

PART I

General Issues

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CHAPTER 1

History and Theoretical Foundations

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The history of psychology, including clinical psychology, is typically treated separately from its theoretical foundations. However, because the history of psychology entails theoretical developments, this chapter interrelates these two topics. R. I. Watson noted in his 1953 *A Brief History of Clinical Psychology* that “Clinical psychologists have been surprisingly ahistorical” and that there was “. . . no generally available history of clinical psychology. . .” (p. 321). Subsequently, several excellent histories were written. Among the accounts of the earliest years is an article by Wallin (1961) entitled “PhD’s in Psychology Who Functioned as Clinical Psychologists between 1896 and 1910.” Chapters by Garfield (1965) and Kirsch and Winter (1983) appeared in earlier handbooks of clinical psychology. Special sections of the *American Psychologist* concerning the history of psychology introduced by Benjamin and Baker (2000) and Dewsbury (2000) partly pertain to clinical psychology. Perhaps the most recent and comprehensive history of clinical psychology was the chapter by Benjamin that appeared in the first volume of the *Annual Review of Clinical Psychology* (2005). The history of psychotherapy by Freedheim (1992) is pertinent to clinical psychology. McFall (2006) added comments on contemporary doctoral training in clinical psychology and our current history.

Clinical psychology rests on multiple theoretical foundations. We begin with its philosophical foundation because, historically, philosophical issues have influenced the theory construction decisions that influenced assessment, intervention, and training decisions made at various meetings constituting part of the history of clinical psychology. Next we consider the scientific (research) academic foundations of experimental psychology and research methods and their influence on the Boulder model of clinical training. Then we consider psychological assessment. Psychological testing was the first professional activity of clinical psychologists. We then consider the psychological interventions that constitute the core and main component of contemporary clinical psychology. Finally, we get to a more traditional history of clinical psychology beginning with a review of professional developments, including training issues, and ending with a discussion of selected contemporary issues facing clinical psychology.

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archive that you can browse or search by subject or year for original documents of historical significance to psychology. The following uniform resource locator (URL) sorts articles by author: <http://psychclassics.yorku.ca/author.htm>.

PHILOSOPHICAL FOUNDATIONS

Clinical psychology, like psychology in general, was and continues to be founded on philosophical issues. Rychlak (1968, 1981a, 1981b) provided a detailed discussion of these foundational issues. He discerned two polar positions and a mixed middle position that continues to organize psychologists into schools of thought and practice. Using Rychlak's terms, at one end of the philosophical spectrum, we have the *demonstrative tradition* grounded in the philosophy of John Locke. At the other end of the philosophical spectrum, we have the *dialectical tradition* grounded in the philosophy of Immanuel Kant. A mixed position drawing on aspects of both sides occupies the middle of this philosophical spectrum. Rychlak (1981a, 1981b) divided personality theorists into Lockean models (e.g., Sullivan, Dollard and Miller, Skinner, Wolpe, and Stampfl and Bandura), Kantian models (e.g., Rogers, Binswanger and Boss, and Kelly), and mixed Kantian-Lockean models (e.g., Freud, Adler, and Jung). Rychlak (1968, p. 456) lists specific philosophical issues that divide clinical psychologists into camps and quite strongly determines a person's position on the philosophical spectrum and consequently his or her theoretical orientation, approach to assessment, and preferred interventions. The five philosophical issues discussed next are especially important.

Dualism versus Monism

Monism maintains that the only type of matter in the universe is physical. Dualism maintains that the universe contains two types of matter: mental and physical. Does the mind exist independent of its physical substance? Or does the mind emerge from the brain? The Committee on Accreditation of the American Psychological Association (APA) specifies biological bases as one of the six areas in which clinical psychologists must be trained. This requirement identifies behavior as a biological property. Hence, factors that alter biological function are expected to alter psychological states (for example, when psychotropic drugs/medications alter mood and behavior). But are all psychological states tied to biology? What about spirituality? The term psychobiology implies that psychological and biological states are reciprocally interdependent. An important advantage of the connectionist neural network perspective of cognitive neuroscience is that it provides a conceptual basis for discussing these relationships that is open to computer simulation and verification via empirical research. What balance or mix of these factors you believe influences your position on many other issues important to clinical psychology.

Idealism versus Realism

Realism maintains the existence of an independent world external to perception and cognition. Idealism maintains that reality is the result of perception and cognition and that we look on a world of our own making. A mixed position might maintain that

both positions are correct; that a real physical world exists but that our psychological world is a transformation of it. Psychophysics endeavors to relate external physical measures to internal psychological impressions. On the one hand, everyone bleeds when cut so it is best to treat sharp objects with caution. On the other hand, a wide variety of individual reactions to the same incident demonstrates that “reality” is not the same for all people. Psychological perspective is shaped by many factors, including the unique sequence of events that constitute each person’s life history. An essential feature of cognition is that it is transformational; it alters experience. Cognitive behavior therapy is based on the premise that how you think can affect how you feel and behave. What balance or mix of these factors do you believe is correct?

Introspection versus Extraspection

Introspection maintains that valid psychological data derive from people’s inner experience, whereas extraspection maintains that valid data must be objective and, therefore, observable by a third party or recordable by an instrument. Fernberger (1922) proposed that psychology be divided into two disciplines: one an extraspective study of stimulus-response relationships; the other an introspective study of intervening mental processes. Limiting inquiry to that which can be physically recorded places many psychological phenomena out of reach. Methodological behaviorism endorsed this position as necessary for psychology to be a natural science. Alternatively, structural equation modeling posits latent constructs that must be estimated through computations based on objectively measured indicators. The accuracy/validity of this method depends partly on meeting the assumptions of this statistical methodology. Inaccurate indicator measurements will necessarily give misleading estimates of latent variables.

Tests are objective only if the test scoring methods are objective. Personality tests probe for personal preferences, attitudes, and dispositions; the answers are subjective not objective. The Paulhus Deception Scale (PDS; Paulhus, 1998) tests for impression management and self-deceptive enhancement. Impression management entails the tendency to give socially desirable answers. Self-deceptive enhancement refers to the lack of insight and to an unconscious bias that people may have that prevents them from reporting accurately even if they wish to. Self-reports depend on memory for past events. Considerable research has demonstrated that people inaccurately report medical events and inaccurately place them in time (Rogler, Malgady, & Tryon, 1992). Clinical diagnosis also depends heavily on self-report. Owing to the absence of any behavioral referent, objective measurement, or gold standard, evidence of diagnostic reliability is frequently, but mistakenly, presented as evidence of its validity (Malgady, Rogler, & Tryon, 1992).

Functional magnetic resonance imaging (fMRI) technology offers a way to physically image and objectively record brain processes while a person responds psychologically to stimuli. But measuring brain activation is *not* equivalent to reading a person’s mind because mental content does not show up on an fMRI plate. Moreover, most psychologists do not have fMRI access and those who do may not be able to conduct all of their assessments with it. The practitioner must decide

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how much they are going to rely on introspection and self-report versus objective measurement.

Procedural versus Validating Evidence

What constitutes persuasive evidence? Rychlak (1968, 1981a) distinguished two types of evidence. Procedural evidence determines truth on the basis of internal consistency, including congruence with what is already accepted to be true. Clinical case formulation is frequently based on such thinking. According to this view, a case formulation is considered to be correct to the extent that the results of psychological testing and clinical interview of the identified patient and all other reporters of fact agree, thereby forming an internally consistent view. Procedural evidence is based on a coherence theory of truth (cf. Thagard, 2000). Procedural evidence is empirical evidence because it is based on experience. However, coherent explanations such as the clinical formulations just mentioned and more formalized positions found in philosophy and religion can be wrong. This is how science can contribute. Coherence alone is not certain proof.

Science can validate evidence. It includes all of the consistency requirements of procedural evidence, is also empirical, but crucially includes hypothesis testing where predictions are compared with observations. Alternatively stated, validating evidence requires that procedural evidence be put to a further test where predictions are made based on a coherent understanding and tested under controlled conditions (termed research designs) to see if the results support or falsify the hypothesis. The ability to predict the future based on the past separates science from philosophy. The ability to explain past events is directly proportional to the complexity of the theory used because complexity enables you to account for diverse outcomes. But the ability to predict future events is inversely proportional to the complexity of the theory used because of the uncertainty involved. Falsifiability is a crucial additional requirement over and above coherence that requires predictions that can be empirically contradicted. This additional requirement is crucial because hypotheses that cannot be falsified are not scientific statements. Philosophy and religion explain much but predict little that can be empirically verified and possibly falsified. Falsifiability separates science from philosophy and religion. Unfortunately, clinical practice does not always allow for case formulations to be empirically tested in ways that permit falsification. The practitioner must decide what blend of procedural and validating evidence is to be sought in principle and what level of evidence is minimally acceptable regarding clinical assessment and interventions. This issue continues to divide clinical psychologists with regard to what constitutes evidence-based practice.

Final versus Efficient Causes

Final causes are goals and objectives toward which a person aspires. Teleology provides explanations based on goal seeking. Efficient causes entail necessary and sufficient conditions that give rise to an event. Teleological explanations are generally unaccepted by science because they do not explain how the goals were established. The physical world was once understood in terms of final causes. Whether it rained

was thought to be determined by choices made by the gods. Science explains rainfall as the result of humidity and temperature; water precipitates out of air when the temperature falls below a critical value. In contrast, teleology is frequently accepted as a psychological explanation. When people are asked to explain their behavior, they frequently say that they chose how to behave in order to reach a goal or obtain a result. Skinner (1989) maintained that such explanations do not explain behavior but, rather, rephrase behavioral variation in terms of choice variation without explaining how the choices were made. Choice cannot be inferred from behavior and then used to explain behavior—that is circular reasoning. It is no more reasonable than defining a word with a sentence that uses the word to be defined (e.g., aggressive people are people who behave aggressively). Connectionist network models provide a possible mixed model solution because their network mechanisms can be examined to see how inputs are transformed into outputs (cf., McLeod, Plunkett, & Rolls, 1998; O'Reilly, & Munakata, 2000).

SCIENTIFIC (RESEARCH) ACADEMIC FOUNDATIONS

Psychology began as philosophy but has developed into a science. That transition entails certain constraints on how psychological hypotheses and theories are formed, tested, and evaluated. This section considers several central issues.

Falsifiability

Philosophy and science are both empirical, that is, they are both based on experience. Religion is also empirical in the sense that it is based, in part, on formative personal experiences including, but not limited to, conversions, revelations, and being “born again.” Science is a subset of philosophy characterized by an emphasis on measurement and falsifiability. The falsifiability requirement distinguishes science from philosophy because concepts that cannot be falsified are not scientific as mentioned previously. Falsifiability entails being able to make measurements or observations that can contradict a hypothesis. Observations that are consistent with a hypothesis may or may not have arisen because the hypothesis is correct. The predicted results could have been observed for an entirely different reason than the one specified by the hypothesis. There is no way to discern which alternative is correct; which is why all empirical confirmations of theory must necessarily be tentative. Alternatively, results that contradict a hypothesis are more definitive. Either the hypothesis is partially or entirely defective and requires revision or rejection or the measurements that constitute the data are unreliable and/or invalid or the experimental design was not properly implemented or was not capable of supporting the required inferences. Empiricism is a necessary but not sufficient condition for scientific study.

Falsifiability typically presumes some form of measurement in order to collect data that can be used to support or falsify the hypothesis in question. The ability to reliably categorize presence/absence regarding a theoretical construct is perhaps the most basic form of measurement. Operational definitions define a concept by the procedures used to measure it:

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- *Ordinal measurement* requires that you be able to rank order measurements or observations.
- *Interval measurement* entails ordinal measurement on scales with equal intervals between numbers.
- *Ratio measurement* entails interval measurement on scales that have an absolute zero value; where zero represents none of the quantity being measured.

Measurement validity presumes reliability because validity coefficients cannot consistently exceed the square root of reliability coefficients (see psychometrics section that follows). However, reliability does not ensure validity. You can reliably measure head size but that is not a valid index of intelligence.

Uncertainty Reduction

Science aims to explain and predict. Explanation enables us to understand and thereby presumably predict though prediction can occur in the absence of understanding so-called blind empiricism. Scientific explanation is more than storytelling; or at least it is a special form of storytelling. Shannon (1949) defined information as the reduction of uncertainty. If you remain as uncertain about the necessary and sufficient conditions responsible for an event subsequent to the explanation as you were before the event then no information has been communicated about the event regardless of how compelling the explanation might be. Explanations entail a sequence of events in which each step is shown to be sufficient, and perhaps necessary, for the next step to occur. An account of what enables the sufficiency or necessity of each step in the explanatory sequence is what helps us understand why the event undergoing explanation occurred or did not occur. Explanations presume empirical consistency; that is, the same sequence of events must result in the same outcome unless the explanation is probabilistic, which usually occurs when there is no mechanism information. Explanations can be complicated and sometimes entail conditional logic that enables a number of branching pathways to be taken. Mechanical explanations refer to the movement of gear B that meshes with gear A and, depending on the radius of each gear and the number of teeth on each gear, a complete rotation of gear A results in a specific number of rotations of gear B. Biological explanations frequently entail a series of biochemical steps that each gives rise to the next. Mathematical explanations appeal to addition, subtraction, multiplication, division, and other operations. Economists use a variety of mathematical models to explain consumer behavior. Psychological explanations can appeal to thought processes that entail a sequence of identifiable cognitive and/or emotional steps leading to the explained result. Formal logic is sometimes used as a model of rational thinking. Albert Ellis frequently uses such explanations. Behavioral explanations often appeal to antecedent stimuli as setting the occasion for behavior and/or consequent events as altering the future probability of that behavior or a similar variant under the same or similar circumstances. Explanation can consist of identifying necessary and sufficient conditions for behavior to occur but questions remain regarding why those conditions and not others are necessary and/or sufficient. These questions are not asked and therefore remain

unanswered. Why reinforcers are reinforcing is one such question that eludes behavioral explanation. Mechanism information regarding such questions is left for neuroscience to provide. Alternatively, connectionism, a facet of cognitive neuroscience, provides proximal causal selectionist explanations that are consistent with the explanatory requirements of operant conditioning (Donahoe, 1997; Tryon, 1993a, 1993b, 1995) and cognitive psychology. Tryon (2005) reviewed the lack of mechanism information currently available regarding systematic desensitization and exposure therapy prior to presenting a possible connectionist mechanism.

Accreditation Bases

Domain B of the *Guidelines and Principles for Accreditation of Programs in Professional Psychology* published by the American Psychological Association (www.apa.org/ed/gp2000.html) specifies six foundational areas in which all clinical psychologists shall be trained: history and systems, biological bases of behavior, cognitive and affective bases of behavior, social bases of behavior, individual bases of behavior, and developmental bases of behavior. The curriculum for covering these bases is left to each training program. Although it is beyond the scope of this chapter to review the theoretical foundations pertinent to each of these six areas, some theoretical developments merit mention.

The biological bases of behavior were once covered by courses called physiological psychology (e.g., Freeman, 1934; Hathaway, 1942; Morgan, 1965; Grossman, 1965; and Brown, 1980). Neuroscience has now eclipsed physiological psychology. Ilardi (2002) noted that *neuroscience* takes a completely reductionistic approach to psychology where biology is expected to fully replace psychology. Ilardi (2002) also noted that *cognitive science* traditionally takes a symbol-manipulating approach that is unconstrained by brain structure and/or function thereby disregarding biology. Cognitive processes are studied independent of the medium in which they are situated. Ilardi (2002) further noted that *cognitive neuroscience* consists of the intersection of neuroscience and cognitive science and seeks to understand how mind *emerges* from brain (cf. O'Reilly & Munakata, 2000) thereby integrating biological and psychological perspectives. Computational cognitive neuroscience has simulated, with varying degrees of success, the full range of psychological processes covered by introductory psychology textbooks using network models (see McLeod et al., 1998, for an introductory textbook). A web-based textbook that interactively introduces basic connectionist concepts can be found at www.itee.uq.edu.au/~cogs2010/cmc/home.html.

Mark Gluck referred to computational modeling as providing the “conceptual glue” that binds psychology and neuroscience (www.gluck.edu/html/research_overview.html). The Cognitive Neuroscience Society web page (www.cogneurosociety.org) reveals that active research programs are underway at a number of interdisciplinary cognitive neuroscience centers including the Center for the Neural Basis of Cognition, jointly supported by the University of Pittsburgh and Carnegie Mellon (www.cnbc.cmu.edu), the Neuroscience Institute at the University of California, Berkeley (<http://neuroscience.berkeley.edu>), the Center for Mind and Brain at the University of California, Davis (

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ucdavis.edu), the Center for Cognitive Neuroscience at Dartmouth College (<http://ccn.dartmouth.edu>), the Center for Cognitive Neuroscience at Duke University (www.mind.duke.edu), and the Center for Cognitive Neuroscience at the University of Pennsylvania (<http://ccn.upenn.edu>). The *Journal of Cognitive Neuroscience* (<http://jocn.mitpress.org>) is a major source of cognitive neuroscience literature.

The cognitive and affective bases of behavior are frequently reviewed in separate courses. Connectionist modeling has helped integrate both areas including Posttraumatic Stress Disorder (e.g., Tryon, 1999, 2005). Connectionist models also address social factors (e.g., Kunda and Thagard, 1996; Read and Marcus-Newhall, 1993; Shultz and Lepper, 1996). Connectionist models are inherently developmental since they must be trained from an initial naïve state. Hence, the connectionist neural network perspective within cognitive neuroscience increasingly provides an integrated view of the six foundational bases that APA prescribes for the training of all clinical psychologists.

Psychometrics (Measurement)

Domain B of the *Guidelines and Principles for Accreditation of Programs in Professional Psychology* published by the American Psychological Association (www.apa.org/ed/gp2000.html) also requires training in “psychological measurement; research methodology; and techniques of data analysis.” Psychological testing (psychometrics) has been extremely important to clinical psychology and its history overlaps substantially with the history of clinical psychology. Psychometrics arose in the context of assessing individual differences that are central to clinical psychology, and clinical psychologists initially provided this service to health service delivery professionals.

Science is limited by the data on which it is based. Garbage in, garbage out (GIGO) is an accurate adage. It has long been known that the validity of tests and measurements cannot consistently exceed the square root of their reliability (Gulliksen, 1950, p. 97). Evidence of diagnostic reliability has sometimes mistakenly been offered as evidence of its validity (Malgady et al., 1992). When the option of conducting research using the “best available” measures means using tests of low reliability and/or questionable validity, it is often advisable to devote your time and resources to constructing a better test of the concept under study than to conducting the planned research. Establishing construct validity for a test is a decidedly theoretical venture that entails hypothesis testing and can yield more rewarding results than conducting the research with excessive measurement error and/or lack of validity. Failure to find predicted results does not necessarily warrant a call for additional research with the same instrument(s) but may call for constructing a better instrument. This is certainly the case when a test has been developed and validated on a majority population but is being used with minority populations. Translating a test from English to Spanish or any other language is not sufficient. You must demonstrate measurement equivalence across the relevant dimensions of diversity pertinent to the proposed study. This entails demonstrating psychometric equivalence (cf. Byrne, 2006, pp. 225–260; Ghiselli, 1964, p. 227; Ghiselli, Campbell, & Zedeck, 1981, pp. 192–227; Honaker, 1988, p. 562).

Test means can be made equal by adding an appropriate constant. Test variances can be made equal using an equipercentile transformation. However, in order for tests to be psychometrically equivalent, correlations must be comparable. Tryon and Bernstein (2002) discussed test reliability, validity, and phantom measurements that occur when reliability estimates substantially exceed validity estimates as they typically do. They also discussed other facets of psychometrics pertinent to understanding measurement issues including the effect of test length on reliability (Spearman-Brown formula), developing operational definitions, methods of collecting data (interviews, questionnaires, behavioral observation, psychological tests, and instruments), units of measure, generalizability theory, plus issues relating to the outcome measurement, particularly difference scores. These concepts are important to establishing a reliable and valid measurement base for clinical practice.

Cattell (1890) coined the term *mental test*. Anastasi and Urbina (1997) reported that Kraepelin, who worked for a while in Wundt's lab, administered many tests to psychiatric patients as part of his clinical examination and that Ebbinghaus administered tests of memory, arithmetic computation, and sentence completion to school children. Although the French physician Esquirol distinguished between mental retardation and insanity in 1838, it was not until 1905 that Binet and Simon published the first intelligence test that they subsequently revised in 1908 and 1911. Goddard translated this test into English, introducing it in the United States. Terman (1916), with colleagues, psychometrically refined this test and introduced the intelligence quotient (IQ) as a ratio of mental age to chronological age. Goode-nough (1949) provided a book length history of psychological testing. Anastasi and Urbina (1997) described the historical antecedents of modern testing as beginning with Francis Galton, an English biologist, who measured individual differences of related and unrelated persons to further his studies of human heredity. He pioneered rating-scale and questionnaire methods in addition to anthropometric and sensorimotor (vision, hearing, muscle strength, reaction time, etc.) measurements. He also pioneered statistical methods for describing these data that Karl Pearson, his best-known student, extended into the now widely used correlation coefficient.

Personality testing can be divided into four categories (cf. Anastasi & Urbina, 1997, Part Four):

1. Self-report inventories designed to measure personality traits such as the Minnesota Multiphasic Personality Inventory (MMPI) and its revision (MMPI-2), the California Psychological Inventory, the Sixteen Personality Factor Questionnaire (16PF), Millon Clinical Multiaxial Inventory, and Personality Research Form (PRF).
2. A second category includes measures of interest and attitudes including the Strong Interest Inventory and the Kuder Occupational Interest Survey.
3. Projective testing was introduced to America by Herman Rorschach in 1921. Five scoring systems were developed of which the Exner system is perhaps the most well developed and currently used. Serious concerns emerged around 1995 regarding the reliability and validity of the Rorschach, particularly as it is used clinically (Lilienfeld, Wood, & Garb, 2000). The Society for Personality

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Assessment (2006) responded with a white paper regarding the current status of the Rorschach in clinical and forensic practice.

4. The Thematic Apperception Test was introduced by Murray (1943). Machover (1949) introduced the Draw-a-Person Test.

Methodology (Experimental Design)

How should practitioners proceed to use their data gathering device(s) in order to acquire clinically useful information or basic information on which to build a foundation for clinical practice? Developing a reliable and valid means of acquiring information is just the beginning of an effort to construct a psychology that can be used in an *ethical* clinical practice. It is important to emphasize *ethical* clinical practice because it is possible to put any set of beliefs into clinical practice including those that are ineffective, unethical, and/or illegal. Textbooks on psychological ethics (e.g., Koocher & Keith-Spiegel, 1998; Nagy, 2005) contain numerous examples of clinicians whose license to practice psychology and/or membership in the American Psychological Association was revoked because of unethical practices. It is notable that most, if not all, of these psychologists believed strongly that they were acting in the client's best interests and that the "services" they were providing were safe and effective. Lilienfeld, Lynn, and Lohr (2003) discussed "science and pseudoscience in clinical psychology" regarding assessment, diagnosis, and psychotherapy including illusory correlation. Clearly personal conviction does not always provide sufficient grounds for ethical professional practice. Research methods were developed to facilitate drawing valid inferences and can be divided into correlational and experimental designs.

With correlational methodology, the practitioner measures all relevant variables and then seeks to understand how they covary. This process begins with simple bivariate correlations. Partial correlations can statistically control for covariates. The same can be done using hierarchical regression where the dependent variable, the variable being explained, is first predicted using one or more covariates and subsequently predicted by these covariates plus one or more explanatory variables introduced one at a time or as a set to see if they enhance predictability over and above the covariates. Factor analysis and principal components analysis can be used to determine if fewer theoretical constructs than measurements is warranted. Structural equation modeling can be used to assess how related two theoretical constructs are.

While variables that are causally related must be correlated, variables that are correlated are not necessarily causally related. Casual inferences require true experiments that consist of manipulation of the independent variable subsequent to random assignment of participants to conditions. Experimental designs can be divided into two categories: between subjects where different people are assigned to different groups and within subjects (repeated measures) where the same people are studied under different conditions. These two types of designs can be combined. The simplest between-subjects design consists of one control group and one experimental group that are matched on all relevant variables to begin with. This is either done explicitly by measuring and matching on an individual or group basis or by

random assignment, which if the sample sizes are large enough, ensures matching on all variables. The experimental group is treated in one way that the control group is not and, if the two groups differ upon posttesting, then the one created difference must be the cause. This may be called reasoning by the *principle of a single difference*. Identification of a second, perhaps unintended, difference results in a confounded experiment because you can no longer unambiguously draw a causal inference. The results could be due to either one of the two variables and/or to their interaction; three possibilities, not one of which can be eliminated.

More complicated research designs are frequently used consisting of multiple treatment and control groups. Frequently, homogeneous clinical groups are studied to determine if the intervention is effective. Subsequent research demonstrating generalizability over dimensions of diversity including comorbidity, age, color, disabilities, ethnicity, gender, language, national origin, race, religion, sexual orientation, and social economic status need to be conducted. This research has yet to be conducted on most, if not all, contemporary psychological interventions.

Repeated measures designs can be conducted on groups of participants or on individual clients one at a time. Such so-called single-subject experimental designs entail manipulation and replication that enables conclusions regarding causation. The more familiar ABAB design is appropriate only for behaviors that can be reversed; that is, behaviors that can increase and decrease. Ethical concerns are frequently raised when considering the reversal to pretreatment levels of problematic or self-injurious behaviors. Alternate designs that do not involve reversal are preferred in these situations (cf. Richards, Taylor, Ramasamy, & Richards, 1996).

Most research designs require homogeneous groups of participants and can therefore only be used by investigators with access to such a resource. Inferences based on these group designs are typically limited to group averages. Clinical psychologists deal with individuals. Investigators infrequently report their findings in ways that enable clinicians to comprehend how they apply to individuals. Single subject research designs are available that enable inferences to be made for individuals. These designs entail some form of replication to exclude alternative interpretations of results. Replication over multiple participants adds further confidence to inferences drawn.

Freud relied on the Necessary Condition Thesis (NCT) in an attempt to conduct informative empirical inquiry in the consulting room unencumbered by experimental design restrictions (Grünbaum, 1984). Freud theorized, as part of his talking cure, that making unconscious themes conscious through interpretation resulted in clinical improvement. He believed that only correct interpretations resulted in clinical improvement. Hence, clinical improvement subsequent to an interpretation was evidence that the interpretation was correct. A lock-and-key type reasoning was used where the symptom is the lock and interpretations are the keys. You can try each key in the lock without altering the lock. Only one key opens the lock. By corollary, the key that opens the lock is the correct one. Treating interpretations as keys, you can try out various interpretations without concern that you may be priming the patient through suggestion, thereby shaping their responses. Psychological changes subsequent to providing an interpretation certify that interpretation as psychologically correct. This approach rests on the assumption that only the correct

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psychodynamically formulated interpretation is able to produce change. Empirical findings regarding the clinical effectiveness of behavior therapies, cognitive therapies, cognitive behavior therapies, and interpersonal therapies contradict the NCT. Apparently, multiple keys will open the lock. Hence, clinical improvement outside the structure of an experimental design cannot certify that treatments work or why they work or establish hypotheses concerning underlying psychopathology. Inferring psychopathology on the basis of therapeutic response is reasoning from correlation and association, and suffers from all of the well-known logical flaws in doing so.

Data Analysis

The theoretical nature of data analysis can be viewed in several ways. Statistical methods can be understood as quantitatively reasoned arguments based on assumptions, like qualitatively reasoned (ordinary) arguments are. Violating assumptions can lead to inferential errors. One such assumption is that measurements are made independent of each other. Violation of this assumption can produce serious inferential errors. Repeated measurements on the same person can be autocorrelated. Under these conditions, the mean of N_1 measures taken during baseline and the mean of N_2 measures taken during intervention cannot be accurately compared using a standard t -test (Parker & Brossard, 2003). Time series analyses model autocorrelation and remove its effects prior to analyzing for mean differences. While some procedures are considered robust to violation of certain assumptions, for example, that a trait is normally distributed in the population from which participants have been sampled, violating the assumption of independence in small and samples of unequal size and variance can lead to serious errors of inference. Establishing statistical difference is a primary interest. Providing evidence that two groups are not statistically different is not evidence that they are statistically equivalent, which is probably what people have in mind when reading that two groups have been matched on a control variable or that two treatments are equally effective. Tryon (2001) discussed issues of statistical difference, equivalence, and indeterminacy (when two groups are neither statistically different or equivalent).

Data can be analyzed qualitatively as well as quantitatively (Kvale, 1996). Ponterotto (2005) addressed the philosophical, theoretical, basis of qualitative analysis. Haverkamp, Morrow, and Ponterotto (2005) introduced the four sections of the special issue of the *Journal of Counseling Psychology* for 2005, volume 52, in which a wide variety of qualitative methods were presented and discussed. Qualitative methods in the form of focus groups can be the first step in developing quantitative outcome measures because they can reveal what constitutes a good outcome. Notable parallels exist between qualitative methods and the goals and objectives espoused by Rogers in his 1955 *American Psychologist* article entitled "Persons or Science? A Philosophical Question" and his 1961 book *On Becoming a Person*.

Interventions

Freedheim (1992) published a book on the history of psychotherapy. The *Encyclopedia of Psychotherapy* by Hersen et al. (2002) provides comprehensive coverage of

psychological interventions. Eysenck (1952) was the first author to present data that the effectiveness of psychotherapy had yet to be demonstrated. That the effectiveness of psychotherapy needed to be demonstrated seemed to come as an unwelcome surprise. Not all clinical psychologists were eager to empirically demonstrate the validity of their interventions. Some still continue to presume rather than demonstrate efficacy (under controlled conditions) and effectiveness (under real world conditions) of their psychological interventions. Most empirical work on psychotherapy outcome seeks to demonstrate efficacy and effectiveness of psychological interventions rather than examine the process by which good and bad outcomes arise. Lambert, Shapiro, and Bergin (1986) noted that as many as 10% of clients deteriorate during psychotherapy and end up worse off than when they began. Mays and Franks (1985) edited a book on this issue but curiously little attention has been given to this important matter since then. A list of empirically supported treatments can be found at the following APA Division 12 Clinical Psychology website (www.apa.org/divisions/div12/rev%5Fest/). Books are available that summarize empirically supported treatments with adults (e.g., Nathan & Gorman, 2002) and children (e.g., Ollendick & King, 2004). Rosen and Davison (2003) recommended that empirically supported *principles* be listed rather than empirically supported *treatments* because adding an inert component to an already proven effective treatment means that the new treatment will pass all the same tests that were passed by the original treatment. Proponents of the new therapy can identify the new elements as therapeutic without any empirical justification for doing so because no incremental evidence is required. Such maneuvers could cause the list of empirically supported treatments to grow without merit and obscure causal factors.

Psychodynamic Therapy

No psychological interventions existed and therefore none were practiced prior to 1909. Freud's lectures at Clark University in 1909 introduced the concept of and a technique for psychotherapy, including a clinical method thought capable of supporting scientific inference (see NCT above). Freud's seminal and revolutionary ideas took the United States by storm; a sort of "big bang" of psychotherapy. The rise of psychoanalysis is a major historical root of clinical psychology.

Freud (www.allpsych.com/biographies/index.html) was trained as a neurologist under Ernst Brücke, a physiology professor, and began clinical practice as a financial necessity subsequent to his marriage to Minna Bernays in 1886. Rychlak (1981a, p. 313) noted that "Freud was—at best—a reluctant therapist" (p. 313). Although in 1909 he emphasized psychoanalysis as a therapeutic modality, by the late 1920s Freud emphasized psychoanalysis as primarily a research tool (Rychlak, 1981a, pp. 305–306). Freud's deterministic developmental theory essentially precluded personality change during adulthood or later life thereby making psychoanalysis a method of inquiry rather than change.

Freud popularized, but did not coin the term "talking cure." That honor goes to Anna O. (Rychlak, 1968, p. 325), the pseudonym used for Bertha Pappenheim, a patient Josef Breuer began treating while Freud was still in medical school. Breuer regressed Anna using hypnosis described by Charcot and discovered that

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Anna could recall the onset of each symptom and the strong emotion surrounding these events that she could not ordinarily express. Breuer and Freud coauthored *Studies on Hysteria* in 1895. Unfortunately, these methods did not provide lasting improvement. Despite Freud's claim that her illness was over, a year after Breuer terminated treatment with her, he confided to Freud that she was suicidal. While some improvements occurred after a protracted stay in a sanitarium, she continued to have hallucinations (www.richardwebster.net/freudandcharcot.html).

Masson (1984) reported that in 1885, when Freud was 29 years old and finishing his medical studies, he traveled to Paris to study with Jean Martin Charcot. His work at the Paris morgue confirmed reports in books he had read by Ambroise Tardieu and Paul Brouardel describing sexual abuse of children. In 1896, Freud presented a paper entitled "The Aetiology of Hysteria" (reprinted in Masson, 1984) in which he reported that all 18 cases of hysteria he had studied entailed childhood sexual abuse. Masson, project director of the Sigmund Freud Archives until 1981, described the strong objections to this conclusion from Freud's medical colleagues and his subsequent recanting of actual sexual abuse in favor of sexual fantasy and the Oedipus complex.

Alfred Adler, Carl Jung, Sandor Ferenczi, Otto Rank, Karl Abraham, and Ernest Jones were among the more notable persons who came to study with Freud to learn more about his theory and methods. Some followed his teachings closely while others began to develop divergent views that led them to establish their own schools of thought. The classic work *Schools of Psychoanalytic Thought* by Monroe (1955) surveyed these views. Ego psychology was an important theoretical development in that it emphasized the use of rational ego-functions to solve problems and promote positive relationships. Tryon (1986) identified several prominent previously unreported parallels between ego psychology (Hartmann, 1939/1958) and cognitive behavior therapy (Beck, 1970, 1976; Mahoney, 1974, 1977; Meichenbaum, 1977). Both therapeutic approaches emphasized new ways of thinking, coping, and problem solving.

Because psychoanalytic training was the only, not just the dominant, theoretical basis for psychological intervention, clinicians who subsequently provided alternative theoretical bases for psychological intervention were themselves initially trained in psychodynamic theory and technique. For example, Carl Rogers received his PhD from the psychoanalytically oriented clinical psychology training program at Columbia University in 1931. He had already learned about Otto Rank's theory and therapy techniques at a clinic run by the Rochester Society for the Prevention of Cruelty to Children. Rogers began his academic career as a full professor at Ohio State in 1940 where he published his first book, *Counseling and Psychotherapy*, in 1942. He set up a counseling center at the University of Chicago in 1945 and set forth his basic theory that people contained a basic capacity for self-healing in his 1951 book entitled *Client-Centered Therapy*. His final comprehensive statement was his 1961 book entitled *On Becoming a Person*. Albert Ellis (www.rebt.ws/albertellisbiography.html) received his PhD in clinical psychology at Columbia University in 1947 and then began personal analysis and training with Richard Hulbeck, a leading training analyst at the Karen Horney Institute. Richard received his training from Herman Rorschach. Dissatisfaction with the lack of

scientific methods and results led Ellis to develop Rational Therapy (Ellis, 1958), Rational Emotive Psychotherapy, and then Rational Emotive Behavioral Psychotherapy (Ellis, 1962, 1994). Aaron Beck (www.allpsych.com/biographies/index.html) received his MD degree in Psychiatry at Yale University in 1946. Psychiatry was entirely psychoanalytic at this time because the first antipsychotic medication, chlorpromazine, was not discovered until 1952 (Lehmann & Ban, 1997). He specialized in the psychoanalytic treatment of depression. Frustrated by the lack of empirical evidence, Beck began cognitive studies of depression that led to the development of scales to measure depression, anxiety, and suicidal ideation and to a cognitive therapy for depression. Joseph Wolpe obtained his MD from the psychoanalytically oriented Department of Psychiatry of Witwatersrand University in South Africa. While there, he attended lectures on learning theory by Leo J. Reyna who subsequently directed Wolpe's doctoral dissertation.

Client-Centered Therapy

Rogers' (1942, 1951) client-centered therapy provided the first systematic alternative to Freudian psychoanalysis and psychoanalytic psychotherapy. Rogers believed that he had successfully identified necessary and sufficient relationship conditions for personal growth to take place (www.pccs-books.co.uk/pdf/Wyattseriesint.pdf). Lambert and Bergin wrote: "Among the common factors most frequently studied have been those identified by the client-centered school as 'necessary and sufficient conditions' for patient personality change: accurate empathy, positive regard, non-possessive warmth, and congruence or genuineness. Virtually all schools of therapy accept the notion that these or related therapist relationship variables are important for significant progress in psychotherapy and, in fact, fundamental in the formation of a working alliance" (1994, p. 164).

Applied Behavior Analysis

After a full career as a physiologist studying digestion, the Russian physiologist I. P. Pavlov turned to a study of the frontal lobes of dogs, discovering *classical conditioning*. Pavlov began publishing his studies on classical conditioning in 1906 and published a book of his lectures on *Conditioned Reflexes* in 1927. Classical conditioning is also known as respondent conditioning because of its emphasis on stimulus-response psychology. It is unfortunate that Anrep mistranslated the Russian word for conditional as *conditioned* (Tryon, 1976). Pavlov intended to say that he had discovered *conditional* reflexes not *conditioned* reflexes. The term conditional carries a dynamic connotation made evident in the principle of extinction. What could be learned could also be unlearned.

Edward L. Thorndike studied cats in what he called a puzzle box and published his dissertation on "Animal Intelligence" in the *Psychological Review* in 1898. He labeled his stimulus-response learning theory *connectionism* on the basis that learning results when connections are formed between stimuli and responses (www.psychology.sbc.edu/Thorndike%20and%20Watson.htm). His theory entailed three laws but he is mainly remembered for the Law of Effect that maintains that stimuli and responses become connected or disconnected depending on

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whether responses are rewarded, ignored, or punished. In 1911, Thorndike established the foundations of operant conditioning in his book *Animal Intelligence*.

J. B. Watson (1913) published "Psychology as the Behaviorist Views It" in *Psychological Review* and further elaborated his position in his book *Behaviorism* (1925). J. B. Watson and Rayner published their famous case on conditioned emotional reactions with Albert and the white rat in 1920. M. C. Jones demonstrated an early form of behavior therapy for fears in a child named Peter in 1924. Mowrer (1947) published his two-factor theory of fear conditioning and subsequently reconsidered it in 1956.

Skinner (1938) advanced Thorndike's Law of Effect as operant conditioning on the basis that the consequences of behavior determine how the organism will subsequently behave in that and similar situations (cf., <http://www.lafayette.edu/~allanr/biblio.htm>, www.muskingum.edu/~psych/psycweb/history/skinner.htm). Operant conditioning is also known as instrumental conditioning because the behaviors studied frequently had practical consequences such as setting the occasion for dispensing food and water, terminating or postponing shock. Skinner maintained that behavior evolved ontogenetically via variation and selection, which he called *reinforcement* to emphasize that some behavioral variants were exhibited more frequently, just as for Darwin species evolved phylogenetically via variation and natural selection (Hernstein, 1989; Skinner, 1981; Tryon, 1993b). Skinner popularized the application of operant conditioning in his *Science and Human Behavior* (1953). The first volume of the journal *Behavior Modification* appeared in 1977. The *Journal of Applied Behavior Analysis* published its first volume in 1978; the same year that Kazdin published a *History of Behavior Modification*. In 2007, Martin and Pear provided a thorough and readable account of how to apply operant conditioning principles to modify behavior.

Kazdin (1977, pp. 19–30) traced the origins of behavior modification to ancient Greece where wreaths were given as prizes during the Olympics and to Rome during the first century where gladiators were awarded crowns, money, and property for prevailing in combat. A monk in southern Europe twisted dough into the shape of children's arms folded in prayer to be to children who learned their prayers. The Latin word for these little rewards was *petriola* from which the word *pretzel* is derived. Kazdin reviewed the extensions of operant conditioning methods to human behavior, which included and referenced an unpublished research status report by Skinner, Solomon, Lindsley, and Richards (1954) regarding behavior modification of psychotic inpatients. Application of behavioral principles within institutions has been referred to as a token economy and the remainder of Kazdin's book consisted of a review and evaluation of token economies. Ayllon and Azrin (1968) reported the first large-scale token economy of clinical interest. Cohen and Filipczak (1971) published a detailed description a successful token economy with delinquent youth.

Behavior Therapy

Operant conditioning provided modification rather than cure. Behavior was understood to be modified by consequences and therefore would change in response

toaltered consequences. Behavioral consistency results from stability of reinforcement schedule; not from a personality trait. On the contrary, behavior therapy offered a cure, not just modification. Mowrer and Mowrer (1938) provided a method for treating enuresis that was designed to end the problem. Wolpe's (1958) systematic desensitization was designed to cure phobias; that is, they would not return unless new traumatic experience occurred. Symptom substitution was strongly predicted by psychodynamic clinicians but has rarely been documented. The absence of symptom substitution is a major theoretical falsification of psychoanalytic theory that has curiously seldom been discussed. Eysenck's *Behavior Therapy and the Neuroses* (1960) was another seminal contribution to behavior therapy.

Cognitive Therapy

The cognitive revolution in psychology also influenced clinical psychology. It helped transform behavior therapy into cognitive behavior therapy (Mahoney, 1974, 1977; Meichenbaum, 1977). The use of language to interact with the client was emphasized and cognitive states and processes were recognized. The use of imagery during systematic desensitization implied memory and other cognitive processes. Transformation is a major characteristic of cognition meaning that people responded to their interpretation of events rather than events themselves. Ellis' *Reason and Emotion in Psychotherapy* (1962) made the case that the way people feel depends on how they think. Beck (1964) emphasized the link between thinking and depression in a journal article. He subsequently extended his views on this topic in two books (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979). Extensions of cognitive therapy to substance abuse followed (Beck, Wright, Newman, & Liese, 1993). In 2006, Beck won the prestigious Lasker Clinical Research Award for his pioneering work in cognitive therapy.

Cognitive-Behavioral Therapy

Although cognitive therapies did not repudiate behavioral therapies, neither did they build directly upon them in an integrative way. Cognitive therapy texts did not start from or presume that the reader understood issues of behavioral diagnosis, reinforcer and contingency identification, and principles of operant and respondent conditioning. Rather, they presumed learning and discussed information processing, its cognitive distortions, and new treatment methods designed to detect and correct cognitive problems. Ellis first introduced what he called rational therapy in 1955, expanded it to rational emotive psychotherapy, and further expanded it to rational emotive behavior therapy (REBT) in 1993 (http://rebt-cbt.net/My_Homepage_Files/Page2.html; Ellis, 1994, pp. 46, 173–174). Ellis (1958) was among the first to emphasize the role of cognitive therapy in treating a broad range of psychological problems. He explicitly connected reason and emotion in his 1962 book *Reason and Emotion in Psychotherapy*. Lazarus (1976) formulated multimodal therapy to deal with the rich complexities of clinical practice and to include a role for medication. Linehan (1993) developed dialectical behavior therapy (DBT) by combining elements of cognitive and behavioral therapy with aspects of philosophy and psychoanalytic theory to treat persons with borderline

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personality disorder. Cognitive-behavioral therapy was extended to families (Epstein, Schlesinger, & Dryden, 1988).

Acceptance and Commitment Therapy

Acceptance and commitment therapy (ACT) was developed by Hayes, Strosahl, and Wilson (1999) and can be understood as an extension of DBT in that it augments cognitive therapy with Eastern philosophy. ACT differs from cognitive and behavioral therapies in that it is not aimed directly at change. Efforts to make direct changes are seen as part of the problem. Instead, acceptance of one's condition is necessary for change to take place. O'Donohue, Fisher, and Hayes (2003) developed a clinician's guide for conducting ACT.

Social Learning

Patterson and his colleagues at the Oregon Social Learning Center (www.oslc.org) pioneered parent management training (PMT). Their social learning theory based research and clinical treatment center observed, coded, and analyzed child and parent behaviors at home and school. A "coercive family process" was discovered to be a core cause of male delinquent behavior (Patterson, 1982, 1986; Patterson, Dishon, & Chamberlain, 1993). Kazdin (2002) noted that PMT is the only independently replicated, empirically supported treatment for conduct disorder (cf. Brestan & Eyberg, 1998). The OSLC web page provides access to an extensive bibliography of their evidence-based interventions. Granic and Patterson (2006) provided a comprehensive social learning-dynamic systems model of antisocial development.

Schema-Focused Therapy

Schemas are understood to be cognitive structures that characterize and facilitate information processing. They help us organize and understand our world. Personality traits can be thought of as enduring ways that people organize thoughts, feelings, and behaviors. J. Young (1990) introduced schema-focused therapy as a way to treat people with personality disorders. He noticed and named what he refers to as maladaptive schemas that are listed and defined at www.schematherapy.com/id73.htm. McGinn and Young (1996) devote a chapter to this therapy.

Interpersonal Therapy

Klerman (1984) developed the interpersonal therapy of depression based on a psychoanalytic understanding of grief and loss. Additional information is available at www.interpersonalpsychotherapy.org/index.html and www.med.umich.edu/depression/ipt.htm.

Network Processing Therapy

Informal network theories were introduced to advance an understanding of cognitive and emotional processes and their interaction. Foa and Kozak (1986) hypothesized fear structures consisting of a network of perceptual, cognitive, and behavioral

tendencies. Foa, Steketee, and Rothbaum (1989) hypothesized that fear networks vary in size, structure (interconnectedness), and accessibility. Chemtob, Roiblat, Hamada, Carlson, and Twentyman (1988) discussed a four-level cognitive schema network wherein activation at one level influenced all others through “spreading activation” thereby interrelating thoughts, feelings, and actions. Foa and Kozak (1986) and Rachman (1980, 1990) developed “emotional processing” therapies. Creamer, Burgess, and Pattison (1992) discussed “network resolution processing.” Interventions based on fear network reprocessing currently form the contemporary basis for treating Posttraumatic Stress Disorder (PTSD) and related disorders. Formal network theories are mentioned in the mechanism of action section that follows.

Other Therapies

The interventions mentioned are but a sampling of the more popular and well-established psychological therapies. Wampold reported that “There are over 250 distinct psychotherapeutic approaches, which are described, in one way or another, in over 10,000 books” (2001, p. 1). The term *distinct* has a clinically trivial and important meaning. Rosen and Davison’s (2003) “Purple Hat therapies” capture the trivial meaning, referring to new therapies that add an inert element to an already proven effective intervention. Their example was having the client wear a purple hat during exposure therapy. Such an approach is distinct, but scientifically trivial. However, controlled research will find such variations of therapies effective because of the effective treatment on which they are based. Advocates of new therapies need to demonstrate the incremental validity of proposed additional components. Alternatively, Rosen and Davison recommend that we focus on empirically supported principles of change rather than on listing empirically supported treatments in order to avoid endorsing purple hat therapies. A therapy that employs a new principle of change exemplifies the clinically important meaning of the word *distinctive*.

Common Factors

Wampold’s (2001) interpretation of the meta-analytic evidence published by Lipsey and Wilson (1993) regarding the empirical effectiveness of psychological, educational, and behavioral treatments and his own meta analysis (Wampold et al., 1997) of bona fide psychotherapies was that factors common to all treatments may be responsible for the effectiveness of such a diverse set of interventions. Grencavage and Norcross (1990) identified the following five common factors: (1) client characteristics such as positive expectation of change and actively seeking help; (2) therapist qualities such as warmth, acceptance, and positive regard; (3) general features of the change process including an opportunity for catharsis, provision of a therapeutic rationale, and the practice of new behaviors; (4) treatment structures including specific techniques, rituals, that according to theory are predicted to work; and (5) relationship elements including the establishment and maintenance of a working alliance.

Mechanism of Action

How do common and specific factors exert their effects? What is/are the mechanism(s) by which people change? Action mechanism frequently means component analysis. For example, the article by DeRubeis et al. (1990) entitled “How Does Cognitive Therapy Work? Cognitive Change and Symptom Change in Cognitive Therapy and Pharmacotherapy for Depression” does not provide mechanism information regarding how cognitive therapy or pharmacotherapy changes thoughts, feelings, or behaviors. Persons (2005) description of mechanisms is limited to a box-and-arrow diagram interrelating cognitions, behaviors, moods, schemas, and events but does not provide causal mechanism details regarding how each of these domains influence the others. Brent and Kolko (1998) included the phrase “mechanisms of action” in their title but failed to provide any mechanism information for how covariation among the components identified in their schematic diagram occurred or why any of the implied relationships occurred in the ways indicated. The first dialogue of *Psychological Therapy* by Grawe (2002) is entitled “How Does Psychotherapy Achieve Its Effects?” The following “mechanisms” were discussed: (a) change of expectations as a general change mechanism in psychotherapy, (b) expectation induction, (c) resource activation, (d) activation and deactivation of intentions, (e) formation and realization of intentions, and (f) intention modification. No causal mechanism information was provided for how these functional effects are realized. In sum, all so-called mechanism explanations located to date have consisted of box-and-arrow diagrams where the boxes identified psychological components such as thoughts, feelings, and behaviors and the arrows indicated covariation among these components without providing any details as to how these relationships could occur or do in fact occur. Stimulus-Response (S-R) psychologists were criticized for their so-called black-box approach to psychology. The absence of mechanism information authorizes us to refer to the box-and-arrow diagrams just mentioned as black-box-and-arrow diagrams. Alternatively stated, the black-box problem is seemingly “solved” by a set of smaller black boxes.

What language shall we use to describe psychological mechanisms? How shall we understand how mind emerges from brain? Rumelhart and McClelland (1986a, 1986b) recommended that the “microstructure of cognition” is best described and understood in parallel distributed processing (PDP) connectionist neural network (CNN) terms. The following five principles play a causative role in how such formal networks give rise to psychology and behavior:

1. *Priming* is an automatic cognitive process that selectively stimulates spreading activation across a network and creates different effects depending on the priming method used. Priming can lead to automatic responding that includes the automatic thoughts discussed by Beck and others. Priming comes in several forms. *Repetition priming* refers to facilitation in the processing of a stimulus subsequent to repetitive prior presentations of that stimulus, the effects of which can persist for hours to several months. *Semantic priming* occurs when people read faster and more accurately a word such as “butter”

when it is preceded by a semantically related word such as “bread” versus an unrelated word such as “doctor.” Repetition augments semantic priming. *Emotional priming* uses words with a common affective tone to predispose associations of that type. *Evaluative priming* occurs when affectively laden words or pictures precede the target stimulus.

2. Networks seek *consonance* via *constraint satisfaction*. Constraints refer to often-conflicting factors such as acceleration and gas mileage when deciding on which automobile to purchase. The search for coherence entails Heider’s (1958) balance theory. Festinger (1957) chose to discuss this process from the alternate perspective of dissonance reduction. Formal network theory incorporates both perspectives. Thagard (2000) discussed how to measure and compute coherence and described several types of coherence and their applications to psychology and philosophy.
3. Networks exhibit a *part-whole pattern completion* property that confers considerable explanatory power. Given partial input, the network completes the pattern to the best of its ability. This principle frequently works in a positive way such as when we recognize someone after catching just a glimpse of them, or we remember personal details after hearing someone’s name, or we remember our vacation experience after hearing the name of a city or hotel we previously visited. Pattern completion can also work in a negative way such as in PTSD when an isolated sight or sound brings back traumatic memories. Tryon (1999) used the part-whole pattern completion principle to provide a comprehensive bidirectional associative memory model (BAM) of PTSD. Emotions appear to be encoded along with cognitions and therefore can trigger pattern completion. This phenomenon has also been called *state dependent recall* where sad people recall unpleasant events more readily than do happy people and vice versa.
4. Networks extract *prototypes*. Winkielman, Halberstadt, Fazendeiro, and Catty (2006) reported that people prefer highly prototypical stimuli because they are processed more easily. Prototypicality predicted fluency, categorization speed, and attractiveness in two experiments. Networks can respond more strongly to the prototype they extract than to any stimulus the network has experienced. Maladaptive prototypes can form stable core beliefs and schemas that strongly modify behavior. Clinicians who treat clients with personality disorders find these concepts especially relevant (Linehan, 1993; McGinn & Sanderson, 1999; Young, 1990).
5. *Graceful degradation* refers to the fact that networks gradually rather than catastrophically lose function as damage increases. This network principle informs us about the psychological and behavioral effects of organic insult and normal aging. The aging brain loses many synapses and some neurons daily but continues to function quite well. More processing cycles are required before the network settles into a stable state thus explaining why slower reaction times are consistently observed as a function of age. A broad range of aging effects can be understood in network terms (cf., Li, Lindenberger, & Sikström, 2001; Li, Naveh-Benjamin, & Lindenberger, 2005; Li & Sikström, 2002).

GENERAL PROFESSIONAL DEVELOPMENTS

Wilhelm Wundt (http://en.wikipedia.org/wiki/Wilhelm_Wundt/) established the first psychological laboratory in Leipzig, Germany, in 1879. Wundt had several students who contributed to the history of clinical psychology. Among his more famous students were Emil Kraepelin, who developed a diagnostic classification system based on symptom patterns rather than a single pathognomonic symptom, James McKeen Cattell, who coined the term “mental test” in 1890, and Lightner Witmer, who established the first psychological clinic in 1897. Witmer also established the first graduate school curriculum for psychologists. Witmer was the director of the Laboratory of Psychology at the University of Pennsylvania in 1892. It was at the 1896 meeting of the American Psychological Association that Witmer discussed “the clinical method in psychology” and coined the term “clinical psychology.” The training course that he taught at the University of Pennsylvania marks the beginning of training in clinical psychology. In 1907, Witmer founded the first *clinical* psychology journal, *The Psychological Clinic*, that he edited until 1935. Garfield (1965) reviewed other early clinical psychologists and cited Wallin (1961) who reviewed clinical psychologists between 1896 and 1910.

G. Stanley Hall was born in 1844 (d. 1924), received the first PhD in psychology in the United States in 1878; founded the first U.S. psychology journal, the *American Journal of Psychology*, in 1887; founded the American Psychological Association in 1892; and founded the *Journal of Applied Psychology* in 1917. Morton Prince established the *Journal of Abnormal Psychology* in 1906.

Garfield (1965) described the mental hygiene movement initiated by Clifford Beers in 1908 and the subsequent establishment of child guidance clinics as part of the history of clinical psychology. A National Committee for Mental Hygiene was formed to foster the prevention of mental illness; a forerunner of what subsequently came to be known as community mental health.

An organizational meeting of 45 psychologists holding doctoral degrees was held in Pittsburgh, Pennsylvania, in 1917 to establish the American Association of Clinical Psychology. In 1919, the American Psychological Association accepted clinicians as a division. The New York State Association of Consulting Psychologists was formed in 1921 leading to the formation of the Association of Consulting Psychologists in 1932. Its membership included psychologists from 21 states and the District of Columbia. It founded the *Journal of Consulting Psychology* in 1937 to provide a forum for clinical and applied psychologists. The American Association for Applied Psychology was formed in 1937 and became the primary affiliation of applied psychologists until 1945 when the American Psychological Association revised its organizational structure to include applied psychologists. More recent professional developments are reviewed below under the heading Training Conferences. The *Journal of Clinical Psychology* began publishing in 1945. The American Board of Professional Psychology began certifying professional psychologists in 1947. The Association for the Advancement of Behavior Therapy was founded in New York City in 1966 and changed its name to the Association for Behavioral and Cognitive Therapies in 2004.

IMPACT OF WAR

In 1917, when the United States became involved in World War I, the American Psychological Association developed Alpha and Beta tests of general intellectual development for the army under the direction of Robert M. Yerkes—the first large-scale group testing. The Alpha version of the test was for literate recruits whereas the Beta version was used for illiterate and foreign-born recruits.

Group testing of recruits was needed again in 1941 when the United States became involved in World War II. Army and navy commissions were given to psychologists that resulted in direct service provision. The publication of Rogers' book *Counseling and Psychotherapy* in 1942 provided psychologists with an alternative therapeutic intervention to psychoanalysis. Group therapy became popular by necessity because of the many psychological casualties from the war. Reorganization of the Veteran's Administration (VA) to cope with psychological casualties placed clinical psychologists in prominent service positions and funded training programs for clinical psychologists, and the VA eventually became the largest single employer of clinical psychologists. At its peak, the VA was training 700 doctoral candidates. The U.S. Public Health Service provided financial support to many graduate students and to internship sites outside the VA system.

FREUD'S "BIG BANG" LECTURES

Freud, who was born on May 6, 1856, became a physician with no formal training in psychology or psychiatry. By 1909, Freud, then 53, had worked in relative obscurity until G. Stanley Hall, the president of Clark University, invited him to present a series of five lectures on the occasion of the university's 20th anniversary of the graduate school (www.clarku.edu/research/archives/freud_jung.cfm/). His title was "The Origin and Development of Psychoanalysis." It is difficult to overestimate the impact Freud has had on the history and present status of clinical psychology. It may not be an overstatement to say that Freud's Clark lectures constituted the "big bang" origin for psychotherapy in that it provided a psychological theory of psychopathology and a psychotherapy for its treatment that rapidly expanded. Within 5 years, the American Psychoanalytic Association was founded and the public became fascinated with psychoanalysis. Benjamin (2005) wrote that by 1920 the American public had accepted Freud's psychoanalysis as "the one legitimate science of psychology" (p. 8) although Benjamin noted that most psychologists of that day rejected Freud's theories as unscientific. Luborsky and Barrett (2006) give the history and current empirical status of key psychoanalytic concepts. That scientific psychology in 1909 presented no alternative theory of psychopathology or intervention meant that psychodynamic theory and psychoanalytic techniques formed core-training elements for all clinical psychologists and psychiatrists.

TRAINING CONFERENCES

The history of clinical training provides a context for understanding the issues confronted by the major training conferences. Donn, Routh, and Lunt (2000) published

a comprehensive history of clinical training in Europe and the United States. They noted that for many years clinical training in Europe was conducted at the pre-doctoral level resulting in a master's degree, a diploma, or a licentiate degree with doctoral training reserved for those preparing for an academic career. During the past decade, the United Kingdom and other European countries have extended clinical training to the doctoral level resulting in DClinPsy, DEdPsy, and DCounsPsy degrees. The United States has consistently preferred doctoral training in clinical psychology but differences in opinion regarding the content of that training have also existed from the beginning. Wundt, who began training "modern" psychologists in 1879, required a doctoral dissertation; and some form of dissertation continues to characterize all contemporary doctoral training. Lightner Witmer received his PhD under the mentorship of Wundt and did not question the need for a doctoral dissertation when he developed the first clinical curriculum in the United States. In 1918, Leta Stetter Hollingworth proposed a training model for consulting psychologists granting the PsD degree (Hollingworth, 1918).¹ She recommended a standardized curriculum and a national examining board that would license qualified graduates. Unsuccessful efforts were made at Columbia University, the University of Montreal, the University of Ottawa, and McGill University to implement this training model.

The president of Harvard University appointed a commission to advise him on how to train psychologists. Gordon Allport and Henry Murray advocated for social-clinical training resulting in a PhD degree whereas Karl Lashley, among other faculty members, advocated for biological training resulting in a PhD degree. Unable to reach agreement, the Department of Social Relations split off from the Department of Psychology.

Boulder Training Model

World War II (1939–1945) produced so many "psychiatric" casualties that in 1945 the VA and the National Institute of Mental Health asked the American Psychological Association (APA) for a list of universities that could train clinical psychologists. The APA established the Committee on Training in Clinical Psychology in 1947. A training conference was held in Boulder, Colorado, in 1949. Its report detailed what has become known as the Boulder model of clinical training. Its findings were published as an article (Report of the Committee on Training in Clinical Psychology of the American Psychological Association Submitted at the Detroit Meeting of the American Psychological Association, September 9–13, 1947) and as a book (Raimy, 1950). The journal article identified the following primary areas of study: (a) general psychology, (b) psychodynamics of behavior, (c) diagnostic methods, (d) therapy, (e) research methods, (f) internship, and (g) dissertation.

The Boulder conference is notable for at least three reasons. First, it reaffirmed that professional training in psychology should be done at the doctoral level. Second, it reaffirmed that doctoral training should be conducted in a university rather than a separate school or institute such as medicine and dentistry. Third,

¹PsD is not a misprint. Page 424 of Donn, Routh, and Lunt (2000) reveals that this is the degree designation that Leta Hollingworth actually recommended.

it asserted the scientist-practitioner training model. Benjamin and Baker (2000) published a photograph of the Boulder conference participants and introduced a special section of the *American Psychologist* devoted to a review of the Boulder scientist-practitioner training model on the occasion of its 50th anniversary. Albee (2000) declared that Boulder's fatal flaw was its implicit endorsement of the medical model of psychopathology; that is, the biological basis of mental disorders. Albee claimed that relying on the VA hospitals to train psychologists wedded psychology to psychiatry and the medical model in ways that precluded its development as an independent profession. Current efforts to seek prescription privileges (see discussion that follows) are an extension of this legacy. Nathan (2000) noted that the primary intent of the scientist-practitioner model is to bring the most empirically supported psychological services to the public service. In this view, science is primary and theoretical orientation is secondary. However, Nathan (2000) also noted that few clinical psychologists read and/or implement research findings in their clinical practice, let alone engage in research resulting in a large and growing gap between psychological science and clinical practice. While professional consensus has largely been reached, and is now part of our ethics code, that psychologists use psychological tests that have been shown to be both reliable and valid for the population and purposes at hand, no similar consensus has been reached regarding empirically supported psychological interventions. Belar (2000) argued that the scientist-practitioner model was more than science training plus clinical training. Clinical practice was to inform scientific study just as much as the results of scientific study were to inform clinical practice.

Vail Professional Training Model

The continuing contrast between clinical training ideals and the reality of clinical training and professional practice fueled consideration of an alternative *professional training* model. In 1963, the number of clinical psychologists became equal to the number of academic psychologists thereby giving them an equal voice. Levy (1962) reported that 28.9% of clinical psychologists published no articles, 19.2% published one article based on their dissertation, and that just 10% of clinical psychologists published 45% of all articles surveyed. Outcome results such as these reopened the question of how clinical psychologists should be trained. Psychology was said to have sufficiently matured to warrant the establishment of professional schools similar to those for medicine, dentistry, and law resulting in the Doctor of Psychology (PhD) degree for those persons whose primary professional goal was clinical practice. Science was still considered important but secondary to quality clinical practice.

Paul Meehl was president of APA in 1962 and unsuccessfully proposed to members of the Psychology Department at the University of Minnesota that they institute a "scientific, scholarly, nonresearch doctorate for clinical practitioners" (Meehl, 1971, p. 37). Donald Peterson, one of Meehl's students, began a PhD program in the Department of Psychology at the University of Illinois in 1968. The dissertation was replaced with a written report of a clinical project. This program did not

receive broad Psychology Department faculty support and was discontinued in 1980. In 1975, Donald Peterson went to Rutgers University to become the founding dean of the Graduate School of Applied and Professional Psychology that began operations the year before. Dorothy Cantor, one of its graduates, was the first person with a PhD degree to become president of APA. Adelphi University began a PhD practitioner oriented program in 1951 that was accredited by APA in 1957. The California School of Professional Psychology founded its PhD program in 1969. Hahnemann Medical College began a PhD program in 1970 that latter moved to Widener University. Baylor University began their practitioner program in 1973. These events provided the context for holding a training conference in Vail, Colorado, in 1973, known as the Vail Conference to discuss professional training in clinical psychology. The American Psychological Association and the National Institute of Mental Health jointly sponsored the conference. Endorsement of the PhD degree and corresponding training model was perhaps the major accomplishment of this conference. Korman (1974) published a detailed report of the proceedings of this conference.

Specialized Training

A call for specialized training in clinical child psychology was first made at the 1977 meeting of the Society of Pediatric Psychologists. It would take until 1984 to gain sufficient professional support and financial backing to hold a clinical child training conference at Hilton Head, South Carolina, in 1985 to discuss the need for specialized training in child psychology. Of special note was their focus on whether specialized training in clinical child psychology was best accomplished within a scientist-practitioner or practitioner-scientist model or if specialty training could or should be done within the context of a general developmental psychology program or if it should be integrated with training in school psychology. Tuma (1985) published all 21 training recommendations made by the Hilton Head conference. Tuma (1986) described the proceedings in a more contextual way. Coursework was to entail a life-span developmental approach. Practicum training was to include assessment experiences with culturally diverse normal children in normal settings and experience with interventions. The Division 37 Task Force Guidelines for Training Psychologists to Work with Children, Youth, and Families (Roberts, Erickson, & Tuma, 1985) were adopted.

Contemporary Clinical Training Issues

McFall (2006) published an extensive review of training issues related to clinical psychology. His monograph examines premises on which training decisions are based, compares our past to our present, considers how clinical training has changed over the years, and proposes a blueprint for future clinical training.

Access to prescription privileges is a very substantial clinical training issue with multiple pros and cons. The ability to write prescriptions for psychotropic medications means that psychologists can practice more independently. It would also expand the services offered by psychologists and thereby increase the proportion of

the population who could receive services; especially currently underserved populations. However, adding sufficient medical training to achieve parity with nurse practitioners who already have prescription privileges would probably have to be done postdoctorally. The Department of Defense Psychopharmacology Demonstration Project first entailed approximately 45 semester hours of training over 2 years of full-time study at the Walter Reed Army Medical Center plus a 9-month to year-long full time residency for a total of 3 years full time postdoctoral training. Added to the 6 to 7 years typically taken to obtain the PhD would extend professional training to approximately a full decade and would proportionally increase student financial debt.

Other training models have been proposed. An APA task force (Smyer et al., 1993) recommended 25 to 30 undergraduate semester hours to meet entry requirements (biology, chemistry, etc.) to medical or nursing schools plus 26 graduate semester hours of medical training prior to practicum training. A blue ribbon APA Division 40 (Clinical Neuropsychology) panel and the California Schools of Professional Psychology-Los Angeles issued the following training standards in 1995: approximately 25 to 36 graduate semester hours of didactic training beyond an unspecified number of undergraduate semester hours plus a supervised 18-month inpatient and outpatient practicum with 2 hours of supervision per week. This program was designed to take 2 years if practicum training is taken concurrently with didactics. In 1996, the APA Council adopted training guidelines that have been used in connection with legislative proposals by several states. Requirements include 300 graduate contact hours of didactic training, approximately 19 semester hours, and practicum experience sufficient to cover treatment of 100 patients seen in both inpatient and outpatient settings with at least 2 hours of supervision per week. Such training is expected to take no less than 2 years. Additional details can be found on the web site of APA Division 55—American Society for the Advancement of Pharmacotherapy (www.division55.org/pdf/draftguidelines.pdf).

An article by Heiby, DeLeon, and Anderson (2004) reported on a 2002 APA “debate on prescription privileges for psychologists.” The need for quality holistic health care and the potential for prescription privileges by psychologists to make such care more widely available were cited as a major reason for granting prescription privileges to psychologists. Heiby was mainly concerned that current training recommendations entail less than half as many semester hours of preparation as the Department of Defense program participants received and that nurse practitioners, dentists, physician assistants, optometrists, and psychiatrists receive leaving prescribing psychologists open to law suits on the basis that their training is substandard and inadequate to protect the public. This concern primarily applies to Level 3 (independent practice) training, which both parties believe should be pursued post-doctorally. Level 2 training entails collaborative practice with a primary care physician who writes the prescription. Level 1 training entails basic psychopharmacology.

Prescription privilege demonstration projects are currently underway in Louisiana and New Mexico. Louisiana legislation permits collaborative prescribing only. New Mexico law permits independent practice only subsequent to

collaborative practice. If successful, social workers and counselors may also seek brief training as gateway to prescription privileges.

SUMMARY

This chapter considers both the history and theoretical foundations of clinical psychology in three major sections. The first section considers several philosophical foundations because they influence theory construction, assessment, intervention, and training decisions. Three general positions can be distinguished along a philosophical continuum defined by the demonstrative tradition of John Locke at one end and the dialectical tradition of Immanuel Kant at the other end. A mixed position has also been identified. Among the more influential philosophical issues are: dualism versus monism; idealism versus realism; introspection versus extraspection; procedural versus validating evidence; and final versus efficient causes.

The second section addresses the scientific (research) academic foundations of clinical psychology beginning with the principle of falsifiability that distinguishes science from philosophy. Religion and philosophy are both empirical in that they are based on experience. Scientific hypotheses must be falsifiable in order to be testable and that requires some form of measurement and/or operational definition. Science aims to predict and explain and that only occurs when uncertainty has been reduced. Explanations are based on necessary and sufficient conditions and can be primarily mathematical, behavioral, or biological. Cognitive neuroscience network explanations combine elements of all three types of explanations. Domain B of the *APA Guidelines and Principles for Accreditation of Programs in Professional Psychology* (www.apa.org/ed/gp2000.html) stipulates that clinical psychologists shall be trained in the following six foundational areas: history and systems, biological bases of behavior, cognitive and affective bases of behavior, social bases of behavior, individual bases of behavior, and developmental bases of behavior in addition to assessment, research methods, and statistics. The histories of clinical psychology and psychometrics overlap substantially. Psychological assessment was psychologist's first professional practice activity and psychological testing remains a major tool for assessing and understanding individual differences. Causal inferences seem frequently to require the structure and logical discipline imposed by research methods because Freud's flawed Necessary Condition Thesis no longer certifies the consulting room as probative. Qualitative data analyses now complement quantitative ones. Questions regarding the effectiveness of psychotherapy have concerned clinical psychologists for several decades. While agreement has been reached that ethical considerations require psychologists to use reliable and valid tests, similar agreement regarding psychological interventions has not yet been reached. The more major psychotherapies are briefly reviewed. Common factors that underlay their effectiveness are considered. Validating psychological principles is an alternative to validating specific interventions and entails an understanding of the mechanisms responsible for therapeutic change. Most mechanism explanations mainly entail box and arrow diagrams. The box labels describe the function(s) performed by the boxes but nothing is revealed regarding action mechanism(s). In other words, the black box explanatory problem is "solved" with a string of smaller

black boxes with functional labels. Formal network theory provides a way to understand how mind emerges from brain. The following five connectionist principles are discussed: priming, consonance via constraint satisfaction, part-whole pattern completion, prototype extraction, graceful degradation.

The third section addresses general professional developments beginning with the establishment of the first psychological laboratory in Leipzig, Germany, in 1879 by Wilhelm Wundt and Lightner Witmer who established the first psychological clinic in 1897 and also established the first graduate school curriculum for psychologists. The impact of World War II and the “big bang” impact of Freud’s lectures at Clark University are considered. Events leading up to the Boulder conference endorsing the PhD scientist-practitioner training model and the Vail conference endorsing the PhD practitioner-scientist training model are discussed. The following URL briefly discusses the Boulder and Vail training models www.psichi.org/pubs/articles/article_171.asp/. Specialized training in clinical child psychology is considered along with contemporary training issues including reasons for and against seeking prescription privileges.

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