the perception of a threat to one's physical well being, property, present or future resources, self-image, social status or image as projected to one's group, maintenance of social rules that regulate daily life, or comfort. Anger is an enduring emotion, and it may persist well after a threat has passed. Anger is associated with attributions, evaluations, and the gathering of information that emphasizes the externalization of blame. Anger motivates a response of antagonism to thwart, drive off, retaliate against, attack, seek retribution, or control the source of the perceived threat. People communicate anger through facial or postural gestures, vocal inflections, aversive verbalizations, and aggressive behavior. One's choice of strategies to communicate anger varies with social roles, learning history, and environmental contingencies.

Several types of thoughts arouse anger. The perception of threat to high, unstable self-esteem often elicits anger. Anger includes an experience of high self-efficacy, or greater power or potency than the eliciting threat. This experience is counter to the common notion that anger is associated with low self-esteem (Baumeister, Bushman, & Campbell, 2000). Often, angry people believe that others do not hold them in the same esteem as they hold themselves. Anger can also be triggered by the perception of injustice, a grievance, or blameworthiness, whereby people perceive others as responsible for the events that preceded their anger. When people experience anger, they hold a hostile attribution of intent, or the belief that bad things occurred because others have purposely tried to do them harm. Resentment, the belief that one has had a worse life than others, is a common thought in those with high trait anger. Anger has been linked to impulsivity, usually in association with aggression. Aggression associated with anger has been called affective, impulsive aggression. Recent research suggests that the cognitive process of rumination is also associated with anger. It appears that people often ruminate about perceived anger triggers for some time. Rumination may tax a person's self-control skills and lead to impulsive aggression.

Because anger generates justification, moral certitude, righteousness, a sense of power, and low motivation for change, people feel little desire to change or control their experience of anger. The only basic emotion that people desire to change less is joy. Theorists have described emotions as motivating either approach behaviors, in which one seeks to get close to the eliciting stimuli, or avoidant behaviors, in which one avoids or withdraws from the eliciting stimuli. Anger produces a strong tendency to approach rather than to avoid the eliciting stimuli. Only joy surpasses anger in this approach tendency (Scherer & Wallbott, 1994). Anger is the only negative emotion to motivate approach behaviors. As a clinical problem, anger resembles addiction with respect to this approach motive. Anger and addictive substances provide short-term positive experiences, but they often lead to long-term negative consequences.

Anger generates several motives in people attempting to cope with threats (DiGiuseppe & Tafrate, 2006). One motive is a desire to resolve the problem that triggered the anger. However, the most common angry motive is revenge, the desire to punish or produce reciprocity with the transgressor. Revenge has been a common theme in literature over the last three millennia. Homer's *Iliad* and Shakespeare's *Hamlet* are among the famous works on revenge. Anger produces a desire to control the environment. This can lead to a secondary dysfunctional motive to coerce others to comply with one's wishes. Anger also motivates a desire to remove or reduce the physiological arousal caused by one's anger, which we call tension reduction. This motive is the only avoidant motive of anger.

Anger elicits greater variability of behavioral expression than other basic emotions (Deffenbacher, Oeting, Lynch, & Morris, 1996). The most adaptive behavior triggered by anger is assertiveness or conflict resolution. Other common reactions include immediate aggressive reactions such as physically assaulting people; physically assaulting objects by throwing, slamming, hitting, or banging them; and negative verbal expression such as noisy arguments, intimidating or threatening comments, and cynical or sarcastic outbursts. Anger is the second most verbally expressive of all human emotions, after joy. Anger elicits stronger paralinguistic changes in a person's voice than any other emotion (Scherer & Wallbott, 1994). Anger can provoke deliberate, premeditated aggression, such as the secretive destruction of property. Alternatively, one can socially isolate the target of one's anger by encouraging others to stay away from the target. In addition, anger

can lead to passive aggression, which is the failure to help or complete tasks, resulting in the blocking of goals or well-being of the target. People often fail to express their anger and ruminate internally about the transgressions done against them. Psychologists refer to this as anger-in. Anger-in can lead to many medical problems.

Although anger is a normal emotion that leads to adaptive behavior, in excess it can also become a clinical problem. Dysfunctional anger frequently leads to aggression, child abuse, domestic violence, and physical or verbal assaults. Clients seek mental health services for anger problems just as often as they do for depression and anxiety disorders. Excessive anger can lead to harmful and dysfunctional consequences. Anger has been associated with many illnesses, including heart disease and chronic pain. Anger has also been associated with medication noncompliance and delayed healing of wounds. Anger can impede sexual functioning and destroy interpersonal relationships. Anger negatively affects marital relations, judgment, and goal attainment. Anger expressed by a family member toward a seriously mentally ill client is one of main elements that lead to relapse of serious mental illness. Excessive anger increases the chances that one will be involved with the criminal justice system and may lead to lower income.

The Roman philosopher Seneca in 50 A.D. was the first to recognize that anger could be a disorder. He referred to anger as *brevis furor*, or temporary madness. Anger has not been identified as an independent disorder in today's classification schemes, because it is assumed to be highly related to other disorders. Historically, psychologists identified a strong association between anger and depression. This came from Freud's proposal that depression was anger turned inward. The relation between anger and depression is very complex. Depression correlates more with the construct of anger-in and less with the outward expression of anger. Anger and depression both represent emotional parts of our social dominance system. Anger is the expression of dominance, whereas depression is the expression of submission. Thus, they are opposite ends of the dominance/submission social hierarchy and display system.

As people shift between dominant and submissive roles, their emotions may shift between anger and depression. Anger is more closely related to anxiety than to depression. Both anger and anxiety are part of the flight/fight system. Both emotions are triggered by the primary appraisal of the presence of a threat. A secondary appraisal of coping resources determines which emotion is experienced. If people perceive the threat as stronger than they are, they experience anxiety. If they experience the threat as weaker than they are, they experience anger.

Despite the association between excessive anger and harmful and dysfunctional outcomes, there are as previously noted no diagnostic categories that represent anger disorders, either in the current fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) or the tenth edition of the World Health Organization's *International Code of Diseases* (ICD). Several authors have proposed criteria for including an anger disorders category in the next edition of the DSM.

Effective treatments exist for disturbed anger in adults, adolescents, and children. The most strongly supported anger treatments include behavioral techniques such as relaxation, exposure to anger provoking stimuli, learning new responses to anger triggers, and rehearsal of new positive behaviors to resolve conflict. Cognitive techniques that have also received research support include cognitive restructuring that targets negative automatic thoughts, dysfunctional thoughts, irrational beliefs, hostile attributions, and inadequate social problem solving skills. No research has yet appeared to support the effectiveness of psychodynamic, family-systems, gestalt therapy, or client-centered treatments for dysfunctional anger. The effective anger treatments are about a third to a half as successful as our most effective treatments for depression and anxiety disorders. Presently, we cannot treat anger as successfully as we treat other emotional problems.

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See also: **Aggression; Emotions**

ANGER MANAGEMENT

Anger control has been a vexing issue that has been addressed in disparate ways by great thinkers across

historical periods and by social scientists, clinicians, and community caretakers alike. It has been a societal agenda since classical philosophers grappled with the regulation of inner life and the enhancement of virtue. Anger is the prototype of the view of emotions as passions that seize the personality, disturb judgment, alter bodily conditions, and imperil behavior. While anger's troublesome facets and by-products are generally acknowledged, its personal and social value remains. Humans are hard-wired for anger because of its survival functions. There can be no sensible thoughts to negate it, much as the Stoics and the Victorians tried. Nevertheless, the aggression-producing, harm-doing capacity of anger is unmistakable, and so is its potential to adversely affect prudent thought, core relationships, work performance, and physical well-being. These problem conditions, however, are not derivative of anger *per se*, but result instead from anger being dysregulated, that is, its activation, expression, and experience occurring without appropriate controls.

Anger is a turbulent emotion that is ubiquitous in everyday life, yet it is also a feature of a wide range of psychiatrically classified disorders, including impulse control dysfunctions, mood disorders, many personality disorders, and schizophrenia, especially paranoid schizophrenia. Anger has long been recognized as a feature of clinical conditions that result from trauma, such as dissociative disorders, brain-damage syndromes, and, especially, posttraumatic stress disorder. Anger also appears in mental state disturbances produced by general medical conditions, such as dementia, substance abuse disorders, and neurological dysfunctions resulting from perinatal difficulties.

The term *anger management* was first used by Novaco (1975) to designate a cognitive-behavioral therapy (CBT) for chronic anger problems that was experimentally evaluated for its efficacy. Since then, anger management has become a rubric for a variety of interventions, as well as a part of common parlance. The term is, in a sense, a workplace metaphor, in that anger might be managed like a troublesome problem on the shop floor or, alternatively, as a crucial resource or asset not to be squandered by unnecessary activation and expenditure. Anger management programs are now marketed commodities.

In the psychotherapeutic context, three levels of intervention can be distinguished: (1) general clinical care for anger, (2) psycho-educational anger management, and (3) CBT anger treatment. General clinical care for anger identifies it as a clinical need and addresses it through counseling, psychotherapeutic, and psychopharmacological provisions, including client education, support groups, and eclectic treatments, without an intervention structure. The psycho-educational variant employs a CBT structure, delivered in group format, as occurs in court-referred or school-based programs, in prisons, and in general public workshops. Such programs typically follow a topical sequence that covers situational activators ("triggers"), how thoughts and beliefs influence anger, self-observation, various relaxation techniques, problem solving and conflict resolutions strategies, and other coping skills, such as calming self-statements, effective communication, and appropriate assertiveness. The length of these programs typically ranges from about 3 to 15 sessions.

CBT anger treatment is distinguished as a relatively high level of intervention by virtue of its theoretical grounding, its assessment and case-formulation basis, and its systematization, complexity, and depth of therapeutic approach. It is best provided as an individual therapy and may require a preparatory phase to facilitate treatment engagement. Increased depth is associated with thoroughness of assessment, attention to client core needs, individual tailoring, specialized techniques, and clinical coordination and supervision. A specialized form of CBT anger treatment follows a "stress-inoculation" approach that involves therapist-guided and -graded exposure to provocation stimuli as a way of facilitating anger control. This occurs "in vitro" through imaginal and role-play provocations in the clinic and "in vivo" through planned testing of coping skills in anger-inducing situations, as established by a hierarchy of provocation scenarios collaboratively constructed by client and therapist.

Cognitive Behavioral Therapy for Anger

The central therapeutic goal of CBT for anger is augmenting self-regulatory capacity. The aim is to minimize anger frequency, reactivity, intensity, and duration and to moderate anger expression. This is an adjunctive treatment for a targeted clinical problem that seeks to remedy the emotional turbulence associated with subjective distress, detriments to personal relationships, health impairments, and manifold harmful consequences of aggressive behavior. The main components are cognitive restructuring, arousal reduction, and enhancement of behavioral skills.

People with serious anger problems are often ambivalent about engaging in treatment, largely due to the value ascribed to anger in dealing with life's adversities. Because of the instrumentality of anger and aggression, the personal costs incurred by anger routines may go unrecognized; because of anger's being embedded in longstanding psychological distress, there is inertia to overcome in motivating change efforts. Getting leverage for therapeutic change can be elusive, particularly when treatment referrals entail some element of coercion. This is a salient issue in forensic settings, where clients are guarded about self-disclosure, and accessing anger in these settings is not straightforward. A preparatory phase may be required to foster engagement, develop core competencies (emotion identification, self-monitoring, skills in communication, and arousal reduction), and build trust in the therapist.

Core Principles and Treatment Provisions

A central perspective is that anger is produced by the self-appraised meaning of events and resources for dealing with them, rather than by objective properties of events. Sometimes anger occurs as a fast-triggered, reflexive response, while other times it results from deliberate attention, extended search, and conscious review. Anger activation is intrinsically linked to perceptions of threat and injustice. Treatment targets the way people process information, remember their experiences, and cognitively orient themselves to situations of stress or challenge.

Anger, as an engagement of the organism's survival systems in response to threat, involves interplay of cognitive, physiological, and behavioral components. Cognitive factors include knowledge structures (expectations, beliefs, and appraisal processes) that are schematically organized as mental representations about environment-behavior relationships and that entail rules governing threatening situations. Arousal or physiological factors include activation in the cardiovascular, endocrine, and limbic systems and tension in the skeletal musculature. Anger is affected by hormone levels (neurotransmitters), low stimulus thresholds for arousal activation, and diminished inhibitory control. Neurobiological mechanisms involve the amygdala, prefrontal cortex, and serotonin. Behavioral factors include conditioned and observationally learned repertoires of anger-expressive behavior, not only aggression but also avoidance. Implicit in the cognitive labeling of anger is an inclination to act antagonistically toward the source of the provocation. However, an avoidant behavioral style, as in some personality and psychosomatic disorders, can foment anger by leaving provocation unchanged or exacerbated.

CBT anger treatment targets enduring change in cognitive, arousal, and behavioral systems, achieved through changing valuations of anger and augmenting self-monitoring capacity. Addressing anger as grounded and embedded in aversive and often traumatic life experiences entails the evocation of distressed emotions, such as fear, sadness, and shame, as well as anger. Therapeutic work centrally involves the learning of new modes of responding to cues previously evocative of anger in the context of relating to the therapist, and this work periodically elicits negative sentiment within the therapist to the sometimes frustrating, resistive, and unappreciative behavior of the client. The treatment can be delivered in a protocol of about 12–15 sessions (see Taylor & Novaco, 2005) or in modular form (see Kassinove & Tafrate, 2002).

The Stress Inoculation Approach

The specialized form of CBT for anger involves (1) client education about anger, stress, and aggression; (2) self-monitoring of anger frequency, intensity, duration, and situational triggers; (3) construction of a provocation hierarchy, created from self-monitoring data and used for practice and testing of coping skills; (4) arousal reduction techniques of progressive muscle relaxation, breathing-focused relaxation, and guided imagery training; (5) cognitive restructuring of anger schemas by altering attentional focus, modifying appraisals, and using self-instruction; (6) training behavioral coping skills in communication, diplomacy, respectful assertiveness, and strategic withdrawal, as modeled and rehearsed with the therapist; and (7) practicing the cognitive, arousal regulatory, and behavioral coping skills while visualizing and role playing progressively more intense anger-arousing scenes from the personal provocation hierarchy. Thus, a key feature is therapist-guided progressive exposure to anger provocation, in conjunction with which anger regulatory skills are acquired (see Taylor & Novaco, 2005).

Research Base

There is convergent evidence that CBT for anger produces therapeutic gains. Several meta-analytic reviews of treatment efficacy have found medium effect sizes for various CBT interventions, indicating that the large majority of those treated were improved compared to those in control conditions (Del Vecchio & O'Leary, 2004; DiGuiseppe & Tafrate, 2003; Sukhodolsky, Kassinove, & Gorman, 2004). Many of the randomized control studies captured by meta-analyses have not involved seriously disordered patients. Nevertheless, there have been positive outcomes in controlled studies with such patients, two examples of which are a study by Chemtob, Novaco, Hamada, and Gross (1997) with Vietnam veterans having severe posttraumatic stress disorder and intense, recurrent post-war anger and aggressive behavior and a study by Taylor and Novaco (2005) with forensic patients having intellectual disabilities and co-morbid disorders. Meta-analytic reviews do not include case studies and multiple baseline studies with clinical populations, for whom CBT stress inoculation for anger has produced treatment gains, including for a hospitalized depressed patient, child-abusing parents, a chronically aggressive patient, an emotionally disturbed boy, a brain-damaged patient, mentally handicapped patients, adolescents in residential treatment, and hospitalized forensic patients (see Taylor & Novaco, 2005).

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ANIMAL COGNITION

Animal cognition is a broad term that includes a diverse array of phenomena. Consider some examples. Can apes learn language? Are selective attention and rehearsal involved in learning and cognition? Do animals use tools? Do animals form categories? Can animals abstract rules embodied in a series of items? As a final example, can animals organize lower order items in a higher order chunk, as for example, humans do when organizing letters of the alphabet into a word?

How is cognition to be distinguished from other psychological processes? There are several answers. According to one, cognition involves complex information processing, as for example, when an animal travels over a broad area in search of prey. Cognition is often said to involve the representation of events, as when an animal forms a memory of some past event or anticipates a future one. Some see various cognitive activities, tool use, spatial learning, and the like as governed by a single general problem solving mechanism. Others suggest that cognitive capacities are best considered as modular. The modular view suggests that cognitive capacities are domain-specific adaptations to environmental demands.

For example, a species that ranges far and wide in search of prey may have better spatial learning abilities than one that does not. Some suggest that cognition involves flexibility and adaptability in contrast with simple learning abilities that are more rigid and inflexible. According to this view, in order to suggest that some activity involves cognition it must be shown that it cannot be explained in terms of simpler learning principles. Honig (1998), however, has suggested that there is no set of agreed-on criteria that distinguish the cognitive from the non-cognitive.

Cognition versus Associationism

It often happens that some cognitive explanation of some phenomenon has a rival associative one. For example, consider a series of items A-B-C-D ... consisting of food rewards that become progressively smaller over trials. Hungry animals learn such series as indicated by progressively weaker responding over the series. Two ways to explain this behavior are that animals have abstracted the rule governing the series, that is, each food item is smaller than the prior one, or animals have learned a series of associations, that is, item A signals item B, B signals C, and so on.

Another example is Pavlovian conditioning. In this procedure a stimulus such as a tone, called the conditioned stimulus (CS), may occur shortly before a biological significant stimulus such as food, called the unconditioned stimulus (US). Learning is said to occur when salivation that is elicited by the US occurs to the CS. A common explanation of such learning is that an association is formed between the CS and the US. The view that the cognitive and associative explanations are mutually exclusive in simpler forms of learning, such as Pavlovian conditioning, may be questioned for three major reasons.

First, it has been suggested, particularly in older treatments, that Pavlovian conditioning is simple, reflexive learning. But here is what one of the leading theorists in the area of Pavlovian conditioning, Robert Rescorla, said of his research:

> Pavlovian conditioning has historically been viewed as the most mechanistic and least cognitive of learning processes. Although it has often been used as an explanatory device to account for apparently cognitive aspects of complex behavior, Pavlovian conditioning has itself been less frequently described in cognitive terms. It is the contention of this paper that such a description can potentially encourage novel and interesting experimentation. (1978, p. 15)

So "simple associations" may themselves involve a greater degree of cognition than some may suppose.

A second reason is that CS-US associations in Pavlovian conditioning have been said by a variety of theorists to depend upon processes that are widely regarded as cognitive, such as attention to the CS, rehearsing the CS and the US together, remembering the CS when the US occurs, and organizing separately presented CS-US trials in a chunk (see Martins, Miller, & Capaldi, 2008).

Finally, many of the associations formed in Pavlovian conditioning are complex and may be said to involve cognition. Consider a single example: An association between a CS and a US may be formed even when a CS is presented and terminated long before the US itself is presented. Some representation of the CS clearly survives the temporal interval separating it from the US.

Some Popular Areas of Cognition

It is not possible in the space allotted here to discuss all the individual areas of study in animal cognition. By considering some of the more popular ones, in combination with earlier remarks, a reasonable idea of animal cognition may be provided.

Language

Language in apes was examined initially by attempts to get them to form words. However, they cannot do so for physical limitations. Two other attempts were to get chimpanzees to press symbols for words and to have them learn American sign language. The animals learned many symbols and signs and, according to some, combined the symbols and words into sentences, giving evidence of language. This conclusion encountered considerable opposition. The major criticism was that the animals were simply learning a series of associations of the sort described earlier, that is, A signals B, B signals C, and so forth. These attacks were successful in that various production methods (producing a gesture, etc.) were replaced by comprehension techniques. A bonobo (close relative of the chimpanzee) named Kanzi learned to understand many words presented singly or in a sentence. Kanzi's understanding of sentences was about equal to that of a three-year-old child named Alia. Beyond three years of age, Alia surpassed Kanzi.

Serial Learning

As we have seen, serial learning has been said to involve cognition in the form of rule learning. Evidence has also been presented that animals can organize items of a series into chunks (see e.g., Martins et al., 2008). Thus, even if language-trained animals learned associations rather than true language, they could be said to be employing cognition.

Transitive Inference

An animal may be said to form a transitive inference if it grasps some relation exhibited by a series of items. For example, if Harry is older than Mary and Mary is older than Peter, then it follows that Harry is older than Peter. There are several ways to investigate transitive inference in animals. A popular one is to provide the animal with a five-item series of the form A > B > C > D > E. After mastering the series, the animal may be tested with the items B and D presented together for the first time. Note that these two items have this in common: Each is smaller than the preceding item and larger than the following item. If in a test the animal provides evidence that it knows B > D, a basis exists for suggesting that an inference has been formed. Several associative models, differing among themselves, are capable of explaining why the animal knows B > D.

Categorization

In a series of investigations, pigeons were shown a number of slides, some containing various kinds of trees, others nontrees. The bird was reinforced for pecking the tree slides but not for pecking nontrees. The pigeon quickly discriminated between the two types of slides, pecking the tree slides but not the others. Subsequently, slides used in the learning phase were replaced by new tree and nontree slides the pigeons had not previously seen. The birds responded appropriately to the new slides. Category learning of this sort has been investigated in connection with a great variety of other categories. On the basis of such data it may be claimed that birds form concepts. Others suggest that concepts involve language and thus birds lack concepts.

Spatial Learning

Animals have to get from one place in space to another for many purposes—to find food, a mate, and so forth—and they do so using a variety of mechanisms. Dead reckoning is one: an internal sense of the direction and distance of its nest from the current position. Or they may orient to landmarks. Animals may also use the sun as a compass. Relevant to present purposes we may ask, do animals have cognitive maps or a device that represents direction and distance among objects or locations? The ability of animals to get around may not involve maps according to some. Rather, animals form memories of local views of the environment associatively linked by memories of movements that take them from one place to another.

Timing and Counting

Timing and counting are often treated together because according to certain models they are accomplished in the

same way (Shettleworth, 1998). There can be little doubt that animals are adept at timing. They time intervals well and can judge time accurately when they both stop and start their "clocks." It seems clear that animals have some ability to count or enumerate events whether they are presented simultaneously or successively. Essentially, timing and counting methods are variants of discrimination learning. For example, following a two-second tone response A will be rewarded and following an eight-second tone response B will be rewarded. Some have suggested that animals' numerical ability may extend beyond counting or the simple enumeration of items, to addition, subtraction, multiplication and division. In the area of counting animals have been shown to exhibit cross-model transfer. For example, animals trained to count auditory stimuli can transfer to counting the same number of visual stimuli.

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See also: **Animal Intelligence; Animal Learning and Behavior**

ANIMAL INTELLIGENCE

The study of animal intelligence has been addressed by ethologists, biologists, psychologists, anthropologists, neurologists, zoologists, and ecologists, among others, each guided by different theoretical perspectives. Representatives from each field have thus defined intelligence in different ways. The resulting disparate theoretical definitions have, not surprisingly, led to distinct operational definitions, encouraging strikingly different methodological approaches to the study of intelligent behavior in animals. Two broad approaches can be identified. Researchers studying animals in the field (e.g., ethologists, biologists, behavioral ecologists) have tended to focus on questions of how animals adapt to and solve ecological problems, whereas those studying animals in captive environments (e.g., psychologists) have focused on questions of generalized learning and memory and concept formation.

Questions of adaptation examine how perceptual and cognitive skills such as attention, memory, and decision making assist the animal's everyday functioning. For instance, how do those skills allow the animal to find food and mates, maintain and defend a territory, and fend off predators? Studies in this tradition have tended to examine species-specific behaviors rather than looking for generalized perceptual or cognitive abilities. Of importance is what typical members of a given species do under the average living conditions they have evolved to face, not what the limits of a species' capacities might be, or what a single individual might do under extraordinary circumstances.

Researchers concerned with questions of adaptation might take a comparative approach and examine, for example, whether species of birds who must cache or store their food over harsh winter months exhibit more advanced spatial memory skills relative to species who live in climates where their preferred food is abundant year-round, or who do not cache. Ethologists and behavioral ecologists study behaviors that are already within a species' behavioral repertoire and ask whether it makes evolutionary sense for a given skill to have evolved under the conditions in which that species naturally lives. With this approach, animals are typically not presented with problems they would not face in their natural environments.

When animal intelligence is framed in evolutionary terms (e.g., abilities that allow organisms to cope with their environments), then all animal behavior is intelligent, for all species are uniquely adapted for the environments they inhabit. Perhaps by that measure, one might consider the most intelligent species the ones that adapt to the broadest range of environments, or that are able to adapt most quickly to environmental changes, or even those who can change the environment to suit their needs. This latter definition might be deemed anthropocentric, as it certainly encapsulates an ability quite advanced in our own species. No other species transforms its environment or adapts to so many environments quite as readily as humans. Although many species of insects exist in a multitude of habitats, only humans have proven capable of advanced technological inventions such as equipment that allows us to breathe under water or in outer space.

Thus psychologists, who tend to focus on questions of what it is that makes humans unique, especially in

terms of their cognition, have conceptualized intelligence in a different manner. They have tended to define intelligence as the ability of an individual to generalize learning beyond the specific conditions under which an event or object was encountered to events or objects that can only be imagined, or that might be encountered in the future, thereby allowing an individual to exhibit a high degree of transfer of learning from one situation to the next. Thus, transfer tests with novel stimuli have become acid tests of intelligent behavior in different domains for comparative psychologists. In this tradition, animals are frequently presented with objects that are foreign to them and asked what they can infer about the function or purpose of the object in order to demonstrate their intelligence. This approach takes an animal out of the context in which its abilities were evolutionarily sculpted and into one in which it might demonstrate, for example, insightful, inferential, or analogical reasoning, allowing researchers to distinguish intelligent from instinctive behavior.

Psychologists have also relied on learning sets. Do animals learn how to learn? That is, do they learn rules about learning or strategies for learning that transcend the particular stimuli they are learning about? For example, when learning a categorization task, they learn not only that particular stimuli such as food items must be grouped together and responded to in a certain way, but they also learn a more general rule: to figure out what the category is for any given stimulus set.

In contrast to field studies, laboratory studies are often directed at searching for a single instance of a behavior that would demonstrate a particular ability. Indeed, in some psychological traditions, only one member of the species needs to demonstrate a given ability in order for that ability to be deemed within the grasp of that species. For instance, Premack's chimpanzee, Sarah, single-handedly contributed to the notion that chimpanzees might be capable of reasoning about mental states (Premack & Woodruff, 1978) or that only language or token-trained chimpanzees might be capable of analogical reasoning (Premack, 1983). There are many instances of individuals who stand alone among their species, exhibiting extraordinary feats of intelligence that have yet to be replicated (e.g., Rico the Border Collie, Alex the African grey parrot, Betty the New Caledonian crow, Koko the gorilla, Chantek the orangutan, Washoe the chimpanzee, Kanzi the bonobo). Single instances of innovation, such as cultural learning and other instances of social learning, might be important for this conceptualization of intelligence as well.

More recently, researchers have attempted to bridge the gap and form multidisciplinary collaborations, taking the best of both theoretical and methodological approaches. Under this approach, researchers are guided to observe what an animal does in its own environment, to understand the contexts in which a behavior naturally occurs, and then to use laboratory tests to rigorously test hypotheses about how and why specific behaviors may have evolved, the underlying mental/neural architecture supporting the behavior, and how those behaviors might be altered under varying conditions. Those behaviors that are flexible and malleable will allow an individual to adjust and adapt to an ever-changing, unpredictable environment—which is a useful operational definition of intelligence. By combining the traditional approaches, it is possible to ask what animals actually do in their own environments and what they are capable of learning when taken out of those comfort zones. Thus, both approaches can be integrated where feasible to promote the best understanding of what it is that makes behavior adaptive.

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See also: **Animal Cognition; Animal Learning and Behavior; Comparative Psychology**

ANIMAL LEARNING AND BEHAVIOR

The study of animal learning and behavior has a rich tradition within the field of psychology. While learning has many definitions across fields, a useful framework for animal learning is defining it as a process in which behaviors are modified as a result of experience, provided that the change in behavior cannot be attributed to innate response tendencies, rapid change of stimuli (Domjan, 2006), developmental maturation, or temporary state factors (such as fatigue; see Runyon, 1977).

There are a number of reasons why animal models are beneficial for studying learning, even for those whose interest lies solely in the study of human psychology. Animal studies allow for the use of methods that, due to ethical considerations, are not accessible for use with humans, such as single-cell recordings from individual neurons in

the brain. In addition, the use of animals permits greater control over the external environment. Environmental factors can often confound evidence of learning, and animals can be reared in environments that permit these factors to be carefully manipulated or controlled, such as the extreme case in which animals may be reared in isolation in order to test whether a particular cognitive feature or behavior relies on social learning. Finally, animal models may also provide an advantage in that they can provide simpler systems for studying behavior, again minimizing potential confounding variables inherent in the study of more complex systems.

Historical Views

Early philosophers, such as Aristotle, posited that animals are similar to humans in many respects, but lack the ability to reason (Pellegrin, 1986). Over the ensuing centuries, many positions on animal cognition were articulated, often influenced by religious beliefs about divine hierarchical ordering. One of the most influential early philosophical positions on animal behavior was espoused by Rene Descartes (1596–1650), whose theory of mind-body dualism was predicated on the notion that humans are capable of voluntary and involuntary behaviors, whereas animals are capable of only involuntary behaviors. This view held sway for roughly 200 years, until Charles Darwin (1809–1882) wrote a series of books positing that phylogenetic continuity across species was not only morphological, but also psychological (Darwin, 1871). Darwin's continuity hypothesis paved the way for modern psychological studies of animal behavior (see Roberts, 1998, for review).

Initially, Darwin and George Romanes (1848–1894), a close friend and author of *Animal Intelligence* (1882), used anecdotal evidence to support the argument for continuity. This method was challenged in the early twentieth century by C. Lloyd Morgan (1852–1936), who introduced a principle known as *Morgan's Canon* (1906). Morgan's Canon asserted that in interpreting behavior, one must exhaust simpler behavioral explanations before invoking the involvement of more complex behaviors. The articulation of this principle coincided with the Clever Hans affair, in which a then-famous horse named Hans was posited to possess human-like intelligence until the hoax was debunked by Oskar Pfungst (1847–1933), who found that Hans's behavior was guided by very simple behavioral associations. These developments, along with the emergence of influential researchers like Ivan Pavlov and Edward Thorndike paved the way for more carefully controlled and systematic studies of animal behavior.

In the early twentieth century, Pavlov and Thorndike began pioneering work on classical conditioning and associative learning, with the underlying theory that the mechanisms responsible for changes in animal behavior had analogues in humans. Pavlov (1849–1936), a Nobel-prize winning physiologist and surgeon, developed the concept of the conditioned reflex. During his research on the physiology of the digestive system in dogs, Pavlov noticed that if he paired the sound of a bell with the presentation of food, the dogs would begin to salivate when hearing the bell alone. This discovery paved the way for a rich theoretical framework, classical conditioning (see below), that is still studied today. Thorndike (1874–1949) was a harsh critic of using anecdotal evidence and is often credited as being the first researcher to bring the study of animal learning into the laboratory. Thorndike's Law of Effect postulated that behaviors that lead to satisfying outcomes are more likely to be repeated, whereas behaviors that lead to less desirable outcomes are less likely to reoccur. Thus, rewards are likely to strengthen stimulus-response (S-R) connections. Thorndike's work on instrumental conditioning set the stage for future behaviorists like B. F. Skinner, who also focused on the reinforcing properties of the environment.

The study of animal learning thrived in the Behaviorist era in psychology that began in the early twentieth century and predominated for roughly 60 years. The central tenet of behaviorism was manifest in J. B. Watson's (1878–1958) paper entitled "Psychology as the Behaviorist Views It" (Watson, 1913). Watson emphasized the importance of learning in psychology, eschewing mentalistic terms while emphasizing the importance of studying behavior. This view was later adopted and expanded by B. F. Skinner (1904–1990), considered to be the founder of radical behaviorism, a school of thought seeking to understand behavior strictly in terms of environmental histories of reinforcement consequences. Skinner extended the behaviorist doctrine to encompass inner physiological experiences as well, a critical deviation from other theoretical behaviorist accounts. Skinner's work on operant conditioning has had a tremendous impact on the field of psychology in research and in clinical applications, extending to the development of behavioral modification techniques.

During the Behaviorist era, most researchers shunned any serious consideration of internal mechanisms, except for two notable psychologists, Edward Tolman (1886–1959) and Clark Hull (1884–1952). Tolman and Hull were amenable to the idea of internal mechanisms mediating stimulus-response (S-R) models. For example, Tolman (1948) believed that stimuli were not connected in a one-to-one fashion with outgoing responses, but rather were elaborated into an internal cognitive map, which in turn determined the responses that would be produced. Tolman's behaviorism focused on the *molar* analysis, asserting the relevant unit for behavior study consisted of an entire action, as opposed to the molecular level favored by many behaviorists who focus on the smaller behavioral components (such as single muscle contractions) that produce more complex behaviors.

Tolman's approach to animal learning foreshadowed later theoretical positions, as the cognitive revolution of the 1960s and 1970s emphasized internal mental processes as central to the field of psychology. In fact, one of the enduring major debates in the description of animal learning and behavior is the extent to which cognitive mechanisms are thought to mediate observed behaviors. Behavioral approaches (consistent with Watson, Thorndike, Skinner, and others) focus on the relationship between observed behaviors and environmental events. In contrast, cognitive approaches posit that behavior is mediated by intervening internal variables (consistent with Tolman, Hull, and others).

Theoretical Orientations

The field of animal learning and behavior encompasses a wide variety of theoretical orientations that differ in their underlying assumptions and interests. Nobel laureate ethologist Nikolaas Tinbergen (1907–1988) proposed a broad framework to examine animal behavior that is useful for illustrating the different levels of analysis. Tinbergen (1952) proposed that in order to truly understand a behavior, four questions must be answered. Two questions pertain to the proximate mechanisms of behavior (i.e., addressing how the behavior is instantiated in the individual organism) and two questions pertain to the ultimate mechanisms (i.e., addressing why the behavior evolved in that species). The proximate level questions concern (1) The mechanisms underlying the behavior: What are the neural, physiological and psychological mechanisms involved in the expression of the behavior? and (2) The ontogeny (development) of that behavior: How does the behavior change with age and what experiences are necessary for its expression? To what extent is the behavior genetically encoded? The ultimate level questions concern (1) The phylogenetic (evolutionary) history of the trait. How does the behavior compare with behaviors observed in related species or in species facing similar selective pressures? and (2) The function (adaptation) of the behavior: How does the behavior impact survival and reproduction (fitness consequences)? Comparative psychologists have traditionally been interested in the proximate level questions, whereas ethologists have been more interested in the ultimate level questions.

Psychologists studying animal learning and behavior have typically adopted an anthropocentric approach (see Shettleworth, 1998) that is based on the notion that all species share a core set of underlying mechanisms that guide behavior. Accordingly, the study of learning in rats or pigeons can provide direct insights into fundamental principles applicable to human behavior. This general process approach (see Domjan, 2006) asserts that a limited system governed by a few basic principles can account for a wide variety of observable behaviors. Pavlov's classical conditioning and Skinner's operant learning theories fall squarely in this tradition, as the study of these learning mechanisms were meant to illustrate general principles and rules of learning that apply to behavior across all species. The anthropocentric approach, then, can be characterized as elucidating the proximate mechanisms underlying learning and behavior of all species.

In contrast to the anthropocentric approach, the biological approach (Shettleworth, 1998) to the study of animal learning and behavior (also termed the comparative approach; Domjan, 2006) is characterized by principles of evolutionary biology, focusing on the extent to which behaviors represent adaptive specializations shaped by natural selection to increase survival or fitness (i.e., ultimate mechanisms). Rather than emphasizing similarities across species, the biological approach to learning seeks behavioral differences across species that may be explained by differences in environmental selective pressures. A recent trend in research on animal learning and behavior has been an effort to incorporate both proximate and ultimate levels of analysis by synthesizing the anthropocentric and biological approaches. These efforts are characterized by studying the underlying mechanisms used by animals to resolve ecologically relevant challenges, thereby framing learning in the context of evolution.

Methodological Considerations

Many of the early theories and claims about animal learning and behavior were fueled by anecdotes. As mentioned above, even Darwin used an anecdotal approach in support of his continuity theory. After heavy criticism from Morgan, Thorndike, and others, the study of animal learning moved into the laboratory, where external variables could be better controlled. In the laboratory, numerous methods have been implemented, and here we review a small subset that represents some of the major classes of research.

Classical Conditioning

A common example of classical conditioning can be demonstrated with Pavolv's dogs. When he paired auditory sounds with the presentation of food (which naturally induced salivation), the sounds became conditioned such that their presentation alone could induce salivation. Classical conditioning studies typically involve taking a neutral stimulus (i.e., a stimulus that does not naturally evoke the conditioned response) and pairing it with an unconditioned stimulus (US) that elicits an unconditioned response (UR). The neutral stimulus becomes a conditioned stimulus (CS) through this pairing and will begin to elicit a conditioned response (CR) after a number of pairings. In the example above, the auditory sound was the neutral stimulus, which prior to conditioning did not elicit a salivating response. When it was paired with the food (the US), which naturally

elicits salivation (the UR), the sounds became conditioned (the CS) such that their presentation alone could induce salivation (the CR).

Instrumental and Operant Conditioning

Unlike classical conditioning, instrumental and operant conditioning are predicated on the modification of behaviors by environmental consequences. The idea behind both instrumental and operant conditioning is that organisms engage in behaviors whose outcomes either lead to an increase in the frequency of the behavior (reinforcement) or a decrease in the behavior (punishment). When the environmental consequence for a given behavior is inconsequential, then the behavior will undergo extinction, the reduction of the reinforced response. There are two varieties of reinforcers and punishers, positive and negative. Positive refers to the additive effects (e.g., receiving a pellet for pressing a lever increases the behavior and is therefore considered to be a positive reinforcer) whereas negative effects are subtractive (e.g., the removal of an aversive stimuli as a result of a behavior will lead to an increase in the behavior, hence it is negative reinforcement).

Untrained Methods

Another type of research conducted with animals examines the fundamental computational abilities of various species, employing methodologies that involve no explicit training or associations. For example, habituation-discrimination experiments (also commonly used in field studies) expose participants to a particular stimulus until they no longer respond to it (habituation) and then are exposed to a new stimulus and the response is measured. If the participant responds, then it is evidence that the participant has detected a meaningful difference between the familiarization stimuli and the test stimulus. An advantage to employing untrained methods is that they can be employed with both human infants and nonhumans, thus allowing for a more straightforward comparison of cross-species similarities and differences (Weiss & Newport, 2006).

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See also: **Comparative Psychology; Ethology; Operant Conditioning; Pavlovian Conditioning**

ANOMIC APHASIA

Anomic aphasia is a very disabling disorder that results from acquired brain dysfunction (typically stroke, traumatic brain injury, or temporal lobe resection). Patients with anomic aphasia manifest an isolated deficit in their ability to name things like concrete entities (named by nouns), actions (named by verbs), or spatial relationships (named by prepositions). Defective naming, also known as anomia, is a frequent part of the symptom complex that characterizes patients with aphasia (Goodglass & Wingfield, 1997; Tranel & Anderson, 1999), where aphasia refers to disturbances of the comprehension and formulation of verbal messages caused by acquired damage to language-related brain structures (typically in the left hemisphere).

Anomia is also a common experience among people with Alzheimer's disease, epilepsy, and several other neurological disorders. However, when anomia occurs as an isolated manifestation of acquired brain dysfunction in the absence of additional symptoms of aphasia and other cognitive dysfunction, the designation of "anomic aphasia" applies. Some of the common aphasia syndromes, such

as Wernicke's aphasia and conduction aphasia, tend to gradually resolve into a picture of anomic aphasia as the patient recovers.

It is sometimes assumed that naming ability and recognition are one and the same process. However, knowing what something is (its meaning, sometimes termed *semantics* or *recognition*) is distinct from knowing what something is called (referred to as *naming* or *lexical retrieval*). In fact, naming and recognition have partially distinct neural mechanisms (Damasio et al., 2004), which helps explain why patients with anomic aphasia have lost the ability to retrieve names of things, but they have not lost the ability to recognize what things are. Thus, even when they cannot name things, anomic aphasics can usually produce accurate descriptions of those things, or indicate by gestures that they have intact conceptual knowledge.

For example, when shown a picture of a camel, the patient may say, "That is an animal that has humps on its back, lives in the desert, and can go for a long time without water." Or when shown a picture of Bill Clinton, the patient may say, "That guy was a president; had an affair, had a southern accent." A related phenomenon known as "tip-of-the-tongue" state occurs fairly frequently in the realm of normal experience. Under conditions of fatigue, distraction, or in connection with normal aging, normal individuals sometimes experience the inability to retrieve a particular name even though they know perfectly well what it is that they are attempting to name (Burke et al., 1991). It is especially common for normal individuals to have trouble retrieving proper names (i.e., names denoting unique entities such as persons and places). In addition, anomia sometimes occurs in the course of normal verbal discourse such as when one is speaking and suddenly cannot retrieve the name for a particular concept that is part of the intended utterance.

The vast majority of current knowledge regarding the neural underpinnings of word retrieval and most theoretical accounts of this process are heavily tied to the visual modality. However, anomia can occur in connection with any sensory modality—for example, when attempting to name a picture of something, a sound, a smell, or something that is felt by the hand. Nevertheless, most researchers utilize "visual confrontation naming" paradigms to test for and investigate anomia, a method that involves presenting participants with pictures, line drawings, or actual objects and then asking them to provide a name for each item. This format is also the standard paradigm for assessing naming ability in patients with brain injuries. In fact, one such visual confrontation naming test, the Boston Naming Test (BNT) (Kaplan, Goodglass, & Weintraub, 1983), is the eighth most commonly used test among neuropsychologists in the United States (Camara, Nathan, & Puente, 2000). Tests of naming ability for the other sensory modalities have primarily been used in research investigations rather than clinical settings.

The classic aphasia syndromes, including Broca's ("nonfluent") and Wernicke's ("fluent") aphasia, are typically associated with brain damage in the vicinity of the sylvian fissure of the left hemisphere of the brain. Although anomia is typically characteristic of these syndromes, it is usually only one of many more serious and severe symptoms of language impairment. Cases of pure anomic aphasia, in which severe naming defects are manifested in the absence of more global symptoms of aphasia, are primarily associated with damage to structures in the left hemisphere that are outside the classic language regions. Specifically, anomic aphasia is most often caused by damage to the left anterior temporal lobe, to the inferior and lateral aspect of the left temporal lobe, or to the left occipitotemporal junction.

Interestingly, scientific investigations of patients with anomic aphasia have revealed a number of intriguing associations between specific brain structures and specific types of naming abilities (Damasio & Tranel, 1993; H. Damasio et al., 1996, 2004; Tranel et al., 2001). Studies in normal subjects, using functional neuroimaging procedures (positron emission tomography, functional magnetic resonance imaging) have corroborated several of these findings (Grabowski et al., 2001; Martin et al., 1995, 1996).

The evidence from this research indicates that the neural correlates of naming ability may be category-specific. For example, naming of proper nouns has been associated with the temporal polar region in the anterior left temporal lobe. Immediately behind the temporal pole, in the inferior and lateral aspect of the temporal lobe, is a region that has been associated with the retrieval of names for animals. And further back, in the vicinity of the temporal-occipital junction, is a region that has been associated with the retrieval of names for tools. These associations may appear arbitrary or even bizarre, but there are principled accounts of why the human brain may be organized in such a fashion (Dell et al., 1997; H. Damasio et al., 1996, 2004; Saffran & Sholl, 1999).

For example, factors such as whether an entity is unique (e.g., Tom Hanks) or nonunique (e.g., a screwdriver), whether it is living (e.g., a pig) or nonliving (e.g., a hammer), whether it is manipulable (e.g., a wrench) or nonmanipulable (e.g., a giraffe), or whether it makes a distinctive sound (e.g., a rooster) or not (e.g., a thimble), are important in determining which neural structures will be used in the mapping and retrieval of knowledge for entities, including their names (H. Damasio et al., 2004). Interestingly, the modality in which a stimulus is perceived may not make much difference: for example, retrieving the name "rooster" when confronted with a picture of a rooster, or when confronted with the characteristic sound of a rooster, appears to depend on the same left temporal lobe region (Tranel et al., 2005).

There are also intriguing distinctions between words that come from different grammatical categories, such as nouns versus verbs. Although the brain regions that are

important for retrieving both types of words are primarily lateralized to the left hemisphere, the specific regions involved in the lexical retrieval of nouns is partially separate from those that are important for retrieving verbs. For example, the retrieval of nouns is related to structures in the left temporal lobe. The retrieval of verbs, by contrast, is related to structures in the left frontal operculum (in front of the Rolandic sulcus). Interestingly, some studies have suggested that noun-verb homophones—e.g., words like "hammer" or "duck," which are used frequently as either nouns or verbs—are retrieved by the brain system that fits the context in which the word is being used. Thus, if "hammer" is being used as a noun, the temporal lobe system will be used, but if "hammer" is being used as a verb, the frontal lobe system will be used (Tranel et al., 2005). Again, such dissociations may appear rather curious on the surface, but there are compelling explanations of why the brain has organized knowledge in different regions to subserve words from different grammatical categories (Damasio & Tranel, 1993; Tranel et al., 2001).

Naming defects are characteristic of a variety of neurological disorders and conditions; however, pure cases of anomic aphasia are rare. Severe naming impairments unaccompanied by other speech or linguistic deficits occur far less frequently than most of the "classic" aphasia syndromes. Nonetheless, patients with anomic aphasia have provided a unique opportunity to learn how the brain operates the processes associated with word retrieval, and how different brain structures are specialized for different types of words and different categories of entities. Thus, while anomic aphasia is important as a clinical disorder, its especial interest lies in the realm of scientific study of how the human brain operates language processes. This, in turn, can help inform rehabilitation efforts aimed at patients with acquired disturbances of naming. However, to date, most studies investigating the neural correlates of naming ability have focused on cases of anomic aphasia in monolingual speakers. Given the fact that bilingual and multilingual speakers greatly outnumber the population of monolingual speakers in the world, future research would benefit greatly from case studies of multilingual speakers who have acquired anomic aphasia.

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See also: **Conduction Aphasia; Language Comprehension; Speech Production**

ANOREXIA NERVOSA

Anorexia nervosa is a mental disorder defined by deliberate self-starvation resulting in body weight below a minimum level necessary for health. In current diagnostic systems, such as the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association [APA], 2000), additional features include an intense fear of gaining weight or becoming fat, misperception or undue influence of weight or shape on self evaluation or denial of the seriousness of low weight, and, in postmenarcheal females, loss of three consecutive menstrual cycles. Of note, no definition provides a single threshold by which to evaluate low weight. In the DSM-IV-TR, weight less than 85% of that expected is provided as an example for diagnosis.

The term "anorexia nervosa" was introduced into the medical literature in 1874 by William Gull (1874). However, a self-starvation syndrome that predominantly affects adolescent and young adult females has been described in various accounts for centuries (see Keel & Klump, 2003). Several features have remained constant over time, including refusal to eat enough food to maintain a minimally healthy weight, denial of severity of the illness, and the increased risk of death due to starvation. Other features, such as fear of gaining weight or becoming fat, appear to be modern additions to the syndrome that may be absent in patients from non-Western cultures (Keel & Klump, 2003). Such historical and epidemiological patterns raise questions regarding the core features of the illness, suggesting that motivations for self-starvation may be ascribed *post hoc* and represent explanations for behaviors for which the cause remains largely unknown.

Epidemiology

In modern industrialized cultures, approximately 1 in 200 females develop anorexia nervosa over the course of their lifetimes, representing a lifetime prevalence rate of 0.5% in women (APA, 2000). Anorexia nervosa is significantly more common in women than men, with a ratio of approximately 10 female patients for every 1 male patient (APA, 2000). Further, the number of new cases per 100,000 individuals per year (or the 1-year incidence) has increased over recent decades (Keel & Klump, 2003). The onset of anorexia nervosa is most likely to occur during mid- to late adolescence.

Risk Factors for Developing Anorexia Nervosa

Lay explanations for anorexia nervosa often focus on the societal idealization of thinness. This explanation appears to account for the gender difference in risk for developing the disorder and increased incidence of the illness over recent decades. However, like any complex form of mental illness, anorexia nervosa is likely to be caused by a combination of biological, psychological, and social factors. The relative contributions of factors may vary on a case-by-case basis. Thus, it is possible for an individual's illness to result from societal pressures to emulate the thin ideal. However, given the pervasiveness of the thin ideal in modern Western cultures and the relative rarity of anorexia nervosa in the general population of women, it is clear that social factors alone are unlikely to account for the majority of cases.

Biological Risk Factors

Studies of identical and fraternal twins have identified the likely contribution of genes to the development of anorexia nervosa. Specifically, the risk of developing anorexia nervosa is higher when an individual has a genetically identical (monozygotic) twin affected with the disorder than when an individual has a fraternal (dizygotic) twin with the disorder (Becker, Keel, Anderson-Frye, & Thomas, 2004). Investigations of the actual genetic make-up of individuals with anorexia nervosa have suggested that they are more likely to have a specific form of a gene that codes for a type of serotonin receptor (Becker et al., 2004). Serotonin is a brain chemical (also called a neurotransmitter) that influences what signals are transmitted throughout the brain and body. Serotonin plays an important role in regulating appetite, mood, and self-regulation of behavior. Serotonin receptors influence how signals are received and processed for this chemical. Thus, finding an association between a gene that codes for a type of serotonin receptor and the presence of anorexia nervosa may help to explain why these individuals are vulnerable to develop the disorder.

Psychological Risk Factors

In her seminal book, *The Golden Cage*, Hilde Bruch (1978) provided a description of patients with anorexia nervosa based on her own observations and information from parents about circumstances and events preceding the onset of the illness. Girls who developed anorexia nervosa were described as striving towards perfection, concerned with controlling their own impulses in order to obtain approval from others, and prone to anxiety. These girls were also characterized by difficulties in differentiating internal states, such as feeling hungry versus feeling sad or tired. This description has withstood the test of time and can be seen in very early descriptions of patients and historical accounts of fasting girls that predate the introduction of anorexia nervosa into the medical literature (Keel & Klump, 2003). In addition, longitudinal studies have shown that individuals with higher levels of perfectionism are at increased risk for developing an anorexic syndrome later in life (Keel, 2005).

Social Risk Factors

As already described, anorexia nervosa has been defined in modern diagnostic systems by a fear of gaining weight or becoming fat, misperception of weight or shape, and undue influence of weight or shape on self-evaluation (APA, 2000). These features appear to be an extension of societal messages regarding the dangers of being overweight and importance of being thin in terms of being happy, healthy, loved, and respected (Becker et al., 2004). Numerous studies have demonstrated the stigmatization of being overweight and obese among children, adolescents, and adults, and numerous studies have demonstrated that individuals prefer thinner figures in themselves, friends, and potential partners (Keel, 2005). A social context that glorifies thinness and denigrates fatness may contribute to an adolescent's decision to go on a weight-loss diet. Once weight loss is initiated, social reinforcement may combine with psychological and biological risk factors in the ultimate development of anorexia nervosa.

Treatment

For adolescents with anorexia nervosa, a family-based treatment has demonstrated efficacy (Keel & Haedt, 2008). This treatment differs from traditional family therapies in which the family is viewed as the patient and treatment is designed to alter pathological family processes. In the family-based treatment for anorexia nervosa, family members are recruited as members of the treatment team in order to provide a home environment for adolescent children that encourages eating and weight gain. This intervention has proven superior to alternative treatments in independent randomized controlled treatment trials (Keel & Haedt, 2008). A striking problem in the field of eating disorders is the lack of evidenced based treatment for adults with anorexia nervosa (Bulik, Berkman, Brownley, Sedway, & Lohr, 2007).

Course and Outcome

As described in the DSM-IV-TR (APA, 2000), course and outcome are variable in anorexia nervosa. Community-based studies have indicated that individuals who meet criteria for anorexia nervosa may recover after a relatively brief period of illness, and this may be particularly likely for those with an early age of onset (Steinhausen, 2002). However, samples followed from clinical settings provide a more sober picture of course and outcome, with fewer than half of patients recovering, a third improving, and 20% remaining chronically ill more than a decade after diagnosis (Steinhausen, 2002). Particularly alarming, anorexia nervosa is associated with one of the highest risks for premature death of any mental disorder (Keel, 2005), with a 10-fold increase in death during early to mid-life compared to matched individuals without the disorder. Primary causes of death include the physical consequences of starvation and suicide. Based on the lack of evidence-based treatments for anorexia nervosa in adults, the chronicity of the illness in a substantial subset of patients, and the elevated risk of death, anorexia nervosa represents a very serious form of mental illness.

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See also: **Bulimia Nervosa; Eating Disorders**

ANTABUSE AND OTHER DRUGS FOR TREATING ALCOHOLISM

Antabuse (disulfiram), a drug used as a supplementary therapy for alcoholism, was originally used in the manufacture of rubber. When the chemical got into the air in one factory and settled on the workers' skin, many developed dermatitis. If they inhaled it, they discovered that they could no longer tolerate alcohol. Beginning in the 1940s, therapists tried using the drug as a therapy for alcoholism, on the theory that alcoholics who drank alcohol

after taking Antabuse would experience unpleasant effects and thereby learn an aversion to alcohol.

Ethanol (ethyl alcohol) is metabolized in the liver by the enzyme alcohol dehydrogenase into acetaldehyde, which is a toxic chemical. Acetaldehyde is then metabolized by the enzyme aldehyde dehydrogenase (also known as aldehyde NAD-oxidoreductase) into acetate (acetic acid), which is a source of energy. Antabuse and a similar drug, Temposil (calcium carbimide), bind to the copper ion of acetaldehyde dehydrogenase and thereby inactivate it. Consequently, after someone drinks ethanol, it is converted as usual to acetaldehyde, but the acetaldehyde then accumulates instead of being converted to acetate. Symptoms of acetaldehyde accumulation include flushing of the face, increased heart rate, hypotension, nausea and vomiting, headache, abdominal pain, and labored breathing. People using Antabuse are advised to take a pill daily. They are warned that drinking alcohol within a day or two after taking a pill can cause severe illness, and drinking alcohol even within a week can produce unpleasant consequences. They need to avoid even using shampoos containing alcohol, because of the danger of skin rashes. Furthermore, Antabuse interacts with other drugs someone may be taking, sometimes producing toxic effects.

People with certain genes produce lower than average amounts of the enzyme aldehyde dehydrogenase. If they drink large amounts of alcohol, they experience symptoms similar to, though milder than, those associated with Antabuse. More than a third of Chinese and Japanese people have low amounts of this enzyme, and partly because of this lack, alcohol abuse has historically been less common in China and Japan than in most other countries (Luczak, Glatt, & Wall, 2006).

Many sources state that Antabuse is not significantly more effective than a placebo, citing a study by Fuller and Roth (1979). That criticism is misleading, however. In that study, people in one group were correctly told that they were taking a placebo and those in another group were given placebos but intentionally misinformed that they were taking Antabuse. The group who believed they were taking Antabuse fared about the same as people actually taking Antabuse: About one-fourth of the individuals abstained completely throughout the year. Both of these groups did far better than the group who knew they were taking a placebo, who unsurprisingly continued drinking heavily. In other words, taking Antabuse, or believing one is taking Antabuse, is an effective deterrent to drinking and a useful adjunct to a decision not to drink. The pharmacological properties of Antabuse are irrelevant to someone who does not consume alcohol, except insofar as they maintain the threat of harm in case of relapse. Someone who takes Antabuse, also relapses, and therefore becomes sick is unfortunately more likely to quit Antabuse than to quit alcohol.

One review of 24 studies concluded that Antabuse on the average decreases the number of drinking days and the total consumption of alcohol, but does not significantly increase the probability of remaining abstinent long-term (Hughes & Cook, 1997). The problem in evaluating the effectiveness of Antabuse is the high frequency of noncompliance. Many alcoholics who begin with good intentions quit taking the pills or take them sporadically. When therapists have taken measures to increase compliance, such as having someone's friend or relative supervise the daily pill-taking, the results have been more encouraging (Azrin, Sisson, Meyers, & Godley, 1982). One possibility is to develop an implant that would provide sustained release in controlled quantities (Hughes & Cook, 1997).

Another drug approved in the United States for use against alcoholism is naltrexone, which blocks opioid receptors in the brain. Alcohol indirectly activates opioid pathways, which have rewarding effects. Naltrexone decreases cravings for alcohol and the subjective reward value of alcohol (Swift, 1999). On the average, people taking naltrexone drink less alcohol per week than those taking a placebo, although their probability of complete abstention is not significantly greater (Morris, Hopwood, Whelan, Gardiner, & Drummond, 2001). As with Antabuse, a major limitation is that many people quit taking the drug.

The third drug approved by the U.S. Food and Drug Administration, acamprosate (Campral), has been reported to increase the probability of abstinence for a year or more (Whitworth & Fischer, 1996). Alcohol facilitates binding of the neurotransmitter GABA to its receptors, and inhibits the neurotransmitter glutamate. When an alcohol abuser abstains from alcohol, the result is a rebound hyperactivity of glutamate, causing nervousness and distress. Acamprosate evidently reduces the glutamate hyperactivity, and therefore decreases the withdrawal effects and the associated craving. Acamprosate is recommended for preventing relapses when people are already abstaining. It appears to be ineffective for people who are still drinking (Chick, Howlett, Morgan, & Ritson, 2000).

The drug tiapride, used in parts of Europe, blocks dopamine receptors (Swift, 1999). Dopamine activity is critical for nearly all types of reinforcement, so although blocking it may have potential for decreasing alcoholism, it runs the risk of decreasing other motivations as well.

Topiramate (an antiepileptic drug) and ondansetron (an antinausea drug) are sometimes prescribed "off-label" for alcoholism, without approval by the Food and Drug Administration. Both of these drugs have shown encouraging results in very limited testing.

For all of these drugs used against alcoholism, the problem is compliance. Many alcoholics have mixed feelings about quitting alcohol and decreasing their own cravings, and at various times many of them quit taking the drugs. In short, any of these drugs can be a useful supplement to other forms of treatment, but none is a substitute for the alcoholic's own wish to abstain.

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See also: **Alcohol Use Disorders**

ANTHROPOLOGY

Anthropology is an outgrowth of the sixteenth-, seventeenth-, and eighteenth-century European discoveries of the remains of ancient civilizations and fossil ancestors, as well as European encounters with contemporary cultures that differed greatly from those of Europe. The need to explain, understand, and deal with these discoveries as a means of better understanding their own cultures gave rise to anthropology as an academic and museum discipline. It was not until the late nineteenth and early twentieth centuries, however, that a coherent intellectual structure emerged for the discipline. In the United States Franz Boas, of Columbia University, helped combine four subfields into what we now see in most major United States university departments of anthropology: cultural anthropology, archaeology, anthropological linguistics, and physical (biological) anthropology. Together, research in these four subfields has achieved a broad coverage of human biological and cultural evolution in its study of the world's cultures, past and present, which is the most distinguishing feature of anthropology. The concept of culture has become the unifying theoretical framework that allows the subdisciplines of the field to interact in research and teaching.

Cultural anthropology deals with the description and analysis of the forms and styles of human social life. One subdiscipline of anthropology, ethnography, systematically describes societies and cultures. Another subdiscipline, ethnology, is the closely related theoretical comparison of these descriptions, which provides the basis for broad-based cultural generalizations.

Archaeology and its systematic excavation of the interred remains of the past reveal sequences of social and cultural adaptations and evolution under diverse natural and cultural conditions. Archaeology makes substantial contributions to the study of man in its quest to understand prehistory and in its investigation of the full cultural record of mankind. Anthropological linguistics provides yet another essential perspective with its investigation of world languages. A major objective of this field is reconstructing historical changes that have led to the formation of contemporary languages and families of languages. In a more fundamental sense, anthropological linguistics is concerned with the nature of language and its functions in human and prehuman cultures. Anthropological linguistics is also concerned with the relationships between the evolution of language and the evolution of cultures. Finally, anthropological linguistics is essential for the cultural anthropologist seeking to understand and to write heretofore unwritten languages.

The subfield of physical (biological) anthropology concentrates on man's prehuman origins and takes into account both genetically and culturally determined aspects of human beings. Physical anthropology seeks to identify the processes of human evolution by studying the fossil remains of ancient human and prehuman species and by describing and analyzing the distribution of hereditary variations among contemporary populations increasingly by means of genetic research. The emergence of biological anthropology as a main adjunct of forensic investigation has involved more biological anthropologists, a specialization that continues to grow within the framework of biological anthropology. The uses of biological anthropology in identifying military casualties has been yet another specialization at least since World War II.

The Relevance of Anthropology as a Discipline

Anthropology does not achieve its general and fundamental significance by organizing the data of other disciplines or by synthesizing higher-level theories from the other disciplines' concepts and principles. Anthropologists are interested in the facts and theories of other disciplines that apply to the study of man. Certainly there are many collaborative efforts and fruitful exchanges between anthropologists and biologists, psychologists, sociologists, social psychologists, geologists, historians, and economists, as well as with scholars in the humanities. Cultural anthropology also shares a broad concern with postmodernism, the arts, and theoretical concerns of other social sciences.

It should also be noted that, as research and publications accumulate in each of the four subfields of anthropology, fewer and fewer anthropologists are masters of the entire discipline. In fact, anthropologists increasingly find themselves working not only with fellow anthropologists, but also with members of entirely different scientific and humanistic disciplines. For example, cultural anthropologists interested in the relationships between cultural practices and the natural environment must study the principles of ecology. Physical anthropologists studying the relationships between human and protohuman fossils may, because of the importance of teeth in the fossil record, become more familiar with dentistry journals than with journals devoted to ethnography or linguistics. Cultural anthropologists who focus on the relationships between culture and an individual's personality are sometimes more at home professionally with psychologists than with archaeologists in their own university departments. Additionally, anthropology makes great contributions to museums, and many anthropologists spend their careers as museologists. In general it may be said that the working links between anthropological specialties and other disciplines are quite pragmatic. Ongoing specialization requires branching out in many directions in response to research opportunities, scholarly interests, and new discoveries and research techniques.

An important feature of anthropology as a discipline is that its scope is panhuman in its theoretical foundation. It is systematically and uncompromisingly diachronic and comparative in its insistence that the proper study of man can only be undertaken successfully through a general study of mankind. The anthropological impulse is, first and foremost, to insist that conclusions based on the study of one particular human group or civilization be checked against the evidence gleaned from other groups under both similar and different conditions. In this way the relevance of anthropology transcends the interests of American, Western, or any other culture. In anthropological perspective, all civilizations are particular, local, and evanescent; thus, anthropology opposes the ethnocentrism of those who would have themselves and none other represent humanity, stand at the pinnacle of progress, or be chosen by God or history to fashion the world in their own image.

Because of its diachronic and comparative perspectives, anthropology holds the key to answering the recurring fundamental questions of contemporary relevance to humanity. It lies peculiarly within the province of anthropology to contextualize the place of man's animal heritage in modern society, to define what is distinctively human about humans, and to differentiate between cultural and noncultural reasons for conditions such as competition, conflict, and war. Anthropological facts and concepts are essential to understanding the origins of social inequality, racism, exploitation, poverty, underdevelopment, and other human problems. Of decisive importance to the entire anthropological enterprise is the question of the nature and significance of human racial variation. Because of its combination of biological, archaeological, linguistic, and cultural perspectives, general anthropology is uniquely suited to address this problem.

In addition to its basic research mission, anthropology has become an applied science with applications in most areas of contemporary life. Techniques of applied anthropology may now be seen in problem solving activities across the spectrum of virtually all cultural and biological domains. Applied anthropologists in the United States alone number in the thousands and are employed as professionals and scientists in government (e.g., the State Department and Department of Defense), business (e.g., General Motors), health, education, and various other fields. Increasingly, anthropologists are employed by the CIA, FBI, ATF, and in the administration of prisons, because of the expanding ethnic groups that must be considered in the activities of such agencies. It is now predicted that half of all graduating doctorates in anthropology will pursue nonacademic careers. Many will join the emerging local practitioner organizations (LPOs) that have emerged in various parts of the U.S. and Canada and identify with these organizations rather than with academic departments of anthropology.

Underlying all of anthropology's other contributions to the sciences, humanities, and society is its abiding search for the causes of social and cultural differences and similarities in the family of man. This enduring quest to understand both the biological and cultural nature of mankind in a diachronic and comparative framework continues to distinguish anthropology as an essential and vital component of a sound education for the modern world.

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ANTHROPOMORPHISM

Anthropomorphism is the attribution of humanlike characteristics to real or imagined nonhuman agents. The word anthropomorphism derives from Greek and, literally translated, means humanlike (*ánthrōpos*) in shape or form (*morphos*). In our daily lives, we do not have different languages to describe humans versus nonhumans. Therefore, humanlike characteristics are often used in a metaphorical sense to facilitate understanding (Lakoff & Johnson, 1980). For example, we might say our car refuses to start, but this does not require that we actually think the car has ill intentions. Nevertheless, anthropomorphism may have important psychological and social ramifications. In some cases, anthropomorphic agents may be thought of as actual persons in the lives of those for whom they are real. These personified agents may be deemed to have rights, responsibilities, or the potential for social interactions.

In psychology, Heider and Simmel (1944) were the first to demonstrate that humans are not the only targets perceived to be agents; people are ready to attribute intentional behavior even to bouncing balls or geometric figures in nonrandom motion. Not until recently have social psychologists documented that anthropomorphism runs the entire continuum, from merely imagining faces in the clouds to believing that they really do possess human characteristics. People anthropomorphize a range of targets from robots and apes to deities and household pets.

When we anthropomorphize something, what exactly are we doing? Are a pet dog and a computer equally humanlike? According to Loughnan and Haslam (2007), we have at least two ways of seeing something as humanlike. First, we can think of ways that humans are unlike other creatures, such as in the ability to be polite or organized. Such characteristics fall into a conceptualization of what is uniquely human. When we perceive rudeness in the automated voice on the telephone that refuses to direct us to a service representative, we are ascribing characteristics to the voice that are unique to humans—the ability to be (im)polite. In other interactions with nonhumans we may perceive characteristics such as curiosity or sociability that, although not unique to humans, are seen as prototypically human. Unlike uniquely human traits, these "human nature" traits tell us about the perceived essence of what it means to be human, but not about the boundary between the nonhuman and the human. When we think of our own pet as being curious, for example, we are thinking along this human nature dimension.

It is important to note that some scholars distinguish anthropomorphism from several closely related ways of thinking about nonhuman beings. In theology, Islam and Judaism hold the position that God is absolutely unique without corporeal form or human attributes. Immaterial entities may be thought of as merely anthropopathic; that is, having the feelings and mental states of a human but not a human form. In other cultures, inanimate material entities may be perceived as being alive or having a spirit, but certainly not a human shape (e.g., rocks, fire, or celestial objects). These beliefs are more commonly described as animism. Finally, totems, demons, and certain Hindu gods are often zoomorphic, having the mental and emotional attributes of humans but the bodies or heads of animals.

Why Do People Anthropomorphize?

Ordinary social cognitions seem to play a significant role in anthropomorphic thinking. For example, by the age of five, children from every culture develop the understanding that other humans have thoughts, feelings, and beliefs that are different from their own. Humans may perceive the mental states of nonhumans using this same cognitive process. In this respect, anthropomorphism is a natural phenomenon that piggybacks on other social cognitions.

Some anthropologists and evolutionary psychologists have argued that humans have evolved to beware of a camouflaged predator in the bush, to identify human forms and faces, or to perceive the intentions of potential friends or foe. These self-protective adaptations may cause us to be over-vigilant in our detection of agency. Thus, in a better-safe-than-sorry strategy, humans often and easily attribute intentionality or causality to invisible agents (Boyer, 2001). After viewing a horror movie, we may be more inclined to imagine a ghost or a burglar, rather than a tree branch, tapping on the window at night.

Some situations induce more anthropomorphism than others. Recent studies show that both chronic loneliness and temporary feelings of rejection can increase anthropomorphic thinking (Epley, Waytz, & Cacioppo, 2007). Like the shipwrecked fellow in the movie *Castaway* (played by Tom Hanks), almost any entity will do when we desperately need to establish social connections—even a volleyball.

Another situation in which people anthropomorphize is when we want to make sense of our surroundings. In doing this, we use ourselves as a referent, inferring our own mental and emotional characteristics. Theoretically, the greater our need to explain, and the less familiar we are with an entity in our environment, the more likely we are to think of it in humanlike terms (Epley et al., 2007). Thus, anthropomorphism is used to understand and anticipate

the behavior of nonhuman agents or to infer the mental states of non-human agents from knowledge of the self.

Further, some nonhuman agents, including pets, are more likely to be targets of anthropomorphism than others. Recently, Kwan, Gosling, and John (2008) examined whether dog owners project their own personality characteristics onto their dogs. Interestingly, they found that people who think that they are intelligent, creative, and imaginative also see these qualities in their dogs, suggesting that pets serve as a medium to allow their human owners to have favorable self-views. These studies and others illustrate the adaptive value of anthropomorphism.

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See also: **Interpersonal Perception**

ANTIANXIETY MEDICATIONS

Classically, antianxiety medications (anxiolytics) have all been medicines referred to as sedative-hypnotic drugs or central nervous system (CNS) depressants. These medicines affect neurons so that the functioning of the brain is depressed, resulting in a behavioral state of calm, relaxation, disinhibition, drowsiness, sleep, and coma as doses of drug increased. These agents were classically ingested to ease anxiety, tension, and agitation and to induce a soporific state. Behaviorally, what was observed was a dose-related state of increasing intoxication with release from inhibitions, sedation, sleep, unconsciousness, general anesthesia, coma, and eventually death from respiratory and cardiac depression. Increasing cognitive and psychomotor impairments were induced as the dose of any anxiolytics was increased. The classic (and certainly first) of these CNS depressants used to treat anxiety was ethyl alcohol (ethanol). Certainly ethanol as a CNS depressant is not a specific treatment for anxiety, despite hundreds of years of use for this disorder. Neither ethanol nor any other CNS depressant is useful in relieving pain (they do not have specific analgesic actions), nor do they possess antidepressant actions (they actually make depression worse). However, until recently, these CNS depressants were treatments of choice for treating anxiety disorders.

Perhaps the first class of medicines used to treat anxiety were low doses of the barbiturates (introduced in the 1920s), with higher doses causing sleep, coma, and even death in overdosage. In the 1950s, variants such as meprobamate (Equanil) and carisoprodol (Soma) were marketed. Then, in 1960, the benzodiazepines (Librium and Valium being the earliest) were introduced as "specific" sedative-anxiolytics. Compared with alcohol and the barbiturates, the benzodiazepines had a lesser capacity to produce potentially fatal CNS depression. Because of this improved margin of safety, the benzodiazepines replaced the barbiturates for the treatment of anxiety. In the 1990s, we began a new era in the treatment of anxiety disorders. This began with the introduction of specific serotonin antidepressants (all of which have anxiolytic properties as well as antidepressant actions). In addition, medications of certain other classes (e.g., certain anticonvulsant mood stabilizers and certain "atypical" antipsychotic medicines) are now being noted to have clinically useful anxiolytic actions, especially in the treatment of anxiety disorders that are resistant to the serotonin antidepressant/anxiolytics.

One might well ask why this move away from benzodiazepines as anxiolytics to serotonin antidepressant/anxiolytics, anticonvulsants, and antipsychotics. First, the benzodiazepines are depressants (rather than antidepressants), are capable of inducing drug dependency, and cause clinically important impairments in psychomotor and cognitive functioning. Occasionally, the benzodiazepines are used to induce amnesia (such as for the performance of invasive medical procedures) and occasionally for the short-term treatment of severe anxiety disorders. Socially, sedative-hypnotic drugs (including alcohol) are used as

drugs of abuse to induce a state of diminished awareness, diminished capacity, and intoxication.

All CNS depressants, including alcohol, diminish environmental awareness, reduce response to sensory stimulation, depress cognitive functioning, decrease spontaneity, and reduce physical activity. Higher doses produce increasing drowsiness, lethargy, clouding of consciousness with amnesia, hypnosis, and unconsciousness. Because sedative drugs can produce amnesia ("blackout") in people who may be otherwise awake, some (including alcohol) have been implicated as "date rape" drugs. In addition, one CNS depressant will potentiate the effects of any other CNS depressant. For example, alcohol exaggerates the depression induced by benzodiazepines, and benzodiazepines intensify the impairment of driving ability in a person who has been drinking alcohol. The depressant effects of sedative drugs are thus additive, and frequently they are supra-additive. They also potentiate the psychomotor impairments caused by marijuana. This interaction between any two or more sedatives (including marijuana) is often unpredictable and unexpected, and it can lead to dangerous or even fatal consequences. Depressant drugs should not be used in combination, especially if one of the drugs is ethyl alcohol.

All the CNS sedative-hypnotic agents carry the risk of inducing physiological and psychological dependence. *Physiological dependence* is characterized by the occurrence of withdrawal signs and symptoms when the drug is not taken. Signs and symptoms range from sleep disturbances (rebound insomnia, for example) to life-threatening withdrawal convulsions. *Psychological dependence* follows from the positive reinforcement effects of the drugs.

Benzodiazepines

Benzodiazepines have anxiolytic (antianxiety), sedative, anticonvulsant, amnesic, and relaxant properties. Soon after their introduction, they became the most widely used class of psychotherapeutic drugs, and the term *anxiolytic* became synonymous with *benzodiazepine*. Diazepam (Valium) and chlordiazepoxide (Librium) are the classic benzodiazepines. Alprazolam (Xanax), clonazepam (Klonopin), and lorazepam (Ativan) are other commonly prescribed benzodiazepines. Fifteen benzodiazepine derivatives are currently available in the United States, and still more are available in other countries. They differ from each other mainly in their pharmacokinetic parameters and by the routes through which they are administered. One major pharmacokinetic difference is the metabolic half-life of each medicine, which is the number of hours it takes one-half of a dosage to be metabolized, and then one-half of the remaining half, and so on. Five or six half-lives are necessary to eliminate the drug from the body nearly totally (Julien, 2008, p. 30). Of the benzodiazepines commercially available in the United States, 12 are available in dosage forms intended only for oral ingestion; two (diazepam and lorazepam) are available for both oral use and use by injection; and one (midazolam [Versed]) is available only in injectable formulation.

Benzodiazepines are generally not utilized for treating chronic anxiety or for treating depression. They should be avoided in situations requiring fine motor or cognitive skills or mental alertness or in situations where alcohol or other CNS depressants are used. They should be used only with great caution in young persons, who need cognitive ability for school success, and in the elderly, in whom these medicines can produce or intensify dementia.

One possible indication for benzodiazepine therapy is for the short-term treatment of anxiety that is so debilitating that the patient's life-style, work, and interpersonal relationships are severely hampered. A benzodiazepine may alleviate the symptoms of nervousness and psychological distress without necessarily blocking the physiological correlates accompanying the state of anxiety. Usually, resolution of the psychological distress is accompanied by amelioration of the physiological symptoms. Benzodiazepines are generally not utilized for chronic anxiety or for treating depression. They should be avoided in situations requiring fine motor or cognitive skills or mental alertness or in situations where alcohol or other CNS depressants are used. They should be used only with great caution in the elderly, in children, or adolescents, and in anyone with a history of drug misuse or ongoing abuse.

Panic attacks and phobias can be treated with benzodiazepines such as *alprazolam* (Xanax), although their efficacy is less than that of the serotonin-type antidepressants, which are actually more specific anxiolytics. Moreover, unlike with the benzodiazepines, cessation of use of serotonin antidepressant/anxiolytics is not accompanied by rebound increases in anxiety, impaired psychomotor performance, impaired learning and cognition, reduced alertness, and the potential for dependence and abuse (Arkowitz & Lilienfeld, 2007).

Serotonin Antidepressant/Anxiolytics

Six serotonin antidepressant/anxiolytics are currently available: fluoxetine (Prozac), paroxetine (Paxil), sertraline (Zoloft), fluvoxamine (Luvox), citalopram (Celexa), and escitalopram (Lexapro). These drugs are all potent blockers of the presynaptic transporter for serotonin reuptake. They do not block postsynaptic serotonin receptors of any subtype. Therefore, the primary acute neuronal effect of serotonin antidepressant/anxiolytics is to make more serotonin available in the synaptic cleft, which activates all of the many postsynaptic receptors for serotonin. This results in both the antidepressant and anxiolytic actions of these drugs as well as their side effects. The latter include serotonin toxicity (nausea, insomnia, anxiety, agitation, sexual dysfunction, and the production of a serotonin syndrome in higher doses) as well as a

"serotonin withdrawal syndrome" upon withdrawal from the medicine. This syndrome is characterized by many symptoms that can include disorientation, confusion, hypomania, agitation, restlessness, symptoms resembling a case of severe flu, and a sensation of electrical shocks (headaches and sensory changes in the arms and legs). Of recent concern is the appearance of these symptoms occurring in newborn infants of mothers who take these medicines during pregnancy.

Approved therapeutic indications for serotonin antidepressant/anxiolytics therapy with serotonin antidepressant/anxiolytics include major depression, dysthymia, and all of the anxiety disorders (panic disorder, obsessive-compulsive disorder, generalized anxiety disorder, posttraumatic stress disorder, and phobic disorder). Additional detail on specific serotonin antidepressant/anxiolytics can be found in the text by Julien (2008, chapter 7). More recently recognized is the fact that the expected therapeutic responses are very often less than desired. For example, treatment of severe cases of posttraumatic stress disorder (PTSD) often necessitates therapy beyond use of a serotonin antidepressant/anxiolytic. In these instances, psychological therapies and adjunct medications are often needed. Two classes of these adjunct medications are discussed next.

Anticonvulsant Mood Stabilizers

Pregabalin (Lyrica) and gabapentin (Neurontin) have shown early onset of action and short-term and long-term efficacy in patients with generalized anxiety disorder (GAD), demonstrating efficacy equal to that exerted by the serotonin anxiolytics. They also are equivalent to paroxetine (Paxil) in significantly reducing anxiety and depressive symptoms and improved sleep quality and overall functioning in comorbid anxiety and depression. In addition, topiramate (Topamax), lamotrigine (Lamictal), pregabalin, and gabapentin have all been found useful for the treatment of PTSD. These mood stabilizers decrease nightmares and flashbacks and improve sleep quality in the majority of persons with severe, resistant PTSD episodes. They are also effective in treating persons with social phobias and severe panic disorder.

Interestingly, these same anticonvulsant mood stabilizers have value in treating persons with aggressive disorders, in whom they can ameliorate their anxiety, irritability, and anger, and reduce the tempestuousness and the impulsive aggressiveness of their relationships. They can be useful in persons diagnosed with intermittent explosive disorder, PTSD, or Cluster B personality disorders (borderline, antisocial, histrionic, and narcissistic disorders). In these instances, they can treat symptoms such as verbal assault and assault against objects, impulsive aggression, and irritability and reduce the global severity of such symptoms.

Finally, some of these anticonvulsant mood stabilizers possess important pain-relieving (analgesic) properties, which makes them especially useful when pain occurs in conjunction with anxiety, depression, and anger. Gabapentin and pregabalin are widely used for this purpose.

"Atypical" Antipsychotics

The use of newer atypical antipsychotic agents in treating anxiety disorders has rapidly increased in the last few years. Examples of such agents include olanzapine (Zyprexa), risperidone (Risperdol), ziprasidone (Geodon), quetiapine (Seroquel), and aripiprazole (Abilify) (Julien, 2008, chapter 9). In treating combat-related PTSD in persons either unresponsive or partially responsive to antidepressants, for example, these medicines can reduce symptoms of hyperarousal, reexperiencing, avoidance, nightmares, sleep disturbances, and flashbacks. They are also useful for persons with PTSD that results in domestic violence or sexual abuse. They also effectively augment the clinical response of patients with obsessive-compulsive disorder who are treatment-refractory to antidepressants. Other anxiety disorders that have been responsive to these atypical antipsychotics, as either monotherapy or an add-on, include social anxiety disorder, generalized anxiety disorder, and panic disorder (Gao et al, 2006).

In summary, we are currently experiencing a rapid progression from treating "anxiety" with sedative-depressants that are dependency-producing and cognitive inhibitors to more sophisticated treatment with serotonin antidepressant/anxiolytics, often in combination with a mood stabilizer and/or an atypical antipsychotic drug. Such medicines and combinations address anxiety, depression, anger, aggressiveness, explosiveness, and sleep disturbances that often complicate treatment of "simple" anxiety.

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See also: **Antidepressant Medications; Mood Stabilizing Medications**

ANTICONVULSANT MEDICATIONS

Anticonvulsant medications, also known as antiepileptic drugs, are a pharmacologically diverse class of medications so named for their common efficacy in the prevention of seizures. Historically, seizures were referred to as convulsions and known colloquially as "spells" or "fits." Epilepsy is a general term used to describe the collection of diseases characterized by chronically recurrent seizures of any etiology. Prior to the advent of anticonvulsant medications and modern surgical therapy, patients with epilepsy were subjected to treatments such as bleeding, cupping, trephination, herbal remedies, and exorcism that were ineffective and often harmful.

In pathophysiological terms, seizures are discrete periods of paroxysmal brain dysfunction characterized by abnormally elevated and synchronous (e.g. "epileptiform") firing patterns of groups of cerebral neurons resulting in altered motor function and/or altered consciousness. Seizures are diagnostically classified by the anatomical extent of epileptiform neural activity that causes the event. Partial seizures are characterized by epileptiform neural activity confined to a particular region of one cerebral hemisphere during an event, whereas generalized seizures involve both hemispheres during an event.

Pharmacological Mechanisms of Anticonvulsants

In the most general sense, anticonvulsant medications suppress epileptiform neural activity and are thought to prevent epileptic seizures by dampening neural excitation and promoting neural inhibition. Individual anticonvulsant medications accomplish this through a diverse collection of pharmacological mechanisms that include attenuated release of the excitatory neurotransmitter, glutamate; enhanced synthesis and release of the inhibitory neurotransmitter, γ-amino butyric acid (GABA); reduced activity of presynaptic and voltage-gated sodium channels; and reduced activity of presynaptic calcium ion channels. It is important to remember that the aforementioned pharmacological effects, as well as other effects not listed, are the most proximal effects of anticonvulsants, and that the downstream physiological and genomic effects of anticonvulsants, both within individual neurons and at the level of neural ensembles and systems, that result in seizure prophylaxis remain obscure.

Despite uncertainty about the precise biological mechanisms of seizure prophylaxis, preclinical research using animal models and clinical research conducted with epileptic patients has resulted in the identification of fundamental differences between anticonvulsants with respect to their efficacy in the treatment of partial and/or generalized seizures (White, 1997). An important outgrowth of this work has been the development of animal models to screen candidate anticonvulsant compounds for both their efficacy and their spectrum of activity with regard to seizure prophylaxis. One of the most extensive methods used for this purpose is measuring the efficacy of a candidate anticonvulsant in the prevention of experimentally induced seizures in laboratory animals.

Experimentally induced seizures fall into one of two categories: (1) seizures induced by the maximal electroshock method; and (2) seizures induced by the administration of a chemical convulsant, typically pentylenetetrazole. Anticonvulsants that are effective in the prevention of maximal electroshock seizures in animal models are generally very effective in the prophylaxis of partial seizure disorders in humans. Conversely, anticonvulsants that are effective in the prevention of convulsant-induced seizures in animal models are usually effective in the prophylaxis of generalized seizure disorders in humans.

In contrast to what is known about the pharmacological mechanisms of anticonvulsants as they relate to the treatment of epilepsy, considerably less is understood about the means by which anticonvulsants are efficacious in the treatment of psychiatric illness. The explanatory power of preclinical *in vitro* or animal models that directly inform our understanding of the pathophysiology of psychiatric illness at a high level of specificity or which provide a highly predictive and biologically based rationale for the treatment of psychiatric illness with anticonvulsants remains limited.

Clinical Considerations in the Use of Anticonvulsants

In addition to their central role in the treatment of epilepsy, anticonvulsants are also used extensively in the treatment of other neurological diseases, including migraine headaches and neuropathic pain syndromes (e.g., trigeminal neuralgia, post-herpetic neuralgia, diabetic polyneuropathy, phantom limb syndrome). Anticonvulsants have also come to occupy a major place in the therapeutic armamentarium of clinical psychiatry as well. The successful treatment of patients with bipolar disorder using the anticonvulsant carbamazepine made available an additional medication option for bipolar patients who were unable to tolerate lithium or were clinically unresponsive to it (Post, Uhde, Putnam, Ballenger, & Berrettini, 1982). Over time, the effective treatment of bipolar patients with carbamazepine provided the impetus for the subsequent successful investigation of the efficacy of other anticonvulsants, most notably valproic acid and lamotrigine, in the treatment of bipolar disorder. More recently, anticonvulsants have also been used to assist in the treatment of alcohol withdrawal; binge eating in bulimic and obese patients; impulsive aggression in patients with head injuries, dementia, or

developmental disorders; and explosive anger in patients with post-traumatic stress disorder.

Anticonvulsants are often quite literally life-saving and life-changing medications for patients with epilepsy or bipolar disorder as well as other clinical conditions. However, their effective and safe use requires vigilance on the part of both physician and patient. As a medication class, anticonvulsants are extraordinarily heterogeneous with respect to their individual patterns of drug interactions (Perucca, 2006), cognitive and physical side effect profiles (Loring, Marino, & Meador, 2007; Reynolds, Sisk, & Rasgon, 2007), risk for idiosyncratic adverse events (Zaccara, Franciotta, & Perucca, 2007), teratogenic potential as applied to risk for developmental delay (Meador, Baker, Cohen, Gaily, & Westerveld, 2007), and structural malformation (Meador, Pennell, Harden, Gordon, Tomson et al., 2008) in children exposed to anticonvulsants during gestation.

Treatment-emergent side effects and risk for teratogenicity or adverse events accompanying the use of anticonvulsants may be minimized through anticipation and avoidance of drug interactions, preference for monotherapy to polypharmacy whenever possible, avoidance of rapid escalation or discontinuation of anticonvulsants except in emergencies, careful assessment of contraceptive practice, exclusion of pregnancy, and prescription of folic acid prior to starting anticonvulsants in any woman of reproductive age. Effective communication with the patient as well as other consulting physicians, a strong therapeutic alliance with the patient, appreciation of psychosocial factors affecting response to the medication, and patient education about medication-associated risks and side effects partnered with careful monitoring of the patient by the physician is central to optimal treatment.

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See also: **Convulsants; Epilepsy**

ANTIDEPRESSANT MEDICATIONS

The observation that the induction of seizure activity was useful in the treatment of psychiatric illness (Fink, 2001) was initially appreciated in asylum patients treated with convulsion-inducing chemical agents such as camphor and metrazole and then later with insulin. The subsequent development of electrical methods of seizure induction and technical refinements to its application resulted in modern electroconvulsive therapy (ECT), the prototypic brain stimulation treatment and one of the most extensively validated treatments for depression.

Since the initial observations of the antidepressant effects of convulsion-inducing compounds on depressed patients, clinical options for the biological treatment of depression have grown extensively. The serendipitous discovery of the first antidepressants, the monoamine oxidase inhibitors (MAOI), during the course of drug treatment for tuberculosis, led over time to additional empirically validated antidepressant medications (Slattery, Hudson, & Nutt, 2004).

At present, medication is the most common biological treatment employed for depression. A number of classes of antidepressant medications exist, based on either structure or function, that are used for the treatment of unipolar depression and, in some circumstances, bipolar depression as well (Nemeroff, 2007). These include the monoamine oxidase inhibitors (MAOIs; e.g., phenelzine, tranylcypromine, selegiline), tricyclic antidepressants (TCAs; e.g., imipramine, desipramine, clomipramine, amitriptyline, nortriptyline), selective serotonin reuptake inhibitors (SSRIs; e.g., fluoxetine, sertraline, paroxetine, citalopram, escitalopram, fluvoxamine), serotonin and norepinephrine reuptake inhibitors (SNRIs; e.g., venlafaxine, desvenlafaxine, duloxetine), and the "atypical" antidepressants (e.g., trazodone, bupropion, nefazodone, mirtazipine). In addition, antidepressants may occasionally be used in conjunction with a wide variety of additional agents including lithium carbonate,

anticonvulsants such as valproic acid and lamotrigine, atypical antipsychotic medications (ziprasidone, risperidone, olanzipine, aripiprazole, quetiapine), thyroid agents (triiodothyronine), psychostimulants (dextroamphetamine and methylphenidate), and anxiolytic medications (buspirone). These and other combinations are based on a sometimes tenuous evidence base, in what are commonly referred to as "augmentation" strategies to optimize antidepressant response (Fava & Rush, 2006).

The common thread linking the various classes of currently available antidepressants is pharmacological activity that alters synaptic concentrations of monoamine neurotransmitters, primarily serotonin and norepinephrine, but also dopamine in some cases (Slattery et al., 2004). Mechanistically, this may occur through the inhibition of enzymes such as monoamine oxidase (MAOIs), which degrade neurotransmitters within the synapse following their release, or the inhibition (TCAs, SSRIs, and SNRIs) of cellular transport proteins, such as the serotonin and norepinephrine transporters that physically remove (the process of reuptake) serotonin or norepinephrine from the synapse. Like conventional antidepressants, some atypical antidepressants have dose-dependent effects on reuptake inhibition, but they also appear to have complex effects on individual subtypes of serotonin and norepinephrine receptors. It is important to remember that the effects on monoamine neurotransmission represent the most proximal pharmacological effects of antidepressant medications and that their downstream physiological and genomic effects, both within individual neurons and at the level of neural ensembles and systems, which result in a clinical antidepressant response, remain obscure.

The key advances that have been made with respect to antidepressant pharmacology have been in substantial improvements in the safety and tolerability of antidepressants (Schatzberg, 2007), as opposed to their clinical efficacy. For example, the use of MAOIs requires particular dietary restrictions (e.g., certain types of cheese, dark chocolate, and other foods that contain tyramine) that, if disregarded, may result in a potentially life-threatening elevation of blood pressure known as a hypertensive crisis. TCAs as a drug class and lithium carbonate are both dose-dependently lethal in overdose, and particular TCAs as well as lithium carbonate have significant dose-dependent side-effect profiles as well. Despite these issues, MAOIs, TCAs, and lithium (in the case of bipolar depression) may produce remission of depressive symptoms when many other agents do not, and they accordingly remain core elements of the antidepressant armamentarium.

As with any medication, close monitoring of patient mental status and any side effects is central to effective treatment. It is very challenging to accomplish this monitoring in the absence of a strong therapeutic alliance with the patient and detailed appreciation of psychosocial stressors that may be impacting the response (or more often the lack of response) to medication. Inadequate duration of medication trials and insufficient drug dosing are additional common sources of perceived antidepressant treatment failure.

A major current focus of clinical trials research in depression is the derivation of treatment algorithms to guide effective implementation of antidepressant therapy, such as with the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) trial (Trivedi, Rush, Wisniewski, Nierenberg, Warden, Ritz et al., 2006) and the integration of psychological and pharmacological treatments for depression. In addition, the discovery of biological predictors of treatment response and treatment-emergent symptoms, such as suicidal ideation and adverse effect burden, are additional major areas of investigation that will eventually allow clinicians to individualize antidepressant selection at the outset of treatment.

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See also: **Antianxiety Medications; Antipsychotic Medications; Mood Stabilizing Medications**

ANTIMANIC MEDICATIONS (See Mood Stabilizing Medications)

ANTIPSYCHOTIC MEDICATIONS

The initial observations of the tranquilizing effects of chlorpromazine on surgical patients were first described in the 1950s by the French surgeon Henri Laborit and the French anesthesiologist Paul Huguenard. At the time, Laborit and Huguenard, in collaboration with the French chemical company Rhone-Poulenc, were experimenting with pharmaceutical adjuncts to use with standard general anesthesia to reduce the prevalence of postsurgical shock. Struck by the relative calmness of surgical patients treated with chlorpromazine, Laborit and psychiatrist J. Hamon, of Val de Grace Hospital, administered a cocktail of chlorpromazine and barbiturates to a manic patient, resulting in a dramatic reduction of manic behavior. Intrigued by the results obtained by Laborit and Hamon, psychiatrists Jean Delay and Pierre Deniker treated a group of psychiatric inpatients with chlorpromazine alone, and they also observed a similarly impressive reduction in agitated behavior.

The serendipitous discovery of the antipsychotic properties of chlorpromazine, the first widely utilized antipsychotic medication, revolutionized the treatment of chronically psychotic patients within asylums around the world; this ushered in the era of modern psychopharmacology in clinical medicine. Antipsychotic medications are the primary pharmacological agents employed for the specific treatment of psychosis (hallucinations and delusional thinking) in thought and mood disorders. In addition, they are also used to manage the behavioral agitation observed in schizophrenia, bipolar disorder, developmental disorders, drug intoxications, and delirium, as well as to augment the effects of antidepressant medications.

The common thread linking the various classes of currently available antipsychotics is pharmacological activity that results in the blockade (also called antagonism) of the type 2 dopamine receptor (D_2). The first generation of antipsychotic medications, the so-called typical antipsychotics, are usefully divided into low-, mid-, and high-potency classes on the basis of their effectiveness (potency) at blocking the D_2 receptor, and they are further subclassified on the basis of chemical structure. For example, high-potency drugs, such as the butyrophenone haloperidol, are able to effectively block D_2 receptors at a lower total dose of medication than do low-potency antipsychotics, such as the phenothiazine chlorpromazine. The second generation of antipsychotics, known as the atypical antipsychotics (clozapine, olanzapine, risperidone, ziprasidone, quetiapine, aripiprazole), are further distinguished by their capacity to antagonize type 2 serotonin receptors ($5\text{-}HT_2$) as well as D_2 receptors. (Aripiprazole is a technical exception in that it is a partial agonist and not an antagonist of the D_2 receptor.) Like the typical antipsychotics, there are medication-specific potency differences with respect to blockade of D_2 receptors within the atypical antipsychotic class as well, with quetiapine and clozapine being low-potency agents and risperidone being a high-potency agent.

The D_2 receptors are found in regions of the brain that participate in the regulation of cognition, learning, and emotion (cerebral cortex, hippocampus, amygdala), movement (caudate nucleus, putamen), emesis (area postrema), and prolactin secretion (anterior pituitary gland). In addition to blockade of D_2 receptors, certain antipsychotic medications also antagonize histaminic, muscarinic cholinergic, serotonergic, and alpha-adrenergic receptors. As a consequence, the side effect profile of antipsychotic medications is variable, and it reflects the heterogeneous pharmacology of individual compounds. Side effects may include sedation (histamine-H_1 receptor blockade); extrapyramidal motor symptoms (EPS), including Parkinsonism (tremor, bradykinesia) and dystonia (D_2 receptor blockade); weight gain (unknown, possibly involving H_1 receptor blockade); dry mouth (muscarinic cholinergic receptor blockade); constipation (muscarinic cholinergic receptor blockade); inappropriate production and discharge of breast milk, called galactorrhea (D_2 receptor blockade); and postural hypotension ($alpha_2$ adrenergic receptor blockade). This is illustrated by the contrasting side effect profiles of low- and high-potency typical and atypical antipsychotics that result from their specific pharmacology.

Dose-dependent induction of EPS as a consequence of progressive D_2 receptor occupancy is observed with all antipsychotics, though high-potency agents carry a higher risk for causing EPS than do low-potency agents. Sedation, postural hypotension, dry mouth, and constipation are more common with the low-potency typical and atypical antipsychotics, whereas galactorrhea is observed at a greater rate with high-potency typical and atypical agents. Weight gain has been observed with high-, mid-, and low-potency agents, though olanzapine and clozapine are also especially problematic in this regard. Adverse events associated with exposure to antipsychotic medications include tardive dyskinesia, neuroleptic malignant syndrome, seizures, arrhythmias, and agranulocytosis.

A major current focus of clinical trials research in schizophrenia research is the derivation of treatment algorithms to guide effective implementation of antipsychotic therapy, as well as the integration of psychological and pharmacological treatments for psychosis. Medication tolerability, as it impacts treatment compliance, is the most significant barrier to effective treatment with currently available antipsychotic medications. The discovery of biological predictors of treatment response, treatment-emergent symptoms, and side effect burden will eventually allow clinicians to individualize antipsychotic selection at the outset of treatment on the basis of genomic and clinical variables to optimize treatment compliance and clinical response.

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See also: **Antianxiety Medications; Antidepressant Medications; Mood Stabilizing Medications**

ANTISOCIAL BEHAVIOR

Antisocial behavior (ASB) is generally defined as conduct and deportment that interferes with society. The essential characteristic of ASB is a repetitive and persistent pattern of behavior in which the basic rights of others or major societal norms or rules are repeatedly violated, beginning in childhood or adolescence and often continuing into adulthood. These behaviors generally fall into several main groupings: aggressive behaviors that cause harm to or threaten harm to others, nonaggressive property destruction, covert aggressive behaviors of lying, deceitfulness, or theft, and rule or legal violations. Included are antisocial behaviors committed by persons of high standing in society and involving fraud and financial violations in business and industry (so-called white-collar crime) (Lewis, 2005). Antisocial behavior is pervasive. It is found in children, adolescents, and adults at all stages of life, with the exception of infancy, and in all cultures around the world. Although males traditionally express more ASB, over the last 30 years rates of antisocial problems in females appear to be rising.

Prevalence

Prevalence rates vary by gender, by setting, and by population. Data from population-based studies of youngsters less than age 18 years using the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR, American Psychiatric Association, 2000) indicate a prevalence of juvenile antisocial behaviors meeting criteria for conduct disorder ranging between 2% and 16% for boys and 1.5% to 15.8% for girls. For adults older than 18 years the estimated lifetime prevalence of antisocial behavior meeting diagnostic criteria for conduct disorder in the United States is 9.5%, including 12.0% for males and 7.1% for females (Kessler et al., 2005). Studies assessing lifetime prevalence rates using retrospective recall methodologies of adults suggest that the median age-of-onset of antisocial behaviors meeting a diagnosis of conduct disorder in the United States is 11.6 years (Kessler et al., 2005).

Documentation from The Office of Juvenile Justice and Delinquency Prevention illustrates rising rates of juvenile court appearances for antisocial behaviors and delinquency in both adolescent males and females. Female case rates have increased more sharply than male case rates since 1985. In males, ASB peaks between the ages of 15 years and 40 years and declines as individuals age. Urban settings generally report more ASB than rural communities.

Risk Factors

Research into risk factors for ASB has generally focused on correlates of antisocial behaviors, delinquency, and conduct problems. Correlational research has usually emphasized single variable and main effects models. Causal mechanisms for antisocial behaviors, however, are multifaceted, complex, and transactional (i.e., multiple risk and protective factors that feed forward and backward to influence one another over the course of an individual's lifetime). The ASB risk field is rapidly moving away from main effects perspectives towards viewpoints that attempt to integrate person factors, parenting and family factors, biological factors, and sociological factors into longitudinal and more ecologically valid models of etiology.

Person Factors

ASB is associated with several cognitive and learning styles. First, psychological testing of youth with conduct problems generally reveals lower scores on intelligence tests than found for nonconduct disordered youths. This is particularly true for verbal intelligence tests relative to performance intelligence tests. Second, individuals with ASB generally show a learning style that appears to be more sensitive to rewards than to the threat of punishment. This reward-dominant response style may explain why individuals with ASB tend to persist in maladaptive behaviors despite the threat of consequences. Third, deficits in social cognition are frequently found in youth with ASB. This may bias them to make more hostile attributional errors concerning relevant social cues, have deficiencies in the generation of varied solutions to social conflict situations, and see positive outcomes from engaging in aggressive behaviors (McMahon & Frick, 2007).

In both boys and girls, the co-occurrence of childhood onset hyperactivity and antisocial behaviors also appears to increase the risk for early adulthood ASB (Fontaine et al., 2008).

Callous Unemotional Personality Factors

Personality traits may identify a subgroup of conduct-disordered youth who possess callous unemotional personality characteristics, but who do not have information processing deficits such as low verbal intelligence. These personality characteristics include shallow emotions, inability to feel guilt or remorse, superficial charm, low anxiety, and increased sensation seeking. Adolescents with psychopathy and conduct disorder have been found to be more aggressive, violent, and self-centered. They also demonstrate decreased interpersonal attachments to others and less anxiety than conduct-disordered adolescents without psychopathic traits (Frick & White, 2008).

Age of Onset

Research has shown substantial differences in children who develop severe ASB in childhood as compared to those who first begin antisocial behaviors in adolescence or adulthood. Antisocial behaviors developing before the age of 10 years portend a particularly onerous prognosis. Early starters are at risk to develop more varied and severe antisocial behaviors, substance abuse, legal difficulties, and persistence of ASB across the lifespan than those who are later starters (McMahon & Frick, 2007).

Parenting and Family Factors

Many studies find that poor parenting practices are related to disruptive behaviors in offspring. Aspects of childrearing that have been consistently associated with children's antisocial behaviors include the degree of parental involvement with the child, poor monitoring of the child's whereabouts, not knowing what peers the child is associating with, coercive family process, and harsh and inconsistent discipline practices. Physically aggressive punishment of the child has been linked to child aggression. Low parental warmth and lack of involvement with the child has been linked to child oppositional and defiant behaviors. Parent psychopathology, including maternal depression, paternal ASB and parental alcohol and substance abuse, is a known risk factor for youth ASB (Connor, 2002).

Developmental Traumatic Stress

Childhood physical abuse may be a particular risk factor for the later development of conduct problems and aggressive behavior. This association is found for both community and clinically referred youth. Investigations of the effects of different forms of early abuse on later development of crime and violence in nonreferred community samples found that physical abuse and neglect early in childhood are significantly associated with arrest for violent crime in adulthood. This association retains its statistical significance even after studies control for the confounding effects of age, gender, and race. Childhood physical abuse, childhood neglect, or the combination of childhood physical abuse and neglect, appears to be particularly associated with increased arrest rates for violent offenses in adolescence and adulthood.

Biological Factors/Heritable Factors

Research has recognized that antisocial, aggressive, and conduct problems cluster in families to a greater extent than pure chance would suggest. Shared environmental factors include growing up in a family with antisocial parents, having a father with ASB, parental psychological distress (including maternal depression), and exposure to paternal alcoholism. Studies are consistent in finding a genetic influence for antisocial behavior, aggression, and adult crime. Weighted concordance rates for adult criminality range between 13% and 22% for fraternal twins and between 26% and 51% for identical twin pairs (Rutter, Giller, & Hagell, 1998).

Approximately 50% of the difference between measures of antisocial and nonantisocial behaviors is found attributable to genetic effects (Mason & Frick, 1994). Significantly larger estimates of genetic effects are found for more severe conduct and antisocial problems, as opposed to less severe behaviors, for antisocial behavior using clinic referred samples, as opposed to community samples, and for overt antisocial behaviors, as opposed to covert antisocial behaviors. Research into gene X environmental risk factor models in the genesis of early-onset ASB and conduct problems finds that in boys who experienced sexual and/or physical abuse during development, polymorphisms in the MAOA gene explained variance in the eventual development of conduct disorder (Caspi et al., 2002).

Physiological Factors

Studies have shown that individuals with conduct problems, antisocial behaviors, and aggression often demonstrate many signs of physiological hypo-arousal and decreased sensitivity to stress. Research has shown low resting heart rates and heart rate reactivity to stressful situations in fearless individuals. A lack of fear and anxiety in childhood to cues of social punishment may contribute to disturbed fear conditioning, the preferential use of aggression to solve interpersonal conflicts, and a lack of moral and conscience development in antisocial individuals.

Neuroendocrinologic Factors

The hypothalamic pituitary adrenal (HPA) axis is a major stress regulating system in the body. The final product of the HPA axis is the release of the hormone cortisol

into the bloodstream. Cortisol has many effects on arousal systems preparing the organism to respond to environmental threats. Consistent with arousal theory, some studies have found low basal cortisol levels to be correlated with conduct problems and antisocial behaviors in clinically referred, at-risk, and nonreferred community samples of children and adolescents. Studies have also reported blunted cortisol reactivity in response to stress in antisocial youngsters (Connor, 2002).

Neuroanatomic Factors

Findings from imaging studies suggest that frontal lobe dysfunction may be associated with generalized antisocial and violent behavior. Findings from clinical case studies involving brain injury implicate the ventromedial and orbitofrontal subregions of the frontal cortex. Imaging studies of impulsively violent offenders with executive cognitive functioning deficits suggest involvement of the dorsolateral prefrontal cortex. Other studies have examined subcortical regions of interest. Emerging evidence implicates amygdala underfunctioning with psychopathic personality traits (Blair, 2004; Raine, 2002).

Sociological Factors

Extra familial risk factors for ASB include those that occur in the neighborhood or community, or in association with a deviant peer group. Larger trends in society, such as poverty, the easy availability of firearms, and the effects of media violence, are also important.

Peer Factors

The association between peer factors and aggression encompasses two distinct yet interrelated phenomena; early rejection of the aggressive child by peers and later association with a deviant peer group. In the early school years, aggression towards peers is highly associated with peer social rejection and peer social group victimization of the aggressive child. The aggressive child is disliked and singled out by the social peer group and then excluded from participation in the peer group's activities. The antisocial child then begins to associate with a deviant peer group. Both rejection and victimization appear to be associated with increased risk for subsequent conduct problems, aggression, and antisocial behaviors in the aggressive child and adolescent.

Social Factors

General social deprivation includes such factors as individual poverty, low socioeconomic class, unemployment, poor housing, location in violent neighborhoods, and overcrowded living conditions. There exists a relationship between indices of general social deprivation and increased rates of aggression, crime, and antisocial behavior in individuals. Low social class and poverty may be related to serious criminal offenses. On the level of the individual family and child, the effects of general environmental social deprivation on youth conduct problems may be mediated by individual parenting factors discussed above. As the number of stressors grows in an individual family, and as economic resources become increasingly constrained, the ability of parents to supervise and monitor their offspring in a manner conducive to the promotion of prosocial behavior may become increasingly strained and limited.

Cumulative Risk Factors

The importance of a cumulative risk model for onset and maintenance of ASB in persons across the lifespan is widely supported. Risk factors do not occur in isolation from one another, are frequently interactive and reciprocal, and are often multiple and chronic in an individual's life. Since most biological, psychological, and sociological risk factors are nonspecific and exert their effects on risk indirectly, the specific type of risk factor appears less important for the development of antisocial behaviors than the total number of risk factors present and their interactions across individual development (Connor, 2002; Rutter et al., 1998).

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See also: **Antisocial Personality Disorder; Conduct Disorder**

ANTISOCIAL PERSONALITY DISORDER

Antisocial personality disorder (ASPD) is characterized by a pattern of socially irresponsible, exploitative, and guiltless behavior that begins in early childhood or early adolescence. Typical behaviors include criminality and failure to conform to the law, failure to sustain consistent employment, manipulation of others for personal gain, frequent deception of others, and a lack of empathy for others.

Antisocial behavior has been described throughout recorded history. Formal descriptions date to the early nineteenth century when Philippe Pinel, founding father of modern psychiatry, used the term *manie sans delire* to describe persons who were not insane but had irrational outbursts of rage and violence. In the late nineteenth century German psychiatrists used the term *psychopathy* to describe a broad range of deviant behaviors and eccentricities. The term was later popularized by British psychiatrist David Henderson and American psychiatrist Hervey Cleckley. In Cleckley's *Mask of Sanity,* originally published in 1941 (1941/1976), psychopathy was portrayed as a syndrome of emotional aloofness, callousness, self-serving attitudes, and impulsive antisocial behavior.

The term Sociopathic Personality Disturbance was introduced in the first edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-I), published in 1952, and was replaced in 1968 in the second edition of the DSM (DSM-II) by Antisocial Personality Disorder, a term that has continued into the fourth edition of the DSM (DSM-IV) (American Psychiatric Association, 2000). Diagnostic criteria were first enumerated in 1980 with DSM-III, based in part on research conducted by sociologist Lee Robins (1966). The term "antisocial" implies that the disturbance is directed against society.

Clinical Findings

Antisocial persons typically report a history of childhood behavioral problems such as fights with peers, conflicts with adults, lying, cheating, stealing, vandalism, fire setting, running away from home, and cruelty to animals or other children. As the antisocial youth achieves adult status, additional problems develop such as unlawful behavior, poor job performance, domestic abuse, physical aggression, general irresponsibility, and disregard for the safety of others. Criminal behavior, pathological lying, and the use of aliases are characteristic.

Psychopathy is generally considered a distinct clinical construct that has much in common with Cleckley's depiction in *Mask of Sanity*, which emphasizes lack of emotional connectedness with others and incapacity for guilt or remorse. Evidence suggests that psychopathic persons have a particularly poor prognosis. The DSM–IV criteria for ASPD focus on observable behavioral manifestations. Most psychopathic persons meet criteria for ASPD, but the reverse is not true. Psychopathy may constitute a subtype of ASPD.

Survey data show that from 2% to 5% of men and 0.5% to 2% of women in the United States have ASPD. The percentages are much higher in prisons, in psychiatric hospitals and clinics, in homeless persons, and in alcohol and drug addicted persons. The disorder is more prevalent in younger than older persons, in persons with low incomes and low levels of education, and among those living in urban areas.

Natural History

ASPD has its origins in childhood, where the syndrome if sufficiently severe is diagnosed as conduct disorder; ASPD is reserved for those 18 years and older. Most children with conduct disorder do not develop ASPD, but they are at risk for doing so. ASPD tends to be chronic, and it is worse early in its course. Antisocial symptoms tend to

abate as the person ages. In a 30-year follow-up study, Robins (1966) reported that of 82 antisocial subjects, 12% were in remission and another 20% were improved; the remaining subjects were considered as disturbed, or more so, than at the onset of the study. The median age at which improvement was noted was 35 years.

Co-occurring psychiatric disorders are common in ASPD, and many antisocial persons have comorbid alcohol or drug disorders, mood and anxiety disorders, or an attention deficit hyperactivity disorder. Risk of death from suicide, accidents, or homicide is greater than in the general population.

Etiology and Pathophysiology

Evidence suggests that ASPD is a neuropsychiatric syndrome with multiple causes. Family, twin, and adoption studies support a genetic diathesis. Not only does ASPD run in families, but ASPD is more commonly concordant in identical twins than nonidentical twins. Offspring of antisocial parents adopted in childhood are more likely to develop ASPD than adoptees who do not have an antisocial biologic parent.

Neurobiological theories of causation have been proposed. Autonomic nervous system under-arousal is thought by some to underlie ASPD. This theory is supported by evidence that antisocial persons have low resting pulse rates, low skin conductance, and increased amplitude on event-related potentials. One possibility is that persons with low levels of arousal seek out dangerous or risky situations to raise their arousal to more optimal level in order to satisfy their craving for excitement.

Abnormal brain structure and function have been associated with antisocial behavior. Positron emission tomography scans of criminals who either committed or attempted murder showed abnormal function in the prefrontal cortex. A study that used structural magnetic resonance imaging found that antisocial men had a reduction in prefrontal gray matter volume (Raine, Lencz, Birle, LaCasse, & Colleti, 2000). Because these brain regions help to regulate mood and behavior, impulsive or poorly controlled behavior could stem from functional abnormalities in these areas.

The central nervous system neurotransmitter serotonin has been linked with impulsive and aggressive behavior. Low levels of cerebrospinal fluid 5-hydroxyindoleacetic acid (5-HIAA), a serotonin metabolite, have been found in men who killed with unusual cruelty or committed arson, and in newborns with a family history of ASPD. Serotonin may help to dampen impulsive and violent behavior, and for this reason low levels of this neurotransmitter may play a role in the development of antisocial behavior.

The social and home environment also contributes to the development of antisocial behavior. Parents of troubled children show a high level of antisocial behavior themselves, and their homes are frequently broken by domestic abuse, divorce, separation, or parental absence. Antisocial persons often have a history of childhood abuse. Another important factor that may influence the development of ASPD is the presence of deviant peers. Antisocial children tend to choose similar children as playmates; these relationships can reward and encourage deviant behavior.

Both environmental and genetic factors may work together in the development of ASPD. In one study, men severely maltreated in childhood who had a polymorphism associated with low levels of monoamine A (MAOA) activity (an enzyme that metabolizes norepinephrine, serotonin, and dopamine) were more likely to engage in antisocial behaviors than men with a version of the gene associated with higher levels of MAOA who had been similarly maltreated. This finding suggests that a functional polymorphism of the MAOA genotype moderates the impact of early childhood abuse in the development of antisocial behavior (Caspi et al., 2002).

Assessing the Antisocial Person

The patient's history forms the most important basis for diagnosing ASPD. Family members and other informants can help fill in the gaps. Records of previous clinic or hospital visits or correctional records can provide diagnostic clues. A review of the medical history is important because antisocial persons are at risk for acquiring HIV and other sexually transmitted diseases, and they are predisposed to traumatic injuries and substance misuse.

Psychological testing is generally unnecessary, but it may be helpful when patients refuse to allow interviews with relatives or have no other informants available. Diagnostic interviews and questionnaires are available for this purpose, such as the Structured Interview for DSM-IV Personality, but these are mainly used in research settings. The Minnesota Multiphasic Personality Inventory yields a broad profile of personality functioning, and a particular pattern of results has been linked to ASPD. The Psychopathy Checklist has been used to measure the severity of psychopathy in criminal populations, in which it predicts both recidivism and parole violation. Tests of intelligence and educational achievement may provide useful information; learning disorders are common, and the IQs of antisocial persons are about 10 points lower than those of their nonantisocial peers. This information may be helpful in gaining a better understanding of the person's strengths and limitations and may help in treatment planning.

Managing ASPD

Antisocial patients rarely seek mental health care for treatment of their condition, but those who do can be evaluated in an outpatient setting. A clinical interview supplemented by information from informants is the best way to assess ASPD, because there are no diagnostic tests. Cognitive therapy has been used to treat mild cases

of ASPD and involves helping patients to recognize and correct situations in which their distorted beliefs and attitudes interfere with functioning. Antisocial patients can be very difficult to treat, because they often blame others for their problems, have a low tolerance for frustration, and have difficulty forming trusting relationships.

Several drugs have been shown to reduce aggression, the chief problem of many antisocial individuals, but no medications are routinely used or specifically approved to treat ASPD. Lithium carbonate and phenytoin have been found to reduce anger, threatening behavior, and assaultiveness in prison inmates. Other drugs have been used to treat aggression in brain-injured or mentally challenged patients, including carbamazepine, valproate, propranolol, buspirone, trazodone, and antipsychotic medications. Tranquilizers from the benzodiazepine class are not recommended, because they may lead to behavioral dyscontrol in some persons and are potentially habit-forming. Medication targeted at comorbid mood or anxiety disorders or at attention deficit hyperactivity disorder may help to curb antisocial behavior. When concurrent substance use disorders are treated, antisocial persons are less likely to engage in antisocial or criminal behaviors and will have fewer family conflicts and emotional problems.

Antisocial persons with spouses and families may benefit from marriage and family counseling. Bringing family members into the counseling process may help ASPD patients recognize the impact of their disorder on others. Therapists who specialize in family counseling may be helpful in addressing antisocial persons' trouble in maintaining enduring attachments to their spouse or partner, their inability to be an affective parent, their trouble with honesty and irresponsibility, and the anger and hostility that can lead to domestic violence.

Prevention of ASPD

Preventive measures should focus on teaching children to recognize and reject bad behavior, to make acceptable judgments between right and wrong, and to connect actions with their consequences. Parents of troubled children may benefit from training to show them how to identify and correct antisocial misbehavior as it occurs and how to steer their children away from negative influences like delinquent peers. Antiviolence programs that have been implemented in some public schools may help children find alternatives to lashing out.

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See also: **Conduct Disorder; Psychopathic Personality**

ANXIETY

Anxiety is a future-oriented emotional state characterized by a sense of apprehension, worry, and lack of control of one's own affective response. Anxiety should be differentiated from fear, a distinct and basic emotion that is best conceptualized as a primitive alarm in response to present danger. In contrast, anxiety is concerned with future threat, and although feelings of apprehension predominate, the emotional state of anxiety may be accompanied by a diffuse mix of shame, guilt, excitement, anger, or sadness. Anxiety tends to be a motivating force. It leads people to both intensify and narrow the focus of their attention to the perceived source of threat. If channeled into constructive activity, anxiety can be the source of motivation for problem solving, creativity, or other forms of adaptive change. However, anxiety may also interfere with performance. This is especially true for stronger feelings of anxiety and for more complex tasks where less-aroused states may be required for careful evaluation or problem solving.

Both anxiety and fear are accompanied by a wide range of somatic sensations associated with autonomic arousal, which at times can become a focus of apprehension in their own right. These symptoms include muscle tension, dry mouth, rapid heartbeat, trembling, dizziness, and shortness of breath. Associated symptoms to an anxious state also include sleeping difficulties, exaggerated startle response, and irritability. Because anxiety also tends to direct attention toward the perception and evaluation

of threat as well as toward monitoring of the self, anxiety can be heightened by a self-perpetuating cycle of increasing attention toward the presence of symptoms and expectations of harm.

Both anxiety and fear motivate escape and avoidance behaviors, and it is avoidance in particular that underlies much of the disability associated with pathological anxiety. The distress and disability resulting from recurrent pathological anxiety has been classified into 12 distinct anxiety disorders in adults (American Psychiatric Association, 2000). These disorders are largely defined by the topography of the anxiety response as well as the focus of the anxious apprehension. *Generalized anxiety disorder* (GAD) and *obsessive-compulsive disorder* (OCD) are both defined by recurrent, anxiety-laden thoughts. Uncontrolled worries about a variety of topics characterizes GAD, whereas OCD is characterized by more focused, idiosyncratic, and repetitive obsessions that are accompanied by compulsive behaviors aimed at neutralizing anxious apprehension. Although acute anxiety may reach panic proportions in any of the anxiety disorders, *panic disorder* is defined by fear of and persistent concern about the anxiety response itself; whereas *social anxiety disorder* is defined by fears of humiliation or embarrassment related to social scrutiny. When panic disorder is accompanied by fear and avoidance of a variety of situations where a panic attack may occur, *panic disorder with agoraphobic avoidance* is defined, though *agoraphobia* may also occur in the absence of panic disorder. When anxiety and avoidance are the result of exposure to specific situations (e.g., heights or dogs), *specific phobia* may be the most appropriate label. *Posttraumatic stress disorder* (PTSD) is characterized by chronic anxiety and avoidance in response to the horror and helplessness that sometimes accompany exposure to a traumatic event. In contrast, when these symptoms (in response to a trauma) are more acute and are accompanied by dissociative experiences, *acute stress disorder* is considered for a diagnosis. Finally, three additional categories are used to define diagnoses from specific etiologies or less distinct conditions; pathological anxiety judged to be direct physiological consequence of a medical condition (*anxiety disorder due to general medical condition*); pathological anxiety judged to be the direct physiological consequence of a drug abuse, medication, or toxin (*substance-induced anxiety disorder*); and a residual category (*anxiety disorder not otherwise specified*).

Although they may begin at any time, most of these anxiety disorders tend to emerge in adolescence or early adulthood. Social anxiety disorder is the most prevalent anxiety disorder and is thought to occur at a lifetime rate of 13% in adults. Specific phobias have an approximate 12% lifetime prevalence in adults. Panic disorder and GAD disorders occur in approximately 5% of adults; OCD and Agoraphobia occur in approximately 1% of adults (Kessler et al., 2005). PTSD is linked to trauma onset and has been found to occur in the range of 21% for physical assault, 49% for rape in particular, and approximate 7% in the adult population more generally (Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski, 1996). Anxiety disorders are more prevalent in women than men, with this difference between the sexes emerging in childhood. Anxiety disorders are also common across cultures, although the form that anxiety disorders take (e.g., the degree to which they are described in terms of somatic versus cognitive symptoms) and the focus and explanation for these symptoms can be culture-specific.

Family and genetic studies have shown that anxiety has a substantial heritable component; however, the greatest evidence points to an inherited vulnerability to develop an anxiety disorder, rather than a direct genetic causal relationship (Barlow, 2002). Fears of somatic symptoms of anxiety, as well as attentional biases toward perceiving threat have received support as potential causal agents for anxiety disorders (e.g., McNally, 2002). Indeed, conceptual models of panic disorder focusing on fears of anxiety sensations have been used as part of early prevention efforts, where early treatment of the fears of anxiety sensations appears to prevent the onset of panic disorder in prone individuals. Also, attempts to avoid or neutralize feared situations is thought to maintain anxiety disorders, thus insulating individuals from corrective experiences with the feared events.

In research studies, anxiety is often measured through interviews as well as self-report questionnaires, although physiological monitoring—of heart rate, breathing rate, muscle tension, or skin conductance—is also used to provide an objective index of anxious arousal. In the case of interview and self-report measures, the most widely accepted anxiety scales include a focus on both somatic and cognitive symptoms. For example, the Hamilton Rating Scale for Anxiety (HAMA) is an interview commonly used to assess anxiety symptoms in studies of pharmacologic treatment. Symptoms are rated on a variety of dimensions such as mood, intellectual functioning, and a variety of physical symptoms, such as muscular tension and respiratory difficulties. One of the most common self-report measures of anxiety is the Beck Anxiety Inventory (BAI), which encompasses nonphysical symptoms such as fear of dying or doing something uncontrolled as well as many physical symptoms such as racing heart and feeling faint.

For treatment, the available evidence supports the efficacy of cognitive-behavioral therapy (CBT) and pharmacotherapy (medication treatment). CBT for anxiety disorders most frequently utilizes informational, cognitive restructuring, and exposure interventions. Informational interventions teach patients about common patterns in their disorder, and cognitive restructuring is designed to correct thinking patterns (such as overestimations of the probability of feared outcomes or the degree of catastrophe assumed should those outcomes occur) that are thought to maintain anxiety disorders. Exposure interventions are designed to provide patients with the opportunity to relearn a sense of safety with feared situations and events

by using the experience from a stepwise re-entry into these situations (Barlow, 2001). Successful pharmacotherapy of the anxiety disorders is most prominently characterized by the use of antidepressants, benzodiazepines, or a combination of these agents (Vasile, Bruce, Goisman, Pagano, & Keller, 2005). Newer antidepressants (e.g., the selective serotonin reuptake inhibitors [SSRIs]) have approximately the same efficacy as older agents (e.g., tricyclics such as imipramine) but offer a different side effect profile and are much safer in case of overdose.

CBT and pharmacotherapy offer similar efficacy for most anxiety disorders, although CBT appears to offer stronger efficacy for PTSD, and it may be a more cost-effective treatment in the long term for many of the anxiety disorders (Otto, Smits, & Reese, 2005). The greater cost-effectiveness of CBT is based largely on the long-term maintenance of treatment gains as patients learn strategies for undoing the cognitive, emotional, and behavioral responses that maintain anxiety disorders. In contrast, relapse is common when medication treatment of anxiety disorders is stopped. Despite the hope that the combination of pharmacotherapy and cognitive-behavior therapy might comprise an especially powerful treatment, these hopes have not been realized to date; combination treatment offers only a subtle and inconsistent treatment advantage over CBT alone (Otto et al., 2005). However, new combination treatment strategies are now being considered; for example, the use of medication (e.g., D-cycloserine) to strengthen the memory of CBT interventions rather than medication treatment in its own right. Early data on this approach is promising (Norberg, Krystal, & Tolin, 2009).

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See also: **Anxiety Disorders**

ANXIETY DISORDERS

Anxiety Disorders are among the most prevalent of psychological disorders, affecting up to 20% of the population. The key features shared by anxiety disorders include excessive or unrealistic fear and anxiety, avoidance of feared objects and situations, and excessive attempts to reduce discomfort or to protect oneself from potential threat. In addition, for an anxiety disorder to be diagnosed, the person has to report clinically significant distress over having the anxiety symptoms, or the symptoms have to cause significant interference in the individual's life. Indeed in severe cases, people with anxiety disorders may be unable to work, develop relationships, or even leave their homes. Anxiety disorders often pose an enormous burden on society. For example, they often lead to lower work productivity and considerable increases in health care utilization (Kessler, Ruscio, Shear, & Wittchen, 2009).

Types of Anxiety Disorders

The most recent edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000) describes 11 different anxiety disorders. Each of these is listed in Table 1, along with its most important defining feature. Although other psychological problems may be associated with extreme fear or anxiety (e.g., eating disorders are associated with a fear of gaining weight), only the conditions listed in Table 1 are officially classified as anxiety disorders in the DSM-IV-TR.

Table 1. Key Features of the Anxiety Disorders

Anxiety Disorder	Key Features
Panic Disorder with or without Agoraphobia	The presence of unexpected or uncued *panic attacks* (a panic attack is a rush of fear or discomfort that peaks quickly and is accompanied by four or more associated symptoms, such as racing heart, dizziness, breathlessness, and others). The presence of anxiety over the panic attacks, worry about the possible consequences of attacks (e.g., dying, losing control, "going crazy"), or a change in behavior related to the attacks. *Agoraphobia* often occurs with panic disorder. This refers to anxiety about, or avoidance of, situations in which escape might be difficult or help unavailable in the event of a panic attack or panic-like symptoms. Feared situations may include crowded places, travel, driving, enclosed places, and others.
Agoraphobia without History of Panic Disorder	The presence of agoraphobia, without ever having met the full diagnostic criteria for panic disorder.
Specific Phobia	An excessive or unrealistic fear of a specific object or situation, such as an animal, heights, blood, needles, elevators, or flying.
Social Anxiety Disorder (Social Phobia)	An excessive or unrealistic fear of one or more social or performance situations, such as public speaking, conversations, or meeting new people. The fear is of being embarrassed, humiliated, or judged by others.
Obsessive-Compulsive Disorder (OCD)	The presence of *obsessions* (i.e., thoughts, images, or impulses that are perceived as intrusive and distressing), such as fears of being contaminated, doubts about one's actions, or irrational fears of hurting others). The presence of *compulsions* (i.e., repetitive behaviors, such as checking, washing, or counting, that are used to reduce anxiety or to prevent something bad from happening).
Posttraumatic Stress Disorder (PTSD)	The experience of a trauma in which an individual has been confronted with a threat to his or her physical well-being, or the physical well-being of another individual (e.g., experiencing a rape, assault, or accident; witnessing an act of violence). One month or more, in which the individual experiences recurrent recollections of the trauma, avoidance of situations that remind him or her of the trauma, emotional numbing, symptoms of arousal and hypervigilance.
Acute Stress Disorder	Similar to PTSD, except with a duration of between two days and four weeks.
Generalized Anxiety Disorder (GAD)	Frequent worry about a number of different areas (e.g., work, family, health), with difficulty controlling the worry and a number of associated symptoms (e.g., muscle tension, sleep problems, poor concentration).
Anxiety Disorder Due to a General Medical Condition	Significant problems with anxiety that are directly caused by a medical condition (e.g., panic attack symptoms triggered by hyperthyroidism).
Substance-Induced Anxiety Disorder	Significant problems with anxiety that are directly caused by a substance (e.g., panic attack symptoms triggered by cocaine use, caffeine, or alcohol withdrawal).
Anxiety Disorder Not Otherwise Specified	Significant problems with anxiety that do not meet the diagnostic criteria for another anxiety disorder, nor for some other psychological disorder.

Demographic Features of the Anxiety Disorders

Anxiety disorders can occur across a wide range of cultures, ages, sexes, and income levels. In most cases, anxiety disorders are more common in women than in men. The more frequent occurrence in women is most pronounced for panic disorder with agoraphobia and certain specific phobias (particularly animals and storms). For other anxiety disorders, such as social anxiety disorder, blood and needle phobias, and obsessive-compulsive disorder (OCD), the differences between men and women are smaller. The typical onset of anxiety disorders varies, with some tending to begin in early childhood (e.g., animal phobias), others beginning during the teen years (e.g., social anxiety disorder, OCD), and others tending to begin in early adulthood (e.g., panic disorder) (Kessler et al., 2009).

Causes of Anxiety Disorders

Although there are still many unanswered questions about how anxiety disorders begin, a number of contributing factors have been identified (for a review, see Antony & Stein, 2009). From a biological perspective, there is mounting evidence supporting the role of genetics. Certain neurotransmitters in the brain also appear to play a role. For example, OCD appears to be associated with abnormal levels of serotonin, whereas panic disorder appears to be associated with abnormalities in the norepinephrine system, as well as others. Differences have also been

found when comparing the patterns of blood flow in the brains of individuals with and without anxiety disorders. A number of studies have found that these patterns may normalize following treatment, either with medication or with psychological treatment.

From a psychological perspective, life experiences appear to play a role in the onset and exacerbation of anxiety disorders. For example, life stress can contribute to the development of panic disorder and other anxiety disorders. In addition, traumatic events in particular situations likely trigger the onset of posttraumatic stress disorder (PTSD), a specific phobia, or another anxiety-related problem.

In addition to the role of life events, there is significant evidence that anxious biases in a person's beliefs, assumptions, and predictions can contribute to anxiety symptoms (McNally & Reese, 2009). For example, individuals with social anxiety disorder tend to be overly concerned that others will judge them in a negative way. Likewise, individuals with panic disorder tend to misinterpret normal physical sensations, such as dizziness or breathlessness, as being dangerous.

Treatment of Anxiety Disorders

Anxiety disorders are among the most treatable of psychological problems. Most individuals who receive appropriate treatment experience a significant reduction in symptoms. For substance-induced anxiety disorders and anxiety disorders resulting from a general medical condition, the focus is generally on reducing the substance use or on treating the medical condition that is causing the problem. However, for the other anxiety disorders, evidence-based treatments include primarily medications, cognitive behavioral therapy (CBT), or a combination of these approaches (Antony, Federici, & Stein, 2009).

The selective serotonin reuptake inhibitors (SSRIs) such as paroxetine, fluoxetine, and sertraline have been shown to be useful for treating most of the anxiety disorders. Other antidepressants (e.g., venlafaxine, mirtazapine) are also useful for particular anxiety disorders. Anxiolytic medications (especially the benzodiazepines, such as alprazolam and diazepam), are also effective for reducing anxiety, although they are usually prescribed with caution due to the potential for abuse and the difficulty that some people have discontinuing these drugs. All of the anxiety disorders, except perhaps specific phobias, have been shown to improve following treatment with medications.

CBT includes a number of components. First, patients are encouraged to expose themselves to the situations they fear until their fear subsides. For example, individuals with social anxiety disorder may practice meeting new people, engaging in conversations, or purposely making minor mistakes in social situations. Individuals with panic disorder are encouraged to expose themselves to the physical feelings they fear (e.g., running on the spot until their fear of a racing heart decreases), in addition to the feared agoraphobic situations. In the case of OCD, the exposure is combined with prevention of the compulsive rituals (e.g., touching "contaminated" objects without washing one's hands).

Cognitive therapy is often used to help individuals to replace their anxious beliefs with more balanced, realistic thoughts, after considering relevant evidence. For example, an individual with generalized anxiety disorder (GAD) who worries whenever his or her spouse is late would be encouraged to consider all of the possible factors that may contribute to the lateness, rather than assuming the worst.

Treatment may also include teaching the individual other relevant skills. For example, people with GAD often benefit from relaxation or meditation-based treatments. Individuals with social anxiety disorder may benefit from learning to communicate more effectively.

Treatment often includes a combination of medication and CBT. Generally, CBT, medications, and combined treatments are equally effective, on average, although some individuals respond better to one approach over another. In the long term, after treatment has been discontinued, symptoms are more likely to return following treatment with medications than they are following treatment with CBT.

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See also: **Generalized Anxiety Disorder; Obsessive-Compulsive Disorder; Panic Disorder; Phobic Disorder; Posttraumatic Stress Disorder**

APPLIED BEHAVIOR ANALYSIS

Applied behavior analysis (ABA) refers to the application of the science of behavior whereby observable behavior is studied and operantly modified. Data are continually collected and evaluated during baseline and intervention phases, and guide all decisions regarding intervention modifications. The roots of applied behavior analysis can be tracked back to the field of experimental behavior analysis in which animal behaviors were modified through systematic manipulation of environmental events, such as the repeated presentation and removal of antecedents (events that immediately precede behavior) and consequences (events that immediately follow behavior).

B.F. Skinner (1904–1990) first coined the term "operant behavior" to denote operational responses. Although Skinner is revered as the founder of operant conditioning and behavior analysis, the classification of this field of study was influenced by his analysis of the work of scientists before him such as Ivan Pavlov (1849–1936) and Edward L. Thorndike (1874–1949), who unknowingly demonstrated both operant and classical conditioning.

As Ivan Pavlov struggled to eliminate the experimental variables confounding his research into qualitative and quantitative aspects of saliva in canines, his subjects exhibited behaviors that were, in retrospect, operant in nature. For example, the dogs were inclined to approach and lick the light bulbs when illuminated, perhaps to hasten superstitiously the delivery of the food pellet. Pavlov eventually shifted his dissertation research to examine related learned phenomena, now known as classical conditioning effects, but he did not identify those effects known as operants.

Edward L. Thorndike also appeared to have demonstrated operant conditioning with his puzzle box. In this study, a hungry cat was placed in a box after seeing food placed outside the box. The cat's successful physical struggle to get out of the box accidentally resulted in the opening of the box and subsequent access to food. After repeated trials with the puzzle box, the cat came to discriminate which responses resulted in escape from the box and access to food, and which did not.

Unfortunately, Pavlov and Thorndike both failed to recognize the importance of these patterns. However, Skinner described this systematic manipulation of antecedents and consequences to increase or decrease behavior as a three-term contingency (A → B → C), or operant conditioning. This three-term contingency is the guiding principle behind the science known today as applied behavior analysis.

Three-Term Contingency

The three-term contingency and guiding principle of ABA consists of the antecedent, the behavior, and the consequence. Once a behavior is operationally defined (in observable and measurable terms), one can manipulate the events that occur immediately prior to behavior (antecedents) and the events that occur immediately following behavior (consequences) (A → B → C) to maintain, increase, or decrease behavior. This interrelation is also documented as

$$S^d \rightarrow R \rightarrow S^r/S^p$$

where the S^d is an antecedent stimulus in the presence of which a response is reinforced, R is the response (or behavior), and S^r is a stimulus presented or removed resulting in the response increasing (reinforcement), or S^p is a stimulus presented or removed resulting in the response decreasing (punishment).

Reinforcement versus Punishment

Through this systematic manipulation of environmental events pre- and postbehavior, one may influence the future probability of behavior. The process of increasing behavior is known as reinforcement. The process of decreasing behavior is known as punishment. Reinforcement and punishment can be broken down even further into positive or negative reinforcement, and positive and negative punishment. It is important to note that the terms "positive" and "negative" do not refer to the quality of stimuli, but rather the presentation (+) or removal (–) of stimuli.

Positive Reinforcement ($S^d \rightarrow R \rightarrow S^{r+}$; behavior increases)

The observable increase in behavior over time following the consistent presentation of a stimulus, contingent on a response, is known as positive reinforcement. For example, upon completion of chores (response), a child receives a dollar allowance (stimulus presented). If this allowance is consistently delivered following the completion of chores *and* completion of chores increases or maintains, this is referred to as positive reinforcement.

Negative Reinforcement ($S^d \rightarrow R \rightarrow S^{r-}$; behavior increases)

If, on completion of chores, instead of the presentation of allowance, the consequence is simply removal of additional chores, *and* chore completion is observed to increase over time, this is known as negative reinforcement. Although commonly misunderstood, negative reinforcement is *not* punishment. Negative reinforcement is the removal of an aversive stimulus (additional chores), contingent on a response (completion of chores), which increases the future probability of the response (completion of chores more often).

Positive Punishment ($S^d \rightarrow R \rightarrow S^{p+}$; behavior decreases)

On the contrary, any procedure that results in a decrease in behavior is known as punishment. If, when asked to do his chores, the child says "no" (response), and the consequence is a verbal reprimand (stimulus presented), and in the future, the child is observed to say "no" less often, then this is referred to as positive punishment. Positive punishment is the presentation of a stimulus (verbal reprimand), contingent on a response (child saying "no"), which decreases the future probability of the response (child says "no" less often).

Negative Punishment ($S^d \rightarrow R \rightarrow S^{p-}$; behavior decreases)

If the child is asked to do his chores, and he says "no," and the consequence is the removal of previously earned allowance, which results in an observed decrease in the child's saying "no" when asked to do his chores, this is known as negative punishment. Negative punishment is the removal of stimulus (previously earned allowance), contingent on a response (child saying "no"), which decreases the future probability of the response (child says "no" less often).

Behavior Analysis Application

Although grounded in experimental studies, the application of the principles of behavior analysis has expanded to enhance the lives of different populations. The effects of ABA are far-reaching and are utilized in many settings, with many populations, with and without knowledge of its use. The principles of ABA first evolved from the experimental analysis of animal behavior to applied settings such as zoos and aquariums, as well as to dog training programs commonly used today. The ABA principles have also extended into the workplace, known today as performance improvement or organizational behavior management (OBM). ABA has been used successfully in the workplace to influence employee behaviors resulting in increased productivity, safety, performance, and time-management, which results in higher profits and less turnover for organizations.

The practice of ABA in institutional settings also evolved from treating mental health patients by modifying behaviors associated with mental illness. It has been utilized with the developmental disability population with whom ABA has been hugely successful in increasing functional language and independence skills and decreasing maladaptive behaviors and physical aggression.

ABA continues to be successfully used in institutional settings, and it is also now commonly practiced in clinical, educational, and medical settings. More specifically, it is used to teach socially appropriate behavior to mental health and juvenile justice populations in an outpatient clinical model in order to prevent institutionalization. It is also practiced in the medical field to increase medical compliance, teach pain management, and increase functional, socially appropriate behavior and decrease addictions as well as the impulsive and aggressive behaviors typical among brain injury patients.

ABA is now frequently used in the educational system. Often the principles of ABA are referred to within this system as positive behavior support (PBS), which is a specific methodology within the field of ABA. Teachers use these principles in their general classroom management to increase academic performance and reduce disruptive behaviors. The use of individual, classroom-, and school-wide contingencies, token systems and response cost procedures, and time-out are all examples of the use of positive and negative reinforcement and punishment used in the schools today. Regular and special education classrooms often use data analysis to create individualized skill acquisition and behavior reduction interventions for students who are gifted, at-risk, or have a variety of disabilities. This is done by simply setting intervention goals and measuring behavioral increases or decreases related to the classroom interventions.

The use of ABA is perhaps most commonly identified with the autism community. Specific ABA technologies employed with this population include discrete trial teaching (DDT), natural environment teaching (NET), and verbal behavior (VB). These teaching procedures are often used in home programs, but are also common in center-based, school, and community programs. However, it should be noted that, although widely used with this population, these procedures are not specific only to the autism community. They are simply different methodologies derived from ABA. As Skinner identified that the principles of Applied Behavior Analysis are effective with all organisms, so too are those specific methodologies.

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See also: **Behavior Modification; Operant Conditioning**

APPROACH-AVOIDANCE CONFLICT

When meeting a group of strangers, or being asked to speak in public, we can experience concurrent approach and withdrawal tendencies—both stick and carrot. When approach and avoidance are both strong, the conflict can be experienced as social, or performance, or some other form of anxiety. It can also bias our economic behavior making us risk averse. If chronic, conflict results in stress.

Conflict can involve approach-approach, avoidance-avoidance, and other tendencies, but "approach-avoidance conflict is by far the most important and the most common form of conflict in animal behavior" (McFarland, 1987). Approach and avoidance can each result from stimuli that do so in a particular species without previous experience, or from previously neutral stimuli after learning. Approach-avoidance conflict is currently important for discovering antianxiety drugs (McNaughton & Zangrossi, in press) and for analyzing the brain areas involved in human anxiety disorders (Gray & McNaughton, 2000).

Conflict in the wild elicits complex patterns of behavior. Suppose food is close to danger. Animals will approach while they are far from the food (and danger) but will move away again when too close to the danger (and food). They will usually finish up in an ambivalent "dithering" posture at some intermediate distance (see, e.g., McFarland, 1987). The problem is how to get your lunch without becoming lunch for someone else, which has forced the evolution of distinctive conflict-resolving behavior. In a simple robot a balance of approach and avoidance would result in unending dithering at an intermediate distance. But animals tend to produce "risk assessment" behavior that can resolve the conflict by providing new information. When this fails, "conflict behavior is [also] often replaced by other seemingly irrelevant, behaviour ... termed displacement activity" (McFarland, 1987)—such as biting your finger nails.

Laboratory experiments provide some explanation of dithering. In 1944, Miller (Gray, 1987; Miller, 1944) described how both the tendency to approach a desired object and the tendency to avoid a feared object increase as the object gets closer to the animal. This has been measured in terms of the strength with which the animal will pull toward or away from the object. The avoidance gradient is often, but not always, steeper than the approach gradient (Gray, 1987). Thus, at large distances, the animal approaches, while at short distances it avoids; so it moves to an equilibrium point at which conflict behavior is observed.

Recently, observations of relatively natural behaviors in a laboratory setting show this pattern extends to time as well as spatial distance (Blanchard & Blanchard, 1989). When a cat is present, rats avoid an arena containing food. When there is no sign of a cat, rats enter the arena and eat the food. When a cat has recently been present or when the smell of a cat is present, the rats engage in an approach-avoidance oscillation accompanied by "risk analysis" behavior that cautiously gathers new information.

Blanchard and Blanchard (1989) ascribe pure avoidance to fear and distinguish this from risk analysis in the presence of threat, which they ascribe to anxiety. As predicted by this, the former are sensitive to antipanic agents and the latter to antianxiety agents (Blanchard, Griebel, Henrie, & Blanchard, 1997); and, in learning experiments involving either fear or frustration, conflict is sensitive to antianxiety drugs but pure avoidance is not (Gray & McNaughton, 2000). As with the ethological analysis, this suggests that approach-avoidance conflict involves more than a simple balance between approach and avoidance. It produces risk assessment behavior, displacement activity, and, importantly, increases avoidance tendencies—animals have a more "safety-first" or "risk averse" attitude than if approach and avoidance were simply allowed to sum arithmetically.

This effect of the antianxiety drugs appears to be mediated by "limbic" areas of the brain such as the

hippocampus and amygdala. These areas receive information about approach and avoidance tendencies, detect conflicts, and (particularly with approach-avoidance conflict) increase avoidance tendencies (Gray & McNaughton, 2000). On this view, generalized anxiety disorder (but not simple phobia or panic) can involve hyperactivity of the septo-hippocampal system.

Risk aversion is also important in economic choices. Neoclassical economics can almost be defined as the study of the rational resolution of conflict. But risk aversion, in particular, produces failures of neoclassical economic theory (Glimcher & Rustichini, 2004). Neuroeconomists, therefore, are now attempting to correct neoclassical economics with neuroscience. The hope is that "economics, psychology, and neuroscience are converging today into a single, ... general theory of human behavior." (Glimcher & Rustichini, 2004).

Approach-avoidance conflict, then, has been under detailed investigation for many decades with a clear picture now emerging of its structure, function, and psychological properties. Dysfunction of the mechanisms controlling approach-avoidance conflict appears fundamental to anxiety disorders. Detailed neural mechanisms and sites of action of therapeutic drugs on those neural mechanisms are now being discovered as substrates of the psychological processes involved. Of particular cause for optimism, ethology, behavior analysis, cognitive psychology, psychopharmacology, behavioral neuroscience, and now perhaps even economics appear to be combining to produce a single, coherent, integrated, story in this area.

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See also: **Fight/Flight Reaction**

APTITUDE TESTING

Aptitude testing has been difficult to understand because this topic has been plagued by definitional ambiguity. This is complicated further because there have been two general types of assessment: achievement testing and ability testing. The distinction between achievement tests and aptitude tests historically has been demarcated by their intended use. Aptitude tests are typically used to predict future performance, such as the likelihood of success in training or on the job. Achievement tests are typically used as summative assessments of the candidate's knowledge after formal learning through education or training. However, the intended use of a test is a highly imprecise criterion to make differentiations among types of tests, as any test score could be used for prospective or retrospective purposes.

The blurring between ability testing and aptitude testing is even more acute. A traditional distinction is that "abilities" are innate (e.g., physical coordination) while "aptitudes" represent a confluence of abilities and the effects of learning under relatively uncontrolled, unknown conditions. The seeming synonymous nature of these terms is further evidenced by descriptions of classic tests. For example, the Bennett Mechanical Comprehension Test (BMCT; Bennett 1980) is variously described as measuring "mechanical ability" and "mechanical aptitude." The test currently used to select U.S. military personnel is the Armed Services Vocational Aptitude Battery (ASVAB). The ASVAB produces several composite scores, one of which is termed "academic ability."

Such definitional inconsistency does not influence the value and diagnosticity of the constructs measured by these tests; however, even the mildly discerning reader could legitimately be confused by what is measured with tests of achievement, aptitude, and ability. Perhaps the safest and most reasonable conclusion is that psychologists have come to understand (primarily through factor analytic research), that there are other attributes not highly correlated with intelligence (or general mental ability) that add to our understanding of human behavior. Although there is variability in what these tests are labeled as measuring, they do add predictive value in our repertoire of psychological assessments.

Substantive Issues

Five substantive issues are worthy of mention in a discussion of aptitude testing.

1. *Uses:* In the history of psychological assessment, aptitude testing has been directed toward making judgments about individuals in the vocational or occupational arenas of life. Aptitude tests are used in helping individuals make vocational choices; individuals are told that their aptitudes are consistent with members of particular vocational groups. Successful performance within any occupation is due to the possession of the requisite abilities plus the interest to engage in activities associated with such occupations. In more restricted contexts apart from vocational guidance, aptitude tests are used to assess a candidate's suitability for employment. Examples include assessments of mechanical, clerical, and artistic aptitudes. In short, aptitude testing was developed for the purpose of facilitating judgments about individuals' suitability for occupational membership.
2. *Validity:* The criterion-related validity of aptitude tests has been assessed for over 80 years (Hull, 1928). The validity of aptitude tests depends upon both the particular aptitude being assessed and the criterion in question. Historically, the validity of mechanical aptitude tests has been impressive (i.e., coefficients in the .30–.50 range are typical) when used to predict success in mechanical training programs or on-the-job performance (Muchinsky, 2004). The validity of clerical aptitude tests is not as high, typically in the range of .20–.35. Finally, the validity of musical and artistic aptitude tests is typically so low as to warrant questioning their practical value in making personnel decisions. However, the lack of validity of musical and artistic aptitude tests may well be more attributable to the choice and relevance of the criteria selected as measures of musical and artistic accomplishment.
3. *Incremental validity:* The current prevailing opinion regarding tests for personnel selection is that assessments of general mental ability (*g*) are superior to any other type of assessment. The superior predictive power of *g* has been well established across a variety of jobs. However, in reality, a given organization offers employment not "across a wide range of jobs," but within a narrow range consistent with its business strategy. Thus, in a practical sense, it is specious to state that tests of general mental ability have higher predictive power over aptitude tests. Such a statement is patently true across all jobs as evidenced by empirical research, and patently irrelevant given the particular staffing needs of individual organizations. In jobs requiring mechanical aptitude, for example, tests of mechanical aptitude have exhibited superior predictability over tests of general mental ability (Muchinsky, 1993). Aptitude tests were developed to assess a very narrow range of human attributes, although multiple tests can be combined to create a battery (e.g., ASVAB). When the prediction context is broad-based (e.g., performance as a student) tests of general mental ability are demonstrably superior. When the prediction context is narrow and specific (e.g., performance as a mechanic), aptitude tests exhibit validity that exceed tests of general mental ability.
4. *Alternative assessment methods:* If the goal of aptitude testing is to facilitate the judgment of a candidate's suitability for entrance into a training program or job, what alternatives to paper-and-pencil assessments are available? The only practical alternative to aptitude testing would be a work sample or performance test. Thus, the rationale of measurement would switch from construct assessment to behavioral sampling (Muchinsky, 2009). The long-standing attendant problems associated with these two assessment strategies would be highly evident. Performance tests (e.g., removing and repairing a gear box as a measure of mechanical aptitude) are individual assessments, inefficient in terms of time and cost, especially with a large applicant pool, and are limited to the generalizability of the behavior sampled. Additionally, performance tests measure what an individual can do at the time of assessment and are not necessarily predictive of the individual's capacity for skill acquisition after a period of training. However, in other capacities, a performance measure (e.g., a musical recital) may well be far more diagnostic of a candidate's potential for accomplishment than a paper-and-pencil test of musical aptitude.
5. *Adverse impact:* Aptitude tests, like ability tests, have demonstrated adverse impact. That is, test scores for one subgroup of candidates are substantially lower than tests scores for another subgroup. Within the domain of aptitude testing, the most frequent object of such research is mechanical aptitude, and the most strongly affected subgroup is gender.

There are two classical strategies for addressing issues of adverse impact of test scores. The first is founded on assessments of criterion-related validity that indicate women perform lower than men on tests of mechanical aptitude, and women also perform lower than men in mechanical training programs or mechanical jobs. As such, the mean difference in tests scores between the genders is not evidence of test bias against women, but the validity (i.e., accuracy) of the assessment. Women have scored lower than men on the Bennett Mechanical Comprehension Test (BMCT) since its initial development in

1940, and a gender difference in test score performance has persisted over decades marked by societal change, including the decline in occupational gender segregation.

Despite the criterion-related validity of the BMCT, there is legitimate concern that many test items are derived from life experiences more typically encountered by men than women. However, the underlying principles of physics measured by BMCT (such as heat conductance, velocity, force, pressure, etc.) are universal and timeless. A relatively new test of mechanical aptitude, the Wiesen Test of Mechanical Aptitude (Wiesen, 1999), measures these same principles, but presents some test items in contexts more typically encountered by women (e.g., the amount of pressure exerted on the floor by a flat-heeled versus a high-heeled shoe). Although the amount of psychometric data on the Wiesen test is sparse compared to the Bennett test, the existing evidence indicates the specific test items used to reflect the principles of physics do influence mechanical aptitude test scores. In short, the magnitude of the male-female difference in mechanical aptitude test scores can be reduced by item content, but to date there is insufficient psychometric evidence to compare to the two tests for predictive accuracy. Gender differences in mechanical aptitude testing are a prime exemplar of the dilemma of simultaneously trying to maximize test validity and social fairness in assessment (e.g., Sackett, Schmitt, Ellingson, & Kabin, 2001).

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ARCHETYPES

Carl Gustav Jung introduced the concept of *archetype* to the discipline of psychology to represent the contents of the psyche called the *collective unconscious* in his theory of the mind. Jung identified this part of the unconscious to be universal, with contents and modes of behavior that are more or less the same in all individuals. Jung (1969) observed that the personal unconscious consists for the most part of complexes, and the content of the collective unconscious is made up essentially of archetypes. Archetype is one of the most popular concepts in Jung's theory. In his theory, he presented the ego as the organization of the conscious mind. He then offered terms for other areas of the psyche (Latin for "spirit" or "soul") such as the personal unconscious, which adjoins the ego and contains psychic activities and content incongruous with conscious functions—repressed or disregarded for various reasons, such as stressful thoughts.

Jung (1969) suggested that the collective unconscious functions as a container full of inherited images from an ancestral past (primordial types), which are predispositions and potentialities for experiencing and responding to the world in the ways of our ancestors. Jung described archetypes as the contents of the collective unconscious not dependent on personal experiences. He believed this part of the unconscious to be universal, in contrast to the personal unconscious. Moreover, he suggested that archetypes function instinctively as universally distributed and inherited ideas that form motive forces, which long to be expressed through the human experience. Jung observed that the number of archetypal images is limitless, and he identified and described many of them, such as mother, God, spirit, angel, wise old man, hero, the child, the trickster, rebirth, and natural objects such as the sun, the moon, trees, wind, rivers, fire, and animals, to name a few. These archetypal images are recognizable in many contemporary ideas about inner mysteries and life's thresholds of passage, such as stages of life span or grief and loss.

Idea of Archetype

Jung resurrected the term *archetype* from philosophical ideas of ancient times. In the earliest periods of ancient Egyptian thought, there were notions that there was a

distinct area of the psyche inherently interconnected with conscious ideas. Jung found that what was myth in Greece was actual ritual in Egypt. In his widely known translated essays on archetypes and the collective unconscious, Jung (1969) noted that the term *archetype* occurs as early as Philo Judaeus, Iraenaeus, and Dionysius the Areopagite. He also noted that in early Greek philosophy, the term originally served to reference the God-image in man, archetypal light, and ideas not yet formed contained in the divine understanding (*ideae principales*).

The concept of archetype resonates with the philosophy of Plato, Romanticism, and idealism. However, these views were silenced in the realm of intellect by the rise of empiricism; they were left to the realm of the humanities such as art, poetry, and literature. Jung (1965) viewed his approach as a natural science, but also conceded its limitations, especially the personal bias of the observer. He suggested that an observer gain some understanding of the historical and literary parallels of observations to avoid at least the simplest errors in judgment.

Jung's early years in psychiatric work at Burghölzli Mental Hospital in Zurich served as a foundation for his scholarly inquiry. There he analyzed his own and his patients' dreams and visions and observed patterns while working with psychotic patients who described experiences of universal religious imagery and mythological symbols they could not have possibly known about. Combining his knowledge of philosophy with the patterns he observed, and influenced by esotericism, occultism, and questions raised by Gnostic spiritual philosophy, Jung was led to form his archetype theory.

Arguably, Jung's travels and ethnological study in such places as Africa, China, and Mexico influenced his ideas about how archetypes were expressed in traditional knowledge systems. Jung (1965) observed that traditional knowledge systems hold the wisdom of the human experience from ancient times. He was especially interested in describing archetype expression in human experience (i.e., visible manifestation of the life of the psyche). He observed sacred rituals and ceremonies, oral traditions, and material culture. Jung believed archetype imagery appears in dreams and in cultural symbols such as anima or trickster images as expressions of positive and negative aspects of human qualities. Archetypes are also found in myths, fairy tales, and legends as symbols of inner forces and human aspirations such as beauty, sexuality, wisdom, and moral virtue, as well as prophetic wisdom.

Archetype Theory in Modern Psychology

Jung presented the idea that the psyche embraces all thought, feeling, and behavior and acts as a guide that regulates and adapts individuals to their social and physical environment. He believed that people are born whole and healthy and spend their life span developing this inherent wholeness to its greatest potential. There is the personal unconscious or private side of psyche life, but archetype refers to contents of the collective unconscious that influence individual personality and character. The archetype is universal representation of psychic content that has not been submitted to conscious expression. In other words, the idea is pre-existent to the phenomenon. Archetype is the form, but many other factors influence the conscious experience. Archetype invites human consciousness into its depths as symbolism that has cultural significance.

Jung believed conscious expression of these basic patterns may be found and taught according to tradition in myths, fairy tales, and legends and cultural products such as works of art, literature, and religious, social, and political ideas. In modern psychology, archetype belongs to the realm of ideas impossible to substantiate using empirical reasoning. Thoughts of metaphysical conjecture, superstition, faith, and subjective reasoning immediately come to mind. While we can no longer deny that thinking, understanding, and reasoning cannot be independent of subjective processes, we tend to accept as valid psychological science only phenomenon that can be confirmed from the outside.

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See also: **Collective Unconscious**

ARGENTINA, PSYCHOLOGY IN

Scientific psychology started developing in Argentina soon after Wundt's 1879 establishment of the first laboratory for experimental research in psychology. In 1891, Víctor

Mercante (1870–1934) founded the first psychology laboratory in the city of San Juan, Argentina. Horacio Piñero (1869–1919) also created an experimental psychology laboratory at the Colegio Nacional de Buenos Aires in 1898, and a psychophysiology laboratory at the University of Buenos Aires in 1901 (Papini, 1976). In 1906, two other research laboratories were created: Félix Krueger, disciple of Wundt, founded a short-lived center at the Instituto Nacional de Profesorado Secundario (National Institute of Secondary Teaching), and Víctor Mercante set up a laboratory at the Department of Education within the School of Law and Social Sciences, at the University of La Plata (Talak & García, 2004). Scientific research in psychology took its first steps in Argentina almost hand in hand with the psychological scientific activity in the world's most important academic centers in Europe and the United States.

Before the year 1930, however, the reaction against positivism represented by Korn, Romero, and Alberini led to the closing of most psychological research laboratories in Argentina (Beebe-Center & McFarland, 1941). Moreover, political instability in the country also negatively affected the development of psychology. From the overthrow of Yrigoyen by the military coup of 1930, through approximately 1945, a "religious integralism" prevailed, which discouraged even the slightest idea of scientific research of the human mind. In turn, the teaching of experimental psychology was prohibited during Perón's first term in office in 1949 (Vilanova, 1994). It was the beginning of a period in which Argentine psychology was isolated from the developments that were taking place in the most prestigious academic centers of the world. In the following years, Argentine psychology gradually became a more service-oriented discipline and, as a result, research was assigned a minor role.

The Programs of Study in Argentina

The various degrees in psychology that are well established today in most public Argentine universities started developing 1950. Most professors of these newly developed programs of study were psychiatrists, educators, philosophers, or theologians, and many among them were clinicians trained in psychoanalysis who lacked research experience (Ardila, 1986). This period of the history of psychology in Argentina is often referred to as the "professional period" or "professional psychology stage" (Klappenbach, 1995; Alonso & Nicenboim, 1997). During the 1950s the development of psychological research in Argentina slowed down. At present, governmental bodies, such as the *Comisión Nacional de Evaluación y Acreditación Universitaria* (National Commission for University Evaluation and Accreditation), the National Board of Education and Culture, and the Board of Health and Environment, and university bodies, such as the *Asociación de Unidades Académicas de Psicología* (AUAPsi; Association of Psychology Academic Units), have underscored the need for a critical revision of the scientific training of future psychology graduates.

Scientific training in psychology became a priority after the degree was incorporated under the provisions of section 43 of the National Act of Higher Education No 24.521; that is, since the study of psychology became regulated by the government because of its status as a high-risk and public service profession. Recently, the AUAPsi and the *Federación de Psicólogos de la República Argentina* (FEPRA) submitted a document to the National Board of Education and Culture outlining national standards for awarding of graduate psychology degrees, a proposal for a core curriculum, and a description of the activities associated with a plan of study for a degree in psychology. Both entities have now started working on a similar outline for postgraduate studies in Psychology.

Institutional Affiliation of Psychologists in Argentina

In Argentina, professional psychologists consider themselves best represented by psychologists' associations that can be found in all the provinces or by national bodies such as FEPRA. In turn, Argentine research psychologists, in addition to the psychologists' associations, group together in national organizations that support research more actively, such as the *Asociación Argentina de Ciencias del Comportamiento* (Argentine Association of Behavioral Sciences), or international associations, such as the American Psychological Association, the *Sociedad Interamericana de Psicología* (Interamerican Society of Psychology), the International Union of Psychological Science, the *Asociación Iberoamericana de Diagnóstico y Evaluación Psicológica* (Ibero-American Association of Psychological Diagnosis and Assessment), and the Research Society on Alcoholism, to name a few.

Psychological Research in Argentina

There are different psychological research groups in Argentina, some of which are well established and internationally recognized, such as the Centro Interdisciplinario de Investigaciones en Psicología Matemática y Experimental in the city of Buenos Aires; the laboratory of Alcohol, Learning and Early Ontogeny at the Instituto de Investigaciones Médicas Mercedes y Martín Ferreyra in the city of Córdoba; the laboratory of Experimental and Applied Psychology at the Instituto Lanari in the city of Buenos Aires; the Comparative and Experimental Psychology group at the Instituto de Ciencias Humanas, Sociales y Ambientales, Centro Regional de Investigaciones Científicas y Tecnológicas, Mendoza; the History of Psychology group in the School of Human Sciences at the National University of San Luis; and the group of Sociocognitive Learning Processes at the Instituto Rosario

de Investigación en Ciencias de la Educación, among others.

Furthermore, there are other psychological research groups at private universities and research institutes all over the country. However, research activities have never received significant financial support from the national governments, or from universities. A brief review shows that psychological research in Argentina assessed by related scientific bodies is varied, basic, and applied. It correlates with research activities carried out in other parts of the world, tries to respond to social demands, is partially financed, and is subject to the evaluation of national and international scientific communities through publications in the field, presentations at national and international meetings, and national and international grant proposal applications.

Publications in Psychology Edited in Argentina

There are refereed periodic publications that are edited mainly by Argentine public universities and are included in international databases. Among the most important journals in Argentina include the following: *Revista de Investigaciones en Psicología* of the University of Buenos Aires; *Perspectivas en Psicología* of the National University of Mar del Plata; *Evaluar* of the National University of Córdoba; and *Investigando en Psicología* of the National University of Tucumán. In addition, the following journals are edited by other organizations and also indexed in well-known databases: *Acta Psiquiátrica y Psicológica de América Latina* (Fundación Acta), *Interdisciplinaria*, *Revista IRICE*, and *Revista Argentina de Clínica Psicológica* (Fundación Aiglé).

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ART THERAPY

"'I could draw it,' a dreamer often says to us, 'but I don't know how to say it.'" So said Sigmund Freud (1963, p. 90). Considering that Freud regarded dreams to be "the royal road to the unconscious," it is surprising that he did not ask his patients to do so.

Put another way, Irvin Yalom discusses the difficulty in communication between client and therapist, preventing a real knowing of one another:

> A series of distorting prisms block the knowing of another.... First, there is the barrier between image and language. Mind thinks in images, but, to communicate with another, must transform image into thought and then thought into language. That march, from image to thought to language, is treacherous. Casualties occur: the rich, fleecy texture of image, its extraordinary plasticity and flexibility, its private nostalgic emotional hues—all are lost when image is crammed into language. (Yalom, 1989, p. 180)

In art therapy, work with images is at the core of treatment.

Although art therapy is a relatively young and small profession, it is very broad, with art used in a number of different ways with varying populations. Most art therapy sessions, whether individual, group, couple, family, or community work, include a period of art-making followed by discussion, in which the art therapist encourages verbal reflection about the image(s) created. Although in the early days of the profession art therapists may have thought in terms of interpretations of the images and sometimes provided these interpretations to the client, for the most part art therapists today urge clients to do their own self-exploration. Many art therapists assure their clients that artistic excellence or even talent is not expected. The purpose of art therapy is self-expression and self-exploration.

Figure 1 is a plaster casting made by Debra Paskind, ATR-BC, LCPC, now an experienced art therapist and art

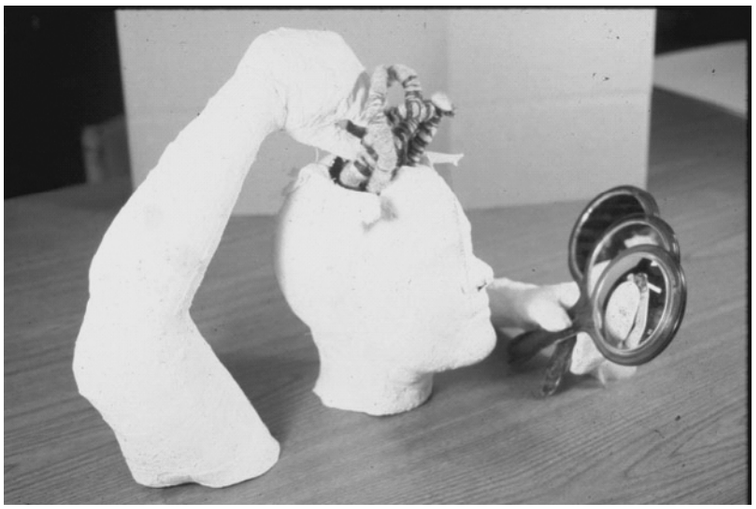


Figure 1. An impression of art therapy.

therapy educator. She made this art piece while still an art therapy student, showing her impression of art therapy, in which she is looking into multiple mirrors and pulling material out of her head to explore.

To give a brief overview of the variety in this work, the venues in which art therapists work with their diversity of populations may suggest how the goals and conditions of treatment may differ widely as the therapists determine the nature of the work. Traditionally, art therapists worked in psychiatric settings, such as hospitals and clinics. As the profession has grown, art therapy has expanded to use in schools, especially those for emotionally and behaviorally disturbed children; in facilities for the elderly, both day centers and nursing homes; in substance abuse programs; in hospital units for medical illnesses, especially cancer; in facilities for survivors of sexual and physical abuse, both children and adults, as well as perpetrators; in shelters for the homeless; in immigration centers, including programs for victims of torture; in penal facilities such as jails and prisons; in after-care programs; in community relief programs; and in many more.

Although art is used with many populations to promote insight, with many others it is more an activity for socialization and the enhancement of self-esteem, particularly in centers where clients stay for long periods of time, such as after-care facilities, shelters for the homeless, facilities for the elderly, and community centers. As is evident from these many venues, the art is likely to be used very differently with specific populations and treatment facilities, with respect both to the art materials used and the kind of art projects encouraged. Nevertheless, there are advantages to using art that would apply to many treatment conditions.

Advantages of Art Therapy Imagery

As stated by Freud and Yalom, we think in images. We thought in images before we had words, knowing our mother's face before we could think or say, "Mama." Because we had images before words, it is likely that imagery forms a significant foundation layer in personality development. Moreover, psychotherapy clients often have had experiences that cannot be expressed in words, especially aspects of trauma. These experiences, embedded in deeper layers than the verbal, often surface in drawings and paintings.

People diagnosed with acute schizophrenia have been able to depict hallucinations and delusions readily in their artwork. Given the idiosyncratic nature of hallucinations and delusions, these people often live in an envelope of isolation. Depicting these phenomena in their art expressions allowed for communication that bridged the moats of isolation that surrounded them.

Decreased Defenses

Because most clients are much less familiar with making art than with talking, surprising and unexpected things often come out in the artwork that would have been repressed in verbal communication alone. These unintended characteristics can form the leading edge of increased insight; for example, when a client drew a face that looked angry while denying such feelings, she was able to identify the feelings in the drawing and eventually came to own them.

The frequent misconception that artistic ability is necessary for self-expression in art may actually work in reverse. Those experienced in art-making may actually be better able to defend themselves in art expression. For example, an elderly man diagnosed with agitated

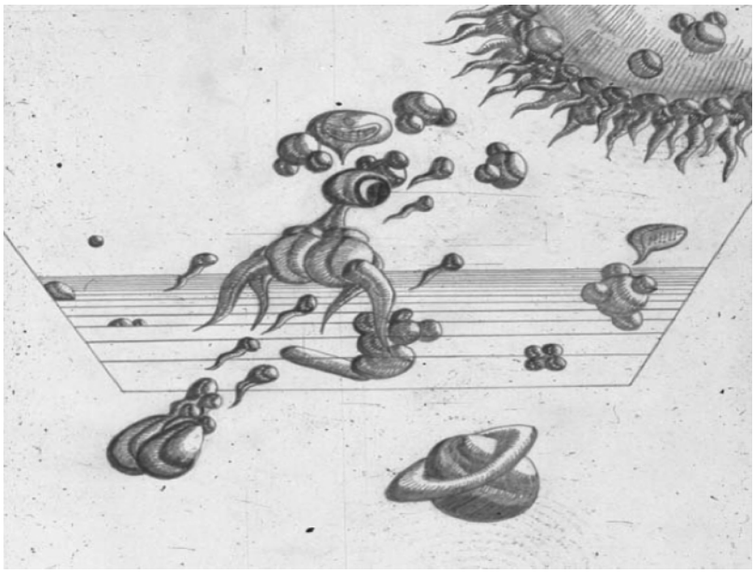


Figure 2. Drawing by a man with paranoid delusions.

depression, who had been a draftsman, created peaceful landscapes, denying that his pictures had any meaning. Eventually, however, he depicted himself as a smoldering volcano.

Catharsis

Catharsis is an especially important aspect of art-making. Clients can do whatever they want to the paper. One middle-aged woman who had made two serious suicide attempts murdered her husband many times on the paper over the course of her treatment before eventually settling into relative contentment in her marriage.

Craig, an adolescent diagnosed with paranoid schizophrenia, whom his parents feared would harm his little sister, was dragged into the National Institutes of Health Clinical Center by seven police officers. Since the research protocol for the schizophrenia project there kept the patients free of medication, most of them regressed on admission. The staff was fearful of potential violence in Craig, but he was one of the few patients who did not decompensate. The reason? He loved to draw. He spent many hours, both in art therapy sessions and on his own, drawing intricate pictures of the Judgment Day, the Mother of the Universe, and various delusions, discharging his feelings in this more productive way. Despite his elaborate paranoid delusional system, he even came to trust me with his "secrets." In Figure 2, he has drawn sperm cells and scrota being pulled into the sun-ovum (upper right). He is riding in the central object with the eye for protection. He said that anyone looking at this picture would become psychotic. Wadeson (1980) gives a more detailed account of work with this patient.

Permanence

Unique to art therapy is the permanence of the art product, which can provide some interesting possibilities. It is not subject to the distortion of memory, as ephemeral words may be, and cannot be denied. Sometimes clients look back on an earlier drawing and are surprised to discover how they felt at that time. New insights may emerge as a result. Most important, looking at the artwork over time allows both the client and the art therapist to discern patterns that may not be recognized when the art pieces are viewed singly. Also, the art is evidence of significant milestones in the ongoing development of the therapeutic process and in this way may be very encouraging.

The art product can also serve as interesting data for research and for communicating about a patient's status to other staff members. For example, with some suicidal patients, the art was often the first expression of renewed suicidal ideation, which could then be shared with staff for the patient's protection.

Spatial Matrix

Whereas speaking is a sequential form of communication, an art piece displays a spatial matrix, which is more often the way a situation is experienced. For example, if a client is exploring family relationships, instead of sequentially describing each family member and their relationships with one another, a picture can show the family dynamics all at once, which of course is the way the client experiences it. A woman can show her mother in an angry fit but close to her brother, her father removed from the other family members, herself small and sad, neglected by the others, and so forth. In family art therapy it is

especially productive to ask each family member to make a picture of the family. When family members share these drawings, there are often surprises about perceptions that have never been communicated. If the father appears on the periphery of every picture, it is difficult for him to deny that his family sees him as removed from them, for example.

Another interesting way to explore family dynamics is with the use of clay. After clients have reflected on their figures and the relationships among them, I often ask them to change the clay tableau to the way they would like the family to be. This activity usually arouses very strong feelings.

Creative and Physical Energy

Some groups, particularly those that meet in the evening, started out sluggishly with a check-in, proceeded to the art-making phase, and afterward miraculously came to life. The change in energy level became activated by art-making. This change is thought to be the result of stimulating creative energy. It may be related to the release of physical energy as well, which is very different from the more passive sitting and talking that is characteristic of verbal therapy.

There is also the particularly interesting contagion in group art therapy, in which the members are stimulated in their own art-making by the creative expression of the others. In a group, they come to know one another by their images and artistic styles.

Brief History of Art Therapy

In a sense, the roots of art therapy can be said to reach back to prehistory, when our ancestors painted animals in the caves of Lascaux, France, 17,000 years ago, or Australian Aboriginals made rock paintings that date back 40,000 years. Since before recorded time, humans used images to make their mark. In the early twentieth century there was much interest in the art of the insane, most notably as exhibited in the Heidelberg Collection that gathered works from the major mental hospitals of Europe. The mother of art therapy was Margaret Naumburg, an educator trained in both Freudian and Jungian analysis, who asked her clients to draw and "free associate" to their art. Working in New York, Naumburg began training other art therapists in the 1950s. Her contemporary was Edith Kramer, an artist who worked with children, also in New York. Whereas Naumburg utilized a more analytical approach, Kramer believed that the art-making process was healing in and of itself, and she based her work on the concept of sublimation.

In the 1960s, Elinor Ulman, a Washington, DC, art therapist, founded an art therapy journal that served to unite the handful of art therapists practicing around the country, and in 1969 the American Art Therapy Association was formed. University training programs were developed, and books and papers on art therapy proliferated (see Junge & Wadeson, 2006).

Art Therapy Today

Currently, there are approximately 5,000 members in the American Art Therapy Association. Art therapy has also been established in other countries, but in most of these countries it is not as developed as it is in the United States. The American Art Therapy Association publishes a newsletter and a journal and holds an annual conference. There are many regional conferences as well. The terminal degree in art therapy is the master's, and there are between 20 and 30 university training programs throughout the country. Some art therapy educators hold a PhD, often in a related area.

In most states, art therapy numbers are too small for licensure, so many art therapists are licensed as counselors or social workers. The art therapy credential is the ATR, Art Therapist Registered, available to those graduating from an approved master's degree program and completing a specified amount of supervised experience. There is also Board Certification, ATR-BC, which ATRs may receive after passing an examination.

Current Trends

Art therapy studies are showing effectiveness in pain management, especially among cancer patients, and links with neurophysiology in examining art-making's influence on the brain. Art therapists are working more and more with trauma victims, utilizing art therapy for social action, and working in areas of community crisis. Art therapists were called on to work with families of those killed on 9/11. In New York, many were involved in helping those affected to create memorials and to deal with their grief and fears. Art therapists from all over the country traveled to Louisiana and Mississippi to work with victims of Hurricane Katrina. Many traveled there over several years to work with displaced persons. The profession of art therapy is a dynamic one, continuing to expand into many areas of individual and social need, often in collaboration with other mental health professionals and in association with numerous societal facilities.

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See also: **Catharsis**

ASIAN PSYCHOLOGIES

Until recently, most Western mental health professionals usually assumed that their own psychologies and therapies were the only ones worthy of serious consideration, but fortunately this ethnocentric attitude is changing rapidly. Here we will limit discussion to four Asian psychologies—the yogic and Buddhist psychologies of India, and the Taoist and neo-Confucian systems of China—which despite their differences, also display significant commonalities.

Personality

Asian psychologies reflect ideas about human nature, health, pathology, and potential that, in certain ways, differ significantly from traditional Western views. We can summarize the Asian claims under the six headings of consciousness, development, identity, motivation, psychopathology, and health.

Consciousness

In *The Varieties of Religious Experience* William James concluded:

> Our normal waking consciousness . . . is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different . . . . No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded.

Asian psychologies agree completely. They recognize multiple states of consciousness (SOCs), and that some states may be associated with specific functions and abilities unavailable in our usual state. Perceptual sensitivity, attention, and the sense of identity, as well as affective, cognitive, and perceptual processes may all vary with the SOC in precise ways.

"Higher" states possess the effective functions of the usual states, plus heightened perceptions, insights or affects outside the realm of day-to-day experience. If higher states exist, then our usual state must be suboptimal. This is exactly the claim of Asian psychologies. They argue that our usual state of consciousness is underdeveloped, constricted, and distorted—even dreamlike—to a remarkable but usually unrecognized degree. Thus "normal" people who are unaware of their mental limitations are seen as "asleep" or "dreaming."

When this "dream" is especially painful or disruptive, it becomes a nightmare, and is then recognized as psychopathology. However, since the vast majority of the population "dreams," our true state of affairs goes unrecognized. When individuals heal these dysfunctions and mature, and thereby permanently "awaken" from their "dreams," they are able to recognize the nature and limitation of both their former state and that of the population. This awakening—known variously as *wu, moksha*, liberation, or enlightenment—is a central aim of Asian psychologies.

Development

The nature of Asian systems, and their relationship to Western ones, can be better understood if research on development is considered. Western researchers describe development as proceeding through three major stages: preconventional, conventional, and postconventional; or prepersonal, personal, and transpersonal. Analogously, psychotherapies address three degrees of pathology-health: pathology reduction, existential and adjustment issues, and transpersonal concerns.

Western psychologies have developed sophisticated maps of prepersonal and personal development, and effective therapies for many pathologies. However, until recently, they offered very little for fostering postconventional development, nor therapies for addressing existential or transpersonal concerns. By contrast, Asian psychologies focus on fostering postconventional development—for example, postconventional stages of emotional, moral, and cognitive development—and on addressing existential and transpersonal concerns. However, they offer little on early development or severe psychopathology.

This relates to the previous discussion of states of consciousness. SOCs are transient. Asian psychologies and disciplines therefore aim to transform temporary higher states into enduring higher stages of development.

These Asian goals are, in part, an extension of traditional Western psychology. For example, the West has long recognized that normal individuals suffer unrecognized perceptual distortions. In addition, Western researchers have recently identified postconventional developmental stages beyond those formerly considered to be the upper reaches of conventional normality.

However, Asian psychologies extend these findings. They assert that "normal" perceptual distortions are far more pervasive and harmful than usually recognized.

Likewise, they suggest that "normal" conventional development falls far short of our potentials.

Fortunately, Asian psychologies also offer good news. They suggest that many of our "normal" conventional psychological limitations can be reduced, and normal capacities can be enhanced by specific mental training. For example, they claim (and research supports) that meditation can enhance perceptual sensitivity and reduce perception distortions. Likewise, they claim (and research again supports) that meditation, yoga, and related trainings foster psychological development to healthier postconventional levels.

Identity

Western psychologists usually assume that our natural and optimal identity is "egoic," implying a sense of self that is inextricably separated, even alienated, from other people and the world. Asian psychologies suggest that our usual egoic identity is unnecessarily constricted, resulting in a sense of egocentricity, alienation, and angst. These psychologists also suggest that a more mature, expansive, or transpersonal identity is possible, and that this claim is directly testable by anyone willing to undertake meditative-yogic practices.

A transpersonal identity is one in which the sense of self "extends beyond (trans) the individual person or personality to encompass wider aspects of humankind, life, psyche, and cosmos" (Walsh & Vaughan, 1993, p. 3). Western psychologists periodically rediscover some of these transpersonal experiences and shifts of identity. Better known examples include Jung's *numinous* experience, Maslow's *peak* and *plateau* experiences, Fromm's *atonement*, Grof's *holotropic* experience, and James' *cosmic consciousness*. These shifts to a transpersonal sense of self can occur spontaneously, especially in exceptionally healthy people, or by mental training. In either case, they may confer significant psychological benefits (Alexander, Rainforth, & Gelderloos, 1991).

Asian disciplines offer methods to systematically induce transpersonal experiences and their benefits. By contrast, until recently, Western psychology was unaware of such methods. Transpersonal experiences and senses of identity were therefore disregarded at best, or even confused with regression to prepersonal pathology—a diagnostic error now known as the pre/post or pre/trans fallacy (Wilber, 2000)

Motivation

Asian psychologies, especially yogic psychology, tend to see motives as hierarchically organized analogously to suggestions by Abraham Maslow and Ken Wilber. However, Eastern psychologies emphasize the importance of "higher motives" such as self-transcendence and selfless service, which are rarely recognized in Western psychology.

One motivational factor that is given great emphasis and viewed as a major determinant of pathology is craving or addiction. Western psychology recognizes addiction to a limited number of things such as drugs, food, and sex. However, Asian psychologies argue that craving is far more pervasive and pathogenic, can occur to almost anything, and that it plays a major role in human suffering and psychopathology. From this perspective, psychologically based suffering is a feedback signal, indicating the existence of addictions and the need to release them.

Addiction/craving invariably gives rise to its mirror image: aversion. Whereas addiction says "I must have something in order to be happy," aversion says "I must avoid something in order to be happy." Aversion is said to underlie anger, aggression, and many psychological and spiritual dysfunctions. Not surprisingly, the reduction of craving and aversion is a major goal of Asian disciplines. They offer an array of practices for this, that Western therapists are beginning to draw on.

Psychopathology

Asian views of psychopathology center around three ideas: (1) immaturity, (2) unhealthy mental qualities, and (3) the "three poisons" of greed, hatred, and delusion.

Asian psychologies regard our usual adult state as a problematic form of arrested development. As such, they would agree with Abraham Maslow's (1968, p. 16) provocative claim that "it seems more and more clear that what we call 'normal' in psychology is really a psychopathology of the average, so undramatic and so widely spread that we don't even notice it ordinarily." From this perspective, development has proceeded from preconventional to conventional, but has then faltered and ground to a premature halt far short of our full potentials. At this stage the mind operates suboptimally, capacities remain unrealized, many unhealthy mental qualities flourish, while healthy ones remain underdeveloped.

These unhealthy qualities include, for example, attentional difficulties such as distractibility and agitation, cognitive deficits such as mindlessness, disruptive emotions such as anger and jealousy, and problematic motives such as craving and selfishness. The most fundamental pathogenic factors are described, especially in Buddhism, as the "three poisons" of (cognitive) delusion and (motivational) craving and aversion.

Asian psychologies agree in significant ways with existentialism about our usual human condition. For example, they agree about the inevitability of existential conflicts and issues—such as finitude, meaning, isolation, and suffering—at the conventional egoic level of development. Indeed, existentialists might be said to have rediscovered part of the Buddha's First Noble Truth: that unsatisfactoriness is part of (unenlightened) life, and (for the untrained mind) is accompanied by angst. However, existentialists' major recommendations are a specific *attitude*

toward these conflicts (such as Tillich's *courage*, Heidegger's *resoluteness*, or Yalom's *heroism*), and a *lifestyle* of *authenticity* and *engagement*.

Asian psychologies agree completely with the importance of such attitudes and lifestyles. However, they also offer more. For example, Buddhism's remaining three Noble Truth's point to the possibility of cultivating qualities such as ethics, attention, awareness, and wisdom. These qualities in turn foster maturation to postconventional stages in which existential conflicts may find a transpersonal resolution (Wilber, 2000).

Mental Health

The Asian ideal of psychological health extends beyond pathology reduction to encompass postconventional development and potentials. Health is defined primarily in terms of three changes: (1) reduction of unhealthy mental qualities, (2) cultivation of healthy qualities, and (3) maturation to postconventional states and stages of development.

Asian psychologies emphasize that specific healthy mental qualities must be deliberately cultivated to ensure psychological and spiritual health and maturity. Valued qualities encompass multiple mental domains. For example, attentional virtues include heightened concentration and focus, while desired modulations of arousal include calm and equanimity. Cultivated emotions include love, compassion, and joy. Cognitive refinements encompass insight and wisdom. Likewise, refinements of awareness include perceptual sensitivity, empathy, and mindfulness. Mindfulness is usually understood in the West as precise and ongoing awareness of the nature of the stimuli being observed. As such, it can be regarded as a highly developed form of the Freudian "observing ego."

Psychological health also includes maturation to postconventional stages and capacities. These include, for example, postformal operational cognition and wisdom, postconventional morality, transpersonal emotions such as encompassing love and compassion, and metamotives such as self-transcendence and selfless service. Research suggests that meditation does foster psychological development on multiple dimensions, including measures of ego, moral, and cognitive development, self-actualization, defenses and coping skills, and states and stages of consciousness (Alexander & Langer, 1990).

Asian Disciplines and Therapies

The applied side of Asian psychologies focuses on disciplines designed to foster psychological and spiritual development and well-being. The best known such disciplines are meditation and yoga. Meditation refers to a family of techniques that train awareness and attention in order to bring mental processes under greater voluntary control. This control is used to reduce destructive mental qualities, to cultivate beneficial qualities such as concentration, compassion, and insight, and to enhance psychological and spiritual growth and well-being. Yogas are more inclusive disciplines that encompass meditation, ethics, lifestyle modification, body postures, breath control, and intellectual study (Shear, 2006; Wallace, 2007).

In addition to specific meditative and yogic techniques, Asian systems, like contemplative traditions around the world, emphasize seven central practices and goals. These comprise (1) redirecting motivation, especially by reducing attachment and aversion and moving up the hierarchy of needs; (2) transforming emotions, especially reducing problematic affects such as anger and fear, and cultivating beneficial emotions such as love and compassion; (3) living ethically, so as to reduce destructive mental qualities such as greed and aversion, and to foster helpful qualities such as empathy and generosity; (4) developing concentration; (5) refining awareness; (6) fostering wisdom; and (7) increasing generosity and altruism (Walsh, 1999, 2008).

To give just two examples of Asian techniques and resultant capacities—which until recently Western psychologists considered impossible—consider the cultivation of love and lucid dreaming. Several meditations specifically cultivate the unconditional, encompassing love and compassion known in the East as *bhakti*, *metta*, or *jen*, and in the West as *agape*. Electroencephalographic (EEG) studies provide experimental support.

Dream yoga is a 2,000-year-old discipline for developing lucid dreaming: the ability to know one is dreaming while still asleep. Advanced practitioners claim to maintain awareness and continue meditation throughout both dream and nondream sleep, a claim now supported by EEG studies. Advanced meditators have now demonstrated at least 12 distinct capacities formerly considered impossible by Western psychologists (Walsh & Shapiro, 2006).

These capacities hint at the remarkable abilities, developmental possibilities, and powers of mind—some still largely unrecognized by Western psychologists—that Asian psychologies have discovered in their 3,000-year-long exploration of our inner universe. The Swiss psychiatrist Medard Boss, one of the first Westerners to examine Asian practices, suggested that compared with the extent of yogic self-exploration, "even the best Western training analysis is not much more than an introductory course." However, even modest amounts of practice can produce significant psychological, physiological, and therapeutic changes, as several hundred experiments and clinical studies have shown (Walsh & Shapiro, 2006).

Integrations

Because of their different foci, Asian and Western psychologies may be partly complimentary. Each has much to learn from the other, and some of the twenty-first-century's major advances may include syntheses between both systems. Three kinds of integrations across different

Western psychologies and therapies are recognized: (1) theoretical integration, (2) recognizing underlying common factors, and (3) technical eclecticism combining techniques.

Theoretical integrations already include the fields of psychosynthesis, Diamond/Ridhwan, transpersonal, and integral psychologies, of which Ken Wilber's (2000) integral psychology is the most encompassing. Underlying common factors that mediate Western psychotherapeutic and Asian meditative-yogic benefits include heightened awareness (mindfulness), insight, and social support (Walsh & Shapiro, 2006).

Technical eclecticism is proceeding rapidly. Meditation is now popular in both the culture at large, and also in psychotherapy where it is often used in conjunction with traditional Western therapies. "Mindfulness-based" therapies—such as *mindfulness-based stress reduction*—that add mindfulness training to traditional therapeutic packages are proliferating, and proving effective for a widening array of disorders.

Experimental studies have found meditation and yoga to be effective therapeutic strategies for a variety of psychological and psychosomatic disorders, especially those that are stressed based. For example, meditation has proved helpful with psychological disorders such as anxiety, phobic, sleep, and eating disorders. Psychosomatic applications include cardiovascular disorders such as hypertension and hypercholesterolemia, as well as asthma, chronic pain, and premenstrual dysphoria. Meditation also appears beneficial for enhancing psychological performance and well-being in normal people.

However, as yet there have been few studies that test the kind of benefits that meditation and yoga were intended for—namely postconventional and spiritual maturation and well-being, let alone the highest reaches of "enlightenment." The deeper potentials of Asian psychologies and what Maslow called "the farther reaches of human nature" that they point to, remain largely untapped.

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ASPERGER SYNDROME

Asperger syndrome (AS; also identified as Asperger's disorder) is a pervasive developmental disorder thought to be closely related to autism. Although first conceptualized in 1944 by Austrian pediatrician Hans Asperger, one year after the independent description of autism by Leo Kanner, AS did not gain wide recognition diagnostically until the early 1980s (Wing, 1981). It has since come to be accepted as a specific neurodevelopmental disorder in its own right within the psychiatric, psychological, and developmental fields (American Psychiatric Association [APA], 2000). AS is generally conceptualized as one endpoint along the autism disorder spectrum; however, there remains significant debate about where AS falls along the continuum of autism spectrum disorders, and more specifically about its relationship to high-functioning autism (HFA), with which it is often compared and contrasted (Ghaziuddin, 2008).

Currently, diagnostic criteria specified for AS in the DSM-IV-TR (APA, 2000) require identification of impairments in social interaction and a history of restricted or repetitive behaviors or interests, but no delays in the acquisition of language. Therefore, when considering just formal diagnostic criteria, the primary difference between AS and autism is the requirement that early speech and language be acquired at a typically expected time developmentally in individuals with AS, whereas individuals with autism have delayed speech and language development (Volkmar & Klin, 2000). Additionally, diagnosis of AS typically occurs later in childhood than does that of autism, although the age of diagnosis of AS is declining, likely because of increased awareness and knowledge of the syndrome among medical professionals and the general public (Cederlund & Gillberg, 2004).

Characteristics

Social impairments

The impairments in social interaction observed in AS may take many forms, such as difficulty with nonverbal

behaviors, failure to form developmentally appropriate peer relationships, and a lack of social reciprocity (APA, 2000). Although individuals with AS may have a good understanding of social conventions, this knowledge may not translate well to spontaneous interactions (Volkmar & Klin, 2000). Individuals with AS often show little regard for the reactions and emotions of others, either within a conversation (Ozonoff, Dawson, & McPartland, 2002) or when relating an interaction with others. Persons with AS may also talk at length without ever realizing that the other person is trying to end or redirect the conversation. They may additionally share socially inappropriate information. A frequent hallmark symptom is that persons with AS may not effectively or appropriately engage or maintain eye contact (Volkmar & Klin, 2000).

Although the diagnostic criteria for social impairment are identical between autism and AS, there are also several important qualitative differences (Ghaziudin, 2008). Unlike with autism, individuals with AS are not seemingly unaware of or disinterested in social interaction (Volkmar & Klin, 2000); instead, they are frequently frustrated by their social failures and may share their frustrations verbally and, at times, behaviorally. Individuals with AS frequently share that they want friends and romantic relationships. Notably, persons with AS may be best able to engage with others who have the same types of intense interests; these individuals often become strong peers of children with AS. Lastly, children with AS are often teased or bullied and may become socially isolated; however, they often have little awareness that their behavior may be a contributing factor to their social failure (Ozonoff et al., 2002).

Repetitive Behaviors and Interests

Individuals with AS exhibit restricted or repetitive behaviors and interests (Volkmar & Klim, 2000). It is common for individuals to ask repetitive questions, talk incessantly about one topic, and to amass information on a specific subject or small number of subjects (Ozonoff et al., 2002). Individuals with AS often gravitate toward subjects about which they can accumulate vast amounts of factual information, such as transportation, music, sports, and video games, and they may pursue their interests intensely, to the exclusion of all other topics. Persons with AS may focus on specific details, but in turn will be unable to differentiate the important information from the trivial. This often means being unable to apply this vast knowledge to decision making. For many individuals with AS, the specific subject of interest is integrally related to their sense of self, such that they experience disinterest in the topic as rejection. Many individuals with AS continue to have subjects of intense focus throughout their lives. As a result of this symptom, some educators have encouraged the integration of the subject of a person with AS's focused interest into person's school curriculum on an individual basis, to help motivate and engage a student who might otherwise be disinterested (Ozonoff et al., 2002).

Speech and Language

Unlike children with autism, individuals with AS develop basic aspects of language; however, their language skills may be quite qualitatively different from those of children without AS (Ozonoff et al., 2002). There are commonly noted impairments in the social use of language and in pragmatic understanding, although these may remediate somewhat as children get older. Conversations are typically associative, rather than goal-oriented; they are also tangential, egocentric, and frequently focused on the individual's topic of interest to the exclusion of other's interests or needs (Volkmar & Klin, 2000). Difficulties interpreting nonverbal cues may contribute to these conversational problems (Ozonoff et al., 2002; Volkmar & Klin, 2000). While listening during conversations, individuals with AS may misinterpret the meaning of statements because of a lack of understanding of nonverbal cues (e.g., sarcasm; Ozonoff et al., 2002).

It is important to note that the appropriate acquisition of language is typically determined during an evaluation through parent report. This retrospective assessment may take place well after the critical age when language is first emerging, with the result that language development may be recalled as having been more typical than was truly the case. This can complicate differentiating AS from high-functioning autism (HFA; Gillberg, 1998) and has led to some debate about what constitutes a language delay. Specifically, if language acquisition is on time, but is qualitatively different from that of children without AS, is it possible to say that language development was typical? This question remains a specific area of ongoing controversy in the literature (Gillberg, 1998).

Motor Skills

There is also ongoing debate as to whether motor deficits should be included in the criteria for diagnosis of AS, as it was one of the original characteristics that Asperger (1944) noted and might further differentiate AS from autism. Studies have found that motor clumsiness is common among individuals with AS, but it is as yet unclear whether there are actual significant differences in dexterity between individuals with AS and those with autism (Smith, 2000). Research is further complicated by the large variety of measures used to ascertain dexterity, making comparisons across studies difficult.

Epidemiology and Etiology

AS is a relatively rare disorder affecting from 0.25 to 7 people per 1000 and more males than females (Fombonne, 2005). The origins of AS are still unclear, although there

is a growing body of research indicating that genetic and environmental factors may together play a role (Volkmar & Klin, 2000; Fombonne, 2005). Studies examining the incidence of AS and autism among families have indicated that there is a strong genetic component and that AS may be particularly common among individuals with fathers or other male relatives with AS or AS-like traits (Volkmar & Klin, 2000). This high incidence of both AS and autism within families reinforces the belief that they are closely related disorders (Fombonne, 2005; Ghaziuddin, 2008). There has been some research into the specific chromosomal abnormalities that may play a role in the development of AS (Cederlund & Gillberg, 2004), including the identification of genes or sets of genes involved in neuronal development that might be particularly significant in AS (Ghaziuddin, 2008; Ozonoff, et al., 2002).

Research into the environmental factors that may lead to the development of AS has been extremely limited, but has considered such prenatal and perinatal risk factors as preeclampsia, prematurity, post maturity neonatal concerns (Cederlund & Gillberg, 2004), and newborn encephalopathy. Results have thus far been inconclusive, but have provided some support for the hypothesis that early neurological insult may be a contributing factor in the development of autism spectrum disorders (Volkmar & Klin, 2000).

Neuropsychological Functioning

Research regarding specific neuropsychological deficits related to AS has focused on general cognitive and executive functioning. Some studies have indicated that individuals with AS may be more likely to have higher verbal than nonverbal IQs (Ghaziuddin & Mountain-Kimchi, 2004), with some individuals meeting criteria for a nonverbal learning disability (Cederlund & Gillberg, 2004). There is evidence, however, that this pattern is reversed for some individuals with AS (Ghaziuddin & Mountain-Kimchi, 2004). Investigations into associated executive functioning deficits have revealed significant impairments in cognitive flexibility, word generation, set shifting, and response selection/monitoring among individuals with AS. These are in fact believed to be common neurocognitive difficulties in individuals with AS that affect their learning and social success (Ozonoff et al., 2002).

Neurological Functioning

Studies of functional and structural neurological abnormalities associated with AS have highlighted dysfunction in the medial temporal lobes and the amygdala-hippocampus region. Other studies have considered differences such as volume of gray matter and connectivity. As yet, no universal pattern of neurological dysfunction has been identified among individuals with AS (Ozonoff et al., 2002; Volkmar & Klin, 2000).

Comorbidity

Many individuals with AS are also diagnosed with other psychological disorders, including most commonly, attention deficit/hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), depression, and anxiety (Ozonoff et al., 2002). ADHD is typically seen in younger children, whereas mood disorders (depression in particular) are more common in adolescents and adults (Ghaziuddin, 2008). It is common for there to be a familial history of depression among individuals diagnosed with AS (Ghaziuddin, 2008). Comorbid disorders are often the more difficult behavioral and psychosocial concerns addressed clinically as individuals with AS mature and move toward independence, given the potential of independence to intensify and complicate already existing social and communication difficulties.

Treatment

Research regarding the treatment of individuals with AS has emphasized that intervention should be tailored to the individual's strengths and weaknesses and should address not only AS-related deficits, but also other areas of impairment and co-occurring psychological disorders (Volkmar & Klin, 2000). Most children with AS do not wish to be socially isolated, and they may become depressed if they are unable to form desired social relationships (Ozonoff et al., 2002). The primary treatment for the interpersonal impairments associated with AS is social skills training. The goal of social skills training is to utilize the individual's intact verbal skills to teach learning strategies, coping techniques, and awareness of social norms (Volkmar & Klin, 2000). It teaches strategies for dealing with commonly occurring social situations (e.g., meeting someone for the first time) and for dealing with novel situations as well. The ultimate goal of social skills training is to increase conversational skills, interpersonal skills, and employability, so that the person can enjoy greater personal and professional efficacy. This is often provided best through a collaborative approach between speech, language, occupational, and mental health therapists; implementation of social skills training interventions should also occur across environments in which the individual with AS participates (Ozonoff et al., 2002).

Repetitive behaviors and focused interests may respond well to behavioral intervention, including such approaches as response prevention, redirection, and substitution. Development of an intervention approach may require conducting a functional behavioral analysis, in order to better understand the role the behavior or interest plays in the individual's daily life. Again, effective management requires cross-environment collaboration.

Psychotherapy is another commonly used intervention among individuals with AS, and it can be useful in addressing problems related to vocational planning, family functioning, social adjustment, and mood variations.

Some individuals with AS also benefit from involvement in support groups in which they can socialize with others with AS. Long-term planning regarding potential supports and guidance in terms of life goals is often required, to obtain positive outcomes for individuals with AS (Ozonoff et al., 2000).

Remediation of cognitive concerns, particularly attentional and executive functioning difficulties, often requires accommodation within the learning environment, together with structured tutoring interventions regarding problem solving and task management. Individuals with AS who present with significant difficulties with organization, flexibility, and engagement may require more specialized educational approaches. Similar to some children with autism, children with AS may respond well to structured behavioral programming and classroom predictability.

Long-Term Outcomes

Research on the long-term outcomes for individuals with AS has been extremely limited, but a recent study by Cederlund et al. (2008) provides some much needed preliminary information. They found that outcomes for individuals with AS are generally better than for individuals with autism, although not as positive as had been predicted. Outcome ratings were based on employment, appropriate school enrollment, independent living, and having friends or a steady relationship. Twenty-seven percent of AS subjects had a good outcome, 47% had a fair outcome, 23% had a restricted outcome, and 3% had a poor outcome. The authors conclude that, although outcomes are better in AS than in autism, they are "suboptimal" when considered in light of the AS individual's intact intellectual skills. Ongoing research is attempting to outline best practices for supporting individuals with AS as they prepare to move into adulthood.

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See also: **Autistic Disorder**

ASSESSMENT PSYCHOLOGY

Assessment psychology is a field of behavioral science concerned with methods of identifying similarities and differences among people in their mental and emotional characteristics, their functioning capacities, and their dispositions to behave in certain ways. To this end, assessment methods are designed to provide information about individuals' intellectual abilities, their personality features, their neuropsychological status, and their attitudes, interests, and attainments. This article reviews the history of assessment psychology, its primary areas of inquiry, its commonly employed measures, and its present position as a field of psychological science and practice.

History

Assessment psychology emerged from scientific and professional interests in assessing individual differences, the roots of which reach back to the very beginnings of scientific psychology. The generally acknowledged "father" of individual psychology is the British scholar Sir Francis Galton, who was intrigued by Darwin's notions of evolution and heredity and was particularly interested in the origins of genius. Galton proposed that differences among people in their intellectual ability could be measured by their performance on various psychomotor tasks, such as

grip strength and visual acuity (Galton, 1869, 1983). In assessment psychology, the honorific of "father" belongs to James McKean Cattell. While working as an assistant in Wilhelm Wundt's Leipzig laboratory, the establishment of which in 1879 is considered to mark the inception of psychology as a scientific discipline, Cattell did his doctoral research on individual differences in reaction time. Subsequently, as head of the Columbia University Psychology Laboratory, Cattell generated widespread interest in psychological tests, pioneered in the development of mental testing, and introduced the term *mental test* to the psychological literature (Cattell, 1890).

In the twentieth century wake of Cattell's generativity, the formal pursuit of methods of identifying similarities and differences among people was often stirred by some practical purpose that needed to be served, as illustrated in the discussion that follows. Advances in assessment methods were psychology's main avenue of response to community and national needs during the first half of the twentieth century, and applied psychology was largely defined during this time by assessment conducted in clinical and educational settings. Students interested in practicing or studying aspects of applied psychology were routinely trained in assessment methods of various kinds, and being a competent assessor was generally considered an integral part of being a competent psychological practitioner.

However, the place of assessment in applied psychology changed markedly in the second half of the twentieth century. Practicing psychologists embraced many new roles as therapists and consultants, and they expanded their primary work settings from a narrow range of clinical and educational facilities to include a broad array of agencies and institutions in forensic, health care, organizational, and government settings. Consonant with these new directions in practice, assessment came to play a lesser part than before in the activities of applied psychologists, and many practitioners chose not to include assessment among the services they offer. Nevertheless, as indicated in the last section of this article, the reduced preeminence of assessment has not marked a decline in the vigor and value of assessment psychology, which more than at any time in its history is currently a scientifically productive and professionally thriving endeavor.

Areas and Measures

Assessment psychology addresses four primary areas of inquiry within applied psychology: (1) the determination of intellectual ability; (2) the identification of personality characteristics and psychopathological conditions; (3) the evaluation of neuropsychological status; and (4) the examination of aptitudes, achievement, and interests. In each of these areas, numerous formal assessment measures have been developed and proved dependable sources of useful information.

Determining Intellectual Ability

Formal assessment of intellectual ability had its beginnings in 1904, when the Minister of Public Instruction in Paris asked Alfred Binet, a distinguished experimental psychologist of his day, to assist him in identifying "subnormal" elementary school children who needed special educational services not available in regular classrooms. In collaboration with a colleague, Theodore Simon, Binet designed a series of verbal and perceptual-motor tasks for measuring whether students' mental abilities were substantially below expectation for their age. Arranged to provide an index of mental age, these tasks were published as the Binet-Simon method of diagnosing abnormal intellectual level, which served its intended purpose well in the Parisian schools. The Binet-Simon scale was translated into English by Lewis Terman at Stanford University and published as the Stanford-Binet Intelligence Scale in 1916. Terman added to this translation a formula by which assessed mental age could be divided by chronological age to yield what he called an "intelligence quotient"—thereby introducing the term *IQ* into the language of psychology and common parlance as well. The kinds of tasks designed by Binet have continued to the present day to provide the foundation on which most other tests of intelligence have been based. The Stanford-Binet itself is currently in its fourth edition and remains frequently used in the assessment of children's intellectual functioning.

The most widely used measure of intellectual testing and the most frequently used of all psychological tests in clinical settings are two scales developed by David Wechsler: the Wechsler Adult Intelligence Scale (WAIS), which was first published in 1939 as the Wechsler-Bellevue, while Wechsler was chief psychologist at Bellevue Hospital in New York City; and the Wechsler Intelligence Scale for Children (WISC), which was first published in 1949 (Hogan, 2005). Wechsler had reservations about the utility of Binet's mental age concept in assessing intelligence, especially in adults. Instead, he proposed determining intellectual level by comparing an individual's test score with the normative distribution of tests scores among large samples of people in general. Proceeding in this way, he formulated the IQ in statistical terms as having a mean of 100 and a standard deviation of 15, which led to a widely accepted convention of translating IQ scores into percentile ranks. For example, approximately two-thirds of the population can be expected to have IQs between 85 (16th percentile) and 115 (84th percentile).

Like the Stanford-Binet, the Wechsler scales comprise a variety of tasks measuring different kinds of verbal, perceptual-motor, and cognitive abilities. Beyond using performance on these subtests to generate a single overall IQ score, Wechsler postulated that a person's pattern of relative strengths and weaknesses across subtests measuring different kinds of mental abilities could be used to

identify normal and abnormal variations in numerous cognitive characteristics and coping capacities. The potential for such meaningful interpretation of profiles of subtest scores has resulted in the Wechsler scales being widely used in clinical health settings as a measure not only of intellectual ability but also of features of neuropsychological impairment and disordered thinking. Both the WAIS and the WISC are in their fourth edition, and there is a Wechsler scale for young children as well, the Wechsler Preschool and Primary Scale of Intelligence.

Identifying Personality Characteristics and Psychopathological Conditions

Formal assessment of personality characteristics and pathological conditions involves some combination of three procedures: self-report inventories, performance-based measures, and interviews. Self-report inventories are relatively structured tests in which respondents reply to specific questions by selecting their answer from a list of alternatives (e.g., Question: "Do you feel unhappy?" Alternative answers: "Most of the time," "Occasionally," "Hardly ever"). Like formal assessment of intelligence with the Stanford-Binet, self-report assessment of personality and psychopathology originated in response to a government request for help in meeting a public need. During World War I, Robert Woodworth, a prominent experimental psychologist who had studied with Cattell, was asked to assist the military in identifying psychologically fragile draftees who would be at risk for nervous breakdown if exposed to the stress of combat. For this purpose, Woodworth designed a list of "Yes" or "No" questions related to emotional stability. Published after the war as the Personal Data Sheet, Woodworth's questionnaire was the first generally available formal self-report personality assessment inventory.

Spurred by Woodworth's initial effort, subsequent generations of psychologists developed numerous longer and more complex self-report personality inventories notable for their breadth and dimensionality. Well beyond Woodworth's original intent merely to classify respondents as emotionally stable or unstable, contemporary self-report inventories help to identify an extensive array of pathological conditions and a broad range of personality characteristics, and they include as well scales that can help indicate whether a person has responded honestly. The currently best known of these inventories is the Minnesota Multiphasic Personality Inventory (MMPI), which is the second most frequently used test in clinical settings, after the WAIS (Hogan, 2005). Other commonly used and extensively researched self-report inventories include the Millon Clinical Mulitaxial Inventory, the Personality Assessment Inventory, the NEO-PI, and the Sixteen Personality Factor Questionnaire.

Performance-based personality assessment measures are relatively unstructured methods in which respondents are presented with somewhat ambiguous test stimuli and given only minimal instructions concerning what they should say about or do with these stimuli (e.g., asked to make up stories about a series of pictures they are shown). Measures of this kind have traditionally been called "projective" tests, because they encourage people to attribute and thereby reveal some of their own characteristics in formulating their responses. However, because most of these relatively unstructured tests have some clearly defined as well as ambiguous aspects, they are becoming more appropriately referred to as performance-based measures. By contrast with self-report data, the data obtained by performance-based measures consist not of what people say about themselves, but of the manner in which they respond to the various tasks that are set for them.

The best known and most widely used of these performance-based personality assessment measures is the Rorschach Inkblot Method (RIM), which is the second most frequently used personality test in clinical settings, after the MMPI (Hogan, 2005). Hermann Rorschach was a Swiss psychiatrist who, in the years just preceding 1920, had the idea that he could learn something about his patients' personality characteristics and adaptive difficulties by studying their perceptual style when they were asked to say what some inkblots might be. Acting on this idea, he developed specific procedures for deriving such information from responses to a standard set of inkblots. Although Rorschach's scoring system procedures and interpretive principles have been substantially expanded and refined in the ensuing 90 years, the 10 inkblots he published in 1921 remain the same standard set that is used today in the U.S. and around the world. Another well-known performance-based personality measure that has stood the test of time is the Thematic Apperception Test (TAT), which was developed in the mid-1930s by Henry Murray, a psychoanalytically trained physician who was then director of the Harvard Psychological Clinic. The TAT consists of a series of pictures of people and scenes about which respondents are asked to make up a story. Like the RIM, the TAT remains in its original form, and it is the second most frequently used performance-based personality assessment measure in clinical practice (Hogan, 2005). Two other frequently used measures of this kind are figure drawing tests, which require drawing people and other objects and answering questions about what has been drawn (e.g., "What is this person like?"), and sentence completion tests, in which the task consists of expressing one's feelings by extending brief phrases (e.g., "I regret . . . ") into full sentences.

Although discussed here in relation to identifying assessing personality characteristics and psychopathological conditions, interview methods are also commonly employed in assessing neuropsychological functioning and aptitudes, achievement, and interests. Of further note, interview methods include both self-report and performance-based components; interviewers typically

base their impressions on not only what respondents say about themselves, but also on how they say it and how they conduct themselves while being interviewed. Clinical interviews vary in their degree of structure, depending on the purposes and preferences of the interviewer. Unstructured interviews consist largely of open-ended requests for information that may give interviewees some idea of what to talk about but little notion of what they should say, as in "Tell me about your family." An unstructured interview format allows considerable flexibility in adapting to how interviewees present themselves, and it is usually a rich source of information about a person's problems and preferences that is useful in planning psychotherapy. On the other hand, unstructured interviews lack sufficiently standardized procedures to ensure reliable and replicable data collection.

By contrast, structured interviews consist of specific and narrowly focused questions that often can be answered "Yes" or "No" (e.g., "Are you having trouble sleeping?"). Several standardized formats for conducting structured interviews have been developed, primarily for purposes of arriving at a formal clinical diagnosis or for classifying participants in research studies. The most comprehensive of these instruments are the Diagnostic Interview Schedule (DIS) and the Structured Clinical Interview for DSM (SCID). In practice, many clinicians combine open-ended and narrowly focused questions to conduct a semistructured interview that allows for both flexible inquiry and the formulation of a reliable diagnosis for clinical and research purposes.

Monitoring Neuropsychological Status

Neuropsychology is a discipline concerned with studying relationships between brain functions and behavior. In applied practice, clinical neuropsychology consists primarily of using various assessment procedures to measure the development and decline of brain functions and their impairment as a consequence of head injury, cerebrovascular accidents (stroke), neoplastic disease (tumors), and other illnesses affecting the central nervous system, of which Alzheimer's disease is the most prevalent. Best known among the earliest psychological methods constructed to measure brain functions is the Bender Visual Motor Gestalt Test (BVMGT), which was developed in the late 1930s by Lauretta Bender, a psychiatrist at New York's Bellevue Hospital. The BVMGT consists of nine cards, each of which has on it a geometric design that respondents are asked to copy. Difficulty in copying these designs is likely to reflect impairments in visual organization and perceptual-motor coordination, which in turn can be helpful in identifying brain damage or dysfunction.

Its long history and still common use notwithstanding, the BVMGT is not as sensitive to neuropsychological dysfunction as more extensive measurements of cognitive functions provided by the previously mentioned Wechsler intelligence scales and by multifaceted neuropsychological test batteries comprising measures of a broad range of these functions. Currently, the most prominent neuropsychological test batteries are the Halstead Reitan Neuropsychological Test Battery, which was first developed in the 1950s, and the Luria-Nebraska Neuropsychological Battery, which was first published in 1985. Other specific measures commonly used by contemporary neuropsychologists include the Wechsler Memory Scale, the Wide Range Assessment of Memory and Learning, the Boston Naming Test, the Stroop Neuropsychological Screening Test, and the Trail Making Test.

Measurement of Aptitudes, Achievement, and Interests

As mentioned earlier, intellectual assessment and personality assessment emerged largely out of a perceived necessity for administrators to make decisions about people, namely, the Parisian schoolchildren and the World War I U.S. draftees. By contrast, methods of assessing achievement, aptitudes, and interests were developed primarily to help people make decisions about themselves. These measures are typically used to assist people in planning their educational and vocational future on the basis of what appear to be their abilities and interests. With respect to assessing abilities, achievement tests identify a person's currently attained performance level in various areas of knowledge or skill, whereas aptitude tests provide an index of a person's potential for increasing knowledge or gaining skill in response to education or training. Illustrative and widely used tests of these kinds include the Woodcock-Johnson Tests of Achievement and Cognitive Abilities, the Wide Range Achievement Test, and the Strong Interest Inventory.

Present Position

As stated previously, assessment psychology is currently a thriving field of endeavor. The utilization of assessment psychology has extended far beyond its original base in clinical and educational settings and become widely applied in the newer and growing areas of forensic psychology, health psychology, and industrial and organizational psychology. Whenever decisions by or about people are based at least in part on psychological considerations, the information provided by formal and standardized psychological assessment can facilitate the decision-making process. In addition to these practical applications, interest in the nature of psychological assessment methods and their psychometric foundations has generated extensive research over the years and a vast body of published literature. There are more quality journals and current textbooks and handbooks concerned with assessment psychology available now than at any time in the past, and this literature includes an international array of publications.

Assessment psychology is also well-represented in prospering scientific and professional organizations that embrace an international community of assessment psychologists. Within the American Psychological Association, Division 40 is devoted to Clinical Neuropsychology and Divisions 5 (Evaluation, Measurement, and Statistics) and 12 (Clinical Psychology) have sections on assessment. Other prominent assessment organizations include the National Academy of Neuropsychology, the Society for Personality Assessment, the European Association of Psychological Assessment, the International Test Commission, and the Division of Psychological Assessment and Evaluation within the International Association of Applied Psychology.

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See also: **Intelligence Testing; Interview Assessment; Neuropsychology; Personality Assessment; Psychological Assessment**

ASSISTIVE TECHNOLOGY

As all areas of society continue to become more technologically advanced, individuals who have disabilities and chronic medical conditions are benefiting through the use of assistive technology and becoming more mainstreamed into American society. As they become more independent in all areas of life and are less reliant on public services, society benefits as well. Many of these persons have been able to find employment or return to work. Therefore, the income for individuals with disabilities increases, as does their purchasing power to buy goods and services. Assistive technology offers an effective and viable means to increase or restore functioning, enhance quality of life, and diminish barriers, physical as well as attitudinal.

Definitions

Assistive technology is defined in the Technology-Related Assistance for Individuals with Disabilities Act of 1988 as any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of people with disabilities. A technology service is any service that directly assists an individual with a disability in the selection, acquisition, and use of an assistive technology device. At present, approximately 20 million Americans with disabilities are using some form of assistive devices, equipment, computers, and other apparatus (Brodwin, Swett, Lane, & Star, 2005). People benefit from assistive technology at the workplace, in school, at home, and in leisure activities.

Use of Technology

Through understanding technology as applied to people with disabilities, practitioners can provide more meaningful, practical, and realistic clinical counseling and services to clients. Technology has a profound impact on improving all aspects of the lives of people with disabilities. As noted by Scherer (2007), technology is significantly changing the lives of individuals who have disabilities. Assistive technology has enhanced the quality of life and extended the life span of persons with congenital and developmental disabilities, as well as those who have acquired disabilities and chronic medical conditions. Devices and equipment may be low-tech (mechanical) or high-tech (electromechanical or computer-related) and can compensate for sensory and functional loss. Assistive technology provides the means to move (e.g., adaptive equipment on automobiles and vans, wheelchairs, powered wheelchairs, scooters, lifts), speak (e.g., augmentative and alternative communication devices), read (e.g., Braille input, voice recognition devices), hear (telecommunication devices for the deaf or TDD, hearing aids, audio loops), and manage self-care tasks (e.g., remote environmental control systems, prosthetic and orthotic devices, devices to aid in eating and in other activities of daily life).

Examples of Technology

Robotics

An example of advanced technology is the continuing development of robotic controls. Through the use of

robotics, a person can manipulate objects, perform functions through prosthetic (e.g., artificial extremity) and orthotic (e.g., braces) applications, render movement in spinal cord injuries (e.g., persons with paralysis), and perform many work tasks that before were not possible (Rubin & Roessler, 2008). A robotic arm can be attached to a powered wheelchair and controlled by a direct selection and toggle interface. It provides assistance with such functions as drinking, removing items from shelves, desktop manipulation of objects, and recreation (e.g., games). Fixed workstation (desktop) robots assist with manipulation of objects. A desktop vocational robot assistant can perform activities of daily living (e.g., meal preparation and feeding, writing, retrieving books, keyboard operations, use of a telephone). It also may assist with hygiene activities by washing and drying the operator's face, brushing teeth, combing hair, and shaving, as well as providing access to video and other games and craft (leisure) activities and to work (Cook, Polgar, & Hussey, 2008; Scherer, 2007).

Sensory Technology

Accommodations for people with visual impairments include both optical and nonoptical devices for low vision. Examples of optical devices are magnifiers, specially coated lenses, and eyeglass telescopes. Nonoptical visual aids include talking clocks and watches, talking calculators, closed-circuit televisions that enlarge print electronically, and personal computers and peripherals with the capacity of print magnification, speech output, and optical scanning (Brodwin, Star, & Cardoso, 2007). Additionally, hearing aids, TDD, cochlear implants, electronic ears, amplified telephones, and audio loops are helpful technology devices for persons who are deaf or hard of hearing.

Eye-Tracking Technology

Eye-gaze technology can track the movement of one eye to activate a computer (Johnson, Beard, & Carpenter, 2007; Mann, 2005). The individual must have sufficient head control and the ability to gaze directly at a camera. Derived from military eye control systems, the camera is typically attached to the head. Current scientific research promises enhanced eyeglass systems. Researchers described innovative gaze technology that features virtual reality goggles with an integrated camera and viewing screen to provide communication through icon choice. The user chooses targets by gazing at icons on the computer screen; the camera, integrated within the goggles, tracks eye-gaze motion and relays information for instantaneous processing.

Benefits of Technology

Upward social mobility is more realistic for persons with disabilities because of increased educational and employment opportunities and a greater sense of personal well-being (adjustment to disability) (Scherer, 2007). Technological devices, equipment, and services have allowed many people with disabilities to (1) exert greater control over their own lives; (2) participate in and contribute more fully and readily to activities in their own homes, school, employment, and community; (3) interact to a far greater extent with nondisabled individuals; and (4) benefit from opportunities that are taken for granted by persons who do not have disabilities (Cook et al., 2008).

Technology Interface

An area often overlooked by practitioners involves the interface (that part of the assistive technology with which the user interacts) between the person and the technological devices and equipment. An appropriate and usable fit may provide the difference as to whether an individual with a disability will continue to use the assistive technology or discontinue its use. The rate at which these people discontinue using technologies ranges from a low of 8% to a high of 75%. A national survey on assistive technology abandonment, conducted by Riemer-Reiss and Wacker (2000), found that 29% of devices and equipment obtained were later discarded. The number one reason cited for discontinuance was a lack of "relative advantage." This concept encompasses the effectiveness of the product, its reliability, and its ease of use, comfort, and enhancement of the user's performance. To decrease nonuse, the user needs to be involved throughout the process. The reality that many forms of assistive technology for people with disabilities are expensive needs to be carefully taken into account before recommending a device. This is not to say that most devices and equipment are costly, because many are inexpensive and easy to find.

The major goal of assistive technology is to enhance functional independence for individuals who have disabilities. The focus, therefore, is not on the disability but on the remaining functional capabilities that people use to accomplish their chosen objectives. Expectations a person has concerning technology are individualized and influenced by the disability and the consequences of that particular disability (Scherer, 2007). Through exploration of the individual's capabilities, functional limitations, and feelings about technological devices, practitioners can most effectively provide rehabilitation services. When assistive technology systems are considered for use, practitioners need to evaluate the various characteristics of the person that affect successful adaptation. With this in mind, practitioners can be well prepared to offer recommendations in the area of technology.

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See also: **Rehabilitation Psychology**

ASSOCIATION FOR BEHAVIOR ANALYSIS INTERNATIONAL

The Association for Behavior Analysis International (ABAI) is a nonprofit membership organization with the mission to develop, enhance, and support the growth and vitality of behavior analysis through research, education, and practice. Behavior analysis is an approach to the science of behavior that emphasizes behaviorist epistemologies and methods. ABAI was founded in 1974 as a result of concerns that this approach to behavior science did not receive adequate consideration from existing professional audiences. Similar concerns gave rise, at around the same time, to the founding of two major behavioral journals, *Journal of the Experimental Analysis of Behavior* and *Journal of Applied Behavior Analysis*.

Although according to some accounts the rise of cognitive science marked the end of behavior analysis, since the mid-1990s ABAI has approximately doubled in size. In 2008, ABAI had more than 5,000 members internationally and was parent organization to more than 60 affiliate groups that encompassed 12,000 members in more than 40 nations. ABAI sponsors an annual convention that attracts more than 4,000 registrants to more than 1,400 professional sessions. ABAI also stages regular specialty conferences and a biennial international conference. At the state and regional level, ABAI's affiliate groups sponsor approximately 40 additional annual meetings devoted to the science and practice of behavior analysis.

ABAI's members include basic researchers, applied researchers, and practitioners. Members' scholarly efforts, at both the basic and applied level, tend to focus on topics in, or that intersect with, operant learning. Topics that receive the attention of special interest groups within the association include, but are not limited to, applied animal behavior, autism, gerontology, behavioral medicine, behavioral pharmacology and toxicology, gambling, clinical issues, crime and delinquency, development, education, health and fitness, neuroscience, rehabilitation, sex therapy, and speech pathology.

ABAI publishes three scholarly journals. Its flagship journal, *The Behavior Analyst*, features review, theoretical, and discussion articles on a variety of topics related to the science and profession of behavior analysis. *Behavior Analysis in Practice* focuses on practical and scientific issues relevant to disseminating behavioral interventions to various field settings. *The Analysis of Verbal Behavior* is a specialty publication that examines the relevance of behavior analysis to understanding language and communication.

The Society for the Advancement of Behavior Analysis, ABAI's sister organization, solicits charitable contributions that support various grant and fellowship programs for students and professionals in behavior analysis. ABAI also is a member of the Federation of Behavioral, Psychological, and Cognitive Sciences. ABAI is based in Kalamazoo, MI, and its web site is http://www.abainternational.org.

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ASSOCIATION FOR BEHAVIORAL AND COGNITIVE THERAPIES

Founded in 1966, the Association for Behavioral and Cognitive Therapies (ABCT) is an interdisciplinary organization comprised of researchers, psychologists, psychiatrists, physicians, social workers, nurses, and other mental health practitioners and students (located nationally and

internationally) who adhere to, develop, evaluate, and disseminate behavioral and cognitive approaches to the assessment and treatment of behavioral and mental health problems.

Mission Statement

The core mission of ABCT is to advance a scientific approach to the understanding and amelioration of problems of the human condition. To that end, ABCT supports the investigation and application of behavioral, cognitive, and other evidence-based principles to assessment, prevention, and treatment. While primarily an interest group, ABCT is also active in (1) encouraging the development, study, and dissemination of scientific approaches to behavioral health; (2) promoting the utilization, expansion, and dissemination of behavioral, cognitive, and other empirically derived practices; and (3) facilitating professional development, interaction, and networking among members.

Professional Activities

ABCT conducts a variety of activities to support and disseminate the behavioral and cognitive therapies. The organization produces two quarterly journals, *Behavior Therapy* (research-based) and *Cognitive and Behavioral Practice* (treatment focused), as well as its house periodical, the *Behavior Therapist* (eight times per year). The association's convention is held annually in November. ABCT also produces fact sheets, an assessment series, and training and archival videotapes. The association maintains a web site (http://www.abct.org) with features such as a "Find-a-Therapist" search engine for consumers, among other resources for the public and the mainstream media. Members receive the benefits of an online clinical directory, more than 30 special interest groups, a list serve, a job bank, and an awards and recognition program. Other offerings available on the web site include sample course syllabi, listings of funding sources, and a broad range of offerings of interest to mental health researchers.

History

The organization was originally founded in 1966 under the name Association for Advancement of Behavioral Therapies (AABT; Franks, 1997). In opposition to the then prevalent models of psychosocial treatment, "The seminal significance of behavior therapy was the commitment to apply the principles and procedures of experimental psychology to clinical problems, to rigorously evaluate the effects of therapy, and to ensure that clinical practice was guided by such objective evaluation" (Wilson, 1997).

The first president of the association, Cyril Franks, founded the organization's flagship journal *Behavior Therapy* and was the first editor of the AABT *Newsletter*. The first annual meeting of AABT took place in 1967, in Washington, DC. An article in the November 1967 issue of the *Newsletter*, entitled "Behavior Therapy and Not Behavior Therapies" (Wilson & Evans, 1967) influenced the association's first name change to the Association for Advancement of Behavior Therapy because, as the authors argued, "the various techniques of behavior therapy all derive from learning theory and should not be misinterpreted as different kinds of behavior therapy . . . " (quoted in Franks, 1987). This issue remains a debate in the field and within the organization, particularly with the emergence of the term "cognitive behavioral therapies," which resulted in yet another name change in 2005 to the Association for Behavioral and Cognitive Therapies.

AABT/ABCT remains at the forefront of the professional, legal, social, and ethical controversies and dissemination efforts that have accompanied the field's evolution. The 1970s was perhaps the most explosive period of development. As noted by Gerald Davison (AABT's eighth president), "A major contribution of behavior therapy has been a profound commitment to full description of procedures and careful evaluation of their effects" (Davison & Stuart, 1974, p. 3). ABCT continues to play an instrumental role in the dissemination of empirically supported treatments.

The training of mental health professionals also remains a significant priority for the association. With continued concerns over quality control and standardization of practice, ABCT plays an active role in supporting the education and training of behavior therapists. As an example, ABCT supported the development of the American Academy of Cognitive and Behavioral Psychology, a specialty board of the American Board of Professional Psychology that provides board certification in Cognitive and Behavioral Psychology.

The governance of ABCT consists of elected officials with voting privileges along with nonvoting, appointed members who serve in volunteer positions. The executive committee (EC) consists of the elected offices of president, immediate past-president, president-elect, and secretary/treasurer. In addition to the EC, elected representatives-at-large and appointed members including chairs of publications, conventions, and membership committees, and a finance committee headed by the secretary/treasurer, form the main leadership positions of ABCT. The organization maintains a central office in New York City. The current executive director of the ABCT is Mary Jane Eimer. For a wealth of historical specifics (governing bodies, lists of editors, past presidents, award winners, SIGs, and conventions from the past 40 years) see ABCT's 40th anniversary issue of *the Behavior Therapist* (Albano, 2006).

About Behavioral and Cognitive Therapies

Cognitive and behavioral therapists help people learn to actively cope with, confront, reformulate, and/or change the maladaptive cognitions, behaviors, and symptoms that limit their ability to function. Goal-oriented, time-limited, research-based, and focused on the present, the cognitive and behavioral approach is collaborative; it values feedback from the client, and encourages the client to play an active role in setting goals and the overall course and pace of treatment. Practitioners teach clients concrete skills and exercises—from breathing retraining to keeping thought records to behavioral activation—to practice at home and in sessions, with the overall goal of optimal functioning and the ability to engage in life fully.

Because CBT is based on broad principles of human learning and adaptation, it can be used to accomplish a wide variety of goals. CBT has been applied to issues ranging from depression and anxiety to the improvement of the quality of parenting, relationships, and personal effectiveness. A wealth of scientific study has documented the helpfulness of CBT for a wide range of concerns throughout the lifespan. Cognitive-behavioral treatments "have been subjected to more rigorous evaluation using RCTs [randomized controlled trials] than any of the other psychological therapies" (Wilson, 1997).

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ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

The Association for Psychological Science (APS, http://www.psychologicalscience.org) is the leading international organization devoted solely to scientific psychology. Its mission is to promote, protect, and advance the interests of scientifically oriented psychology in research, application, and improvement of human welfare. APS has been a significant force in unifying and strengthening the science of psychology.

Overview

Established in 1988 as the American Psychological Society, APS was instantly embraced by psychology's scientific community, and its membership grew rapidly. By the end of its first year, APS opened an office in Washington DC and now has approximately 20,000 members from around the world. Members are engaged in scientific research or the application of scientifically grounded research spanning all areas of psychology. There are also student affiliates and organizational members. Distinguished contributions are recognized by Fellow status and awards. In 2006, the members of APS voted overwhelmingly in favor of changing the organization's name to Association for Psychological Science, to underscore both its scientific mission and its international scope. Today, APS is a vibrant and significant organization whose impact on national policy is well recognized and whose journals are among the best in the field of psychological science.

History

APS was created out of recognition that (1) the needs and interests of scientific and academic psychologists were distinct from those of members of the professional community primarily engaged in clinical practice, and (2) there was a strong need for an organization that would advance the interests of the discipline in ways that more specialized organizations were not intended to do. An interim group, the Assembly for Scientific and Applied Psychology (ASAP) had sought to reform the American Psychological Association from within, but their efforts were rejected by an APA membership-wide vote. APS then became the official embodiment of the ASAP reform effort, and the new organization was launched on August 12, 1988.

APS Publications

APS publishes four journals, all of which span the entire field of scientific psychology. *Psychological Science*, which is among the field's most highly ranked and prestigious journals, publishes authoritative articles of interest across all of scientific psychology's subdisciplines. *Current Directions in Psychological Science* offers concise invited reviews

spanning all of scientific psychology and its applications. *Psychological Science in the Public Interest* is a unique journal that provides definitive assessments by panels of distinguished researchers on topics where psychological science has the potential to inform and improve the well-being of society. *Perspectives on Psychological Science* is a bimonthly journal that features longer integrative pieces and an eclectic mix of reviews, essays, and other formats. APS has taken the additional step of allowing much public access to these journals, including never charging copyright fees for use of any journal article in the classroom or other education use; this policy stems from APS's founding commitment to "give psychology away."

APS also publishes the following: the monthly *Observer*, featuring news and opinion pieces; a *Current Directions Readers* series in conjunction with Pearson Education; a book series "Modern Pioneers in Psychological Science" in conjunction with Psychology Press; and self-published books on the teaching of psychology.

Annual Convention

APS's annual meeting, generally held in late spring, showcases the best, cutting-edge research across the full range of scientific psychology. The program features presentations by distinguished researchers and educators in a variety of formats, including invited addresses and symposia, unique crosscutting theme programs, and submitted symposia and posters. The convention also includes workshops on specialized topics, and increasingly is the venue for meetings of researchers in emerging research areas.

APS Funds

The David and Carol Myers foundation has given $1,000,000 to APS for the creation of an endowment fund that aims "to enhance the teaching and public understanding of psychological science for students and the lay public, in the United States, Canada, and worldwide." This endowment led to the establishment of the APS Fund for Teaching and Public Understanding of Psychological Science, which supports a variety of initiatives, including a program of small grants for innovative teaching projects, the annual APS David Myers Lecture on the Science and Craft of Teaching Psychology, and a public affairs internship to develop a new generation of science writers in psychology. APS also administers the Fund for Advancing Psychological Science, which receives significant donations for the benefit of psychology; this fund is partnering with the Cattell Fund, which supports sabbatical extensions for outstanding scholars.

Achievement Awards

APS recognizes exceptional contributions to scientific psychology with two annual awards: the APS William James Fellow Award for significant intellectual contributions to the basic science of psychology, and the James McKeen Cattell Fellow Award for outstanding contributions to the area of applied psychological research.

Advocacy

APS is widely recognized as an active and effective leader in advancing the interests of basic and applied psychological research in the legislative arena and in the federal agencies that support these arenas of research. One of the primary reasons APS was established was to provide a distinct Washington presence for scientific psychology. From its earliest days, APS has shaped the federal science infrastructure to increase support for behavioral and social science research. APS was a driving force behind the creation of a separate directorate for these disciplines at the National Science Foundation and was organizer of several discipline-wide summit meetings that resulted in the development of research agendas in the broad areas of health and behavior, aging, violence, productivity, psychopathology, and basic research.

As a core constituent of the National Institutes of Health, APS has successfully advocated for greater support of behavioral science and research and training at NIH. APS has led the effort to establish an infrastructure for basic behavioral science research at NIH, resulting in strong Congressional encouragement for programs in this area. APS has also advocated for the translation of basic behavioral research into clinical applications, with particular emphasis on mental health treatment, health promotion, and disease prevention.

APS is also supporting an effort by the Academy of Psychological Clinical Science to develop an accreditation system for clinical science training programs, with the ultimate goal of ensuring that future clinicians deliver mental health treatments and clinical interventions.

Engaging the Public

As part of the Association's mission to increase public understanding and use of research findings in psychology, APS showcases the latest findings in psychological science directly through blogs, audio podcasts, and an interactive public information Web site, as well as through coverage in a wide variety of science and general news outlets. In one example of the scope and reach of these efforts, versions of Wray Herbert's blog, "We're Only Human," featuring research published in APS journals and other psychology journals, consistently are in the top 10 most popular items on *Newsweek.com*, which translates into millions of readers for each column. Herbert's blogs also appear in *Scientific American MIND*, with similarly positive impact.

By engaging the public with psychological science through modern technology and social networking, APS is

restoring the image of psychology as a science-based discipline and providing people with interesting and important information in the areas of health, education, business, society, and virtually all other areas of human activity.

Detailed information on APS is available at http://www.psychologicalscience.org.

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ASSOCIATION OF PSYCHOLOGY POSTDOCTORAL AND INTERNSHIP CENTERS

Founded in 1968 and incorporated in 1982, the Association of Psychology Internship Centers (APIC) was originally constituted as an informal group of psychologists involved in internship training. These trainers banded together for the purpose of sharing information about mutual problems. Over time, the organization expanded its mission to include postdoctoral training as well as internship training, and in 1992 it was renamed the Association of Psychology Postdoctoral and Internship Centers (APPIC).

The overarching mission of APPIC is to enhance internship and postdoctoral training in professional psychology (Kaslow & Keilin, 2006) (http://www.appic.org). To accomplish this mission, APPIC (1) develops minimum standards for quality training programs at the internship and post-doctoral levels; (2) fosters the creation of new internship and postdoctoral programs; (3) devises selection policies and procedures to ensure a fair and orderly process of matching internship applicants and internship sites; (4) offers an online directory of internship and postdoctoral programs in professional psychology that fulfill APPIC membership criterion; (5) provides the APPIC Clearinghouse, which facilitates placing unmatched internship applicants to available positions; (6) encourages dialogue regarding salient selection and training issues for applicants, interns, and postdoctoral fellows; (7) facilitates, through both formal and informal mechanisms, management and resolution of challenges that emerge during selection or training of interns or fellows; (8) interacts with professional organizations and groups focused on doctoral and postdoctoral training and other aspects of professional psychology; (9) fosters the exchange of information between doctoral programs and agencies providing internship and/or postdoctoral training in professional psychology; (10) represents the views of internship and postdoctoral agencies to relevant groups and organizations in professional psychology; (11) shares with relevant stakeholders information on experiential training to members of the psychology community; and (12) encourages empirical investigations pertinent to psychology education, training, and supervision.

APPIC has a central office in Washington D.C. that includes a full-time executive director and two additional full-time staff. The APPIC board of directors includes seven psychologist members elected by APPIC-member internship and postdoctoral programs and one nonpsychologist public member chosen by the other board members. APPIC also has a number of committees focusing on membership at the internship and postdoctoral levels, the directory, universal application, and problem resolution.

APPIC is a membership and not an accrediting organization. To be accepted for APPIC membership, internship and postdoctoral residency programs must meet specific membership criteria related to the amount of training, the number and qualifications of supervisors, due process, and the payment of trainees. Membership is automatic for programs accredited by the American Psychological Association (APA) or the Canadian Psychological Association (CPA). To assist new and developing programs in meeting the criteria for membership, APPIC sponsors a mentoring program. In addition, doctoral-level academic programs in professional psychology may choose to become APPIC academic affiliates, a status that provides specific services to the program and its students.

APPIC offers a multitude of services. Beginning with the 1972–1973 training year, APPIC published a printed directory that contained descriptions of its member programs. In the summer of 2000, APPIC launched an online and more comprehensive version of the directory that can be updated at any time by training directors, and that permits users to search for programs using a variety of criteria. Effective 2008, the printed version of the directory will no longer be published. In the 1972–1973 directory, there were 90 internship programs listed and no postdoctoral programs. As of December 2007, in the 2008–2009 APPIC Directory Online, a total of 760 APPIC-member programs (650 internship and 110 postdoctoral residency programs) were listed.

Another major service is the facilitation of the internship placement process. For the 1972–1973 through 1998–1999 training years, APPIC conducted a standardized internship selection process, which utilized a uniform notification date to structure a previously unregulated process (Keilin, 1998). In 1999, APPIC instituted a computer-based internship matching program (called the APPIC Match) to place applicants into available positions (Keilin, 1998). Furthermore, APPIC has operated a postselection clearinghouse since 1986 to assist unplaced students and programs with unfilled positions.

In 1996, responding to concerns expressed by students about the variability among sites with regard to application formats and requirements, APPIC developed a standardized application form called the APPIC Application for Psychology Internships (AAPI). This form requires

the applicant to describe his/her background and education, as well as his/her practicum experiences and hours. There also are five essay questions on the AAPI. APPIC is currently developing a Web-based centralized application service that will allow applicants to complete and submit their application materials via the internet.

APPIC offers formal and informal assistance with problem resolution. These mechanisms are available to address formal complaints, as well as to provide consultation and assistance to all constituency groups.

The provision of information is another key service offered by APPIC, and this occurs in multiple ways. The first APPIC newsletter was published in 1980, and it has served as a major communication method regarding internship and postdoctoral training issues for member and subscriber programs. The APPIC Web site (http://www.appic.org), along with a variety of e-mail news and discussion lists, also aids in the dissemination of information to member and subscriber programs, intern and postdoctoral applicants, interns, and postdoctoral residents. More in-depth sharing of information also occurs at biannual membership conferences. In addition, APPIC has played a major role in the collection and dissemination of data and perspectives related to the supply and demand imbalance (Baker, McCutcheon, & Keilin, 2007; Keilin, 2000; Keilin, Baker, McCutcheon, & Peranson, 2007), internship matching process (Keilin, 1998; Keilin, Thorn, Rodolfa, Constantine, & Kaslow, 2000), models of internship training (Rodolfa, Kaslow, Stewart, Keilin, & Baker, 2005), and competencies in professional psychology (Kaslow, 2004; Kaslow et al., 2004).

In 2007, in collaboration with the American Psychological Association (APA), APPIC launched a peer-reviewed journal, titled *Training and Education in Professional Psychology*, published quarterly. This journal is published quarterly and includes papers that advance professional psychology education and that pertain to such topics as supervision, training, and the process of education leading to licensure.

There are myriad ways in which APPIC has been involved actively in the larger national and multinational psychology education, training, and credentialing communities. APPIC has ongoing liaison relationships with doctoral, internship, and postdoctoral training councils, as well as credentialing organizations. APPIC participates actively in various interorganizational groups related to training, credentialing, and professional issues in psychology. APPIC is directly responsible for nominating candidates for three seats on the APA Commission on Accreditation of the APA. APPIC coordinates the nomination process for the two additional "other internship seats" and one additional "postdoctoral" seat in conjunction with the other internship and postdoctoral communities of interest.

APPIC has taken a leadership role in national and multinational psychology conferences. In 1992, APPIC hosted the National Conference on Postdoctoral Training in Professional Psychology in Ann Arbor (Belar et al., 1993), which helped to lay the groundwork for the accreditation of postdoctoral residencies. In response to the supply and demand crisis in psychology, related in part to the imbalance in the number of intern applicants and internship positions (Keilin, 2000; Keilin et al., 2000), in 1996 APPIC and APA cosponsored the National Working Conference on Supply and Demand: Training and Employment Opportunities in Professional Psychology (Pederson et al., 1997). This conference drew attention to the crisis and led to the development and implementation of multiple strategies designed to reduce this imbalance. In 2002, APPIC hosted, with multiple other sponsoring groups, Competencies 2002: Future Directions in Education and Credentialing in Professional Psychology in Scottsdale (Kaslow, 2004; Kaslow et al., 2004). This conference has resulted in greater attention by the profession to the identification and training of core competencies, as well as a competency-based focus on assessment and evaluation of interns and postdoctoral fellows.

APPIC remains committed to taking the lead in addressing many of the complex issues that pertain to internship and postdoctoral training. This includes, but is not limited to, the internship supply-demand imbalance, postdoctoral requirement and structures, quality control monitoring, competency-based approaches to education and training, training models, new roles and new settings, funding, and the conduct of meaningful research (Kaslow & Keilin, 2006; Stedman, 2007).

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See also: **Clinical Psychology; Clinical Psychology, Graduate Training in**

ASTHMA

Asthma is characterized by inflammation of the airways, leading to hyperresponsiveness and/or and obstruction, which result in cough, shortness of breath, wheezing, and other clinical symptoms. Asthma often begins in childhood and is the most common chronic illness of childhood. Host (e.g., genetic) and environmental (e.g., allergens, stress) factors appear to interact to produce altered immune system responses that result in inflammation. Asthma is more prevalent in children (8.5%) than in adults (6.7%), females than males, African Americans than whites, those of Puerto Rican than Mexican origin among Hispanics, and among impoverished persons versus those at or above the federal poverty level (Moorman et al., 2007).

Psychological Aspects

The role of stress in the initiation, persistence, and exacerbations of asthma has long been recognized. As such, asthma may be considered a psychosomatic illness: a physical disorder with demonstrable perturbation in physical function and structure that is associated with psychological factors. A stressful early family environment, perhaps especially maternal distress, seems to contribute to the onset of childhood asthma. While the pathophysiology of stress and asthma is complex, there are several pathways through which stress alters immune function, which may include inflammatory processes in the airways, resulting in asthma symptoms. Strong emotions and/or stress may be among patients' triggers for asthma, or impair appropriate asthma self-management.

Asthma warrants more attention from behavioral scientists (see Lehrer, Feldman, Giardino, Song, & Schmaling, 2002, for a review of psychological aspects of asthma). Successful asthma self-management depends on patients who are educated and engaged in their care. Every patient with asthma should have a self-management plan. In partnership with their healthcare providers, patients with asthma should identify personal triggers for asthma exacerbations (such as strong emotions, allergens) and learn how to control them or mitigate their effects; learn their typical patterns of symptoms; and learn how to recognize the need for additional treatment (e.g., when to self-administer more or different medications). However, a minority (less than 40%) of adults and children with asthma reported that they have ever had an asthma management plan (King & Rudd, 2007). Improved collaborations between patients (and for children with asthma, family members, and others with significant roles in children's lives such as teachers) and providers that emphasize education, communication, and empowerment, could lead to better management and less impairment secondary to asthma.

The self-monitoring and self-management of asthma present a number of potential psychological challenges including cognitive-perceptual, behavioral, and interpersonal challenges. Patients with asthma vary in their ability or willingness to monitor and interpret appropriate bodily sensations that might herald airway changes because of insensitivity to these sensations or due to denial, minimization, or rejection of the sensations (for example,

because of not wanting to take more medications). In the most serious cases, underresponding to asthma symptoms and subsequent delays in seeking treatment can be fatal. There are a variety of feedback methods that can increase patients' abilities to recognize airways changes. For example, a peak-flow meter is a self-monitoring device that many patients with asthma use to check and monitor their breathing. Medication adherence is a challenge: adherence to an inflexible medication regimen should be easier to establish because of the ability to develop routine habits and prompts; an asthma self-management plan usually includes contingent and therefore changing medication use.

Management

The National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health has developed and disseminated comprehensive guidelines for the diagnosis and management of asthma since 1991 when the first Expert Panel Report (EPR) was published. The second EPR was published in 1997, and an update to the second EPR was published in 2002. The third and most recent EPR, EPR-3, was published in 2007 (NHLBI, 2007). The goals of asthma management are to help patients avoid diminution in quality of life or functional limitations because of asthma.

Health services researchers consider asthma to be an ambulatory care sensitive condition—a condition that should be managed on an outpatient basis and for which hospitalizations should be preventable. Hospitalizations for asthma may reflect poor access to primary care and/or the failure of the asthma self-management plan. As evidence of the former, nearly 30% of healthcare visits for asthma occurred in emergency departments among patients without health insurance whereas only 6% of healthcare visits for asthma occurred in emergency departments for patients with private health insurance (CDC, 2003). Regarding the latter, Flores, Abreu, Chaisson, & Sun (2003) found that providers tended to attribute avoidable hospitalizations for asthma among children to parent or patient self-management failures whereas parents tend to attribute them to provider failures. Increased access to primary care and better communication among providers, patients, and significant others should result in better disease management, few life disruptions, and significantly decreased healthcare costs.

The EPR-3 presented emerging evidence of comorbid conditions that complicate or interfere with asthma management; some of these conditions—such as depression and obesity—also have strong behavioral components. There is some evidence that weight reduction among obese persons with asthma is associated with less perceived breathing difficulty and improved pulmonary function based on physiological measures. Comorbid depression seems to be more strongly associated with patient perceptions of more asthma symptoms and poorer asthma self-management, such as medication adherence, than with objective measures of pulmonary function. Depression treatment may improve asthma medication adherence (including the treatment of depression for depressed mothers who have the primary responsibility to manage their children's asthma) and patients' perceptions of asthma symptoms.

Attending to the behavioral and perceptual issues associated with asthma is a best practice (per the EPR-3) and some studies have made psychological interventions the centerpiece rather than an adjuvant intervention. Written emotional expression and relaxation training are examples of such interventions (Lehrer et al., 2002; NHLBI, 2007). There is limited evidence regarding their efficacy: positive effects tend to be found for patients' perceptions of asthma symptoms, but there is less evidence for change in objective measures of pulmonary function. Further research to establish the efficacy of primary or adjuvant psychological interventions is indicated.

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See also: **Stress Consequences**

ATHLETIC COACHING

At all levels of sport, coaches function as educators, leaders, and strategists. In these roles, they can strongly

influence the performance and personal development of the athletes with whom they come in contact. In the United States alone, an estimated 41 million children participate in nonschool programs, and another 6 to 7 million in interscholastic sports. Others participate at more elite levels, in intercollegiate, or professional sports. The teaching techniques coaches employ, the goal priorities they establish, the values they exhibit and reinforce, and the relationships they form with athletes in this important domain of athletic involvement have all been topics that have attracted the attention of psychological researchers.

One important area of research is coaching instructional techniques. Behavioral researchers have observed and analyzed the techniques employed by outstanding coaches at all levels of competition. They have found that such coaches tend to use approaches that have proven successful in enhancing performance in other performance domains, such as education and business. Systematic goal setting has proven to be a powerful technique for positive skill development (Gould, 2006). Coaches who employ this technique analyze the task requirements and current skills of the athlete, set specific behavioral (not outcome) goals, develop individualized action plans for developing the needed skills, set timelines for attainment, and closely monitor the targeted behaviors. This approach has proven effective from the youth to the professional levels.

Other research has shown that behavioral feedback and the use of positive reinforcement enhances the development of sport skills. In general, a "positive approach" to strengthening desired behaviors through encouragement, sound technical instruction, and positive reinforcement of desired behaviors is preferred by athletes to a negative one featuring criticism, punishment, and an emphasis on avoiding mistakes (Smith, Smoll, & Christensen, 1996). Athletes expect coaches to exert control over the situation and to establish and enforce discipline, but they prefer that it occur within the context of a basically positive coach-athlete relationship.

Increased research attention has been directed toward youth sports in recent years (Conroy & Coatsworth, 2006). Behavioral coding techniques have been developed, enabling researchers to observe coaches during practices and games, code their responses to particular classes of situations (e.g., positive and negative athlete behaviors, particular game situations), and generate behavioral profiles of the coaches based on thousands of their behaviors (Smith et al., 1996). They can also obtain athletes' and coaches' ratings of how often the coach engaged in the various behaviors that were coded. Such research has shown that even child athletes are more accurate perceivers of coaching behaviors than the coaches are, indicating that most coaches have limited awareness of their behavior.

Research has also shown that coaching behaviors are far more strongly related to athletes' attitudes toward the coach than are won-lost records. Although winning becomes more important in adolescence than at earlier ages, behaviors continue to be more powerful predictors of athletes' evaluations of coaches. In line with the "positive approach" described above, coaches who create a supportive environment through their use of encouragement, technical instruction, positive reinforcement of desired athlete behaviors (including compliance with team rules), and avoidance of punitive behaviors are best liked by athletes (Smith & Smoll, 1997). On teams coached by positive coaches, athletes also like their teammates more, possibly because of the socially supportive atmosphere encouraged and modeled by the coach.

Such findings have inspired a number of coach training programs designed to help coaches create an athletic environment that is enjoyable and fosters positive psychosocial outcomes (Conroy & Coatsworth, 2006; Smoll & Smith, 2006). Such programs give coaches specific behavioral guidelines, show them how to engage in the positive behaviors and find alternatives for punitive ones, and teach coaches how to monitor their own behavior so as to make them more self-aware.

In research assessing the effects of such training, behavioral observations and athletes' ratings of their coaches' behaviors indicated that, compared with untrained coaches, trained coaches behaved in a more supportive and encouraging manner. Although they were not more successful at a won-lost level, the trained coaches were evaluated more positively by their athletes and their athletes showed significant increases in self-esteem and decreases in performance anxiety by the end of the season. They also showed a lower rate of dropping out of sports the following season. Athletes who played for trained coaches showed only a 6% attrition rate compared with a 27% dropout rate among athletes who played for untrained coaches (Smith & Smoll, 1997). The latter finding is important because there is considerable evidence that children and adolescents who remain involved in sports are less likely to engage in delinquent and other self-defeating behaviors.

An important current focus of research is the "motivational climate" created by coaches. Analyses of achievement-related goals in children and adults have identified two important goal orientations, known as mastery and ego orientation. Mastery-oriented people feel successful and competent when they have learned something new, witnessed skill improvement in themselves, mastered the task at hand, or given their best effort. Their achievement strivings are described as self-referenced because they compare their effort and performance with their own internal standards.

In contrast, ego-oriented people's feelings of competence are other-referenced, relying more on comparison with others. They feel successful when they show their superiority over others or avoid feeling inferior to others. Although both orientations can lead to successful performance, research in both educational and sport settings indicate that mastery-oriented people are more likely to persist

in the face of adversity or failure, place more emphasis on effort than outcome compared with ego-oriented individuals, and select more challenging goals. They can feel successful even when the desired outcome has not been attained if they believe that they gave maximum effort and learned important things from the experience. Ego-oriented individuals are more likely to experience distress and eventually to avoid settings in which they do not win out over others.

Most people have both task and ego orientations to varying degrees. The situational context or motivational climate that exists in achievement settings can differ in the extent to which task- or ego-involving goals are emphasized. A mastery-oriented motivational climate supports and strengthens task orientation, whereas an ego-oriented climate fosters other-referenced competitiveness with others. Much educational research has shown that mastery-oriented climates promote better academic performance and intrinsic motivation to learn, lower levels of fear of failure, and a positive orientation toward mastery, and the same is being found within sports (Duda & Balaguer, 2007).

These research results are now being applied within the athletic domain by coaches at all levels of sport. The principle is that if athletes are thoroughly oriented toward becoming as proficient as possible ("their" best rather than "the" best), are not shackled by fear of failure, and are prepared and well-coached, winning will take care of itself within the limits of their ability. Research shows that mastery-oriented sport environments provide more enjoyable and fulfilling settings for the majority of athletes. One recent study revealed that the extent to which coaches created a mastery environment was 10 times more important than was the team's won-lost record in accounting for variations in young athletes' liking for their coaches (Cumming, Smoll, Smith, & Grossbard, 2007).

Other research has shown that training coaches to create a mastery climate has notable positive effects on young athletes. In response to a decreased emphasis on winning, such athletes exhibited significant decreases in performance anxiety over the course of the season, whereas anxiety increased in a control condition whose coaches were not trained as competitive pressures increased over the course of the season (Smith, Smoll, & Cumming, 2007). Athletes also showed salutary changes in their achievement goal orientations, moving toward a mastery orientation and defining success in terms of personal improvement and effort rather than winning or besting others (Smoll, Smith, & Cumming, 2007). More importantly, the lessons learned in mastery environments may have salutary carryover to other achievement domains as well. In the latter study, children who played for the trained coaches exhibited stronger mastery achievement orientation in school as well by the end of the athletic season.

Recent years have witnessed an increasing awareness of the fact that coaches must not only be skilled teachers of technical skills and strategies, but also must attend to social-psychological aspects of the athletic environment. This awareness has been reflected in a burgeoning literature on psychological principles in peak performance, team cohesion, and athletes' sport commitment and enjoyment, as well as psychologically oriented coach training programs.

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See also: **Sport Performance Interventions; Sport Psychology**

ATTACHMENT AND BONDING

"Attachment and bonding" is a phrase that one now naturally thinks of in describing the early intimate interactions

between parent and infant. "Attachment" is the more scientific term that originally referred to an infant's relationship with his or her parent. As attachment theory and research developed, it became applied to individuals of all ages when describing relationships in which they turn to another for safety and the felt-sense of safety. "Bonding" or "affectional bonds" is taken to refer to an ongoing relationship with a specific person that is emotionally meaningful and creates a desire to maintain mutual contact. Using the terms in this manner, a mother would not be considered to be "attached" to her infant, because she would not turn to her infant for safety. Seeking safety from the other may or may not be a feature in an "affectional bond," whereas it is always a central component of an attachment relationship. In the most important book in the attachment field, *Handbook of Attachment* (Cassidy & Shaver, 1999), "bonding" is not even listed in the subject index.

Attachment theory originated through the joint work of John Bowlby (1969), a British psychiatrist, and Mary Ainsworth, an American psychologist, in the 1950s and 1960s. Over the past 50 years, buttressed by a very large body of research, it has emerged as the dominant theory of child development. It is accepted as a central organizing principle of emotional, social, motivational, and cognitive development, not only in childhood, but throughout life. Attachment relationships become organized into comprehensive patterns of interactions that are quite comparable to, and influential in, the development of the personality. These attachment patterns, when functioning well (i.e., characterized by security), demonstrate a persistent and repetitive quality, but they are not rigid. The patterns are able to change over time in response to new attachment relationships. Thus, a boy's attachment characteristics may develop one way in response to his relationship with his parents and evolve in different directions in relationship to teachers, coaches, mentors, therapists, and partners. Attachment patterns develop—and remain important—from infancy and childhood to adulthood and old age (Grossmann, Grossmann, & Waters, 2005).

The experience of safety, the core of attachment relationships, is now seen as a crucial feature in the optimal functioning of the brain (Schore, 2001). Within conditions of safety, the entire brain functions in a unified and coherent manner to best understand the immediate situation and to respond in the best possible manner. For young children, their attachment figures become the focus of their early learning about themselves and the world. Their emerging experience of self and other and of objects and events is organized and deepened through the attuned and "meaning-making" relationship that they have with their attachment figures (Siegel, 2001).

The most common attachment classification (close to two thirds of the population) is known as "secure." Children (and adults, in which case the classification is called "autonomous") who manifest this pattern have a relationship with their attachment figure that is characterized by open and inclusive communications. When under stress, these children readily turn to their attachment figures for safety, including comfort and support. Once they feel safe, they are then free to explore the world, often with a good degree of interest and independence. Securely attached children are most definitely not "dependent" children. They are able to blend very adaptively the need to rely on an adult when necessary and to rely on self when able to do so. The securely attached—of all the classifications—are the most able to successfully combine their own need for autonomy with intimate relationships. They are aware of their own interests and values as well as those of others. They are able to address and understand differences and they have the skills needed to resolve conflicts (Sroufe, Egeland, Carlson, & Collins, 2005).

Parents of securely attached children are likely to be available, sensitive, and responsive to their child's needs along with his or her inner life of thoughts, feelings, and wishes. They are also willing and able to repair any breaks in the relationship when necessary, providing the child with a crucial sense of safety that the relationship will exist in spite of separations or conflicts. Most importantly, the parents of such children manifest attachment security in their own relationships. In fact, measures of their own attachment classification, which are based on their telling the story of their own attachment histories, are better predictors of their child's attachment classification than are their specific interactions with their child (Hesse, 1999).

"Avoidant" and "ambivalent" are the two other organized attachment patterns. In the former, the individual tends to minimize the importance of his attachment relationship while attempting, instead, to "go it alone." The "avoidant" individual tends to downplay the importance of both emotions and relationships in his life and adopts a more detached, self-reliant, and rational view of his situation. The "ambivalent" individual tends to overemphasize the importance of her relationships with attachment figures and downplay her own perspective and independence. She is likely to become immersed in the emotional immediacy of situations rather than taking a more distant and long-term perspective. This individual often compulsively, but unsatisfactorily, focuses on attachment relationships at the expense of developing her independence and more reflective skills.

There is a fourth attachment classification that does not represent an organized pattern of interactions and perceptions as do the other three. This classification is known as "disorganized" (or "unresolved" for the adult), which reflects the individual's lack of a predictable response to relationships, especially in situations of stress. Because of its unpredictable features, persons with these features were originally considered to fall in a "cannot classify" category. Children with this classification tend to attempt to control all events in their lives. They are at risk for problems of externalization (attention deficit/hyperactivity,

oppositional-defiance, aggressive outbursts) as well as problems of internalization (anxiety, depression, dissociation) (Lyons-Ruth & Jacobvitz, 1999). Parents of these children tend to have difficulty in maintaining their own sense of safety when their child's attachment needs are the most active. The parents tend to become frightening to the child or show signs of being frightened by their child in those circumstances. In worst cases, they are at risk to abusing and/or neglecting their child.

Although attachment security is seen to be positively correlated to many important features of childhood development, one might emphasize now two central features. First, children with attachment security tend to manifest a high level of emotional development. They are likely to be quite able to identify, express, and regulate the full range of their emotional experiences. In doing so, they tend to be proficient in maintaining ongoing "affectional bonds" with family and friends and to have excellent social skills in most situations. Second, individuals with attachment security tend to be able to reflect on their experiences and to be aware of the features of their own inner lives as well as the inner lives of others. They are proficient at considering other perspectives and integrating their relationships with others into their own developing sense of organized values and interests. Being proficient in both their emotional and reflective abilities, they tend to be able to determine the "best possible" response in a given situation and then to respond in a flexible, adaptive, manner.

Although attachment theory is now firmly established in academic centers studying human development, it is only beginning to present applications of this theory and related research in the many fields where it most certainly is relevant. These include maternal care and childbirth, early childhood development, day care and preschool programs, education, social services, mental health and psychotherapy, health, parenting and family studies, child abuse and neglect, trauma and its treatment, life cycle, and aging.

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See also: **Attachment Styles; Attachment Theory**

ATTACHMENT DISORDERS

Attachment describes the human infant's tendency to seek comfort, support, nurturance, and protection from a relatively small number of preferred caregivers or attachment figures. The capacity to form an attachment is not present at birth, but develops over time. Although infants in the first 6 months are able to distinguish among different interactive partners, they do not express an obvious preference for one caregiver over another. All of this changes at around 7 to 9 months of age. At that point, infants begin to exhibit stranger wariness and separation protest, two behaviors that herald the onset of focused attachment. Stranger wariness varies from mild reticence to outright distress, but it contrasts with the infant's comfort with an attachment figure, from whom the infant seeks comfort, support, nurturance, and protection. Separation protest describes the infant's reaction to actual or anticipated separation from an attachment figure. After these two behaviors appear, infants are attached to one or more caregivers. Once infants have developed the cognitive capacity to exhibit separation protest and stranger wariness, they may form new attachments with any caregivers with whom they have significant interactive experiences.

Under species typical rearing conditions, the infant forms a small number of selective attachments to caregiving adults, based on having regular interactions with them. Although older children can sustain attachment relationships over time and space, in the first three years of life or so the young child needs actual interaction with

caregivers in order to become attached to them. Behaviors of the young child that promote physical proximity to the caregiver are called attachment behaviors and are readily observed, especially when the child is frightened, frustrated, tired, or ill. These states tend to diminish the child's exploration of the physical or social world and intensify the child's seeking proximity from an attachment figure. Strangers, or even adults with whom the child is familiar and comfortable, cannot provide the child with needed comfort unless the child has formed an attachment to them.

For infants raised in species atypical rearing conditions, disturbed and developmentally inappropriate ways of relating may evolve. Examples of atypical rearing conditions include institutions (i.e., orphanages), frequent changes of caregivers (as sometimes happens in foster care), neglectful or abusive caregiving, losing a caregiver suddenly, and being raised by an inappropriately responsive or unresponsive caregiver.

The clinical entity describing serious attachment abnormalities is called reactive attachment disorder (RAD). RAD is rare, occurring only in conditions of severe neglect. According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV-TR; American Psychiatric Association [APA], 2000), RAD is a disorder in which specific behavioral abnormalities result from pathogenic care and appear before the age of five years. DSM IV-TR defines two subtypes of RAD, inhibited and disinhibited.

Inhibited RAD is characterized by "persistent failure to initiate or respond in a developmentally appropriate fashion to most social interactions as manifest by excessively inhibited, hypervigilant, or highly ambivalent and contradictory responses" (APA, 2000, p. 130). Children with this subtype have been severely neglected and become emotionally withdrawn and unresponsive, exhibit few positive expressions of emotion, and do not seek comfort when distressed (Zeanah & Smyke, 2008).

Disinhibited RAD is characterized by "indiscriminate sociability with marked inability to exhibit appropriate selective attachments" (APA, 2000, p. 130). Children with this RAD subtype also have been severely neglected, but they look quite different from children with the emotionally withdrawn/inhibited type. They express positive emotions, interact readily, are socially responsive, and may even seek comfort when distressed. Nevertheless, they are not selective in expressing these behaviors. What characterizes their behavior is lacking the expected reticence around strangers, approaching them without hesitation, and being willing to go off with them. They may lose track of their caregivers in public, wander away without concern, and seem socially comfortable with unfamiliar adults (Zeanah & Smyke, 2008).

Longitudinal data about the course of attachment disorders are limited. The criteria define a disorder of early childhood. At this time, there is no agreed upon method for diagnosing attachment disorders in older children or adults, although indiscriminate behavior has been described in adolescents (O'Connor & Zeanah, 2003).

Although some of the signs and symptoms of RAD are similar to those of other disorders, the diagnosis is clear because of its distinctive clinical subtypes and the history of neglect. The social impulsivity in attention-deficit-hyperactivity disorder, the unresponsiveness in pervasive developmental disorders and the marked inhibition in some anxiety disorders may pose diagnostic challenges. Other clinical problems associated with severe neglect, such as language and cognitive delays, may co-occur and sometimes complicate the clinical picture. In order to diagnose RAD, the American Academy of Child and Adolescent Psychiatry Practice Parameters for RAD (AACAP, 2005) recommend observing the child serially with all involved caregivers and with an unfamiliar adult, in addition to obtaining a thorough history of early caregiving environments from collateral sources.

The first priority of treatment is to establish a safe and stable caregiving environment with a warm and consistent caregiver. Treatment of RAD begins with addressing the relationship between the primary caregiver and child. Treatment may be conducted with the caregiver or with the caregiver and child, but it is essential for the relationship between the child and a primary caregiving adult to be the focus. The chief goal of the treatment is helping the child learn through repeated interactions with the adult caregiver and that the caregiver can be relied on to provide comfort, support, nurturance, and protection. Associated problems, such as cognitive and language delays, aggression, and posttraumatic symptoms, should also be addressed with appropriate therapeutic interventions.

The emotionally withdrawn/inhibited subtype of RAD seems to be especially responsive to introduction of a caring adult, although it is less clear whether the child remains at risk for subsequent interpersonal difficulties. The indiscriminate/disinhibited type of RAD, on the other hand, is less responsive to caregiving, particularly in children who experience neglect after they reach the age of 2 years. Children with the indiscriminate/disinhibited type of RAD do appear to be at increased risk for peer relational problems in adolescence (Zeanah & Smyke, 2008).

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See also: **Attachment Theory; Separation Anxiety Disorder**

ATTACHMENT STYLES

Unraveling the nature of the bonds that form between people and identifying the sources of variation in the relational characteristics observed across groups of people are prominent topics in the social sciences. One approach to explaining and predicting the variations in close personal relationships is to classify individuals based on consistent patterns of interpersonal behavior and emotional reactions to relational partners. A variety of typologies based on Bowlby's (1969) attachment theory have been proposed for classifying interpersonal tendencies according to prototypical categories known as attachment styles. Attachment styles have been classified categorically on the basis of observed behavioral differences in response to controlled situations, by inference from responses to structured interviews, and from scores derived from responses to multiple-choice questionnaires.

Dimensions of attachment that can be scored along a continuum, such as relational anxiety and avoidance of intimacy, have also been derived from categorical attachment styles to allow finer grained analyses of individual differences. Even a cursory understanding of the meaning and implications of attachment styles requires some familiarity with the underlying theory, the empirically derived typology of styles, the methods used at various ages to assess attachment styles, and the implications of individual difference in attachment styles across a variety of domains of human functioning.

Attachment Theory

Bowlby (1969) formulated his attachment theory based on the premise that many of the most primitive aspects of human relatedness evolved to support the survival of infants, who are born helpless and are thus highly vulnerable to predators and to fatal accidents. Because human infants must maintain close physical proximity to a responsive and protective caregiver, an attachment-maintaining behavioral system is thought to have developed as an adaptation to constrain infant mortality rates. Without such consistent protection and nurturance, children are unlikely to attain puberty and produce progeny of their own. Thus, children of nurturing and protective parents are endowed with an adaptational advantage that results in a greater likelihood of their familial genetic legacy enduring and influencing the characteristics of their species.

Given the propositions that compose this framework, attachment theory is clearly rooted in theories of evolutionary biology and child development. However, attachment-maintaining traits are not understood to be purely heritable but are instead attributed to experiential learning transmitted from parent to child in a manner consistent with social learning theory. Indeed, when Bowlby first presented the ideas that led him to formulate attachment theory, he was characterized by his detractors in the British psychoanalytic community as a behaviorist (Bretherton, 1997).

Attachment theory has been extended beyond its more circumscribed beginnings in child development and romantic bonding to explain the interpersonal regulation of affect (Diamond & Fagundes, 2008) and the cognitive representation of relational experiences and expectations (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996). Furthermore, what was once understood as a theory pertaining mainly to developmental psychology has been adopted by researchers in the domains of clinical and social psychology, as well as primatology and behavioral neuroscience. As attachment theory is applied across diverse cultures in manifold domains by researchers trained in disparate disciplines, there is some danger that its principles and meaning will be distorted to fit so many aims that a corresponding loss of coherency will result. For instance, Main (1999) raised the objection that attachment has been applied in such an overly general manner to pertain to all affectionate relationships that

its unique relevance to enhancing children's safety under conditions of perceived threat is often lost.

Typology of Attachment Styles

Individual relational patterns, known as *attachment styles*, have been observed to emerge during infancy and are linked to the sensitivity, responsiveness, and consistency of children's caregivers (Ainsworth, Blehar, Waters, & Wall, 1978). These patterns are held to provide evidence of flexible but enduring cognitive structures termed *internal working models* (Bowlby, 1969), which in turn guide interpersonal expectations and relational behaviors while influencing the meanings attributed to interpersonal experiences throughout the lifespan.

Infants whose cries and other signals of distress consistently receive warm, sensitive, and nurturing care tend to develop a style of responding well to soothing behavior from others. Such children appear to expect nurturance and to thrive on it. These children demonstrate a balance of exploratory interest in their environment and reliance upon the caregiver as a secure base in times of insecurity or distress. The attachment style of children fitting this description is deemed to be a *secure* one. Adults who are comfortable with depending on others and having relational partners depend on them are considered to exhibit a secure adult attachment pattern. Patterns of attachment behavior at any age that deviate substantially from this model are characterized as *anxious* or *insecure*.

Anxious attachment styles have been defined by various terms, including ambivalent, avoidant, and disorganized/disoriented among children and preoccupied, dismissive, and fearful among adults. Children who seem reticent to seek parental care and who may even show somewhat more interest in the attention of adult strangers may be classified as avoidant. The corresponding style of adults who adopt an extremely self-reliant attitude and who express little desire for relationships with others is termed *dismissive*. If, however, an adult's pattern of devaluing relationships contains evidence of chronic interpersonal anxiety and concerns about how well they themselves can function in close relationships, the classification of a *fearful* attachment style is more fitting.

Some children heartily protest the absence of their caregivers, but are difficult to soothe when their signals of distress are responded to. This pattern has been attributed to inconsistencies in the sensitivity and responsiveness of the child's caregivers. Such inconsistent care undermines the child's ability to reliably predict the caregiver's behavior, thus raising the child's anxiety in anticipating that the caregiver's response may be delayed, inadequate, or unpleasant. This style of anxious attachment may be classified as *ambivalent*, because the child appears to relate to the parent as alternately desirable and aversive. When adults perceive relationships as highly desirable, but seem prone to anxious concerns about rejection and to require excessive reassurance from their partners, they are likely to be classified as exhibiting a *preoccupied* attachment style.

The most recent classification of attachment in children, termed *disorganized* (Main & Solomon, 1986), was created to capture the behavior patterns of children who fit poorly in the other attachment categories. These children display idiosyncratic and contradictory sequences of attachment responses that may reflect the insensitive and erratic characteristics of their caregivers. Parent-child relationships in this group have sometimes been characterized as highly conflictual or hostile, and these children have been shown to be at elevated risk for disorders of conduct and defiance (Lyons-Ruth, 1996). The corresponding category on Main's Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) is termed *unresolved,* in reference to the frequent association between unresolved issues of loss and trauma in childhood and this attachment style. Members of this attachment category tend to experience fear in close personal relationships. When methods other than the AAI are employed to assess adult attachment, such individuals may be more likely to be classified with the previously noted fearful attachment style.

Methods of Assessing Attachment Style

Although attachment classification was pioneered by means of observing infants in the Strange Situation Test (Ainsworth et al., 1978), later studies examined attachment styles in adults by employing either interviews or self-report measures. The previously mentioned AAI is the most prominent example of the interview approach.

Researchers desiring measures that lend themselves to use with larger population samples have developed paper and pencil measures yielding various indices of self-reported attachment tendencies. Early samples of this method included the three-category approach of Hazan and Shaver (1987) and the four-category approach of Bartholomew and Horowitz (1991). Later developments of these measures have departed from categorical assignment and allowed individuals to rate the degree of correspondence between themselves and each of the attachment-style prototypes. These scores can then be combined to develop a more complex picture of individual differences in adult attachment styles. An alternative method has been to disassemble the attachment prototypes into their constituent statements, which can be rated on a Likert-type scale. The scores can then be combined to provide indices of various theoretical dimensions or subscales.

One such method (Bartholomew & Horowitz, 1991) yields scores along dimensions of anxiety about oneself in relationships (model of self) and one's appraisal of the reliability and desirability of others as attachment partners (model of other). These dimensions within attachment styles can then be used to make finer distinctions regarding linkages between attachment styles and other personal

and interpersonal characteristics. This approach is congruent with the conceptualization of internal working models of the self and of the attachment figure described earlier as components of attachment theory.

Since Bartholomew first established a dimensional model for assessing attachment styles, much research has been conducted on the relative merits of categorical and dimensional models, as well as on comparisons between self-report questionnaires versus interviewing methods. Bartholomew and Shaver (1998) demonstrated varying degrees of convergence across a variety of methods, supporting the proposition that the underlying conceptual dimensions of attachment theory can be tapped by various means. A large and elaborate factor-analytic study comparing the results obtained from most of the established self-report measures of adult attachment (Brennan, Clark, & Shaver, 1998) found support for two independent factors corresponding to the theoretically formulated dimensions of relational avoidance and relational anxiety. A study contrasting the AAI with two prominent self-report measure of adult attachment (Shaver, Belsky, & Brennan, 2000) found further support for the existence of underlying dimensions that connect the otherwise different methods of assessing adult attachment and concluded that dimensional assessment of adult attachment provides results of greater precision when compared to methods employing categorical typologies.

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See also: **Attachment and Bonding; Parental Approaches; Separation-Individuation**

ATTACHMENT THEORY

Attachment theory defines an evolutionary-based relationship between a child and a parent figure. Attachment is a biologically based behavioral system that evolved in ways that influence and organize human motivational, emotional, and cognitive and memory processes. The relationship is conceived to develop initially in infancy and contribute to development, other relationships, risk, and mental health throughout the life span (Bowlby, 1969/1982, 1973, 1980; Cassidy & Shaver, 2008). Attachment has become a shorthand term that connotes a complex set of interrelated patterns of behavior and thinking directed toward a parent figure that is wiser, protective, and caring.

Attachment is distinguished from other social relationships by the following constellation of behavior and processes: (1) proximity seeking; (2) distress when

separation is not understandable; (3) happiness at reunion; (4) grief/sadness at loss; (5) secure base behavior, which is the capacity to explore when the attachment figure is present (Ainsworth, 1989); and (6) viewing the attachment figure as having an enduring commitment to being available when needed (Kobak, Cassidy, & Ziv, 2004). Children develop preferred attachment relationships with parents and other caring adults (e.g., foster parents, day-care providers). Attachment contributes to the development of an integrated self, confidence in self and others, and the ability to endure life's challenges and stressors (George & West, in press; Sroufe, Egeland, Carlson, & Collins, 2005).

Attachment behavior is adaptive, from both an evolutionary perspective and a proximate, immediate care perspective. It keeps children close to and cared for by attachment figures, thus improving the chances of survival and parent reproductive fitness. Attachment behavior is guided by a neurologically based mental representational system that has specific biological substrates and influences physiological homeostasis (Cassidy & Shaver, 2008). When the attachment system is activated by perceived stress or threat, individuals desire physical or psychological proximity or contact with attachment figures (Bowlby, 1969/1982, 1973). Both internal cues (e.g., illness, fatigue, hunger, pain) and external cues can activate attachment. Some of these cues are universal to humans through evolution, (e.g., peripheral movement; separation from attachment figures), and others are learned.

Childhood Attachment Patterns

The quality of the child's attachment reflects real experience with the parent. Attachment patterns, also termed "status" (Ainsworth, Blehar, Waters, & Wall, 1978), are influenced but not determined by temperament, genetics, parents' marital satisfaction, and culture. Attachment is dyad-specific; quality of attachment with one parent is independent of other attachment relationships. There are four major patterns of child attachment, originally identified in infants and later extended to older children. Three patterns are conceived as organized forms of attachment; secure, insecure-avoidant, insecure-ambivalent-resistant (Ainsworth et al., 1978). The fourth pattern is disorganized-controlling (Main & Cassidy, 1988; Main & Solomon, 1990). Several decades of research provide a lens for understanding these patterns, including cross-cultural naturalistic and laboratory studies (e.g., Strange Situation, Attachment Q-sort) and studies of attachment and caregiving representations (e.g., Attachment Doll Play, Separation Anxiety Test, interview) (Solomon & George, in press).

Children with organized attachments signal need and get close to their parents when they experience attachment distress. *Secure* children signal promptly and clearly and prefer care by their parents above all others. They are confident that their parents are accessible, sensitive, and responsive and will follow through promptly and completely. Their parents view them as deserving care. They work hard to juggle their own needs with their children's needs in a developmentally and contextually appropriate manner. The secure relationship is balanced, mutually satisfying and comfortable, and characterized by emotional sharing and the co-construction of plans and activities. The secure attachment relationship is conceived as a "goal-corrected partnership" (Bowlby, 1969/1982).

Children develop insecure attachments when parental accessibility and sensitivity are compromised. Insecure children are anxious and use defensive processes to manage distress (e.g., exclusion, transformation of attachment experience and affect) so as to achieve at least minimal parental care. Insecure-avoidant children maintain an independent facade. Defensive deactivation, the goal of which is to cool down distress, is their primary form of defense. Deactivation is not always 100% effective, and distress does leak through, for example, in the form of strong separation anxiety when separated from parents. Their parents contribute to attachment distance with mild rejection and behavior that shifts children's attention away from attachment. A goal-corrected balance is compromised by mutual emphasis away from comfort and intimacy to exploration, achievement, and activity.

Insecure-ambivalent-resistant children are overtly anxious, immature, and clingy. Their primary form of defense, cognitive disconnection, separates attachment affect from its source. As a result, attachment signals are unclear, contradictory (e.g., desire to be picked up and immediately put down), and often intense (to remind parents to keep them close by). Anger wells up in these children because their parents are inconsistently responsive. Parental actions are often not related to their children's needs. These parents are uncertain about what their children need and are distracted by worry, frustration, and guilt. A goal-corrected balance is compromised by a mutual emphasis on intimacy and over-involvement over autonomy.

Insecure-disorganized children are the most anxious children in the attachment nosology. They are called disorganized because organized attachment behavioral and defensive processes literally break down, leaving these children defenseless and overwhelmed. Disorganized infants appear disoriented (e.g., trance-like state), frightened (e.g., freezing, apprehensive), conflicted about proximity (e.g., approach with head uncomfortably averted), and hostile (e.g., aggression without apparent cause). Typically by age 6, children develop controlling strategies that direct the parents' attention and behavior such that children assume a role that is usually considered appropriate for a parent. Controlling children can be punitive (e.g., rude, vindictive) or caregiving (overly solicitous). The roles of child and parent are inverted, and disorganized-controlling relationships are completely out of balance.

Studies investigating parental contributions to disorganized-controlling attachment emphasize a range of processes and experiences carried from the parent's past or in the current relationship that include (1) extreme parental psychological or physical withdrawal and "invisibility" (e.g., dissociative behavior); (2) unresolved, contradictory, or unpredictable frightening experiences (e.g., rage, hostile-intrusive interaction), sometimes associated with certain forms of psychopathology (e.g., anxiety disorder, borderline personality disorder, depression), abuse, alcoholism, or parental conflict; (3) helplessness; (4) child empowerment/deference (e.g., glorification, in which the child is viewed as more capable of caring for others than the parent); and (5) dissolution of parent-child boundaries (the parent merges with the child, acts like a child, and treats the child like a spouse). The single underlying thread in this list is the fear generated by feelings of helplessness and isolation in both the parent and the child. Disorganized-controlling children become so overwhelmed by their parents' inaccessibility that organized attachment strategies are disrupted or blocked. Their parents are inaccessible and helpless to provide care and protection in those exact moments children need them the most. They are essentially alone and defenseless in a world that is dangerous and out of control (George & Solomon, 2008).

Attachment theory suggests that attachments should become increasingly stable and resistant to change during early childhood (infancy to age 5) as relationships become internalized through the development of representational skills. Continuity and discontinuity is lawfully connected to experiences with their parents; changes in attachment status occur when there are significant changes in parental sensitivity and responsiveness due to life events that can stabilize attachment security (e.g., infant mental health intervention) or threaten it (e.g., loss of a parent).

Secure attachment is the most common attachment for children around the world. The predominant forms of insecure attachment vary and are influenced by the degree to which families and cultures emphasize closeness. Avoidant insecurity is more predominant in groups that value independence; ambivalent-resistant insecurity is more predominant in groups that value closeness and enmeshment. The proportion of disorganized-controlling attachment ranges from 13% to 90%, depending on the family risk factors present (Cassidy & Shaver, 2008).

Attachment status contributes to and serves as a buffer or risk factor for social, cognitive, and emotional development, including autonomy, confidence, self-esteem, emotion regulation and stress, problem solving, abstract reasoning, mastery, ego resilience, sociability, peer and leadership skills, and the development of conscience. Security with father contributes to play and exploratory competence. Disorganized-controlling attachment is associated with developmental risk, including internalizing and externalizing problems; peer aggression, defiance, coercion, poor academic- and self-esteem, limited social competence, poor math and deductive reasoning skills, and fantasies of helplessness, destruction, and death. Disorganized attachment in infancy also predicts dissociative symptoms and high psychopathology ratings in adolescence.

Adolescent and Adult Attachment Patterns

The goal of attachment—proximity to attachment figures when distressed—is the same for adolescents and adults as for children. There are also important differences. The range of activating conditions, response intensities, and need for physical proximity to attachment figures decrease. Attachment relationships extend to peers and spouse/partner in addition to parents (Cassidy & Shaver, 2008; West & Sheldon-Keller, 1994).

Adult attachment status is conceived in terms of representation or "state of mind," which is one's current perspective on past attachment experiences. Adult attachment status is assessed using representational measures and reflects one's qualitative synthesis of memories and affects of past attachment experiences and emotions in light of current expectations and evaluations (e.g., Adult Attachment Interview; Adult Attachment Projective Picture System). Attachment status in adolescents and adults may differ from one's actual childhood patterns. Metacognitive and abstract thought that emerge beginning in adolescence can provide a lens of understanding that is not possible in childhood and can re-organize or disrupt childhood patterns.

There are four main adult attachment groups, three that are organized (secure/flexibly integrated, dismissing, preoccupied) and one that is unresolved. Adult attachment status is a generalized representation of attachment experience. It should not be confused with attachment style, which is a social-cognitive model of personality (Cassidy & Shaver, 2008).

Adults with organized attachment status use a range of strategies to manage feelings of need, closeness, and intimacy, to assuage attachment distress, and to maintain psychological closeness to attachment figures. Secure adults are flexibly integrated in thought and action. They fluidly reconsider and reevaluate attachment from new perspectives as an ongoing process in their lives. Secure adults value attachment figures as available and accessible to provide comfort when needed. They have internalized resources that promote constructive problem solving, integrity, and connectedness in relationships ("internalized secure base," George & West, in press).

Insecure-organized adults want closeness, but past and current attachment anxiety interferes with their ability to use personal and attachment resources to assuage distress. They manage anxiety with defensive processes that shift attention and behavior away from making bids to

attachment figures they know will be ineffective and disappointing. Dismissing attachment, analogous to avoidant child attachment, is maintained by deactivating strategies that mute mistrust, distress, and anger. Individuals appear cool, neutralized, and detached. Attachment relationships are viewed as instrumental, in that they can provide basic care without intimacy or dependence. Representations of self and others emphasize personal strength, rules, achievement, intellect, problem-solving capabilities, and strict adherence to social scripts, all of which are characteristics that protect the self from feeling rejected. Preoccupied attachment, analogous to ambivalent-resistant child attachment, is maintained by disconnecting strategies that fosters closeness but does not effectively manage accompanying feelings of anger and sadness. Preoccupied individuals are confused about how to think about self, attachment figures, and contexts. Preoccupied individuals portray self and others as unable to solve problems, entangled, angry, withdrawn, emotionally withholding, distracted, and over-involved.

Unresolved adult attachment is analogous to disorganized child attachment. The etiology of unresolved attachment is trauma that is so painful and threatening that these adults cannot integrate experience and affects at the representational level. In essence, attachment trauma becomes repressed or "segregated" (Bowlby, 1980). Segregated memories and feelings are unleashed when attachment is activated, resulting in lapses in metacognitive monitoring and dissociation (Hesse & Main, 2006). Unresolved individuals are overcome by attachment trauma to an extent that flexible integration and organizing defenses break down; they are flooded and dysregulated by fear and feelings of isolation, abandonment, and helplessness (George & West, in press).

Attachment status in adolescence and adulthood is also lawfully related to attachment experience. In adolescence, the transition to psychological and relationship autonomy may account for a greater proportion of dismissing adolescents than avoidant children or adults in many studies. Population statistics for attachment group prevalence depends on the populations being studied (e.g., college students, parents, psychiatric patients). Proportions of security tend to be smaller in adolescent and adult samples than in child samples (Cassidy & Shaver, 2008).

Adolescent and adult attachment status is associated with self and relationship characteristics, including autonomy, reflective capacity, family/relationship interaction patterns (communication, relatedness, conflict), and adjustment. Attachment status is related to emotion regulation and stress responses (heart rate, skin conductance) and the interactions among cortical (thinking, planning, regulation) and limbic system (autobiographical and emotional memory) processes. Unresolved individuals are more likely to demonstrate dissociative tendencies, although typically not at the level of mental health risk. Participants in clinical as compared with community samples have higher rates of unresolved attachment, but unresolved attachment does not in itself predict any particular psychiatric diagnosis.

Attachment theory predicts interrelationship transmission of attachment to other intimate social relationships based on the template developed in childhood, including friendship, dating, partner selection, and parenting. Interrelationship transmission is robust for secure adults, but equivocal for insecure adults. Past attachment experience in childhood serves as an important foundation for other relationships, although current experience in new relationships has the potential to change appraisals of the past.

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See also: **Attachment and Bonding; Attachment Disorders**

ATTENTION (See Selective Attention)

ATTENTION LAPSES

Attention lapses are a frequently annoying fact-of-life with which we all have firsthand experience. Technically, attention lapses are taken to be failures of sustained attention. The lapses referred to are therefore usually defined as temporary and often brief shifts of conscious attention away from some primary task to unrelated internal information processing. This sort of definition of attention lapse has the advantage of specifying research paradigms as well as relating absentmindedness to the important practical issue of understanding cognitive and action failures during instrumental tasks (Reason & Mycielska, 1984).

On the other hand, such a negative definition may distract us from considering potential benefits of what also might be more neutrally defined as spontaneous redirections of attentional focus. Attention lapse–induced mind wandering may also be seen as a form of curiosity, a spontaneous toying with ideas, facilitating discovery and innovation. Cognitive activity during attention lapses often involves productive forward planning and problem solving, even though unrelated to the present task at hand. Moreover, although many cognitive errors and action slips can certainly be directly linked to absentmindedness, the observation that people often continue successfully to perform complex tasks without explicit conscious attention suggests that attention lapses may also have interesting implications for our understanding of intention, volition, and agency in human action.

Notwithstanding potential benefits of absentmindedness, research has almost exclusively focused on the costs of failures of sustained attention in terms of personal productivity and well-being. Real-world health and economic costs of absentmindedness have been extensively documented (e.g., Reason & Mycielska, 1984). Although attention lapses are often assessed using self-report measures, the development of the Sustained Attention to Response Task (SART; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) provided an important behavioral tool enabling the investigation of cognitive and physiological processes underlying failures of attention. Different aspects of SART performance have been shown to be differentially associated with self-report measures of attention lapses, cognitive errors, and action slips in everyday life (Cheyne, Carrier, & Smilek, 2006). The development of the SART has undoubtedly contributed significantly to the reinvigoration of interest in attention lapses and has been employed in studies of cognitive, physiological, and phenomenological components of absentmindedness as well as in the investigation of such applied issues of attention deficit disorder and traumatic brain injury.

Although research has often focused on individual differences, persistence in achieving difficult goals is something that most people find difficult—especially when the task at hand is not under the control of basic biological imperatives (hunger, sex, and so on). A perhaps radical hypothesis about attention lapses is that they reflect the natural state of flux characterizing all biological systems: consciousness, behavior, and physiology alike. Cognitive systems appear often to be governed by a kind of pandemonium model, shunted here and there by cognitive demons and salient environmental events. Directed thinking and action, guided by an executive system with an overarching goal, monitoring automatic processing and environmental variations, may be a rare, hard-to-achieve anomaly rather than the norm.

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See also: **Attention-Deficit/Hyperactivity Disorder**

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Attention-Deficit/Hyperactivity Disorder (ADHD) is characterized by persistent and chronic inattention and/or excessive motor restlessness and impulsivity. Inattentive symptoms include poor organizational skills, making careless errors, forgetfulness, trouble listening, and distractibility. Hyperactive/impulsive symptoms include restlessness, excessive talking, and interrupting. For the purpose of diagnosis, symptom manifestation should be developmentally inappropriate and exhibited in two or more settings (e.g., home and school). Much of the research in the past decade has focused on deficits associated with the disorder in regard to executive function, response inhibition, cognitive control, and motivational dysfunction in response to delayed reinforcers.

The manifestation of ADHD and its associated core problems vary with development. ADHD in the combined subtype is characterized in the preschool and prepubescent period by high rates of gross motor activity, difficulty sitting in one's seat, academic difficulties, and peer-interaction problems. ADHD in adolescence is a period associated with high risk-taking behavior, and teenagers and young adults with ADHD are likely to have more traffic accidents, substance abuse, treatment for sexually transmitted diseases (Barkley et al., 2006), and earlier initiation of sexual activity and intercourse (Flory, Pelham, et al., 2006). ADHD in adulthood is recognized as a period with less observable gross motor hyperactivity. However, problems with sustaining attention and impulsive behavior continue to result in poor work performance, greater unemployment, higher divorce rates, and engagement in criminal behavior (Barkley, 2006).

According to the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR, 2000), there are three ADHD subtypes: predominantly inattentive, predominantly hyperactive-impulsive, and a combined subtype that is the most prevalent. Individuals diagnosed with the combined subtype exhibit both inattentive and hyperactive/impulsive symptoms to a significant degree. Individuals identified with the inattentive or hyperactive/impulsive diagnoses present with predominant inattention or hyperactive and impulsive symptoms, respectively. There is also recent interest in a subset of the ADHD, inattentive, which is characterized by slow or sluggish cognitive tempo (McBurnett et al., 2001). Children with this inattentive type of ADHD appear hypoactive and seem to be in a fog or daydreaming.

There is evidence to suggest that there are differences in the genetic profile and treatment response among the ADHD subtypes. Consistent, robust differences on a neuropsychological level among the ADHD subtypes are difficult to identify, however. Neuropsychological studies that have found differences have been contradictory in nature or apply primarily to a subset of the subjects. In general, however, it appears that children with the ADHD combined subtype perform poorly on planning, cognitive flexibility, and response inhibition tasks, whereas children with the ADHD inattentive subtype display difficulty using cues to guide their behavior and demonstrate slowed motor output, impaired vigilance, and altered arousal effects.

ADHD is frequently comorbid with other disorders, most commonly with disruptive behavior disorders. From 42.7% to 56% of children meeting criteria for ADHD in community samples meet criteria for conduct disorder as well. It is the ADHD-type symptoms rather than the conduct disorder symptoms that are most likely to predict academic achievement, thus indicating that the attentional symptoms need to be addressed as robustly as the conduct problems in children who have both. Other frequently occurring comorbid disorders in childhood ADHD include learning disabilities and anxiety disorders. Children with ADHD are also more vulnerable than young people in general to develop a substance abuse disorder and smoke nicotine.

Prevalence

Prevalence rates of ADHD in the childhood population vary, with expert opinion most often citing an incidence of approximately 3%–7% (American Psychiatric Association, 2000). The majority of children with the disorder continue to exhibit some symptoms in adulthood. Prevalence rates in adults are estimated to be about 4.4% (Kessler et al., 2006). The disorder is more common in males, with 6:1 frequency among clinic-referred samples and a 3.4:1 frequency among nonclinic-referred samples for males to females (Barkley, 2006).

Etiology

There is considerable evidence to suggest a genetic basis for ADHD. The disorder is highly heritable, with a risk of 57% of occurrence from parents with ADHD to their children. Most of the genetic research has focused on candidate genes involved in dopaminergic transmission, although noradrenergic and serotonin systems are also studied. The most reliable findings in ADHD are associated with the DRD4 repeat polymorphism (Barkley, 2006). Other associations for candidate genes have included DAT1, DBH, DRD5, SNAP-25, 5HTT, and HTR1B. ADHD also has been associated with markers at several chromosomes including, but not limited to, regions 5p, 6q, 9q, 11q, 16q, and 17p. Additional factors thought to contribute to ADHD include low birth weight, environmental toxins such as prenatal exposure to maternal smoking and alcohol consumption, and postnatal exposure to lead.

Neuroimaging research into brain structure and function in ADHD repeatedly finds significant differences

between ADHD and controls in frontal, anterior cingulate, basal ganglia, and cerebellar anatomy and function. Reviews of the literature from structural MRI methods (e.g., Krain & Castellanos, 2006) reveal perhaps the most consistent findings in regard to ADHD imaging studies. Comparisons in global brain volume between children with ADHD and healthy comparison children have repeatedly found evidence of significantly reduced total brain volume, frontal cortical volume, and reductions in frontal regions in ADHD using gray-white matter segmentation techniques. Measures of cortical thickness via a recent longitudinal study (Shaw et al., 2007) revealed a delay of approximately three years in an ADHD group compared to controls in attaining peak thickness throughout the cerebrum, with delays ranging from two to five years in the prefrontal regions. Interestingly, the ADHD group had slightly earlier peak thickness (about four months) in the primary motor cortex compared to the control group.

Studies that use a variety of functioning imaging techniques suggest decreased brain activation in the frontal cortex in ADHD, although a number of studies have also shown relative increased brain activation in ADHD (see Fassbender & Schweitzer, 2006). Accumulating evidence also suggests that the anterior cingulate cortex is implicated in ADHD and is often hypoactive in both child and adult participants. The basal ganglia are another structure of inherent interest in ADHD, given the functional attributes of this structure and the fact that it is a clear target of the most common treatment for ADHD, which is stimulant medication. Methylphenidate appears to increase dopamine levels in the basal ganglia via blocking its reuptake. Alterations are consistently found in the basal ganglia during functional brain-imaging studies, with the evidence mixed about whether the alterations in basal ganglia activation are increased or decreased (see Fassbender & Schweitzer, 2006). Stimulants appear to increase basal ganglia activation in children with ADHD.

Another subcortical structure, the cerebellum, also appears to be altered in structure and function in ADHD. The cerebellar vermis and hemispheres are smaller in children with ADHD than in comparison groups of healthy controls. Methylphenidate appears to increase cerebellar vermis activity, but only in a nontask-related fashion. Rates of hyperactivity and response to methylphenidate treatment also appear to be linked to the degree of activity in the cerebellar vermis (Fassbender & Schweitzer, 2006). Associations between the cerebellum, the basal ganglia, and the PFC suggest that abnormalities found in these regions may reflect a circuit-wide dysfunction in prefrontal-basal ganglia-cerebellar loops in ADHD. Ultimately, methods combining behavioral, imaging, and genetic techniques should help identify ADHD subgroups and potentially develop more targeted treatment efforts for the subgroups.

Diagnosis

Practice parameters for ADHD have been identified by several organizations including the American Academy of Pediatrics (AAP) and the American Academy of Child and Adolescent Psychiatry. These organizations include recommendations for the evaluation of ADHD and, via AAP, access to rating scales for evaluating ADHD and monitoring treatment response. A comprehensive evaluation of ADHD in adults or children should assess the presence or absence of symptomatology, differential diagnosis from other disorders that mimic ADHD, and the possibility of comorbid psychiatric disorders. At a minimum, the evaluation should include a clinical interview, a medical evaluation conducted within the past year, standardized behavior-rating scales from parents and teachers, and a direct observation of the patient. Evaluations for both children and adults also should include a family history as well as documentation regarding developmental, social, and academic functioning.

An evaluation for adults also ought to include information regarding childhood via academic records and retrospective-childhood ratings by the adult patient and a parent or another individual who knew the patient as a child. An assessment of intellectual, academic, neuropsychological, and attentional functioning is desirable for purposes of differential diagnosis, as well as for pointing out individual strengths and weaknesses. Psychoeducational testing can also be useful when a low level of intellectual functioning or a learning disability mimics or coexists with ADHD. Preferably, the evaluation should be individualized to address areas of concern for each patient.

Treatment

Although the evidence for the efficacy of pharmacological treatments for ADHD has strong empirical support (Jensen, 2002; MTA Cooperative Group, 1999; MTA Cooperative Group, 2004), there is also a role for behavioral interventions in the treatment of the disorder. Behavioral interventions are necessary for the 20%–30% of patients who do not respond to stimulants and for those who experience significant side effects from pharmacological agents. Perhaps most importantly, these interventions can also address comorbidity such as anxiety, academic performance, parent-child conflict, and stress in the parent (MTA Cooperative Group, 1999). Behavioral interventions for children include social skills training, school interventions, and parent training in contingency management. There is recent support for the use of behavioral and cognitive-behavioral treatments for adults with ADHD (e.g., Solanto et al., 2008) as well. The adult interventions teach compensatory strategies, organizational skills, planning, and the development of new habits to help resist distracters. Adults and adolescents may also benefit from "coaching" to monitor progress toward academic, career, and social goals.

The use of pharmacological interventions is warranted if the symptoms are interfering significantly with functioning. Most medications for ADHD appear to affect the dopaminergic and/or noradrenergic system. The majority of individuals (children and adults) are responsive to psychostimulant medications (e.g., methylphenidate and dextroamphetamine), and these compounds are considered safe and effective treatments for ADHD. Stimulants, typically considered the first line of defense, can produce improvements in impulse control, attention, on-task behavior, and social behavior. A number of fairly new delivery systems (including a pill and a transdermal "patch") for psychostimulant medications are commercially available, including several with long-acting or extended-release options, such as Concerta, Metadate, Ritalin SR, and Ritalin LA. A recently released drug, Vyvanse (lisdexamfetamine dimesylate and mixed amphetamine salts), is an extended-release formulation of *d*-amphetamine that becomes therapeutically active following oral ingestion. Thus, Vynase should be less likely to be abused than other stimulants. Atomoxetine, a nonstimulant compound that is a highly selective inhibitor of the presynaptic noradrenergic transporter, has FDA approval for treatment of ADHD in adults and children. Other pharmacological options include bupropion and tricyclic antidepressants, but these drugs are prescribed less frequently than the stimulants. The most common side effects for stimulants and atomoxetine include decreased appetite, mild stomachaches or headaches, insomnia, increased anxiety, and/or irritability. All medications need to be monitored on a frequent and regular basis, given that children's needs may change as they mature.

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See also: **Psychostimulant Treatment for Children**

ATTITUDES

Psychologists use the term *attitude* to refer to a general evaluation that an individual holds regarding a particular entity, such as an object, an issue, or a person. An individual may hold an extremely favorable attitude toward a particular political candidate, for example, and a mildly unfavorable attitude toward another candidate. Thus, attitudes vary in valence as well as extremity, and they reflect an individual's overall summary evaluation of an attitude object. Attitudes toward the countless objects that we encounter in our day-to-day lives are stored in memory, and they remain at least somewhat stable over time. In this way, attitudes are different from fleeting, momentary evaluative responses to an object. In addition,

attitudes are specific to particular objects, unlike diffuse evaluative reactions like moods or dispositions.

How Are Attitudes Formed?

Attitudes can be formed in several different ways. Some attitudes are derived from our cognitions about an attitude object. We may hold a positive attitude toward a particular political candidate, for example, because we believe that the candidate will enact legislation that will bring about a set of desirable outcomes. Our beliefs about candidates and their policy positions may be organized in an elaborate interconnected cognitive structure containing an array of knowledge about these candidates, and from this set of cognitions we may derive a positive or negative overall evaluation of these candidates.

Other attitudes have little to do with our cognitions about an object and are instead based on our affective reactions to the object. Rather than basing our attitude toward political candidates on our thoughts and beliefs, for example, we may derive our attitude from the emotional response that they elicit. To the extent that candidates evoke feelings of optimism and pride, we may form a positive attitude toward them. But if instead candidates elicit feelings of contempt or anger, we may derive a negative attitude toward them. Such attitudes would be affectively based.

In addition to affect and cognition, attitudes can also be based on our behavior. We often infer others' attitudes from the behaviors that they perform, and in much the same way we sometimes look to our own behavior for insights regarding our attitudes (Bem, 1972). When contemplating our attitude toward a particular political candidate, for example, we may reflect on the behaviors that we have performed for insight into our attitude. We may recall, for example, that we recently signed a petition in favor of the candidate when a co-worker asked us to do so, or that we accepted a button from one of the candidate's campaign workers whom we encountered on our way to work. From these behaviors, we may infer that we hold a positive attitude toward the candidate.

Our behaviors can affect our attitudes in a second way as well. Rather than inferring our attitudes from our behaviors, we sometimes modify our attitudes so that they align more closely with the behaviors we have performed in the past. According to cognitive dissonance theory, we do this because we find it uncomfortable when we discover internal inconsistencies (e.g., Festinger, 1957). When we recognize, for example, that we have performed a behavior that is incongruent with our attitude, we experience an uncomfortable tension. To reduce this tension, we look for ways to eliminate the inconsistency. Of course, the behavior has already been performed, so the easiest way to restore consistency often involves changing the attitude so that it is more congruent with the behavior. And indeed, there is evidence that people often do precisely this, revising their attitudes in light of their past behavior.

What Do Attitudes Do?

Attitudes play a critical role in our interactions with the world around us. Because they summarize the positive and negative outcomes or attributes associated with an object, attitudes help us to obtain rewards and avoid punishment, efficiently guiding our behavior toward the object. Without attitudes stored in memory, we would need to size up the evaluative implications of the people, places, and things in our social environment every time we encounter them. This slow and cognitively taxing process would leave us in a precarious situation when the circumstances call for swift action.

Instead, attitudes permit us to make sense of and react to the world around us quickly and efficiently. In fact, physiological evidence indicates that, as soon as we encounter an object, our attitudes are activated, enabling us to differentiate between things that we like and things that we do not like. Even when we are not explicitly intending to evaluate an object, our brains seem to do exactly that. Given the evolutionary significance of being able to swiftly approach things that are beneficial to us and even more swiftly avoid things that are detrimental, it should perhaps come as no surprise that our attitudes are spontaneously activated upon encountering an object.

But what happens when an attitude has been activated? A large literature attests the far-reaching consequences of attitudes for thought and behavior. There is evidence, for example, that attitudes can color our interpretations of events. When we watch a political debate, we often come away convinced that our preferred candidate was victorious, and we are mystified when we learn that others came to a different conclusion. In many cases, this is because our attitudes toward the candidates biased our perceptions of their respective performances. In this and many other ways, attitudes often influence information processing.

And when an attitude is activated, it often influences our behavior as well. We approach things that we like and we actively avoid things that we dislike. Whether we take the extra step to recycle yesterday's newspaper, for example, depends to a large degree on our attitudes toward recycling. In the same way, our attitudes toward consumer products have a big impact on how we spend our money. And of course, attitudes toward political candidates largely determine our electoral behavior. In countless domains, there is clear evidence that attitudes often motivate and guide behavior.

Attitude Strength

As we have seen, attitudes can be tremendously consequential, influencing virtually all of our interactions with

the world around us. It is important to note, however, that this is not always the case. To the contrary, although some attitudes exert a powerful impact on thought and behavior, others are largely inconsequential. Similarly, whereas some attitudes are firm, resistant to even the strongest challenges, others are highly malleable and fluctuate greatly over time. Psychologists use the term "attitude strength" to capture this distinction. More formally, strong attitudes are those that (1) resist persuasion, (2) remain stable over time, (3) guide behavior, and (4) influence information processing (Krosnick & Petty, 1985).

Attitude strength provides important leverage for anticipating an attitude's cognitive and behavioral consequences. For example, knowing that an individual holds a positive attitude toward recycling can be quite useful in predicting his or her likelihood of participating in various recycling programs, but knowing the strength of that attitude vastly improves the precision of these predictions.

Not surprisingly, then, attitude strength has been the focus of sustained scholarly attention for more than two decades. Of particular interest has been the identification of specific features of strong attitudes that differentiate them from weak attitudes, and a large literature now exists that does precisely this (see Petty and Krosnick, 1995; Visser, Bizer, & Krosnick, 2006). For example, strong attitudes tend to be held with great certainty, and they tend to be supported by a good deal of information stored in memory. Strong attitudes also tend to be those to which people attach a great deal of psychological significance, considering them to be personally important. Given this, measures of attitude certainty, attitude-relevant knowledge, and attitude importance offer fundamental insights regarding the strength of an individual's attitude and therefore its likely impact on thought and behavior.

Ambivalence is also an indicator of attitude strength. Toward some attitude objects, we may experience a mix of positive and negative reactions, rendering us ambivalent about the object. Even if we support capital punishment, for example, we may nonetheless have a number of unfavorable thoughts and feelings about it as well. Ambivalent attitudes of this sort tend to be weaker than univalent attitudes, so measures of attitudinal ambivalence can provide useful leverage for differentiating strong attitudes from weak ones.

Finally, the speed and ease with which we can access and report our attitudes also yields valuable information about the strength of those attitudes. Strong attitudes tend to spring to mind quickly, whereas weaker attitudes often require more time and effort to retrieve from memory. Increasingly, then, researchers have relied on the latency with which individuals report their attitudes as an indicator of attitude strength.

Attitudes are overall evaluations of the people, places, and things around us. They can have cognitive, affective, or behavioral bases (or some combination of the three). Attitudes enable us to effectively navigate our social environment by efficiently summarizing the evaluative implications of the stimuli we encounter. They guide our behavior toward those objects that are beneficial to us and away from objects that may be deleterious, and they often influence the way we process information.

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See also: **Cognitive Dissonance**

ATTRIBUTION THEORY

Attribution theory refers to a field of study rather than to a specific scientific conception. The heart of this area of investigation includes assumptions, hypotheses, and theories regarding how laypersons arrive at answers to "why" questions such as: "Why did I fail my exam?" and "Why did Jim and Mary break up?" Note, then, that this approach grapples with both self- and other perception. In addition, there also is concern with the consequences of causal beliefs, including their emotional and motivational significance. Although attribution inquiry is typically included

under the domain of social psychology, it has had impact in the areas of clinical, cognitive, developmental, educational, personality, and motivational psychology as well, thereby providing a general foundation for psychology.

Attribution thinking was introduced into psychology by Fritz Heider (1958). But his seminal book was relatively neglected prior to subsequent publications by Jones and Davis (1965) and Kelley (1967). In addition to these contributions, the book *Attribution: Perceiving the Causes of Behavior* (Jones, Kanouse, Kelley, Nisbett, Valins, & Weiner, 1972) also was responsible for ushering in nearly two decades (1970–1990) of dominance in social psychology. Attribution analyses, often associated with naïve or commonsense psychology, replaced the "noncommon sense" theory of cognitive dissonance in social psychology, and itself was subsequently supplanted within social psychology by a return to the irrational, this time with a focus on unconscious processes and "priming."

Reaching Causal Inferences

One goal of attribution research has been to identify the personal and situational determinants of causal understanding. It is assumed that humans want to attain a cognitive mastery of their world. Further, people are regarded as naïve scientists, logical and rational, albeit not infallible and subject to systematic biases and errors.

In the desire for understanding, it has been documented that causal search is not undertaken in all instances but is most likely given an important, unexpected, and negative event or outcome. This might be failure at a crucial exam, rejection of a marriage proposal, and the like. Principles found in covariation analyses regarding the presence and absence of causes and effects are important sources of causal information to help determine the answers to "why" questions. For example, failure at an exam is more likely to be self-attributed if there have been many prior personal failures and knowledge of the successes of others (see Kelley, 1967). In addition, causal rules are used such that, for example, if beliefs of multiple causality for achievement failure are elicited, then even in the presence of insufficient effort, there will be additional attributions to lack of ability or to some environmental factors as causes of the negative outcome. Further, the presence of some causes may result in other causes being discounted. One controversy associated with the latter process concerns the arguable hypothesis that rewarding pupils for successful achievement performance reduces their motivation because the extrinsic reward results in a discounting of their intrinsic interest.

It also has been reasoned (again with controversy) that the behavior of others tends to be ascribed to a stable disposition or trait inasmuch as explanations that capture enduring aspects of the world are preferred and the other is dominant in social perception. Underestimation of the situation as a perceived cause of the behavior of others and over-attribution to the person has been labeled "the fundamental attribution error." However, this principle is being challenged in cross-cultural research, for it has been argued that situational attributions are more salient among Asians.

Another bias that has been examined in attribution research concerns beliefs about the causes of positive and negative events. Self-attributions tend to be given for positive outcomes ("I succeeded because I studied hard"), whereas negative outcomes elicit external attributions ("I failed because the exam was unfair"). This pattern of attribution is labeled the "hedonic bias" inasmuch as positive self-directed emotions and the maintenance of self-esteem are fostered. The postulation of a hedonic bias and the hypothesis that self-related attributions are made to environmental causes at times are conflicting. That is, if individuals tend to ascribe personal success to internal causes such as ability and effort, then this masks or supersedes the tendency to attribute personal outcomes to causes located in the environment (see Malle, 2006).

Consequences of Causal Beliefs

The research activity concerning the consequences of perceived causality is less voluminous than that associated with the reaching of causal inferences, but it nonetheless is very substantial, particularly in disciplines other than social psychology. Here again only a small sample of the research direction is presented.

A large body of research in the field of emotion documents that what is being thought, including causal beliefs, directly relates to emotional experience. For example, in educational contexts, failure due to lack of effort gives rise to guilt; failure because of low ability produces shame and embarrassment; success attributed to help from others elicits gratitude; and so on (see review in Weiner, 2006). These thinking-feeling relations have important implications in nonachievement-related contexts as well. For example, in the field of clinical psychology, it has been suggested that ascribing negative events to something about the self that is not subject to personal control, that is, a cause the individual can do nothing to alter, produces a state of "learned helplessness." This belief promotes and/or accompanies depression. Hence, for example, social or job failure ascribed to lack of aptitude may be an antecedent (or correlate) of depression (see Seligman, 1975).

Attribution-guided research within clinical psychology also has revealed that when the behavior of a mentally ill family member is ascribed by others to a cause under personal control, that is, when the cause implicates personal blame and "it could be otherwise" (e.g., "he is just lazy"), then negative emotions including anger are elicited among family members. This increases the likelihood of subsequent recidivism. The relation between causal beliefs in personal control, anger, and adverse mental-health consequences has been found among both

schizophrenic and depressive persons (see Barrowclough & Hooley, 2003).

Assignment of responsibility and blame also are central in many other contexts, revealing that in addition to being naïve scientists, humans also act as naïve judges. Other-blame is one indicator of marital distress, is elicited by a variety of stigmas including alcoholism and obesity, and in general decreases help giving. Thus, for example, less charity aid is offered to persons obese due to overeating as opposed to having a thyroid problem, or to those with AIDS because of promiscuous sexuality as opposed to AIDS caused by an infected mother (see reviews in Weiner, 1995, 2006).

The anticipation of negative consequences due to being perceived as responsible for a negative outcome gives rise to a variety of impression management techniques to alter this inference. For example, students publicly claim lack of ability rather than low effort as the cause when explaining their failure to authority figures (but not when ascribing the cause of failure to peers). In addition to excuses (ex = from; cuse = cause), confessions also are an effective interpersonal technique because the cause of the transgression is altered from something stable about the person ("he is a bad seed") to something unstable and changeable ("he did a bad thing but is not a bad person and will not do it again").

Adaptive and maladaptive attributions also have been identified in studies of coping with stress. Following a negative life stressor, such as rape, individuals ascribing this event to their character ("I am a risk-taker") do not cope as well as those attributing the event to a particular behavior ("I accidentally was in the wrong place at the wrong time"). A trait is perceived to be a relatively stable and uncontrollable cause, whereas a behavioral causal ascription is temporary and subject to volitional change. For these reasons, attributional therapies have been devised that attempt to change causal beliefs so they are more adaptive. In educational contexts, these programs often alter beliefs about the cause of failure from lack of ability to the absence of effort or effective strategies (see Perry, Hechter, Menec, & Weinberg, 1993). These latter ascriptions again are more adaptive because behavioral change and instrumental activities are possible to alter the anticipated (and actual) consequences.

In sum, causal beliefs play an important role in self- and other- understanding and significantly influence emotions and subsequent actions. The study of causal attributions therefore provides one of the basic building blocks for social psychology and also has great relevance for other disciplines within psychology.

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See also: **Cognitive Development; Emotion Regulation; Self-Control**

AUDITORY PERCEPTION

The world is a noisy place. Almost all objects vibrate, and those vibrations can produce audible sound. Hearing allows an organism to process information about these sound sources. Hearing assists animals in navigation, seeking prey, avoiding predators, finding a mate, and in communication (e.g., speech and language). Sound can also add an aesthetic quality, as in music. The study of auditory perception seeks to understand the auditory system's ability to process the sound from sound sources. Such processing turns out to be a challenging task. The sound pressure wave that radiates from a vibrating object (e.g., the string of a violin) does not have physical parameters that directly indicate the physical dimensions of the

source. Sound is defined by its frequency, amplitude, and temporal dimensions.

For instance, the sound pressure wave itself carries no information about where the sound source is located, yet most animals can locate the sources of sound. Thus, the auditory system must do the calculations that allow for sound source location. The problem of processing the sound from sources is even more complicated when there is more than one sound source producing sound at the same time, such as at a cocktail party. The sounds from all sources are combined into one complex sound that impinges upon the auditory system, so the auditory system must do the analysis that allows for the perceptual segregation of the various sound sources (Yost, Popper, & Fay, 2007). Bregman (1990) refers to this challenge as "auditory scene analysis."

The peripheral parts of the auditory system (outer, middle, and inner ears; auditory nerve) perform an eloquent analysis of the spectral (frequency), amplitude, and temporal dimensions of sound (Yost, 2007). The temporal-spectral neural code for the three physical dimensions of sound is sent to the brainstem via the auditory nerve and then to the auditory cortex for further processing. A great deal of what is known about auditory perception relates to the neural code provided by the auditory periphery (Yost, Fay, & Popper, 1993).

Many animals, including humans, can detect the presence of sound at remarkably low sound-pressure levels (20 micropascals—at this pressure the human eardrum moves a distance equal to approximately the diameter of a hydrogen atom). The auditory system can tolerate changes in sound pressure over a very large range (approximately 10^7 in humans). And, the auditory system processes frequency over a considerable range (approximately 10 octaves from 20 to 20,000 Hz for humans), although the frequencies at which sensitivity is best are in the middle of this frequency range (500 to 4000 Hz for humans).

The sound-pressure-level thresholds required to detect the presence of sound over the frequency range of 125 Hz to 8000 Hz have been standardized and are the reference for the basic measure of hearing loss, the audiogram. The audiogram measures a person's ability to detect the presence of sounds of different frequencies and compares this ability to standardized values based on the detection of these sounds by normal hearing young listeners.

Just as the auditory system is exquisitely sensitive to the absolute values of the physical properties of sound, so too is it able to discern very small changes in these properties. A change of about 0.5% in frequency is discriminable, as is a 7% (less than 1 dB) change in sound pressure level, and a 10% change in sound duration. When the sound pressure level changes over time (the sound is amplitude modulated), the auditory system remains sensitive to these sound-pressure level modulations up to about 50 modulations per second; above 50 modulations/second human listeners lose their sensitivity to the sound pressure fluctuations.

In the everyday world many different sound sources often produce sound at nearly the same time so that the sound from one source (the masker) could interfere with the ability to detect the presence of another sound (the signal). Sounds similar in frequency mask each other more than sounds of different frequencies. In detecting a signal of one frequency, there is a critical band of masker frequencies centered on the signal frequency that produces the most masking. Signal threshold is usually proportional to the power of the masker within this critical band. It is also the case that low-frequency maskers provide more masking of higher-frequency signals, than high-frequency maskers provide for lower-frequency signals (upward spread of masking) (Moore & Patterson, 1986).

Sound has no physical dimensions of space, yet humans and almost all other animals can locate the position of sound sources based on the interaction of sound with obstacles in the path of sound as it travels to the outer ears. A sound from a source off to one side of a listener will arrive at the ear closest to the sound source before the sound reaches the other ear, and because the head produces a sound shadow, the sound pressure level is greater at the near ear. These interaural (between ears) time and level differences covary with the location of the sound source in the horizontal plane around the listener (the azimuth plane). The auditory system uses microsecond variations in interaural time difference (ITD) and 0.5 to 1 dB variations in the interaural level difference (ILD) to process the azimuth location of sound sources (Blauert, 1997).

The ITDs and ILDs are not usable cues for localizing sounds in the vertical direction. For instance, consider sound sources located directly in front of a listener, directly above the listener, and directly behind the listener. Because each of these sources is located midway between the ears, the ILD and ITD are always both zero, yet human listeners can locate the position of each of these sound sources (i.e., ILDs and ITDs could not be cues for locating these source locations). Localization in the vertical plane appears to depend on the interaction of sound with the torso, head, and outer ear (pinna) of the listener as the sound travels from a source to the outer ear. These structures selectively alter the sound, especially the high-frequency content of the sound, that arrives at the outer ear. These transformations are called Head Related Transfer Functions (HRTF), and the form of the HRTF changes as a function of the relative location of a sound source. Thus, the form of the HRTF and a comparison of the HRTFs between the ears probably provide the information used by the auditory system to assist in the location of sound sources in the vertical plane (Blauert, 1997).

A masking sound that arrives from a sound-source location that differs from that of a signal sound source

provides less masking of the signal than when the signal and masker are colocated. Thus, the ability of the auditory system to separate the position of sound sources (especially in the azimuth plane) aids in the ability to detect and attend to a sound from a source at one position when competing sounds sources are at other locations. These spatial effects are often studied as masking-level differences (MLDs) in which there are differences in the signal level required for signal detection when the spatial parameters of the signal differ from those of the masker.

In addition to the perception of the location of sound sources, the sound pressure waveform has the subjective attributes of loudness, pitch, temporal change, and timbre. Loudness is directly related to sound pressure, but a sound's frequency will also affect perceived loudness, in that two sounds of different frequency but of the same sound-pressure level can be perceived as different in loudness. Equal-loudness contours describe the sound-pressure level required to judge sounds of different frequencies to be equally loud and are the basis for the phon measure of loudness (ANSI, 1997).

One aspect of the nonlinearity of peripheral processing is a compressive transfer of input sound level to neural output in that for low-level (soft) sounds there is a linear relationship between sound level and neural output. At higher (loud) sound levels, the same increase in sound level that produced a large change in neural output at low sound levels produces a smaller change in neural output at this higher input sound level. This compressive nonlinearity influences loudness perception and masking (Bacon, Fay, & Popper, 2004).

For simple sounds, pitch can be directly related to frequency, but for complex sounds pitch is more likely related to the fine structure of the synchronous neural response to the sound's time-pressure waveform rather than to the sound's spectrum (Plack et al., 2005). For instance, a harmonic complex sound that has frequency components of 400, 500, 600, and 700 Hz will have a perceived pitch of 100 Hz, despite the fact that there is no energy in the sound at 100 Hz (100 Hz is the fundamental of the harmonic complex, and the fundamental is missing). The pitch of missing fundamental type stimuli can often be explained by the fine-structure timing of the neural discharge pattern to the sound-pressure waveform.

Timbre is defined as that perceptual quality of sound that allows a listener to differentiate the sound from two sources when each sound is judged to have the same pitch, loudness, and duration. Thus, a violin is discernable from a viola even when each instrument produces the same note (pitch), at the same loudness, and for the same duration. This difference in sound quality is a timbre difference. There is no clear relationship between timbre perception and the physical properties of sound, nor is there anything about the neural peripheral code for sound that has been usable to account for the wide variety of timbre differences that have been studied.

Sound sources produce sounds that are perceived as being different in pitch, loudness, temporal properties, timbre, and spatial location. All of these variables influence the ability to determine sound sources and to segregate sound sources when several exist together. But identifying and segregating sound sources involves other aspects of auditory perception as well. For instance, a masking sound of one frequency will not mask a signal sound of a very different frequency. But this result occurs in an experimental procedure in which the masker and signal are repeated many times to estimate signal threshold. As long as the masker frequencies are not similar (are outside the critical band) to the signal frequency, little masking occurs. However, if from trial to trial the masker frequency varies randomly so the listener receives no predictable repetition of the masker frequency, there can be considerable masking even when each of the individual masking frequencies provide very little masking when measured alone. This additional masking caused by the random presentation of the various masker frequencies is called informational masking. These results might be explained in terms of attention, in that when the masker frequency varies randomly from trial to trial the listener cannot attend to the pitch of the signal; the changing pitch of the masker distracts the listener (Kidd et al, 2007).

Informational masking along with masking that occurs as a function of the direct interaction of the sound from various sound sources (energetic masking) are both components of segregating the sound from one source from that of other sources. The ability to attend to one sound source over another and the storage and retrieval of acoustic information from memory are other variables that probably play a role in processing an auditory scene.

While speech and music have unique perceptual aspects, they are nonetheless sounds that travel through the same neural pathways as all other sounds. Thus, processes that determine the perception of speech and music are probably also based partially, or maybe largely, on those that process all sounds. There is an emerging view of auditory perception that attempts to incorporate an integrated perceptual-cognitive account for processing all sounds that enter the auditory system (Holt & Lotto, 2008).

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See also: **Deafness and Hearing Loss; Speech Perception**

AUSTRALIA, PSYCHOLOGY IN

The history of psychology in Australia is relatively well documented. It was highly influenced in its early years by British psychology, and indeed the early psychologists formed an Australian chapter of the British Psychological Society as their learned society and primary professional body. It was only in 1966 that the Australian Psychological Society, with its own charter, Code of Ethics, and accreditation and standards committees came into being, with a resounding vote from the Australian members to become independent. Since those early days, the Australian Psychological Society has grown into a strong peak professional and scientific body in Australia, with more than 17,000 members in 2008 (approximately 60% of all psychologists in the country). The Australian Psychological Society is consulted by government and nongovernment organizations and by the media on the broad range of issues affecting psychologists and the general community, and for expert comment and advice on various psychological issues that arise.

Psychologists in Australia must be registered to practice in their state or territory. Psychologist Registration Boards are appointed by the state or territory government and comprise senior psychologists, members of other professions, and community members. The Council of Australian Governments has determined that, by July of 2010, health professions will be subject to a national registration, and this includes psychologists, whether working in the health sector or not. In order to be registered as a psychologist currently, one must have followed a minimum course of study that includes four years of psychology.

Accreditation of university courses for the purpose of gaining professional standing as a psychologist is done through the Australian Psychology Accreditation Council (APAC), which was formed through agreement between the Australian Psychological Society and the Council of Psychologist Registration Boards and is wholly owned and operated by those two entities.

Psychology can be studied at 37 different Australian universities via APAC accredited courses. There are accredited postgraduate courses in at least nine different specialties that coincide with the specialist colleges of the Australian Psychological Society, namely, clinical psychology, clinical neuropsychology, community psychology, counseling psychology, developmental and educational psychology, forensic psychology, health psychology, organizational (industrial) psychology, and sports psychology.

Psychology as a profession has boomed in Australia since the beginning of the twenty-first century. With an increase in acknowledgement of the role of human behavior in the development and course of serious illnesses, and with the increased concern with the prevalence of mental illness, psychology has become a high-profile and well-thought-of profession. There is considerable competition for places in postgraduate programs, despite the recognition of a workforce shortage by the government and the subsequent release of scholarships to support students.

In 2006, after a 32-year battle for recognition, psychological services for the treatment of people with a mental illness were included in the schedule of items that are reimbursed under Medicare, the national health insurance scheme. This has changed the face of psychological practice in Australia, with members of the community having significantly increased access to psychological assistance when they need it. People are referred through their family doctor for up to 12 sessions in a calendar year with a psychologist or specialist clinical psychologist.

The Australian population is mainly centered in metropolitan areas, with about 30% of the population living outside the major cities. Even the indigenous population, 70% of whom live outside major centers, are nowadays largely urbanized. Psychologists reflect the general population, with a much higher proportion living and practicing in the major cities than in remote areas; only about 30% of psychologists practice outside the major cities. This distribution of psychologists has meant that,

with Medicare, there are increased services for those people who live in areas not serviced by a psychiatrist. Entry into the Medicare scheme has also altered the relationship between psychology as a profession and many other health professions. In recent years, psychology, through the Australian Psychological Society, has become part of the Allied Health Professions Australia and the Mental Health Professions Association. These relationships with other professions have enhanced psychology's ability to advise the government and impact government policy.

There are many psychological scientists of world repute working in Australian universities and research centers. Australian research is published in both Australian and international journals. There has been an increasing effort in recent years to do translational research, so that the community can understand the contribution of psychology to human understanding and well-being.

The indigenous population is very small in Australia—probably only 2.5% of the total highly multicultural population. Until recently there was almost no acknowledgement of the specific needs of indigenous Australians and the particular nature of indigenous Australian psychology. In 2008 the Australian Indigenous Psychology Association was launched, under the auspices of the Australian Psychological Society. The goals of this association are to support the two dozen or so indigenous psychologists in Australia, as well as fostering the development of more indigenous psychologists. Some 400 additional indigenous psychologists will need to be trained in order to provide parity of service with the nonindigenous population. This association will work with the Bendi Lango ("cutting edge") Bursary Foundation, which was established by the Australian Psychological Society in 2006 to provide financial support bursaries for postgraduate indigenous psychology students.

National Psychology Week was established in 2003, following an inaugural National Psychology Day in 2002. Through media activities, a national research survey and a range of member events throughout Australia, National Psychology Week showcases the diverse ways in which psychologists enhance community well-being. The focus of the week, which encompasses all areas of psychology, is "Think well. Be well." In 2008 there were more than 400 member events around the country, with displays in public areas, public lectures, professional development activities, and the first National Oration by a highly esteemed psychologist.

Australian psychologists are represented internationally through membership of the International Union of Psychological Science and the International Association of Applied Psychology, as well as many other international organizations. Australian psychology plays a role regionally through the Asian Psychological Association, and the Australian Psychological Society has Memoranda of Understanding with various other national psychology associations, to ensure that Australian psychology remains international in its purview. Australian psychologists have also shown a willingness to engage with social issues, both locally and internationally, and have spoken up to enhance community and individual well-being whenever they can be supported by the psychological evidence. In recent years individuals have used their psychological knowledge to support community action in areas such as the health and well-being of refugees, asylum seekers, and victims of torture, trauma, natural disasters, racism, and terrorism. Being able to represent oneself as a psychologist in Australia is something of which one can be proud.

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AUTHORITARIANISM

Authoritarianism is one of the most studied and most controversial concepts in personality, social, and political psychology. It also has wide usage in political discourse, as, for example, in the distinction between authoritarian and totalitarian regimes. It has entered the general vocabulary: a Google search finds more than one-and-a-half million references to the word.

In psychology, the seminal discussion of the concept was *The Authoritarian Personality* (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). It was published soon after the end of a world war against fascism, and the authors hoped to identify an authoritarian personality (AP) trait that predisposes some people to support fascistic political philosophies, programs, and politicians.

Theory

Who are these people? Using in-depth interviews and questionnaires, and interpreting results following psychoanalytic and Marxist theories, Adorno et al. (1950) identified AP as the product of what would now be called a positive feedback loop between dictatorial, punitive child-rearing methods and an exploitive, oppressive, capitalist economic system. Authoritarians had parents who punished them harshly if they misbehaved or expressed disagreement with the rules of society and the family, especially in sensitive areas such as sexual mores. Components of the adult AP include prejudice against religious, ethnic, and other outgroups; the prominence of defense mechanisms such as repression, projection, and denial; rigid thinking; adherence to conventional values and aggressiveness toward those who violate them, particularly about sexual morality; submissiveness toward authorities; preoccupation with toughness and power; disdain for introspection and tender-mindedness; superstitious beliefs in unknown powers; general cynicism; and a belief that wild and dangerous things are going on.

Later theorists have neglected or ignored Adorno et al.'s psychoanalytic explanations and instead linked authoritarianism with cognitive styles marked by simplistic and black-and-white thinking, aversion to novel ideas, need for structure and closure, and rigid closed-mindedness. Cognitive styles are content-free; these ways of thinking characterize how the individual processes all information, whatever its nature or source. Whether there can actually be content-free authoritarianism is a moot point.

Current researchers often use the concept of right-wing authoritarianism (RWA) and the RWA Scale (Altemeyer, 1981). RWA focuses on three aspects of AP: (1) deference to traditional authorities, (2) adherence to conventional norms of the person's in-group, and (3) aggressiveness against those who reject or violate those authorities and norms. As a general measure of authoritarianism, it is an improvement over a Fascism (F) Scale developed by Adorno et al., but it has problems of its own. One problem is that it treats differences in degrees of authoritarianism (higher vs. lower) as differences in personality type (AP vs. non-AP); another problem is inattention to what a low score actually means. Martin (2001) presents an extended critique of RWA.

Measurement

Adorno et al.'s interpretations of their in-depth interview responses have been criticized as biased (Martin, 2001); this issue aside, more attention has been paid to their culminating questionnaire for measuring anti-democratic tendencies, the F Scale, which remains today widely known and used. The F Scale came under scientific attack for two major reasons. One was psychometric problems related to subject sampling, item wording, susceptibility to response bias (e.g., a high score on every item was pro-Fascistic), and the conflation of conservative and fascistic ideas. The other reason was ideological: in 1950, the Korean War and the Cold War loomed on the horizon, and critics argued that communists were just as prone as fascists to submission to authority, aggressiveness against those who disagreed with their moral code, focus on power, rejection of tender-mindedness, and the like (e.g., Eysenck, 1981–1982).

AP and Political Ideology

Revised scales corrected the most obvious technical errors in the F Scale (Christie & Jahoda, 1954), but the political criticism was less amenable to such a simple solution. Alternative scales (e.g., of dogmatism and rigid thinking) were developed to be ideologically balanced, and the RWA Scale labels all authoritarians as being right-wing—presumably including Mao's Red Guard, the Animal Liberation Front, eco-terrorists, and so on—thereby defining the problem out of existence.

Studies administering authoritarianism scales to various samples have generally found AP all along the left-right political spectrum, but more prevalently on the right, as Adorno et al. had reported. However, the studies were conducted in European and North American democracies, where leftists by definition do not support the nation's traditional politics and economics and have professed ethnic tolerance. Had the studies been done in ethnocentric (and in some cases anti-Semitic) communist dictatorships, such as the Soviet Bloc, North Korea, and China, the findings might have been different. In post-communist Hungary, authoritarianism is associated with extremism across the political spectrum (Todosijeviç & Enyedi, 2008), and neither the moderate left nor the moderate right can be convincingly depicted as authoritarian. A recent Left-Wing Authoritarianism Scale, tapping submission to left-wing leaders and support for violence against "the Establishment," found a few high scorers in a Dutch voter sample but significantly high scores among extreme leftist political activists (Van Hiel et al., 2006).

Adorno et al. pointed out that content may change: a leader could move a conventionalistic person from communism to Catholicism (p. 230); many loyal Nazis turned into loyal communists in postwar Eastern Europe. Whether movement between being an AP or non-AP individual is possible needs to be established, as do relationships between AP and political behavior, other values and attitudes, and even genetics. Much remains for future research of both theoretical and applied political interest.

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See also: **Attitudes; Political Psychology**

AUTISTIC DISORDER

Autistic disorder is an Axis I clinical disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association [APA], 2000) and is one of three autism spectrum disorders (ASDs) in this diagnostic system. The current diagnostic criteria for ASDs are those listed in the DSM-IV-TR; however, it is likely that these criteria may undergo changes in the upcoming DSM V, based on a growing research literature suggesting that autistic disorder, Asperger's disorder, and pervasive developmental disorders-NOS (not otherwise specified) represent points on a severity continuum that run in the same families, rather than being qualitatively distinct conditions.

History

Although autism was first described by Itard in 1801 and later in the clinical literature in 1943 by Leo Kanner, in the 1952 DSM, children with autistic disorder (AD) symptoms received the schizophrenic reaction diagnosis. In the 1968 DSM-II, children with such symptoms were diagnosed schizophrenic, childhood type. The 1980 DSM-III explicitly listed the condition we now call autistic disorder, but it was called infantile autism; in 1987, the name was changed to autistic disorder. The DSM-IV includes AD among other pervasive developmental disorders (Asperger's disorder, Rett's disorder, childhood disintegrative disorder, and pervasive developmental disorder-NOS (PDD-NOS).

Prevalence

Until the middle to late 1980s, it was believed that 6 in 10,000 children had autism. Only children now diagnosed with more severe AD would then have been identified as having autism. Subsequent studies revealed that prevalence was approximately 1:1,000, if every child within a given catchment area was tested at regular intervals to the age of 5. Shortly after the introduction in 1968 of the first widely accepted diagnostic test, the Autism Diagnostic Observation Schedule (ADOS), ASD prevalence estimates abruptly rose, as more clinicians were trained to administer the test. The ADOS detected PDD-NOS and Asperger's disorder, as well as AD. Many parents sought early diagnoses, so their children could receive early intervention services. In 1991 the U.S. Department of Education created a new category of special education eligibility for ASDs. Over the past decade, the Center for Disease Control has reported prevalence figures as high as 1:150.

A combination of factors appears to account for most of the apparent increase in prevalence: (1) increased ascertainment; (2) broadened diagnostic criteria; (3) creation of an ASD special education category; (4) diagnostic substitution, as children formerly labeled learning disabled or mild intellectual disability and language problems were now diagnosed with an ASD; and (5) questionable diagnoses by some community providers. Although actual prevalence may have risen, it is more likely that most of the apparent increase is an artifact (Rutter, 2005). The best estimate at this time is that actual prevalence is, and probably always has been, approximately 1:170, with the use of modern diagnostic criteria. Approximately 1:454 have AD, and 1:272 are diagnosed with Asperger's disorder or PDD-NOS (Chakrabarti & Fombonne, 2005).

Etiology

The ASDs have multiple etiologies. Miles and colleagues (2005) reported that 20% of individuals with ASDs had small head size and/or unusual physical features (dysmorphology), or complex autism. The remaining 80% had normal or larger than normal head size and no dysmorphology, or essential autism. Complex autism is believed to result from early errors in embryonic development (morphogenesis) that affect various brain areas as well as causing other dysmorphic features. Essential autism appears to result from microdeletions, which are mutations or chromosomal rearrangements producing localized brain developmental differences. Essential autism appears to be a heritable disorder, with more relatives with ASDs within families (20% vs. 9%). Individuals with complex autism are likely to receive an autistic disorder diagnosis, rather than Asperger's disorder or PDD-NOS, because their symptoms are usually more severe. There has been widespread speculation about vaccines containing mercury causing autism, but more than 16 independent studies have failed to find an association between autism prevalence and vaccinations (Doja & Roberts, 2006).

Diagnostic Features

A total of 6 features from a list of 16 must be endorsed from three symptom categories to qualify for an AD diagnosis. The three categories are (1) social impairment, (2)

communication impairment, and (3) repetitive fixed interests and routines. Delays in social interaction, language, or imaginative play must have been apparent prior to age 36 months (APA, 2000).

Social interaction impairments include such things as eye contact, gestures, appropriate facial expression, failure to develop peer relationships, lack of interest in showing enjoyment, and lack of social reciprocity. Communication impairments include delay in or total lack of spoken language, marked impairment in the ability to initiate or sustain a conversation, repetitive use idiosyncratic language (e.g., echolalia), and lack of make-believe play. Restricted repetitive and stereotyped behavior, interests, and activities include preoccupation with restricted patterns of interest that are excessive or highly focused (e.g., exclusive interest in weather or dinosaurs), rigidly following specific and nonfunctional routines (e.g., lining up objects), repetitive stereotyped motor mannerisms (e.g., rocking, flapping, twirling), and persistent preoccupation with parts of objects rather than the whole object and its function (e.g., the wheels of toy cars).

Screening and Diagnostic Assessment

Diagnosis of autism is made by a psychologist or physician with extensive experience with individuals having autism spectrum disorders within the chronological age range in question. A clinical psychologist, clinical neuropsychologist, school psychologist, or other licensed psychologist with specialization in autism typically conducts the diagnostic assessment. Medical specialists in developmental behavioral pediatrics, child psychiatry, or pediatric neurology are also often qualified to conduct diagnostic assessments. General pediatricians often conduct screening for possible autism and refer their patients to other specialists for full evaluation.

There is currently no biological test for autism. Combinations of history, an interview around current symptoms, and standardized psychological screening and diagnostic assessment instruments are used. Children with speech, language, and social behavioral developmental delays are screened beginning at age 1 year to 18 months. First-Signs is an excellent resource in planning screening for possible ASD. Screening determines whether a child has sufficient autism features to warrant thorough diagnostic evaluation. Screening instruments include the Checklist for Autism in Toddlers (CHAT), the Childhood Autism Rating Scale (CARS), the Gilliam Autism Rating Scale, (GARS), and the Social Communication Quotient (SCQ).

The Autism Diagnostic Observation Schedule-Generic (ADOS-G) is the gold standard in autism diagnostic assessments. The Autism Diagnostic Interview-Revised (ADI-R) is primarily a research tool and is used infrequently for routine clinical diagnosis because it is time consuming to administer. The Pervasive Developmental Disorder Behavior Inventory (PDDBI) is a parent and teacher informant questionnaire that is used less frequently than the ADOS. It is often helpful to interview more than one informant in arriving at a diagnosis. Diagnostic assessments by experienced practitioners yield a high degree of agreement (more than 90%) if all three ASDs are included in a sample. However, agreement drops sharply in distinguishing between Asperger's disorder and PDD-NOS. People undergoing autism diagnostic assessment should also receive developmental and age-appropriate speech and language, intellectual, and adaptive behavior assessments.

Comorbid Conditions

Few studies have examined comorbidities differentially among the three ASD subtypes. There is a high degree of comorbidity between fragile X syndrome and ASDs (50% of boys and 20% of girls met ASD in one study). Nearly all individuals with Smith-Lemli-Opitz (SLO) syndrome exhibit autism spectrum disorder symptoms. Many individuals with Cornelia de Lange syndrome display autistic features. People with the maternal uniparental disomy (UPD) form of Prader Willi syndrome are at greater risk for autistic symptomatology than those with paternal deletions of 15q11-q13. There is overlap between symptoms of attention-deficit/hyperactivity disorder (ADHD) and ASDs, as well as shared genes. However, the DSM-IV-TR states that ADHD should not be diagnosed in an individual with autism, in that attention problems are considered part of autism spectrum disorders. Many professionals treat children and youth with autism for their ADHD symptoms if they meet diagnostic criteria for both conditions. Epilepsy is present in 20–60% of individuals with autistic disorder, depending on their age and the setting from which the sample is drawn (Thompson, 2007).

Differential Diagnosis

It is as important to rule out alternative diagnoses that could account for symptoms as it is to identify autistic features during a diagnostic assessment. Children who do not have an ASD but who have obsessive-compulsive traits, language disorder, attention problems, or Tourette's syndrome, in combination with borderline intellectual functioning, can appear to present some autistic features during standardized assessments. Such individuals may become upset when a preferred routine is changed, may have difficulty verbally responding to some questions, may flap their hands when excited, may appear shy and anxious, and may have difficulty in focusing on a task for more than a few seconds at a time. However, individual children may exhibit good eye contact, smile reciprocally, exhibit joint attention, exhibit imaginative play, display appropriate affect, and share their interests with the examiner. It is very unlikely that an individual with autism would display these behavior patterns, so

a more appropriate diagnosis should be sought in such instances.

Treatment and Prognosis

Until the late 1980s, it was believed that there were no effective treatments for autistic disorder. At that time, approximately 80% of people receiving an autism diagnosis would test within the intellectual disability range (less than 70 IQ). Most youngsters diagnosed with AD were served in special education classrooms for the severely emotionally disturbed or had the label "moderate/severe mental retardation" (a term no longer used). In 1987, psychologist Ivar Lovaas published a landmark study showing that after 3 years of treatment, half of a group of children who had received intensive early behavior therapy for 40 hours per week functioned within the typical range intellectually and in their adaptive behavior and successfully attended regular education classrooms. Since then, there have been numerous replications of Lovaas's findings with similar outcomes.

Relatively fewer children with an AD diagnosis (as contrasted with Asperger's disorder and PDD-NOS) would be expected to achieve this level of functioning, because they have more severe symptoms at treatment entry. Nonetheless, many children with autistic disorder show high levels of achievement in intensive early behavior therapy. Lord and McGee's (2001) National Research Council panel, reviewing education for young children with ASDs, concluded that structured behavior therapies were the only interventions demonstrated to produce lasting cognitive, language, and social gains for young children with ASDs. A more recent review of all published early intervention research concluded that TEACCH and the Colorado Health Sciences interventions for children with ASDs were "probably effective" and that various behavioral interventions based on applied behavior analysis were the only interventions "well established" (Eikeseth, 2009).

Among older individuals with ASDs who display behavior challenges, the most effective interventions have been based on functional assessment of circumstances surrounding the behavior problem, including skill deficits. Within educational settings, positive behavioral support strategies are widely used with favorable outcomes (O'Neill et al., 1997).

Pharmacological, Dietary, and Complementary Alternative Medicine Interventions

Because of frequent tantrums, compulsive ritualistic behavior, hyperactivity, and aggression, many youth and adults with AD are treated with psychotropic medications. Selective serotonin reuptake inhibitors can reduce repetitive stereotyped behavior among individuals with AD. The atypical antipsychotic drug risperidone was approved by the FDA for treating irritability in autism (aggression and self-injury). Risperidone and other atypical antipsychotics cause weight gain and risk Type II diabetes (Posey & McDougle, 2000). The opiate antagonist naltrexone has reduced self-injury by 30–50% of individuals with severe intellectual disabilities, some of whom had AD (Symons, Thompson, & Rodriguez, 2004). Melatonin improves sleep onset among children and youth with ASDs (including autistic disorder), a very common problem.

A 1998 publication concluded that the pancreatic hormone, secretin, when administered to three children with autism, had curative properties. Since then, more than 15 double-blind placebo-controlled studies have failed to reveal any positive treatment effects of secretin in autism (Sturmey, 2005). Though diets without casein-gluten (CG) are very widely used by parents of children with autistic disorder, controlled blind studies have failed to reveal positive treatment effects from the CG diet. Two studies have suggested that high-dose vitamin B_6 and magnesium supplements may have improved symptoms of some children with autism spectrum disorders. Parents of children with autism use many other alternative medicine therapies, but in very few instances have controlled investigations been conducted (Thompson, 2007).

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See also: **Asperger Syndrome**

AUTONOMIC NERVOUS SYSTEM (See Parasympathetic Nervous System; Sympathetic Nervous System)

AUTOSHAPING

Autoshaping typically occurs when biologically primed stimulus-response relations interact with and occasionally override operantly learned, potentially incompatible response-reinforcer relations. It may also be referred to as "misbehavior of organisms." The name is derived from quick operant shaping that occurred without apparent reinforcement of successive approximations. Typically, the behavior observed depends on object or goal received; for example, food appears to release eating behavior and water to release drinking behavior. Although initially thought to manifest only among simpler mammals, autoshaping may occur in different animals including humans (Siegel, 1978). Consensus regarding etiology is lacking, although this is not a result of irregularities in data; the phenomenon of autoshaping is valid and reliable. As an example of autoshaping, pigeons quickly learn key pecking responses when a key is illuminated and provides a reliable and salient cue for the delivery of food (Brown & Jenkins, 1968). However, attempts to operantly extinguish or negatively punish pecking generally fail, which leaves open the question of whether the behavior was acquired through operant training or some other modality.

Theories of Autoshaping

As with most behavior, autoshaping resides in the gap between nature and nurture. It represents an interaction between organism and environment, phylogeny and ontogeny, and respondent and instrumental processes. Each of these explanations represents a different level of analysis to the puzzle of autoshaping.

Although the formal study of autoshaping largely began in the late 1960s, the existence of the phenomenon may have been foreshadowed by Darwin's theory of evolution (1859), which posited natural selection as the mechanism whereby species-specific morphogenesis and behavior would need to show environmental adaptation (i.e., functionality) with regard to subsistence and reproduction. At worse, the new structure or behavior could not impair the animal's relative ability to compete for basic resources. Influenced by Darwin's work, William James (1890) implied the existence of autoshaping in discussions of instinct. James defined instinct as "the faculty of acting in such a way as to produce certain ends, without foresight of the ends, and without previous education in the performance" (p. 383). However, instincts were not to be considered immutable stimulus-response relations; they were to be considered "blind" to the resultant consequences of the action only on the first occurrence of the behavior, after which they could be "disguised or modified." Hence, fixed action patterns, an interchangeable term for instinct used by ethologists, may be more or less fixed depending on the effect of the behavior, as well as on the species under consideration. James implicated the existence of a process whereby innate, hard-wired behavior might interact with and be modified by resultant environmental stimuli.

Lorenz (1957), an early ethologist, posited the more widely held view that, due to the simplicity of the nervous system of lower animals, constraints on stimulus perception and response are more likely than in humans, and that those responses would be adaptive to the survival of the animal. This view of instinct proposed a mechanism whereby the animal perceived a stimulus that *released* a species-specific response (e.g., pecking) designed to provide a specific consequence (e.g., food). This paradigm also adhered to the assumption that instinctive responses were unlearned, yet were modifiable, although the modification would only be found in the offspring. Lorenz postulated that the fixed-action pattern released by a specific stimulus should be referred to as an instinct; all supporting,

orienting, or learned behaviors maintaining or modifying an instinct are to be considered appetitive responses. In practice, however, the line between instinctive and appetitive behaviors remained blurred, perhaps because the etiology of instincts, or phylogenically predisposed fixed-action patterns, was not well understood.

Better understood are ontogenic models for acquiring behavior within the life of the animal. Two specific forms of learning, classical and operant conditioning, appear relevant to autoshaping. In the aforementioned example with autoshaped pecking in pigeons, it was originally thought that innate aspects of the bird provided for, or predisposed the bird for, rapid shaping via reinforcement of successive approximations of pecking. However, introducing terms like "innate aspect" or "predisposition" weakened the scientific explanation, as those terms were not operationally defined, did little to advance the understanding of the data, and were usually tautological (i.e., based in circular reasoning). Brown and Jenkins (1968) were the first to report that noncontingent food presentation temporally contiguous with key illumination resulted in pigeon pecking. Furthermore, Williams and Williams (1969) conducted the first example of omission training with pigeons, whereby the presentation of food was contingent upon the nonoccurrence of pecking. Under an omission-training model, behavior under operant control would cease or become greatly reduced. However, the pigeons continued to exhibit pecking over many trials without food. This study underscored the implausibility that autoshaping was maintained by contingent reinforcement with food, even if intermittently or superstitiously. This prompted researchers to investigate the possibility that key pecking was classically conditioned.

The rationale for considering classical conditioning as the mechanism of action for autoshaping stems from the fact that within each operant there resides the potential for simultaneous classical conditioning (for in-depth discussion, refer to texts by Davis & Hurwitz, 1977; Honig & Staddon, 1977; Rachlin, 1976; Schwartz, 1989). Due to the stimulus properties of consequences, particularly primary consequences, neutral stimuli that reliably precede and predict delivery may become conditioned. In other words, reinforcers and punishers may also serve as unconditioned stimuli-unconditioned response (US-UR) pairs, inadvertently creating conditioned stimuli (CS) and responses (CR). In the example with pigeons, the food pellet was contingently delivered upon pecking at the key when illuminated. This food pellet, both a potential reinforcer and paired US-UR, might allow the light inside the key to become a CS that elicits a key pecking response (CR) that closely approximates a normal unconditioned eating response (UR). This model fits the data well, as autoshaped behaviors closely approximate the normal phylogenic response released by the "goal" stimulus. In a further testing of this model, noncontingent delivery of the food maintained key pecking as long as the illumination preceded and was temporally contiguous to the food delivery, that is, CS continued to evoke the CR when it reliably predicted the US → UR delivery (Brown & Jenkins, 1968). Later, Jenkins (1977) altered the predictability of the CS so that it no longer preceded the food delivery. Classical conditioning extinction curves were noted, as were spontaneous remission curves when contiguity was reestablished. Jenkins also noted that maintenance of the pecking response was best when both contiguity and contingency were in place; in other words, that classical and operant conditioning may be additive processes.

In summary, autoshaping appears to be primarily a function of classical conditioning in that underlying US-UR relations are a requisite condition. However, operant consequences may also serve as US-UR pairs, allowing the occurrence of classical conditioning. Autoshaping per se only manifests when operant training appears to be overriding US-UR patterns, or in the terms of James and Lorenz, attempting to modify instinctive fixed-action patterns for obtaining goals. Hence, behaviors exhibited during autoshaping continue to defy simple categorization and precise etiologic explanation.

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See also: **Comparative Psychology; Operant Conditioning**

AVOIDANCE LEARNING

Avoidance learning occurs when an individual's behavior prevents exposure to an unpleasant consequence. This arrangement, or contingency, is pervasive in everyday life. For example, in writing a mortgage check each month, the homeowner does so not because this behavior is immediately pleasurable, but rather because it avoids conflict with, and possible foreclosure by, a financial lender. Or, consider the motorist who is traveling above the speed limit posted on a highway. On seeing the blinking light of a police vehicle ahead, the driver slows down to avoid a negative encounter with law enforcement. It might be said, in fact, that learning by avoidance is what motivates most people, most of the time.

Avoidance learning has its roots in experimental psychology and conditioning theory. This article describes theoretical basis of avoidance learning, reviews conceptual issues, and discusses the role of avoidance learning in clinical psychology.

Theory

B. F. Skinner was a psychologist who, among other things, studied the effects of behavior consequences on animal and human learning (Skinner, 1953). Although he wrote extensively about many topics, he is most commonly associated with operant conditioning and the principles of positive and negative reinforcement. Positive reinforcement is the presentation of a pleasurable consequence following a behavior, which produces an increase in the future probability of that behavior. By contrast, negative reinforcement is the behavior-contingent removal or postponement of a nonpleasurable experience, which also produces an increase in responding.

As noted, negative reinforcement can operate in two ways. When a person's behavior stops or reduces ongoing contact with an unpleasant experience, it functions as "escape." To illustrate, turning up the thermostat at home during winter months will terminate the cold temperature in a room. With the second operation, a person is not confronted with a contemporaneous unpleasant situation, but behaves to prevent or "avoid" its occurrence. Escape responding, therefore, requires that behavior be demonstrated in the presence of the nonpreferred (negative) situation, whereas avoidance responding occurs in the absence of the nonpreferred (negative) situation.

Avoidance learning can be traced to the study of "discriminated avoidance" that emerged from animal research (Hoffman, 1966). A neutral stimulus such as a light or tone was presented to a rat in an experimental chamber preceding the delivery of electric shock through a grid floor. If the rat pressed a lever during a preset interval between onset of the stimulus and the noxious stimulation, the electric shock would be prevented. The behavior of lever pressing is "discriminated" because it does not occur in the absence of the light or tone, which has become a "warning signal."

Other Considerations in Avoidance Learning

As revealed in the preceding example with lower organisms, avoidance learning is predicated on exposure to aversive stimulation that subsequently can be predicted by an exteroceptive cue or "signal." Among humans, however, similar learning can be promoted without direct contact with an unpleasant situation. On one hand, an individual's behavior may adhere to the avoidance paradigm by observing other people behaving. Avoiding interpersonal difficulties with a supervisor on the job, for instance, might be the outcome for a worker who sees colleagues being chastised, rebuked, or receiving similar harsh consequences when they interact with that individual.

Learning through avoidance without actually experiencing negative situations also can be the result of giving an individual verbal instructions, directions, or explanations. Such is the case when a parent informs a young child, "Don't touch the stove," in order to prevent injury. Similarly, the visibility of "do" and "don't" signs abundant in our environment provides explicit warnings for the purpose of avoiding untoward (and possibly fatal) consequences. Verbal and written language is said to mediate or control behavior through rule governance (Skinner, 1957).

Avoidance Learning in Clinical Psychology

Within clinical psychology avoidance learning is pertinent in both understanding the causes of maladaptive behaviors and formulating methods to intervene therapeutically. Relative to etiology, psychologists have long posited that experiential avoidance is at the heart of many clinical disorders. Thus, a person who struggles to cope effectively may abuse alcohol or use illicit drugs to avoid confronting sources of stress and discomfort. Our internal language, or "self-talk," also contributes to avoidance behavior (Hayes, Follette, & Linehan, 2004).

When implemented for therapeutic purposes, avoidance learning follows a five-step process: (1) identifying a problem behavior to be reduced or eliminated, (2) selecting a

response to serve as replacement for the problem behavior, (3) choosing a negative consequence, (4) pairing the negative consequence with the problem behavior, and (5) allowing the person receiving treatment to avoid the negative consequence. Although this step-wise progression looks like a straightforward process, it is not without complications. First, there are ethical concerns when proposing or using negative and distressing events with individuals who already have adjustment difficulties. Second, even if an avoidance learning approach to treatment seems appropriate, it can be an arduous task arranging behavior and unpleasant conditions contiguously. And third, negative reinforcement generally would not be considered the sole basis of treatment but instead would be combined with other therapeutic procedures to prompt and maintain compensatory skills.

Avoidance learning for therapeutic purposes is employed typically by professionals from the disciplines of behavior therapy and behavior modification. Beginning in the early 1960s, several research reports by behavioral psychologists described examples of avoidance conditioning that incorporated extremely aversive stimulation. In one demonstration, children who had autism and were unresponsive to social interaction learned to avoid electric shock by approaching a therapist who called to them, "Come here" (Lovaas, Schaeffer, & Simmons, 1965). Faradic and other noxious stimuli such as foul odors and tastes also were programmed with individuals to condition avoidance of cues and situations associated with alcohol ingestion, drug use, and "deviant" sexual orientation (Hallam & Rachman, 1976). By contemporary standards these approaches would be unacceptable and viewed by some as "de-humanizing." In fact, the majority of behavioral practitioners have essentially abandoned invasive treatment procedures in favor of positively oriented and skill-building strategies.

Although avoidance learning is still included in many current therapies, the types of negative experiences are more benign than those found in the historical record. Notably, when contrasted to other behavior-change procedures, avoidance learning and training is used less frequently in clinical practice. Again, because teaching avoidance requires exposure (real or threatened) to unpleasant conditions, it should be considered cautiously and applied with great care on those occasions where it can be justified clinically (Iwata, 1987). Having children or adults relieved from performing mildly effortful tasks or activities when they refrain from problem behavior is one way avoidance learning can motivate desirable change with low risk (Luiselli, 2007).

Avoidance learning is a powerful influence on human behavior. It is generated by encountering a negative situation, observing other people in similar circumstances, or being informed about the consequences of behavior. Verbal and written language serve frequently as "warning stimuli" that occasion avoidance-maintained responding. In a clinical context, avoidance learning has been incorporated to overcome problems and teach compensatory skills.

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See also: **Behavior Modification**

AVOIDANT PERSONALITY DISORDER

At the core of avoidant personality disorder (APD) as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) is an extreme sensitivity to negative evaluation that, coupled with a view of self as incompetent and inferior to others, leads to pervasive avoidance in a number of social situations (American Psychiatric Association, 2000). People with this disorder may, for example, refrain from trying new activities for fear of failure. They are also likely to be inhibited in relationships, even with family members, for fear of shame and ridicule. This leads to isolation and a lack of close relationships, and often to secondary disorders such as major depressive disorder. This negative cycle is not a function of disinterest in intimate

relationships. Rather, the fear of negative evaluation is so intense as to outweigh the deep-seated longing to interact with others.

The DSM-IV-TR (American Psychiatric Association, 2000) estimates the prevalence of APD to be between 0.5% and 1%. Features of this disorder start as early as infancy or childhood. There is a lack of longitudinal studies of APD, but there is evidence to suggest that without intervention it runs a chronic course. Some symptoms may be more stable than others, however, and one longitudinal study suggests that the personality trait of feeling socially inept and inadequate is stable over time, but that dysfunctional behaviors such as avoiding jobs with interpersonal contact is less stable (Skodol, Gunderson, Shea, McGlashan, Morey, et al., 2005).

Different theories of APD all hold that a behaviorally inhibitive temperament (which is conceptualized as genetic, biological, or psychological depending on the theory) interacts with early experiences of ridicule or shame in creating APD (Alden, Laposa, Taylor, & Ryder, 2002). In many cases, parents of people with APD were overly critical of them and their performance in social situations. These individuals learned that social situations are dangerous and that it is devastating if others do not think highly of them. At an early age, these experiences created a negative view of self and a hypersensitivity to negative evaluation. Cognitive approaches to intervention stress how people with APD process information; they are always scanning every social situation for clues of negative evaluation. Because they resort to avoidance rather than testing out what cognitive theorists call *schemas* (Beck & Freeman, 1990), there is a tendency to overestimate how dangerous the social situations are, and avoidance becomes a lifestyle.

Although there are many descriptions of avoidant individuals since at least the early twentieth century, the category of avoidant personality disorder was not formally introduced into the DSM until the third edition, published in 1980, in large part due to the work of Theodore Millon (1981). The conceptualization and history of APD must be tied to social phobia (SP), which was also brought into the DSM for the first time in the third edition. There was a distinction made between Axis I clinical disorders and Axis II personality disorders in the DSM-III, and SP was categorized as a clinical disorder and APD as a personality disorder. There were clear similarities between the two disorders, and social phobia was defined as the fear of being humiliated or embarrassed in a social situation. Initially, social phobia would only be diagnosed when the individual feared one social situation. If there were more than one social situation, APD would be assigned. However, in the revision of the third edition of the DSM (American Psychiatric Association, 1987), both disorders could be assigned to the same person if he or she met criteria for them. In addition, the subtype of "generalized" social phobia was created to refer to those individuals who feared "most" situations. It seems that SP, like APD, follows a chronic and unremitting course if left untreated (Heimberg & Becker, 2002).

What is the difference between SP and APD? This question has been the subject of considerable debate and has not been completely resolved. Some theorists have argued that the research findings are biased, in that they are for the most part based on studies of participants who meet criteria for SP (Arntz, 1999). The majority view, however, is that there is not a *qualitative* but a *quantitative* difference between the two disorders. More specifically, there are some additional symptoms in APD, such as not seeking involvement with people unless being certain of being liked, that indicate a more severe condition than SP. However, it is not accurate to say that a person who meets criteria for both generalized SP and APD has two disorders, but rather that he has a severe form of this condition (see Heimberg & Becker, 2002). The distinction between the two disorders in different editions of the DSM was not based on empirical data (Reich, 2000). In conclusion, the best way to make sense of the empirical literature is to think of APD and SP as referring to the same general condition, with APD capturing a more severe form of generalized SP.

APD is not only found to be frequently comorbid with clinical disorders such as major depressive disorder. Its comorbidity with other personality disorders is quite high, in particular with dependent personality disorder (DPD). There is some evidence to suggest that only the symptom of social withdrawal reliably discriminates between these two personality disorders (Alden et al., 2002).

APD is seldom the sole focus of empirical studies (Alden et al., 2002). As an example, there is just one published paper in existence reporting on an outcome study comparing different forms of therapy for APD (Emmelkamp, Benner, Kuippers, Geiertag, Coster, et al., 2006). This is probably in large part due to the close ties between APD and SP. Thus, there are many studies that study the association between SP and APD, and whether APD predicts response to treatment of SP, rather than studying APD in its own right. These studies seem to suggest, in general, that rates of improvement for participants with APD in addition to generalized SP are similar to participants without APD. Limitations of these studies with regard to outcome for APD are that the outcome measures assess SP rather than APD. In the only study involving solely participants with APD, cognitive-behavioral treatment (CBT) outperformed brief dynamic therapy (BDT), and only 9% of the CBT participants compared to 36% of the BDT participants met criteria for APD at a 6-month follow-up (Emmelkamp et al., 2006). Although much more research needs to be done on the treatment of APD, this work extends the finding that CBT is effective for APD in addition to SP, and that a personality disorder such as APD, which by definition is resistant to change, is treatable.

In addition to specific techniques based on the CBT model, the relationship between therapist and client may be a crucial vehicle of change. The APD client is commonly distrustful of the therapist and fears negative evaluation and even embarrassment in the treatment setting. Therapists aim to build trust between themselves and the client and to teach clients that they can be assertive without losing the bond with their therapist. If the therapist is successful in creating that trust, the next step in treatment becomes to generalize that experience to other relationships in the client's life, and to creating new relationships.

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See also: **Shyness; Social Phobia**