CHAPTER 1

Studying Development

CHAPTER OUTLINE

- Development Observed
- What is 'Development'?
- Obtaining Information about Behaviour and Development
- Working with the Data: Quantitative and Qualitative Methods
- What Implications does Psychological Knowledge have for Society?
- The Scientific Status of Psychology

The study of how behaviour develops forms part of the science of psychology. But what do we mean by terms such as 'science', 'psychology' and 'development'? This chapter aims to supply the answer, but although it comes first in the book, it may not necessarily be best to read it thoroughly at the outset. Especially if you have not studied psychology before, it might be useful to read it through quickly at this stage and return to it later, even after finishing the rest of the book, for a more thorough understanding. The issues raised in this chapter are important, but understanding them fully will be easier if you already know something of psychological theories and methods of investigation.

In an important sense, we are all psychologists. We are all interested in understanding behaviour, both our own and that of our parents, children, family and friends. We try to understand why we feel the way we do about other people, why we find certain tasks easy or difficult, or how certain situations affect us; we try to understand and predict how other people behave, or how their present behaviour and situation may affect their future development. Will a child settle well with a childminder, or do well at school? Will watching violent films on television be harmful? Will a child be bullied at school? Can we teach children to cooperate? What level of moral reasoning can we expect a child to understand?

Nicholas Humphrey (1984) described us as 'nature's psychologists', or *homo psychologicus*. By this he means that, as intelligent social beings, we use our knowledge of our own thoughts and feelings—'introspection'—as a guide for understanding how others are likely to think, feel and therefore behave. Indeed, Humphrey went further and argued that we are conscious, that is, we have self-awareness, precisely because this is so useful to us in this process of understanding others and thus having a successful social existence. He argued that consciousness is a biological adaptation to enable us to perform this introspective psychology. Whether this is right or not (and you might like to think about this again after you have read Chapter 2), we do know that the process of understanding others' thoughts, feelings and behaviour is something that develops through childhood and probably throughout our lives (see Chapter 15). According to one of the greatest child psychologists, Jean Piaget, a crucial phase of this process occurs in middle childhood, though more recent research has revealed how much has developed before this.

If we are already nature's psychologists, then why do we need an organized study of the science of psychology? A professional psychologist would probably answer that it is to try and arrive at greater insight, and greater agreement on contentious issues. Sometimes, common-sense beliefs are divided. For example, attitudes to physical punishment of young children as a form of discipline are sharply divided and polarized in many countries (see Chapter 4). Sometimes, common beliefs are wrong. In the course of researching the lives of children of mixed parentage, Tizard and Phoenix (1993, p. 1) reported to a group of journalists that many of the young people in their sample saw advantages in their family situation through the meeting of two distinctive cultures. The journalists responded with incredulity, since the findings ran contrary to the popular belief that these children inevitably suffered from identity problems, low self-esteem and problem behaviour!

By systematically gathering knowledge and by carrying out controlled experiments, we can develop a greater understanding and awareness of ourselves than would otherwise be possible. There is still much progress to be made in psychology and in the psychological study of development. We are still struggling to fully understand areas such as the role of play in development, the causes of delinquency and the nature of stages in cognitive development. Most psychologists would argue, however, that the discipline of child development has made much progress, and even in the most difficult areas knowledge has now become more systematic, with theories being put forward. We now know more, for example, about the importance of social attachments in infancy (Chapter 4), the process by which a child learns its native language (Chapter 12) and how our understanding of others' minds develops (Chapter 15) than previous generations ever did or could have done without organized study.

So, how can we go about this?

DEVELOPMENT OBSERVED

The biologist Charles Darwin, famous for his theory of evolution, made one of the earliest contributions to child psychology in his article 'A biographical sketch of an infant' (1877), which was based on observations of his own son's development. By the early 20th century, however, most of our understanding of psychological development could still not have been described as 'scientific' knowledge; much was still at the level of anecdote and opinion. Nevertheless, knowledge was soon being organized through both observation and experiment, and during the 1920s and 1930s the study of child development got seriously under way in the USA with the founding of Institutes of Child Study or Child Welfare in university centres such as Iowa and Minnesota. Careful observations were made of development in young children and of normal and abnormal behaviour and adjustment. In the 1920s, Jean Piaget started out on his long career as a child psychologist, blending observation and experiment in his studies of children's thinking (see Chapter 13).

Observation of behaviour in natural settings fell out of favour with psychologists in the 1940s and 1950s (though it continued in the study of animal behaviour by zoologists; see Chapter 2). Perhaps as a reaction against the absence of experimental rigour in philosophy and early psychology, and the reliance on introspection (that is, trying to understand behaviour by thinking about one's own mental processes), many psychologists moved to doing experiments under laboratory conditions. As we will discuss later, such experiments do have advantages but they also have drawbacks. Much of the laboratory work carried out in child development in the 1950s and 1960s was described by Urie Bronfenbrenner (1979) as 'the science of the behavior of children in strange situations with strange adults'.

We hope that in the course of reading this text you will begin the process of integrating perspectives—for example, by reflecting on the links made by psychologists between the concept of the child's 'internal working model of relationships' (Chapter 4) and discoveries about 'theory of mind' (Chapter 15). We hope too that you find the opportunity to recognize the complementary virtues of various different methods of investigation and gain a sense that the child's developmental processes and the social context in which they exist are closely intertwined, each having an influence on the other.

WHAT IS 'DEVELOPMENT'?

The term 'development' refers to the process by which an organism (human or animal) grows and changes through its life-span. In humans, the most dramatic developmental changes occur in prenatal development, infancy and childhood, as the newborn develops into a young adult capable of becoming a parent himself or herself. From its origins, much of developmental psychology has thus been concerned with child psychology, and with the changes from conception and infancy through to adolescence. These are the primary areas covered in this book.

Generally, developmental processes have been related to age. A typical 3-year-old has, for example, a particular mastery of spoken language (see Chapter 12), and a 4-year-old has typically progressed further. A developmental psychologist may then wish to find out, and theorize about, the processes involved in this progression. What experiences, rewards, interactions and feedback have helped the child develop in this way? Two important but different research strategies have commonly been used in this endeavour: 'cross-sectional' and 'longitudinal' designs. Each method has advantages and disadvantages.

Cross-sectional design: In a cross-sectional design, an investigator might look at several age groups simultaneously. For example, she might record language ability in 3-year-olds and 4-year-olds, at the same point in time. The cross-sectional design is quick to do, and is appropriate if the main interest is in describing what abilities or behaviours are typical at certain ages. Because of the convenience of the method, the majority of developmental studies have been cross-sectional. However, they do not give insight into the causal processes involved in developmental change.

Longitudinal design: In a longitudinal design, the investigator follows certain individuals over a given time period, measuring change. For example, our investigator might have recorded the language ability for a sample of 3-year-olds and a year later visited the same children to get a sample of what they can do as 4-year-olds. Longitudinal designs are generally preferable if the focus of interest is the process of change, and the relationship between earlier and later behaviour. In our example, it is longitudinal data that give us the most ready access to information on what kinds of experience foster language development, and whether individual differences at 3 years of age predict anything about individual differences a year later, at age 4.

Although longitudinal studies are more powerful in this way, they have a number of drawbacks. One is simply the possibility of subject attrition—some participants may move away, lose contact, or refuse or be unable to participate by the next time of testing. This could influence the generality of conclusions, especially if the reason for participant loss is related to the dependent variables of the study.

Another problem with longitudinal designs is that they are time-consuming! In our example, a wait of one year may not be too off-putting. But if you wanted to see whether friendships in childhood related to happiness as an adult (see Chapter 5), you might find yourself having to wait 20 years! Some longitudinal studies have now in fact proceeded for this length of time and longer, for example in relating infant attachment security to later attachment type as an adult (see Chapter 4).

A few major studies that originated in the USA in the 1930s, as well as some nationwide surveys starting in Britain since the 1940s, have provided or are providing longitudinal data from birth and continuing over a time-span of 20, 30, 40 or even 50 years. Table 1.1 shows two examples from the USA, five examples from the UK (four are national cohort studies,

Table 1.1 **Some major longitudinal studies in the USA, UK and New Zealand.**

Study	Acronym	Birth date of sample	Initial sample size	Follow-up surveys	Website
Some longitudinal programmes in the USA					
Early Childhood Longitudinal Program	ECLS-B	2001	14,000	Five follow-ups to 2007–2008, ages 6–7	http://nces.ed.gov/ecls/
NICHD Study of Early Child Care and Youth Development	SECCYD	1991	1,364	Three follow-ups to 2005–2007, age 15	https://www.nichd.nih.gov/research/supported/pages/seccyd.aspx
Some longitudinal programmes in the UK					
National Survey of Health and Development	NSHD	March 1946	13,687	20 follow-ups, to 2008–2009, ages 60–64	www.nshd.mrc.ac.uk
National Child Development Study	NCDS	March 1958	17,634	Nine follow-ups, to 2012, age 55	www.cls.ioe.ac.uk
British Cohort Study	BCS70	April 1970	17,287	Seven follow-ups to 2012, age 42	www.cls.ioe.ac.uk
Avon Longitudinal Study of Parents and Children	ALSPAC	April 1991–December 1992	14,138	Many follow-ups to 2013, age 21, more planned up to 2019	http://bristol.ac.uk/alspac
Millennium Cohort Study	MCS	September 2000–August 2001	18,819	Four follow-ups to 2012, age 11	www.cls.ioe.ac.uk
A longitudinal study in New Zealand					
Dunedin Multidisciplinary Health and Development Study	DMHDS	April 1972–March 1973	1,037	Ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, and 38 years; next follow-up at 44–45 years	http://dunedinstudy.otago.ac.nz

while ALSPAC is based on families in the Avon area around Bristol) and a longitudinal study based in the Otago region of New Zealand. Such long-term studies give us some of our most powerful evidence on the nature of development.

However, when a study goes on for so long, another problem may arise. When the study was initially designed decades ago, it may not have asked the sort of questions that we now find most interesting. Any long-term longitudinal study will be dated in its conception. It will also be dated in its conclusions, which will refer to developmental outcomes for people born decades ago. Such conclusions may not always be applicable to today's children. For example, the effects of parental divorce on a child's later adjustment may be different now, when divorce is more frequent and socially acceptable, than 50 years ago when the social stigma attached to divorce in Western societies was greater (see Chapter 4).

Stop and Think

Longitudinal studies can be powerful, but what are their practical and theoretical limitations?

Baltes's Conceptualization of Life-Span Development

Paul Baltes, a German psychologist, was influential in emphasizing the life-span nature of development and the importance of historical influences (see Baltes et al., 1980). Baltes pointed out that age-related trends, the traditional staple of developmental psychology, constitute only one of three important influences on development throughout the life-span (Figure 1.1). Each of these influences is determined by an interaction of biological and environmental factors (see Chapter 2), though one or the other may predominate in particular cases.

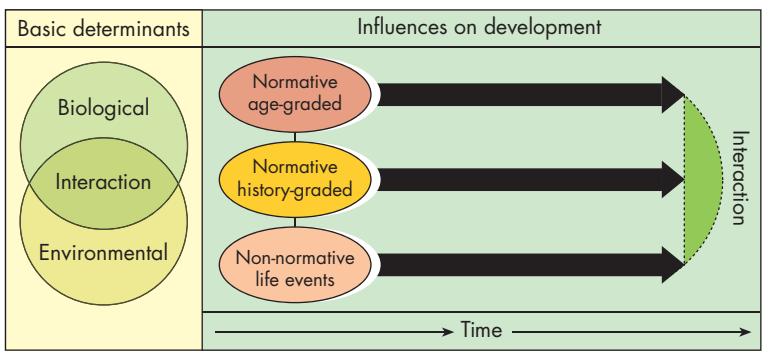

Figure 1.1 Three major influence systems on life-span development: normative age-graded, normative history-graded and non-normative life events. These influence systems interact and differ in their combinational profile for different individuals and for different behaviours.

Source: Adapted from Baltes, P.B., Reese, H.W., & Lipsitt, L.P. (1980). Life-span developmental psychology. *Annual Review of Psychology*, *31*, 65–110, by permission of Annual Reviews.

Normative age-graded influences have a fairly strong relationship with chronological age. The advent of puberty at adolescence (see Chapter 19) would be an example of a normative age-graded influence with a strong biological component, while entering school at 5 years (in Britain) would be a normative age-graded influence with little biological determination.

Normative history-graded influences are those associated with historical time for most members of a given generation (or 'cohort'; see below). A famine or natural disaster, such as the earthquake in Haiti in 2010 or the earthquake and tsunami in eastern Japan in 2011, would be examples. The advent of television in the 1950s and the internet and mobile phone use in the 1980s and 1990s (see Chapter 8, for example Table 8.1), or historical changes in family size (for example, the 'one child' policy in China since the early 1980s) are other examples brought about by human agency.

Non-normative life events are those that do not occur in any normative age-graded or history-graded manner for most individuals. The effects of brain damage in an accident would be an example with strong biological determinants; the effects of job loss or moving house are examples with less strong biological determinants. All are significant events that can occur in the life-span of an individual at many age points and at many historical times.

Many developmental studies examine normative age-graded influences, for example the effects of puberty or changes in cognitive development with age, as in Piaget's theory (see Chapter 13). Some examine the effects of a particular kind of non-normative life event when it happens, such as the effects of divorce or of a traumatic event such as the sinking of a cruise ship; this might be done irrespective of age or with age as another factor.

Rather fewer studies have examined the effects of normative history-graded influences, such as exposure to warfare, or how the advent of television or the internet changed children's behaviour. However, the consideration of history-graded influences leads to further designs for studying development apart from the cross-sectional and longitudinal ones already mentioned. One of these is cohort design.

Cohort design: Here, different cohorts (i.e. samples of children born in different years) are compared at the same ages. This design will inform us of the impact of historical change. For example, if we compare the leisure activities of 8-year-old children born in a Western society in 1930, 1970 and 2010, we will see changes influenced by (among other factors) the advent of television in the 1950s and the widespread use of the internet and mobile phones in the last 20 years.

The characteristics of the three designs mentioned so far are as follows:

Cross-sectional design		
Different participants	Different ages	Same historical time
Longitudinal design		
Same participants	Different ages	Different historical times
Cohort design		
Different participants	Same ages	Different historical times

Yet another design is a combination called cohort-sequential design.

Cohort-sequential design: This combines aspects of all the above three designs to create a very powerful analytical tool for studying developmental processes. As an example of this, we might look at the effects of compensatory preschool programmes (see Chapter 18) on children born in 1980, 1985 and 1990, following each cohort longitudinally through from

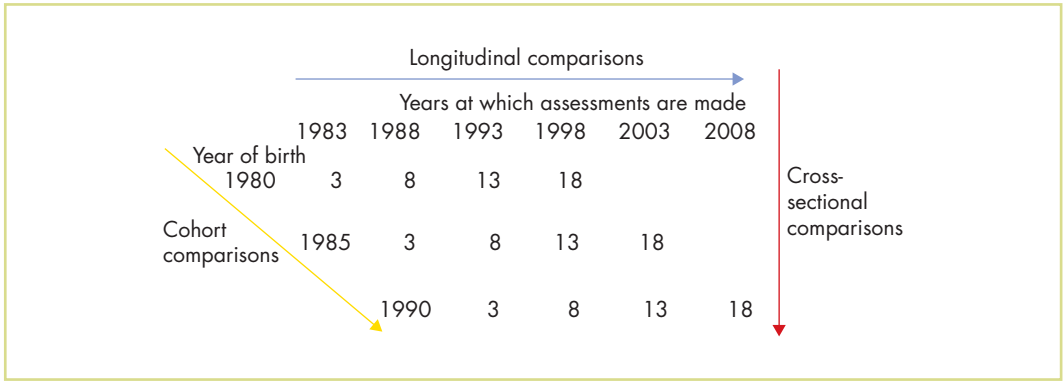

Figure 1.2 A hypothetical study design, combining cross-sectional, longitudinal and cohort comparisons, to examine the effects of compensatory preschool programmes at different ages and different historical periods. It starts in 1983 and continues until 2008. The ages of each sample of children from each cohort and at each year of study are shown in years.

age 3 years to, say, age 18 years. As well as several sets of cross-sectional and longitudinal data, this hypothetical design (Figure 1.2) would let us see whether historical change over the last two decades (for example, in educational policy or the relative position of minority groups in society) had an impact on long-term effects of the programmes. Obviously, this would be very time-consuming and, so far, cohort-sequential designs have been rather rarely used; one example is given in Box 10.2.

Bronfenbrenner's Ecological Model of Human Development

The American psychologist Urie Bronfenbrenner proposed another influential conceptualization of development (Bronfenbrenner, 1979). He emphasized the importance of studying 'development-in-context', or the ecology of development. 'Ecology' refers here to the environmental settings that the person or organism is experiencing or is linked to directly or indirectly. Bronfenbrenner conceived of this ecological environment as a set of four nested systems (Figure 1.3) and as an interaction amongst the processes of person, context and time.

Microsystem: This inner level refers to what an individual experiences in a given setting, and is the most familiar to psychologists. For a young child, one microsystem may comprise the home environment with parents and siblings. Another microsystem may be the school environment, with teachers and peers. Most psychological research is carried out at the level of one microsystem, for example looking at mother's talk and child's speech in the home (Chapter 12), or peer popularity and aggression at school (Chapter 10).

Mesosystem: This next level refers to links amongst settings in which the individual directly participates. For example, the quality of the child's home environment might affect his or her school performance or confidence with peers.

Exosystem: This third level refers to links to settings in which the individual does not participate directly, but that do affect the individual. For example, the mother's or father's work environment may affect their behaviour at home, and hence the quality of parental care. The child does not directly experience the parent's work environment, but he or she experiences the effects indirectly.

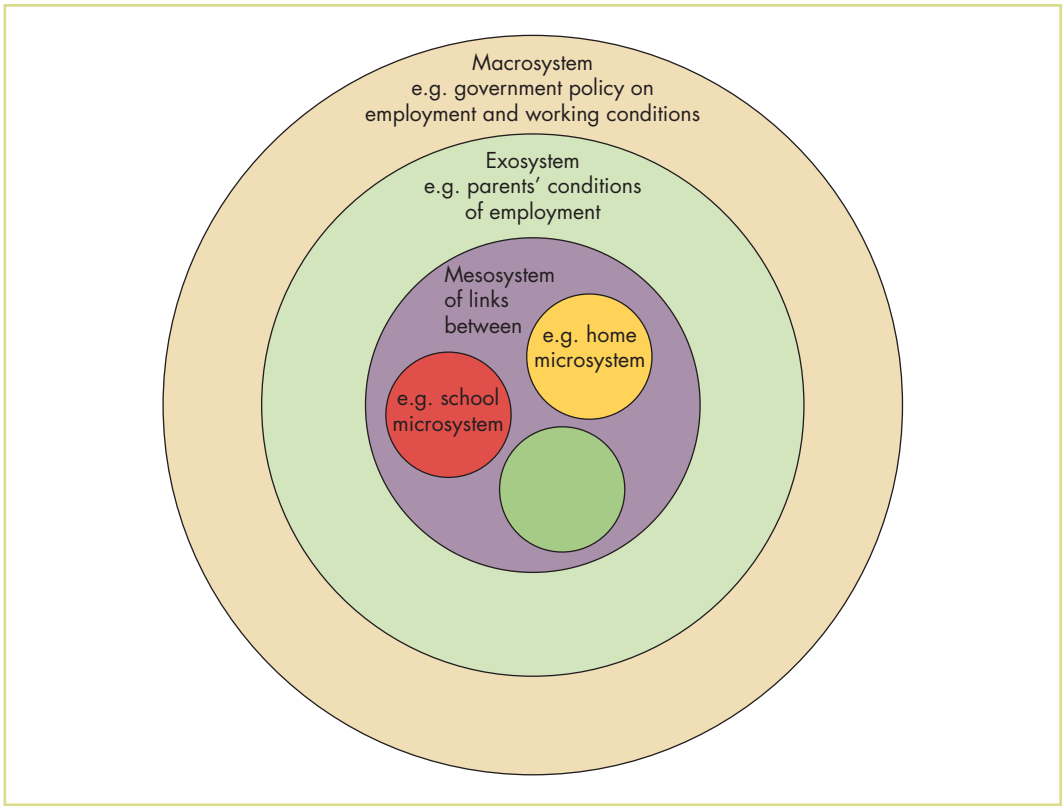

Figure 1.3 The nested circles of macro-, exo-, meso- and microsystems proposed by Bronfenbrenner (1979), with examples relevant to a school-age child.

Source: Adapted from Bronfenbrenner (1979)

Macrosystem: This fourth level refers to the general pattern of ideology and organization of social institutions in the society or subculture the individual is in. Thus, the effects of parental stress at work, or unemployment, will be affected by such factors as working hours in that society, rates of pay, holiday and leave entitlement, occupational status, or the degree of social stigma attached to unemployment.

Bronfenbrenner's model illustrates how a decision or change in the macrosystem (e.g. change in employment conditions) may affect the exosystem (parent's work experience), and hence a child's mesosystem and microsystem. This is not controversial in itself. However, recognizing these links does suggest the importance of trying to conceptualize and design psychological investigations extending beyond just the microsystem level.

Bronfenbrenner proposed that we view human development as the process of understanding and restructuring our ecological environment at successively greater levels of complexity. The child first comes to understand its primary caregivers, then its home and nursery or school environment, then wider aspects of society. Changes in the ecological environment (or 'ecological transitions') are especially important in development. Examples might be having a new sibling; entering school; getting a job; being promoted; getting married; taking a holiday. (Note the similarity to Baltes's ideas of life events.) At such times, the person is faced

with a challenge and has to adapt, and thus development takes place. Indeed, Bronfenbrenner feels that seeing how a person copes with change is essential to understanding that person: 'If you want to understand something, try to change it'.

Bronfenbrenner and Ceci (1994) later proposed empirically testable basic mechanisms called *proximal processes* through which the genetic potential for effective psychological functioning is realized. These proximal processes lead to particular developmental outcomes, including controlling one's own behaviour, coping successfully under stress, acquiring knowledge and skill, establishing mutually satisfying relationships and modifying one's own physical, social and symbolic environment. Bronfenbrenner's model predicts systematic variation in the extent of such outcomes as a result of the interplay amongst proximal processes, their stability over time, the contexts in which they take place, the characteristics of the persons involved and the nature of the outcome under consideration.

OBTAINING INFORMATION ABOUT BEHAVIOUR AND DEVELOPMENT

As you read through this book, you will see that psychologists have used a wide variety of means to obtain useful information, whatever their theoretical or conceptual orientation has been. Some form of experimental study is perhaps the most common form of investigation reported in psychological books and journals. Nevertheless, non-experimental methods, such as naturalistic observation or field surveys, are also respectable procedures provided there is a clear aim to the research. The crucial variable here is the degree of control the investigator has over what is happening. We shall discuss this in some detail, together with two other aspects of obtaining data—the way behaviour is recorded and the selection of participants. These aspects are also highlighted in the boxes within all the subsequent chapters.

What Degree of Control?

A great deal can be learned from recording behaviour in natural situations or settings. Suppose we were interested in what kinds of help are shown by preschool children to others in distress (see Chapter 9). Perhaps the most suitable approach here is for the investigator simply to observe children in natural settings such as the home, or ask parents or adults to keep diary records of events. Or we might try to save time simply by interviewing parents or giving a questionnaire. The investigator interferes as little as possible, only to the extent of making sure he or she gets reliable data. This kind of approach is most suitable when we do not yet have much systematic knowledge about the phenomenon in question, and need to gather this descriptive data. As an example, Dunn and Kendrick (1982) gathered observational records of interactions between siblings in the first few years of life (see Chapter 5). Even though some experimental work had been done on sibling relationships, this study produced a richness of detail and uncovered a wide variety of phenomena that fully justified such a naturalistic approach.

From this kind of study, we can learn what kinds of behaviour occur, and how frequently. But do we advance our understanding of the processes involved? To some extent, the answer is yes. For instance, we can carry out correlational analyses of various kinds.

Correlational analyses: Here we examine whether a behaviour occurs systematically or more frequently together with some other particular behaviour or in some particular situation.

A large set of correlations is called a *matrix*. For an example, see Box Table 6.1.2, which presents an intercorrelation matrix of trait emotional intelligence (EI) scores and peer nomination scores in 10-year-old children. As another example, we may find that how children categorize sounds at preschool is correlated with reading and spelling scores four years later (see Box 12.2).

Such findings certainly suggest explanations as to the processes involved. For example, emotional intelligence might help a child develop better peer relationships or a child's practice in rhyming and alliteration may have a causal relationship with learning to read and spell. However, can we be confident that these explanations are better than some other, different explanations? Not really.

Firstly, the relation between cause and effect might be reversed: for example, children who have better peer relationships may have more opportunity to develop emotional intelligence.

Secondly, some third factor may account for the correlation. As discussed in Box 12.2, general intelligence, or memory for words, might help in earlier sound categorization skills, and in later reading and spelling achievement.

This weakness of correlational evidence is a most important concept to grasp. If you find it difficult, think of this example. Suppose you correlated, from day to day through the year, the number of people wearing shorts and the number of people eating ice creams. You would probably get a positive association or correlation. This does not mean that wearing shorts causes people to eat ice creams, or vice versa; we know that in this case the daily variation in temperature, a third variable, is the likely cause of both.

To some extent, the weakness of correlational methods can be alleviated by using regression analyses, or by using cross-lagged correlations. In *regression analyses*, quite a wide range of correlates are considered as possibly influencing a certain variable; the statistical procedure of regression then tells us which correlates are most predictive of the outcome variable, once the other correlates are taken into account (see, for example, looking at effects of father involvement on child outcomes separately from mother involvement, p. 137). In *cross-lagged correlations*, measurements are taken at two or more time points in a longitudinal study. Besides correlations between two variables at one time point, the cross-lagged correlations (those from time 1 to time 2, etc.), when compared, can give stronger suggestions as to which variable is influencing which other one (see pp. 186, 277).

The other way in which psychologists have tried to proceed further is to use some form of experiment. In an experiment, we focus on one or a small number of variables of interest that we think are important, then we try to exclude other variables from our possible explanations.

Quasi-experiments: These are the weakest form of experiments (see Cook & Campbell, 1979, for extended discussion). Here the variable that the investigator thinks is important is changed naturally, and the investigator watches what happens. For example, in 1955 Himmelweit, Oppenheim and Vince (1958) carried out a before-and-after study of the effects on children's behaviour of introducing a new television transmitter in Norwich. The investigators felt that the introduction of the opportunity to watch TV was an important normative history-graded variable and they took the opportunity to measure its effects.

Unfortunately, quasi-experiments are not much more powerful than correlational studies at excluding alternative explanations. Usually, we know too little about (i.e. have too little control over) the characteristics of our participants and the circumstances of the variable that

is changing. For example, in the situation just described, which parents first acquired television sets when they were available? They would almost certainly be different in various ways from those who did not acquire television sets (and indeed, the study identified some such differences). Also, children might differentially view programmes of certain types, depending on personality and interest. How can we tell whether changes in behaviour are due to watching the programmes, or whether the programme watching is just a by-product of differences in behaviour due to other factors?

True or controlled experiments: These provide the most powerful way to answer cause-and-effect questions. We can distinguish field experiments and laboratory experiments, but both share two important features. The first is that there are two or more well-specified 'conditions' that participants can experience. The second is that participants are assigned to conditions in a systematic fashion. In these ways, the experimenter seeks to ascribe an outcome definitely to differences between certain conditions. Strongest of all is the *randomly controlled treatment design* (RCT), in which participants are assigned totally randomly to the different conditions. Alternative explanations in terms of other uncontrolled differences between conditions, or between the participants in different conditions, can then be excluded.

Let us take further the idea that television viewing may affect children's social behaviour. Suppose we invite children in small groups to a laboratory, where we randomly assign them to one of three conditions. In one condition, they see several violent cartoon programmes; in another, they see several non-violent cartoons; in the third (called a *control* condition), they do not watch television at all but do something else, like drawing. Afterwards they go to a playroom and are filmed by the experimenter, who records their social behaviour.

Suppose the experimenter finds a significant difference. Children who watched the violent cartoons are more aggressive to each other in the playroom than those who watched non-violent cartoons or did drawing. This difference in aggressiveness can confidently be ascribed to watching the violent cartoons. It cannot be explained by systematic differences in the participants (we assigned them randomly) and it cannot be explained by unknown variations in the children's experiences (we chose the cartoons, and made the children sit through all of them).

Sometimes the investigator compares the effects of two or more conditions he or she is interested in (for example, violent and non-violent cartoon films). Sometimes it is appropriate to include a *control group*, which is a condition including all the same experiences except that which the investigator is particularly interested in. The children who experienced drawing, above, were a control group for the general experience of coming to the laboratory and meeting the experimenters. Any differences between the control group and the two experimental groups showed the effects of watching cartoons. Any difference between the two experimental groups further showed the effects of whether the cartoons were violent or non-violent.

In all experiments we can identify *independent variables* and *dependent variables*. Independent variables are those controlled or manipulated by the experimenter—in our example, the experience of watching cartoons, and whether the cartoons were violent or not. The dependent variables are those we choose to examine for possible effects—in our example, social behaviour in the playroom.

The laboratory experiment allows tight control of assignment of participants and of the independent variables—but is it rather artificial? What do the participants feel about coming to the laboratory? Would they normally choose to watch such cartoons? Can we expect a reasonable range of normal behaviour in this environment? Perhaps not. To some extent, we can try to overcome these objections in a *field experiment*. For example, we might try showing

different kinds of television cartoons to different groups of children at a school or at a summer camp. The children would normally be at the school or camp, and watching some television might be part of their expected programme.

In general, in a field experiment the investigator attempts to combine the rigorous control of true experimental design with the advantages of a naturalistic setting (see Box 9.1 for an example). This can, at its best, be a very powerful method. However, it is difficult to maintain both experimental control and naturalness, and the field experiment may either slip into becoming a quasi-experiment or into becoming more constrained and unnatural, like many laboratory experiments.

Thus, in all investigations the naturalness of the setting needs to be balanced against the degree of knowledge and control we have over the setting. Where the balance is best struck depends very much on the kind of behaviour or skill we are interested in. We do want to be reasonably sure that the conclusions we draw from our study apply to the 'real world'. This concern has been labelled as the need for 'ecological validity'. Bronfenbrenner (1979) defined ecological validity as 'the extent to which the environment experienced by the participants in a scientific investigation has the properties it is supposed or assumed to have by the investigator'. In other words, is it reasonably representative as regards the conclusions we wish to draw from the study? If we felt that the results of a laboratory experiment on cartoon watching were not representative of the effects of real-life television watching, then we would say this experiment lacked ecological validity.

Stop and Think

When is it important to use tightly controlled experimental designs, despite a possible lack of ecological validity?

Recording Data

Whatever design of investigation we are using, we also have to decide how to record the data. A variety of methods is available. Sometimes several types of data may be gathered in one study.

Observational methods: Here the investigator watches the participant(s) and makes systematic records of whether certain behaviours occur (e.g. Box 2.1, where observations were made of mother and infant activities in Bofi farmers and foragers). Usually the investigator defines certain *behaviour categories* in advance, and then scores when they occur. Some method of *time sampling* is often employed to assist in quantifying the scoring (see Martin & Bateson, 2007, for extended discussion).

Very often such studies are described as *non-participant observation*; this means that the observer watches the behaviour from 'outside' and does not interact much or at all with those observed. An alternative is *participant observation*, or *ethnographic study*, where the observer is also one of the actors in the situation. For example, in a study of a Chicago gang of adolescent delinquents, Whyte (1943) acted as a gang member in order to get insight into what was really going on. Patrick (1973) described a similar study of a gang in Glasgow, from the insider perspective. This kind of study is more difficult in terms of recording data, but will give unique insights as well. Another approach is where the investigator asks the participant(s)

to keep his or her own records or observations of their own behaviour; perhaps a daily record of occurrences, sometimes called a *diary method*. Sandstrom and Cillessen (2003) used a diary method with 10–13-year-old children, to get records of negative interactions with peers such as victimization and exclusion.

Interviews and questionnaires: In an interview, the investigator asks participants about a topic and explores their thoughts, feelings or attitudes with them (e.g. Box 2.2). Often some degree of structure is imposed on the kinds of questions asked in the interview (e.g. Boxes 5.2, 16.1). A still more structured approach is to give participants a questionnaire in which they fill in replies to preset questions (e.g. Box 19.2). A questionnaire is often given individually, but can be given in groups. A questionnaire sent to large numbers of participants is called a survey (e.g. Box 10.2).

Focus groups: These provide a less structured interview approach, in which several participants (usually around six is seen as a good number) discuss some topic—for example, what is good or not so good about school. The debate amongst peers can often bring out interesting facets that individual interviews might not, although peer pressures need to be borne in mind.

Tests: Here a participant, either individually or in a group, is asked certain questions and is often asked to carry out certain actions (for example, solve certain puzzles). The test differs from the interview in that it is designed to measure a particular ability or trait, and it is scored in a strictly defined way that can be compared with normative values obtained earlier in the process of test design (see Chapter 17 for the case of intelligence tests).

Experimental techniques: There are many more specialized experimental procedures, which may be used for specific purposes. For example, ultrasound scanning may be used to study the fetus *in utero* (see Box 3.1); conditioning and habituation may be used to study infant perception (see Chapter 11); genotypes can be identified from DNA extracted from buccal (cheek) swabs (see Chapter 2); and a variety of neuroimaging techniques may be used by developmental cognitive neuroscientists to study changes in the brain (see Chapter 2).

Reliability and Validity

Whatever measuring instrument or method we use, we need to be sure of its *reliability*. Basically, a reliable method is one that would give the same answer if you, or another investigator, were to repeat the measurement in the same conditions. For example, if we recorded aggressive behaviour in children but did not define our behaviour categories or method of time sampling, this would be unreliable; someone else might have a different idea of what is aggressive, and get different results even if watching the same behaviour. Methods need to be carefully specified, and tried out, if they are to be reliable.

Reliability is often confused with *validity*: both are very important in any investigation. We have just seen that reliability refers to the recording of data. Validity, in contrast, refers to whether the data we obtain are actually meaningful.

There are a number of threats to validity. One problem might be that our measurement instrument, although reliable in the sense of well defined, might be poorly conceived in terms of what it is measuring. For example, our definition of aggression might include unintentional as well as intentional hurt (cf. Chapter 10), rendering it less meaningful.

A common issue is that of *ecological validity*, discussed above. Our measurements in a laboratory experiment might be very reliable (well specified and repeatable) but this does not guarantee that they are valid in the sense of meaningful in the 'real world'. Also, in experiments there can be *experimenter effects*. The experimenter may unwittingly inhibit some behaviours,

or help some participants more than others, or score some participants more leniently. One type of experimenter effect is known as the 'Clever Hans' effect. Clever Hans was a horse that apparently could count. If his trainer asked, 'What is three and four?' Hans would tap with his front foot seven times. However, the German psychologist Oskar Pfungst (1911) discovered that Hans actually relied on subtle non-verbal (and unintentional) cues from his trainer, who inclined his head slightly forward after Hans had tapped the correct number of times. Hans was clever, but not in the way originally thought. The demonstration was a reliable one, but the conclusions drawn initially were not valid.

Problems of validity actually arise in all kinds of investigation. If we are making records in a natural setting, the presence of an observer might change the behaviour being observed. If you stand in a playground recording children's aggressive behaviour, will less aggression occur than usual because you are there? This is a problem of *observer effects*.

Participant Characteristics

One aspect of validity concerns the representativeness of the participants investigated. A key factor is the size of the sample. A data set obtained from one person is called a *case study*. Normally a case study tells us little about the general population but if we can obtain very extensive records (for example, the records Piaget obtained of his own children described in Chapter 13) or if the person is especially interesting (for example, the case studies of extreme deprivation described in Chapter 18) then this method may be very valuable. A case study may often serve as a source of ideas or hypotheses for later study (e.g. the case studies of the Koluchova twins and of Genie, pp. 608–612).

Many psychological investigations are done on small samples of some 10–50 individuals, who can be brought to a laboratory or observed in a single setting. Again, valuable findings may be obtained, but if the sample is small (e.g. Box 6.2) then it is difficult to generalize to a much wider population.

Sometimes a survey or other investigation is carried out on a large sample of hundreds or thousands of participants. In certain circumstances, such a sample may be regarded as normative, or representative, of some section of the population. For example, it may correspond to characteristics of the wider population such as age, gender, ethnicity or socioeconomic status. The NSHD longitudinal study in Britain included all the children born in one week of March 1946, and this could reasonably be taken as representative of children born in Britain in the later 1940s. Other major longitudinal studies have adopted a similar sampling procedure (see Table 1.1).

Children/Young People as Active Participants in Research

Some studies have gone beyond observing or interviewing children or young people, and have moved to involving them as researchers themselves. It can be argued that children have the right to be consulted, informed, and also involved, in order for their voice to be truly heard (e.g. Alderson, 2008; Harcourt & Einarsdottir, 2011). Treseder (1997) provided a model which identified five different levels of participation in research:

Assigned but informed: Adults decide on the project and young people volunteer. Adults respect the young people's views and provide appropriate information to ensure that the young participants understand the project.

Consulted and informed: The project is designed and run by adults, but young people are consulted. They have a full understanding of the process and their opinions are taken seriously.

Adult-initiated shared decisions with young people: Adults have the initial idea but young people are involved in every step of the planning and implementation. Not only are their views considered, but young people are also involved in taking the decisions.

Young people-initiated and directed: Young people have the initial idea and decide how the project is to be carried out. Adults are available but do not take charge.

Young people-initiated shared decisions with adults: Young people have the ideas, set up projects and come to adults for advice, discussion and support. The adults do not direct but offer their expertise for young people to consider.

A key concept is a belief in the competency of children to construct their own meanings. The challenge for the researcher is to design tools to facilitate the expression of that voice. To meet this challenge, the multi-method Mosaic Approach (Clark, 2011) adopts playful methods, for example, running group conferences, giving children cameras to record their everyday lived experience and encouraging children to create maps of their environment through photos and drawings. Other participatory researchers have designed methods that are appropriate for older children and adolescents. Kernaghan and Elwood (2013) established a young participants' Research Advisory Group (RAG) to monitor their research into cyber-bullying. The RAG offered illuminating insights into issues of communication, recruitment and interpretation. Researchers have also developed methods that show sensitivity to the particular emotional needs of participants. Veale (2005) used participatory methods (social mapping, story games, drawings and drama) in rural Rwanda post genocide to explore the impact of violence on social relations as it impacted on children without intruding insensitively on their personal stories; ownership and control of the material generated rested with the young people.

Participatory methods like these offer an innovative way of accessing the inner worlds of children and young people in ways that traditional approaches often fail to do. Cowie, Huser and Myers (2014) indicate that participatory research is characterized by a concern for the rights of children and young people. Researchers in this field typically have a strong desire to enable their participants' voices to be heard, particularly in the context of marginalized young people, such as young carers, children in care and young offenders. This concern is often balanced by huge enthusiasm on the part of the participants who typically express their deep desire to share their experiences and to represent others in a similar situation as if they were young ambassadors. The quality of the research may actually be enhanced by using alternative forms of communication like play, activities, songs, drawing and stories so that children, who are practised in these types of activities, may experience the research process more meaningfully than if they were participating using a traditional format.

However, these participatory methods have yet to be fully accepted. Data can appear to be unsystematic or even chaotic. There is an urgent need to develop sophisticated qualitative methods of analysis, as the Mosaic Approach has demonstrated, in order to gain credibility with mainstream academia.

Stop and Think

How feasible is it to use child participatory methods in the research process, beyond just providing data?

WORKING WITH THE DATA: QUANTITATIVE AND QUALITATIVE METHODS

Once we have our data, what do we do with it? There has been much debate here about the advantages and disadvantages of quantitative and qualitative methods. Sometimes, disciplinary and professional biases have led to unproductive disputes about these approaches, rather than productive selection of methods that best suit the aims of the study. However, most psychologists now recognize the value of both kinds of approach, depending of course on the topic of study and the current state of knowledge (Coolican, 2009).

Quantitative methods: Here, the emphasis is on predetermined categories, and the researcher has often already decided what he or she is interested in—they are not 'exploring the area' but 'looking for the answer to certain questions'. Often, quantitative researchers use experiments or data from non-participant observation. Usually statistical tests are carried out to look at correlations, or at differences between subgroups in the sample, and to see whether the results are sufficiently stable or characteristic that it is likely they would be true of larger samples. The means of carrying out simple statistical tests (such as correlation, *t* test and chi-square) are described in texts such as Robson (1999), together with the meaning of probability or *p* values. Examples of the results of such tests are given in many of the boxes in this book.

Qualitative methods: Here, the emphasis is on the meaning of the behaviour or experience for the person concerned. The data recording methods usually used are unstructured or semi-structured interviews, focus groups or participant observation. Often, qualitative researchers obtain transcripts of interviews, and then use specialized methods such as grounded theory and discourse analysis to extract dimensions of meaning and experience from these. While clearly not suitable for very young children, such methods can be used with older children. An example is a study of girls' bullying by Owens et al. (2000). Qualitative methods can also be illuminating in studies of how parents think about child rearing (Phoenix et al., 1991).

It is possible to combine both approaches (a 'mixed methods' approach, see p. 59 as an example), or to move from initial, exploratory qualitative study to more focused quantitative study as an investigation progresses.

Objectivity and Bias

Scientific investigation is supposed to be objective, not biased by the personal beliefs or values of the individual investigator or the wider society. In practice, this is not entirely the case. The kinds of problems chosen for study, and the way they are tackled, are inevitably affected by personal or societal ideas of what is important. Some qualitative researchers believe that this is quite intrinsic to research, as the investigator is part of society too; the best the researcher can do is to describe their own orientation and background so that others are aware of it. Quantitative researchers tend to believe that by defining units of measurement closely, and training observers or interviewers, a degree of objectivity can be obtained.

Some areas of psychology may be especially susceptible to decreased objectivity, when personal beliefs are closely involved. Stephen Gould (1996) argued this in the instance of the study of intelligence testing and the view held by some psychologists that there were innate racial differences in intelligence. The kinds of study carried out in the earlier 20th century, and the way those studies were interpreted, clearly reflected bias (for example, racial prejudice) in some investigators. At times this involved misconceived inferences from results or observer

bias in scoring or testing. At extremes, it bordered on fraudulence (see the next section). Gould, in turn, has been accused of misrepresenting aspects of his case (Rushton, 1997). Even though objectivity is far from perfect, it is possible to recognize and expose biases, at least after the event. Much more sophisticated studies of the issues involved in race and intelligence have now been carried out, bearing these past errors in mind (see Chapter 17, and Nisbett, 2009).

Ethical Issues

Whenever an investigation is made with human or animal participants, investigators should have due respect for their rights and welfare. Investigations with animals kept for experimental purposes are usually controlled by strict guidelines, for example by the Home Office in the UK.

General principles: For human investigations, general principles are as follows.

- *Informed consent*: participants should know what will be involved in a study they are invited to participate in, and be able to give or withhold consent without any pressure or duress. Occasionally, temporary deception concerning the purpose of the study may be thought necessary; this would need to be very carefully justified.
- *Confidentiality* of information obtained: participants should know that they will not be personally identifiable (by name or other means) in any reports or publications. Any exception would have to be agreed to by the person involved.
- *Lack of harm* to participants themselves or to others: some investigations may involve some disturbance of privacy, or inconvenience to participants. Even when legally permissible, any negative outcomes should be balanced carefully against the likely benefits from carrying out the investigations; they must be very carefully justified, and should never be a feature of student experiments or investigations.

Many psychological societies have issued ethical guidelines for the planning of investigations. For example, the ethical principles approved by the British Psychological Society (BPS, 2009) are available at www.bps.org.uk. However, the guidelines contain very little on research with children and young people.

Ethics of research with children: Special ethical issues arise around research on children. Firstly, infants and younger children cannot give fully informed consent, and consent by parents or carers (or those 'in lieu' of parents, such as teachers in school) must be obtained. However, consent from children themselves should also be obtained so far as possible. It is essential that the information be provided in a form that is easily understood by the child with proper regard for their age and level of capability. To this end, researchers working with children have adopted a number of strategies, including leaflets, packs and posters written in child-friendly language and often illustrated with pictures, drawings and cartoons.

Regarding confidentiality, children need to be reassured that adults, such as parents and teachers, will not listen to any tape recording that is made and that none of their responses will be traced back to them personally. This kind of reassurance could be crucial where researchers are investigating such sensitive topics as the mental or physical health of parents (for example, in research into young carers) or the child's own experiences of abuse, whether from peers or family members.

Confidentiality is a key ethical issue in research and children should be offered the same degree of anonymity as adult participants. However, complete confidentiality can never be

totally guaranteed to a child participant if, for example, a child discloses that he or she is at risk of harm through, for example, bullying or abuse. Any such limitations of confidentiality should be carefully explained to the child prior to data collection at the point at which informed consent is sought.

Certainly, researchers should guarantee that the location where the research took place should not be identified, anonymity should be ensured through use of pseudonyms and any identifying features should be changed or omitted. As we saw in the earlier section on children as active participants in research, there are a number of methods that can be adopted by researchers to safeguard the rights of the child and to facilitate active involvement in the research process.

Reporting of results: Another ethical issue relates to the accurate reporting of results. It is clearly the duty of investigators to report their results in as accurate and unbiased a way as possible, but there have been occasions when this principle is known to have been violated. The British psychologist Sir Cyril Burt reported data on twins, which he claimed to have gathered for many years, in order to prove that intelligence was largely inherited. His results were published in numerous articles as his sample of twins accumulated. However, a strong case has been made that in the latter part of his life Burt did not gather more data, but invented it (Hearnshaw, 1979). Thus a great deal of his twin data set is believed by most psychologists to be fraudulent, and the conclusions drawn from it unwarranted. This deception attracted much attention, partly because of the social implications of the theory of hereditary intelligence, and partly because fraud on this scale is believed to be rare. Drawing attention to any such misdemeanours hopefully serves to make future occurrences less probable.

WHAT IMPLICATIONS DOES PSYCHOLOGICAL KNOWLEDGE HAVE FOR SOCIETY?

Bronfenbrenner and Ceci (1994) argued that many people have a potential for development that goes far beyond the capacities that they currently display, and proposed that this untapped potential might be realized through appropriate public policies and programmes of intervention. They argued that social changes in both developed and developing countries have 'undermined conditions necessary for healthy psychological development' (op cit., p. 583).

Bronfenbrenner was concerned about what he called the 'growing chaos' in America's children, youth and families, which he saw as being caused by disruptive trends in society over the previous four decades. In fact, alarmist writings about the state of youth and families are not new. Pearson (1983) showed how worries about the unruliness of adolescents, and the increase in rates of delinquency and adolescent crime and violence, appear to resurface in each generation. Looking at newspapers, books and journals over a period of some 150 years, he found that each generation was bemoaning rising crime and harking back to a golden age of a generation ago! We can go a long way back with such thoughts—Sommerville (1982) cited a tablet from Mesopotomia that stated, 'Our Earth is degenerate in these latter days ... Children no longer obey their parents'; this was dated to 2800 BC!

However, whether new or not, there are clearly important social problems that developmental and child psychologists have a responsibility to address. As a society, we have

knowledge of ways in which we can foster competence in the young and of interventions that can act as buffers against dysfunction in the family. Bronfenbrenner was one of the founders of Project Head Start, an intervention that had positive and long-lasting effects on disadvantaged children (see Chapter 18). He was convinced that the belief systems of parents, peers, teachers and mentors can change as a function of education, intervention programmes and the mass media; the internet is also a growing source of influence. We need to ensure that new knowledge, and new technologies, are used effectively for human betterment.

The Rights of Children

Are we agreed on what human betterment is, and what is best for children? The United Nations' *Convention on the Rights of the Child* (UNCRC; United Nations, 1989) advocates rights on behalf of all children, and places emphasis on non-discrimination, acting in the best interests of the child and listening to the views of the child. The Convention built on earlier legislation by specifying children's rights not only to protection and provision, but also to participation—so giving some political rights to children. In the context of participation, it addressed such contentious issues as child labour and children's rights to freedom of thought and speech. Its recommendations are binding on those countries that ratified it (including the UK, which signed it in 1991; the USA is one country that did not sign).

Lopatka (1992), the chairman of the United Nations working group that drafted the Convention, argued that the rights of the child are universal, yet he also asserted the need to take into account the cultural values of the child's community. However, a criticism of the Convention concerns difficulties in implementing it in societies where families are very poor, civil liberties are severely constrained or a country is at war. The tension between a child's universal developmental needs and the realities of his or her social situation may be nearly impossible to resolve. We look at an example of extreme violation of children's rights in Box 18.1; this describes a project about the reintegration back into their communities of young mothers who had, as children, been abducted and raped by soldiers during armed conflict in Sierra Leone, Liberia and Northern Uganda (Veale et al., 2013).

European Forum on the Rights of the Child: The European Commission adopted 'an EU Agenda for the Rights of the Child' in 2011. This aimed to ensure the effectiveness of children's rights and to step up efforts in protecting and promoting the rights of the child. The Eighth European Forum on the Rights of the Child, held in 2013, emphasized the need for integrated, multidisciplinary approaches to children's rights issues. Four issues of particular concern were parental child abduction (where one parent illegally takes a child away from the other parent, usually to another country); children on the move (this includes child trafficking for sexual or labour exploitation), bullying and cyberbullying (considered in Chapter 10), and female genital mutilation (considered next).

Female genital mutilation: An example of the contravention of children's rights is the practice of female genital mutilation (FGM), or cutting (FGM/C). FGM involves the partial or whole removal of the outer sexual organs. It happens in a number of countries throughout the world, but especially in Africa. It is carried out on girls for traditional or religious reasons, although the practice is related to the social control of girl's and women's sexuality. FGM is a very painful procedure, carried out in childhood, usually with the consent of the parents but

without the consent of the girls themselves. The World Health Organization estimates that up to 140 million girls and women have been subjected to FGM.

Besides the pain involved, FGM can have severe health consequences. In a study in The Gambia, where prevalence of FGM/C was 78% in 2006, Kaplan et al. (2011) examined 871 cases. In 34.3% of these there were health complications due to FGM, primarily haemorrhage (excessive bleeding), anaemia, infections and abnormal scarring. A review by Berg and Underland (2013) showed that FGM/C has a later negative impact on birth, being associated with prolonged labour, obstetric lacerations, instrumental delivery, obstetric haemorrhage and difficult delivery.

There have been extensive efforts by the World Health Organization, NGOs, health professionals and others to protect children from the immediate and long-term physical and psychological damage of FGM/C. The United Nations has declared 6 February each year as the International Day Against Female Genital Mutilation. In some countries this campaigning has had some success; for example, in Senegal, where the NGO Tostan is working alongside local women to achieve large-scale abandonment of FGM. The success of this project is claimed to come through respect for the culture and through a process of consultation, cooperation and education, rather than from prohibition (see www.tostan.org/female-genital-cutting). However, progress is slow and it seems likely that legal sanctions will need to be invoked in order to end this abhorrent practice.

In the European Union, FGM is criminalized in all member states. However, with the exception of France (with 29 court cases up to January 2012), prosecutions have been rare. In the UK, the practice is illegal but at the time of writing no successful prosecutions had taken place. Nevertheless, young women themselves are organizing campaigns to heighten awareness of the huge psychological and health risks involved and the UK government has pledged that strong action will now be taken against parents and medical practitioners who inflict FGM on girls.

A global agenda for children's rights in the digital age: The rapidly changing ICT environment means that children and young people are encountering an increasing number of risks as well as opportunities in their use of mobile phones and the internet. Children have rights as well as responsibilities in this domain, and these are active areas of social concern and research (Livingstone & Smith, 2014; see also Chapters 10 and 19). Livingstone and Bulger (2013) suggest a research agenda to develop this area. They claim that there is currently insufficient knowledge of how to promote beneficial online opportunities for children, of what makes children vulnerable to risk and how to protect them, and inadequate assessment of those initiatives that have been undertaken.

The Children Act: The England and Wales Children Act (Department for Children, Schools and Families, 2004) states that the child's welfare must be paramount and that adults must ascertain what the wishes and feelings of the child are. All local authority agencies should work together in the best interests of protecting the child. This means, amongst other things, that teachers are legally obliged to share their knowledge of abuse or significant harm to the child with other agencies, most frequently social services. Additionally, children and young people should be consulted on matters that affect them. To this end, the Children's Commissioner for England regularly consults with children to find out their views and, for example, provides a helpful website on which young people can have their say and

access information about important aspects of childhood, at www.childrenscommissioner.gov.uk.

The Children Act shifts the emphasis from parents' rights over their children to their responsibilities towards the young people in their care. For example, when parents divorce, the local authorities have a duty to protect and promote the welfare of the children involved, and the courts must now pay due attention to the wishes of the child. A process of conciliation is now more common, in line with its intention to benefit children in this situation. In practice, courts have the right to judge the child's competence to make autonomous decisions, and may as a result disregard children's wishes in the wider context of 'the best interests of the child'. It is difficult to achieve the balance between what the child thinks he or she wants at the time and what in the view of adults may be best for the child in the longer term. And who is right—the adult or the child?

The Children's Rights Alliance for England: The Children's Rights Alliance for England (CRAE) is a pressure group for protecting the rights of children by lobbying government, supporting test cases and providing free legal information and advice. CRAE also mobilizes children and young people to take positive action to promote and protect children's human rights, and publishes an annual report on its findings. CRAE has raised concern about a general climate in the UK of intolerance and negative public attitude towards young people, especially adolescents, who are so often portrayed in the media as 'yobs' or 'thugs', and would like to see greater opportunities for young people themselves to promote more positive images of youth.

Following an inquiry by Lord Justice Leveson (2012), a review of the Editors' Code of Practice required that the press must avoid making pejorative references to certain personal characteristics, such as race and disability. However, the review did not mention 'age'. CRAE (2013) called for age to become a protected ground of discrimination in the code. CRAE has also challenged the UK government on harmful age and disability discrimination against children, for example, through the government's decision to exclude schools and children's homes from the age element of the public sector's duty to promote equality of opportunity for all children and young people. This decision means that some children may be prevented from enjoying full protection of their rights as set out in the UN Convention on the Rights of the Child. Some other countries, such as Australia, Finland and Sweden, have already prohibited age discrimination. Furthermore, CRAE argues that more could be done by public authorities in the UK, including schools, health services, police and social services, to promote the equal worth of children and young people and to give them more opportunities to participate in decision making about issues that concern them.

The CRAE (2013) report indicates that the UK has been condemned by two United Nations treaty bodies, the Committee against Torture and the Committee on the Elimination of Discrimination against Women, for consistently failing to address certain violations of children's rights, including 'the unlawful use of restraint against children in detention, the low age of criminal responsibility and the persisting legality of corporal punishment' (p. 4). Other examples of violation include the increased use of tasers against children (323 times in 2011 compared with 71 in 2008) (Office for National Statistics, 2013a). Similarly, Lord Carlile (Carlile of Berwick, 2006), in a report commissioned by the Howard League for Penal Reform, expressed grave concern about the extent of mental health difficulties being experienced by young offenders in the UK. He found that their access to treatment and protection,

during and after detention, was less than that offered to children in society at large, a state of affairs that contravenes their rights according to the Children Act 2004, and the UN Convention on the Rights of the Child. Although this legislation aims to uphold children's right to be consulted in matters that affect them, rarely are young offenders given a voice on their own mental health issues, and their suggestions for supportive provision.

Stop and Think

In what additional areas of children's rights might research on children's development be important?

The Well-being of Children

Several cross-national surveys and reports have been published regarding aspects of children's development. One source is the Programme for International Student Assessment (PISA), organized through the Organization for Economic Cooperation and Development (OECD), which began in 2000. This is conducted every three years and assesses reading; mathematics and science literacy; study and learning practices; family resources and structure; and the organization of schools and school environments. Another is the Health Behavior in School-age Children (HBSC) survey, undertaken by the World Health Organization; this includes measures of material well-being, children's relationships and behaviours, and subjective well-being.

UNICEF also produces regular Report Cards on children's well-being. For example, UNICEF Report Card 11, issued in 2013, reported on children's well-being in 29 rich countries (European countries plus Canada and the USA). Well-being was assessed along five dimensions: material well-being; health and safety; education; behaviour and risks; and housing and environment (UNICEF, 2013). Despite some variations, the picture was generally one of improvement—for example, infant mortality rates fell in all 29 countries. As the data were mostly gathered a few years previously, they may not show effects of the economic recession starting around 2008 but the analysis did not find a strong relationship between per capita gross domestic product (GDP) and overall child well-being.

The UNICEF data are based on *objective* indicators, such as infant mortality rates, proportion of young people in higher education, etc. Using this and some other sources, Martorano et al. (2014) ranked the 29 countries on each dimension. They also derived a composite index based on the five dimensions cited above. These rankings are shown in Table 1.2.

It is also possible to assess children's *subjective* well-being, based on what children and young people report themselves. The HBSC surveys provide these sorts of data. Using this (from the HBSC 2009–2010 data set, reported in detail by Currie et al., 2012), Bradshaw et al. (2013) derived measures of subjective well-being in four domains: life satisfaction; peer and family relationships; subjective education; and subjective health. Their composite measure of overall subjective well-being correlated 0.67 with the overall objective measure. The ranks for overall subjective well-being are also shown for each of the 29 countries, in Table 1.2. It needs to be borne in mind (for both objective and subjective data sets) that the data were obtained some years previously (in around 2008–2010) and the

Table 1.2 Ranks of 29 rich countries on composite objective and subjective measures of child well-being.

Country	Objective well-being	Subjective well-being
Netherlands	1	1
Norway	2	10
Iceland	3	2
Finland	4	11
Sweden	5	7
Germany	6	5
Luxembourg	7	16
Switzerland	8	8
Belgium	9	15
Ireland	10	12
Denmark	11	9
Slovenia	12	3
France	13	22
Czech Republic	14	24
Portugal	15	14
United Kingdom	16	20
Canada	17	25
Austria	18	4
Spain	19	6
Hungary	20	13
Poland	21	27
Italy	22	28
Estonia	23	17
Slovakia	24	21
Greece	25	18
USA	26	29
Lithuania	27	26
Latvia	28	19
Romania	29	23

Source: Adapted from Bradshaw, J., Martorano, B., Natali, L. & de Neubourg, C. (2013). Children' s subjective well-being in rich countries. *Child Indicators Research*, 6, 619–635.

quality does vary, although the composite measures should be more reliable than individual components.

The Netherlands does best on both indicators of child well-being, and the Scandinavian countries generally do well; some eastern European countries do poorly, as does the USA. Comparing the HBSC data from 2009–2010 to earlier data from 2001–2002, subjective well-being showed some changes. Some countries improved their scores (notably the UK, which had very low scores in the earlier data set); in others there was some decline, for example in Greece.

THE SCIENTIFIC STATUS OF PSYCHOLOGY

This chapter began by briefly considering the nature of psychology as a scientific discipline. We shall conclude by discussing briefly what is meant by the term 'science', and whether this is what psychologists practise. The nature of scientific inquiry has been written about by philosophers of science; we shall summarize the views of two: Popper and Kuhn.

For a long time it was generally held that science proceeded by gathering factual data, by observation and experiment, and by deriving general laws from these facts. This has been called the 'traditional' or 'inductivist' view. However, throughout the 20th century, scientists and philosophers of science have put more emphasis on the role of hypotheses or theories in science. A hypothesis, or theory, is a proposition that some relationship holds amongst certain phenomena. For example, some psychological hypotheses discussed in this book include: that the fetus can learn characteristics of the mother's voice (p. 83); that the first hours after birth are critically important for mother–infant bonding (p. 100); that viewing violent television programmes makes children behave more aggressively (pp. 275–278); that children are attracted to a level of moral reasoning just above their current level (p. 321); that children cannot understand another's point of view until about 8 years of age (p. 455); that preschool 'Sure Start' programmes can benefit a child educationally throughout the school years (pp. 635–638).

The 'traditional' view would be that hypotheses such as these are derived from facts we have gathered, and that if we get enough factual support then the theory will have been 'proved' correct. However, this view is not now generally held. Instead, most scientists and philosophers believe that the role of theory is a primary one, and that theories cannot be proved, only disproved. A most articulate proponent of this viewpoint was Sir Karl Popper (1902–1994), who argued that our ideas about the world, or 'common-sense beliefs', serve as the starting point for organizing knowledge from which scientific investigation proceeds. Thus, theory serves a primary role and, indeed, structures what and how we observe or categorize 'facts' or observations about the world. Psychologists are in a good position to appreciate this argument, as part of their discipline (and part of this book, e.g. Chapters 11, 13 and 14) is concerned with how children construct hypotheses about perceptual data and how they gain greater knowledge about the world through forming hypotheses to test against experience. Indeed, we started this chapter by considering how people are 'nature's psychologists' in this sense (see also Chapter 15).

Popper considered that science and knowledge progress by advancing hypotheses, making deductions from them, and continuing to do so until some deductions are proved wrong, or 'falsified'. The hypothesis is then changed to cope with this. A hypothesis can thus never be finally proved correct, as there is always the possibility that some further observation or experiment might discredit it. A hypothesis can, however, be falsified and it is through this process that science progresses.

You can think about this by examining the hypotheses we have just listed above. Have any been falsified? (Some have.) Did the falsifying lead to better hypotheses? (Sometimes.) Could any be 'proved' beyond question?

Popper's notion of falsification has been a powerful one, and he used it to distinguish 'science' from 'non-science'. If propositions, hypotheses or theories cannot actually be falsified, then, according to Popper, this is not science. It may be interesting and enlightening, like a novel, but it is not science. Not all philosophers of science agree with Popper's approach.

At least, not many believe that scientists spend most of their time trying to disprove their theories. A different view was put by Thomas Kuhn (1922–1996), who saw a mature branch of any science as having an accepted 'paradigm'. A paradigm is a basic set of assumptions, or way of trying to solve problems. Atomic theory provided a paradigm in the natural sciences, for example.

In psychology, 'psychoanalysis', 'behaviourism' and 'sociobiology' (see Chapter 2) could be taken as paradigms in this sense. So too could 'attachment theory' (see Chapter 4) and the 'information processing' approach (viewing the brain as a computer; see Chapter 14). An influential paradigm informing much child development research is the 'cognitive-developmental' approach; this links behaviour to the kind of cognitive development or thinking ability expected at the age or level of development the individual is at. Piaget's theory of cognitive development (see Chapter 13) is an obvious example, but the approach is much wider than this.

Kuhn described how a branch of science might develop; it starts in a 'preparadigmatic stage', where it would be characterized by rather random fact gathering and many schools of thought that quarrel about fundamental issues. With maturity, one paradigm is accepted and directs the way observations and experiments are made. Kuhn called this phase 'normal science'. Scientists work within the paradigm, extending and defending it. The paradigm is not rejected unless many difficulties or falsifications accumulate and, in addition, a superior paradigm appears. A period of 'revolutionary science' with competing paradigms then emerges, with one eventually proving superior, when 'normal science' resumes.

Kuhn characterized a science as having a fruitful paradigm that can unify the efforts and direction of study of many scientists. Falsification has a relatively minor role to play, he argued, since all theories have some anomalies (phenomena that cannot yet be well explained). Only the appearance of another paradigm can really upset things.

Kuhn's ideas have been criticized, and modified, but his idea of a paradigm, while rather vague in practice, has had considerable impact. Psychologists in particular often seem to be claiming that a particular approach or theory is setting up a 'new paradigm'! Kuhn himself seems to have thought that psychology and other social sciences may well still be at a preparadigmatic stage. It is indeed true that no single paradigm as yet unites the whole of child psychology. Still, certain paradigms (e.g. the cognitive-developmental approach) do seem to be fruitful and capable of bringing together several areas. Perhaps, after working through this book, the reader may decide for himself or herself what kind of scientific status the study of psychological development has, what it has achieved, and what it may reasonably hope to achieve in the foreseeable future.

CHAPTER SUMMARY

- Development refers to the process of growth and change in the child, or organism.
- Two main approaches to studying development are cross-sectional design and longitudinal design. Cohort studies can take account of historical changes in developmental processes.
- Both Baltes and Bronfenbrenner contributed important models of human development.
- There are many methods of obtaining data relevant to developmental processes, varying in the degree of control of the situation, from free observations through to quasi-experiments and controlled experimental design.
- Data can be recorded using observational methods, interviews, questionnaires, focus groups and tests.
- A relatively new procedure is to use young people as researchers.
- Reliability, validity and participant characteristics are important aspects of any research study.
- Both quantitative and qualitative methods can be useful, separately or in combination, depending on the aims of the study.
- Ethical implications of research should always be considered.
- Child development research has bearings on issues such as the rights of children and children's well-being, with policy implications.
- Child development can be considered as an important area of social science, which gathers factual data and uses them to test theories and hypotheses, thus helping us to advance beyond common-sense knowledge and opinions.

DISCUSSION POINTS

1. Has our knowledge of psychological development advanced beyond 'common sense'?
2. What is meant by 'development' and how can we study it?
3. What are the advantages and disadvantages of carrying out experiments in psychology?
4. What impact has psychological knowledge had on society?
5. In what ways can psychology be considered to be, or not to be, a science?
6. Are children themselves capable of investigating childhood?

FURTHER READING

- Breakwell, G.M., Smith, J.A. & Wright, D.B. (Eds.) (2012). *Research methods in psychology* (4th ed.). London: Sage, and Howitt, D. & Cramer, D. (2010). *Introduction to research methods in psychology* (3rd ed.). Harlow: Pearson, provide good overviews of a range of research methodologies. Other useful sources are Coolican, H. (2014). *Research methods and statistics in psychology* (6th ed.). London: Hodder Arnold, and Gray, D.E. (2014). *Doing research in the real world* (3rd ed.). London: Sage.
- Martin, P. & Bateson, P. (2007). *Measuring behaviour: An introductory guide* (3rd ed.). Cambridge: Cambridge University Press, is especially useful on observational methods.
- For an introduction to qualitative methods, see Smith, J. (2008). *Qualitative psychology: A practical guide to research methods* (2nd ed.). London: Sage. For particular methods, see, for example, Kvale, S. & Brinkmann, S. (2008). *Interviews* (2nd ed.). London: Sage, and Yin, R.K. (2009). *Case study research* (4th ed.). London: Sage. Also recommended is Christensen, P. & James, A. (Eds.) (2008). *Research with children: Perspectives and practices* (2nd ed.). New York: Routledge.
- There are many good statistics texts available for psychology and the social/behavioural sciences. These include Howitt, D. & Cramer, D. (2005) *Introduction to statistics for psychology* (3rd ed.). Hemel Hempstead: Prentice-Hall, and Howell, D.C. (2009). *Statistical methods for psychology* (7th ed.). Belmont, CA: Wadsworth.
- The journal *Childhood* is a good source for issues around children's rights and young people as researchers. See also Montgomery, H.K., Burr, R. & Woodhead, M. (Eds.) (2003). Changing childhoods: Local and global. *Childhood*, Vol 4, Chichester: John Wiley.
- An accessible general overview to ideas in the philosophy of science is in Chalmers, A.F. (1999). *What is this thing called science?* (3rd ed.). Milton Keynes: Open University Press.