

Chapter 2

Research Methods in Child Psychology



SELECTING A SAMPLE

Some Solutions to the Problem of Representativeness
Another Approach: The National Survey

METHODS OF GATHERING DATA ABOUT CHILDREN

Children's Self-Reports
Reports by Family Members, Teachers, and Peers
Direct Observation

RESEARCH DESIGN: ESTABLISHING RELATIONS AND CAUSES

The Correlational Method
The Laboratory Experiment
Field and Natural Approaches
Combination Designs in Developmental Research
The Case Study Approach

STUDYING CHANGE OVER TIME

The Cross-Sectional Method
The Longitudinal Method
The Sequential Method

THE ETHICS OF RESEARCH WITH CHILDREN

SUMMARY



A theory can provide us with insights, hunches, and ideas about human development, but if it is to be useful, a theory must enable one to predict with some degree of accuracy such things as how children change as they grow older and why development unfolds as it does. In this chapter, we investigate some of the many strategies and methods that psychologists who study child development use to help answer these and other questions.

scientific method

The use of measurable and replicable techniques in framing hypotheses and collecting and analyzing data to test a theory's usefulness.

Like other scientists, child psychologists use the **scientific method** in their research, that is, they formulate hypotheses on the basis of a theory and use measurable and replicable techniques to collect, study, and analyze data in an effort to test the theory's usefulness. This chapter follows the steps of the scientific method, considering first how developmental researchers select a group of children to study. The chapter then explores ways in which researchers gather the data they need to test their hypotheses and examines the principal research strategies, or designs, used to investigate issues of child development. Among the designs we discuss, the correlational and experimental methods are the most commonly used, and most designs have the option of using one of several techniques that are particularly useful in revealing how children change over time: the cross-sectional, the longitudinal, and the sequential methodologies. The scientific method culminates in the analysis of data gathered in a search for a meaningful pattern and support for the original hypothesis and, often, in a replication of the study to ensure that its results are trustworthy. Throughout this entire process, researchers are guided by the ethical principles that we discuss at the conclusion of the chapter.



SELECTING A SAMPLE

If you wanted to study the typical weekend activities of grade 1 children, how would you go about collecting your data? How many children in grade 1 do you suppose there are at a given time in North America? Rather a lot. Thus, you could not possibly study all of them, but you could select a **sample**, or a group of manageable size and made up of individuals who, you hope, are representative of the entire population of grade 1 children. Because it is rarely possible to look at all the members of a given population, researchers must limit their focus in some way, and sampling is the most common solution.

sample

A group of individuals who are representative of a larger population.

Some Solutions to the Problem of Representativeness

If we want our research conclusions to be applicable to the population our sample is designed to reflect, we must ensure the **representativeness** of that sample, that is, the persons we choose to study must possess nearly the same characteristics evidenced by the larger population in which we are interested; depending on that population, we may need a very broad sample in which, say, all social classes or many ethnic backgrounds are represented. Consider the following example:

A researcher wants to study the way children's vocabularies change over time. Living near a private nursery school in a rather affluent suburban community, she selects 30 three-year-olds and 30 five-year-olds from the school population and carefully tests their vocabulary levels. On the basis of the performance of these children of professional parents, the investigator reports that she now has a set of norms or guidelines for what may be expected of preschoolers' vocabulary knowledge. What is wrong with the researcher's conclusion?

The investigator has chosen her sample poorly, for, other things being equal, the children of professionals are likely to have verbal skills that surpass those of children of less well-educated parents. It is also possible that direct teaching at the school, where the ratio of teachers to students may be more favourable than in public schools, facilitates children's learning. Clearly, we cannot generalize about the average vocabulary accomplishment of all children of three and five years unless we sample a wide range of children from different backgrounds and in different instructional settings.

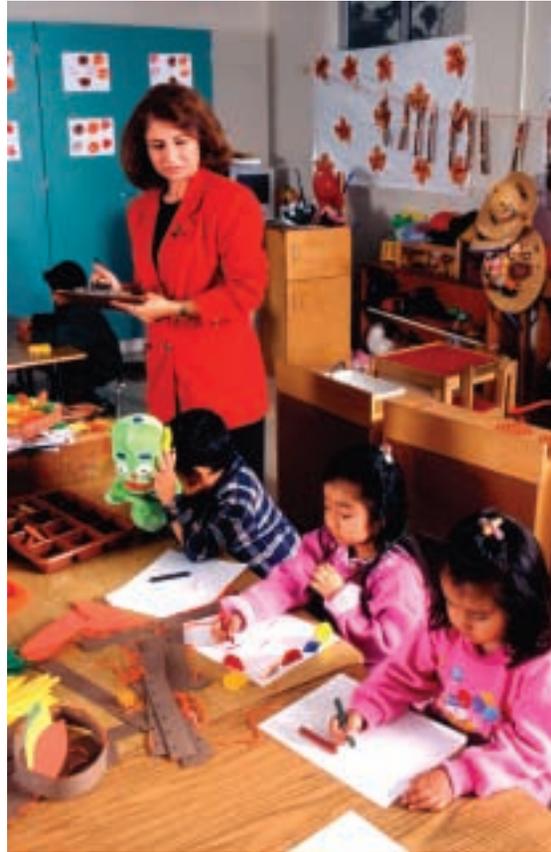
Here is another example: Suppose you are interested in the development of aggressive behaviour in children. You select a sample of children who have been brought to a psychology clinic because of family problems. There are 30 boys and five girls in the sample, and all come from a poor part of a large urban area. You evaluate various aspects of the children's behaviour by watching them play with other children and by asking them how they would resolve a dispute with a peer. To begin the search for causes, you assess how well each child's parents get along and how much television the children watch. Ultimately, you conclude that boys are more aggressive than girls and that aggression in children is related both to watching a lot of TV and to parental fighting.

representativeness

The degree to which a sample actually possesses the characteristics of the larger population it represents.

Problems plague this study. Perhaps, children who are brought to a clinic because of behavioural problems are different from children whose families do not or cannot seek this kind of help. It is possible that boys are, in fact, more aggressive than girls, but the sample of girls in this study is disproportionate to the sample of boys, and it is also too small to support such a conclusion. Given the nonrepresentativeness of this sample, there is no basis for connecting excessive TV viewing and parental conflict with aggressiveness in children. To draw such a conclusion legitimately, you would have to test equal numbers of girls and boys (perhaps as many as 50 of each) and divide them equally among varying socioeconomic backgrounds and between those who were and those who were not attending a clinic for behavioural problems.

These examples illustrate one of the major problems that a researcher faces in selecting a sample—namely, to try to recruit a group of people that is representative of the larger population about which the researcher wishes to make general statements. Great care must be taken in generalizing to a larger population from a sample that is restricted in some way (e.g., by race, gender, social class, or region of the country). Increasingly, investigators are finding it helpful to select several samples, each made up of people who vary in race, gender, and social class. By selecting multiple samples, they can be more certain that their conclusions about development do, in fact, apply to a broad range of people. This strategy is often used in developmental research when investigators in different parts of the country tackle the same issues. When researchers use multiple samples to collect their data, and if several researchers draw similar conclusions, we can have greater confidence in the generalizability of the findings.



Selecting a sample is a crucial step in the research process. For example, if scientists include children of different cultural backgrounds in their research they may be able to draw useful conclusions about the universal or culture-specific nature of the phenomena they study.

Another Approach: The National Survey

In an innovative approach to sampling called the **national survey**, researchers interested in a particular issue or issues select a very large, nationally representative group of people. In the United States, the National Longitudinal Survey of Youth (NLSY), which began in 1979 with a sample of young men and women ranging in age from 14 to 24 years, has interviewed its participants annually on a variety of topics. In a similar vein, Canada, in 1994, launched the National Longitudinal Survey of Children and Youth (NLSCY), whose goal is to monitor children from birth to 25 years, collecting data for the analysis of biological, social, and economic factors affecting children. In their first round of data collection almost 23,000 children were surveyed, with participants drawn from different sub-populations across Canada.

Both projects have begun to investigate a range of topics (Brooks-Gunn, Berlin, Leventhal, & Fuligni, 2000; Brooks-Gunn, Smith, Berlin, & Lee, 2001; Elgar et al., 2003; To, Cadarette, & Liv, 2001). For example, the NLSCY has looked at the impact of immigration on development. In general, immigrant families tend to be poorer than their counterparts born in the host country. Yet, despite the evidence that familial poverty is a serious threat to the mental health of children (Canadian Institute of Child Health, 1994; Rutter, Tizard, & Yule, 1976), immigrant children in Canada are as healthy as their host country counterparts and even often do better in school (Beiser, Hou, Hyman, & Toussignant, 1998, 2002). The important point here is that the broad sampling strategy used in these works has the advantage of allowing the researchers to make general statements that may be applied to all North Americans in the same age groups. Without such large representative samples, researchers would not know whether any pattern they discovered was confined only to the people who shared the characteristics of those they studied.

national survey

A method of sampling in which a very large, nationally representative group of people are selected for a particular study.



Minority Groups in Child Development Research

According to the 2001 Canadian Census, the total visible minority population of Canada was about 16.8 percent, including about 3.3 percent made up of the Aboriginal (i.e., North American Indian, Métis, & Inuit) population (Statistics Canada, 2001a, 2001b). In the United States, this proportion was even higher, at 25 percent, and is expected to reach 30 percent by 2020 (U.S. Department of Commerce, 1996). Moreover, currently in Canada, the proportion of the population classified as low-income is about 20 percent, with young children under six years most likely to live in low-income situations (Health Canada, 1999). Similarly, in the United States, about 50 percent of the population is either working class or poor (Children's Defense Fund, 1997). Despite these statistics, most developmental research has virtually ignored non-European, non-middle-class children and families (Demo et al., 2000; Fisher et al., 1998). For example, as late as 1989, only 1.5 percent of articles in *Developmental Psychology* and other journals in the field pertained to people of African descent, and despite the fact that the nonwhite population has been *increasing* steadily, this was a decrease from the proportion of articles (5.5 percent) found in the early 1970s (Graham, 1992)!

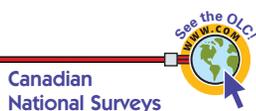
Although many minority people have moved from lower social classes into the middle class, when researchers do explicitly include non-European individuals in their studies, they tend to sample only those of low socioeconomic status (Fisher et al., 1998). This practice may reinforce a stereotypical view of racial-ethnic people as a group of people who are uniformly poor and "different" from middle-class people when, in fact, there are minority people in all social classes. In addition, studies typically use materials and procedures that have been developed from a "monocultural" perspective and that, therefore, often elicit responses from minority participants that are seen as deficient in some way (Fisher et al., 1998).

This "deficit" orientation essentially rules out the possibility of exploring the assets, strengths, skills, and resiliencies of people whose heritage and cultural patterns are different from the dominant North American patterns

(Fisher et al., 1998). It also prevents researchers from understanding the sociocultural bases for minorities' beliefs, attitudes, behaviours, and lifestyles from the points of view of the minorities themselves and leads to the evaluation of research participants on the basis of the dominant group's perception of social reality. According to Fisher et al. (1998), such a failure to give ethnic minority members a voice in a scientific enterprise that is designed to characterize their individual and collective natures seriously challenges the ability of the social sciences "to respond to the full diversity of human nature." (p. 1181)

Stimulated, in part, by such increasingly popular theoretical perspectives as Vygotsky's sociocultural theory, dynamic systems theory, and Bronfenbrenner's ecological theory (Chapter 1), a new research paradigm that emphasizes cross-cultural and multicultural comparisons is emerging (Fisher et al., 1998). This model proposes that to understand human growth and development, researchers must add cultural context as a parameter of equal importance with the biological, psychological, and social aspects of human life. Thus, to carry out useful research with ethnic minority participants, researchers need to understand the fundamental cultural values and practices of the groups they seek to study. Such new methods as ethnographic approaches that involve rich descriptions of the cultural practices of minority groups in their everyday environments are becoming commonly used to improve our understanding of the unique characteristics and mores of different ethnic groups. In addition, using the language of participants can facilitate communication between investigators and research participants.

Cultural understanding needs to inform research instruments and methodology as well; questionnaires, interview protocols, and tests need to be adapted to the cultural characteristics of the group being studied. Some psychologists have pointed out that the most widely used tests of intelligence draw on white, middle-class language, experience, and values. For example, the vocabulary used on such tests often differs from the language or dialect some children use everyday. On this view, some researchers have argued that



Canadian
National Surveys

National surveys have some disadvantages, however. One obvious problem is that they are costly. Consider the time and labour required to interview the nearly 12,000 original participants in the NLSY, or the 23,000 in the NLSCY! In addition, national surveys are limited in that although the large samples allow them to reveal overarching patterns, these broad-based studies are less suited to answering specific questions about the processes that may account for different aspects of development. For this reason, a national survey is sometimes used in combination with a more intensive look at a smaller sample of people. For example, we might select a subsample of 100 or 200 children and then observe, study, and test these subjects in some depth in order to achieve a better understanding of the processes that underlie changes over time in their thinking and behaviour.

minority children's lower verbal scores may reflect cultural bias, not lack of intelligence.

As Garcia-Coll & Magnuson (2000) argue, the way a person interprets a task influences the way he or she performs it, and significantly, this interpretation is related not only to the specific features of the task but also to the person's earlier cultural experiences. Consider the effect of experience on a minority child's success or failure on a question from the Stanford-Binet test, a widely used intelligence test (we discuss this test in Chapter 11). For the question "What's the thing for you to do if another child hits you without meaning to do it?" the correct responses suggested include, "I'd say, 'That's all right. I know it was an accident' and walk away." In some minority communities, children must fight to survive. A child who took a chance like that might end up with a knife or bullet in the back (Williams, 1970).

Children who have not been exposed to information about tests and what they are for may not understand the context of the testing situation. Once again, the child's interpretation of the context will influence his or her behaviour in that context.

Tester: "What is a ball?"

Child: "You kick balls."

Tester: "What is a hat?"

Child: "You put it on your head."

Tester: "What is a stove?"

Child: "You cook. That's what you writing down?"

Tester: "Yeah. I'm writing down what you say so I can remember it later."

Child: [Incredulously] "'Cause you don't know what it's for?"

If all children taking a particular test do not understand and interpret both the goal of the testing situation and the meaning of each specific test item in the same way, can the tester legitimately compare the responses of different children? Equating tasks or test items in terms of familiarity or cultural appropriateness is very difficult, but it is reasonable to suppose that the more psychologists try to use culturally relevant materials and procedures and to ensure that the

individual being asked to perform understands both the nature of the task and the examiner's sincere interest in his or her responses, the more likely it is that the person will perform competently.

Theorizing that children from minority and low-income groups may feel uncomfortable with examiners of European origin and may become anxious in unfamiliar testing situations, especially when pressed to respond within rigid time limits, some researchers have tried a number of ways of facilitating children's performance (Garcia-Coll & Magnuson, 2000). For example, they have tried to familiarize children with the test environment and test materials, to give them specific encouragement and feedback on various tasks, and to use material rewards, such as candy or toys, to motivate performance. The fact that such efforts have had much more effect on economically deprived children than on middle-class children supports the notion that minority children may be just as competent as nonminority children but unable to perform under the conditions ordinarily set for them.

The new research paradigm points out that culture is not static and, in accord with contemporary psychologists' emphasis on the processes rather than the products of development, encourages investigators to design studies that seek to understand and describe the processes that reflect the dynamic nature of culture (Parke & Buriel, 1998). For example, regardless of their relative positions in a social-class hierarchy, cultural subgroups constantly influence each other. The music of American jazz, now a universal art form, is largely the creation of African Americans; conversely, among talented interpreters of classical (European) ballet today is the Dance Theatre of Harlem. Cultural borrowing as well as cultural shock affects the development of children and youth from every group within a society. If research is to be useful in developing policies, services, and institutions to promote the healthy development of all children, it must be sensitive to and explore the basic values and characteristics of society's many groups.



Canadian Health Studies

Finally, researchers need to ensure that sampling not only provides broad representativeness on such fairly obvious parameters as age, gender, and socioeconomic status, they must also recognize that many aspects of development vary across different cultural, ethnic, and racial backgrounds (Demo et al., 2000) and work to ensure that their samples represent the diversity of their respective populations. Unless there is a special effort to target particular ethnic groups, we may be losing significant opportunities to discover important ethnic differences (Box 2-1). As we discuss later, psychologists are increasingly recognizing the importance of research that informs us about children around the world.



METHODS OF GATHERING DATA ABOUT CHILDREN

Once researchers have decided what group or groups they want to study, they must decide how they will study these youngsters. This next step involves deciding on a method of gathering information relevant to the development issues in which the investigators are interested. Essentially, there are three approaches: we can ask the children about themselves; we can ask the people who are close to these children about them; or we can observe the children ourselves in various situations. Each approach has its advantages and limitations, and researchers' choices depend on the kinds of questions they want answered.

Children's Self Reports

self-report

Information that people provide about themselves, either in a direct interview or in some written form, such as a questionnaire.

A **self-report** is information a person provides about himself or herself, typically by answering a set of questions devised by a researcher. Soliciting such information from a child, as you may imagine, presents special problems. Compared with adults, children—especially younger ones—are apt to be less attentive, be slower to respond, and have more trouble understanding the questions that researchers ask. Children are no less truthful than adults; in an interview study of a national sample of 2,279 children between seven and 11 years of age and their parents, the interviewers rated the apparent truthfulness of parents and children to be equal (Zill, 1986), although they rated younger children as less reliable reporters than older children. Interestingly, researchers also rated children as less truthful if a parent was present and listening closely during the interview. Barring the possibility that younger children are sometimes simply less knowledgeable about certain matters, we may increase the truthfulness of children's answers by interviewing them alone.

Despite these limitations on children's self-reports, some kinds of information are difficult to obtain in any other way (Cummings et al., 2000). Zill (1986), for example, points out that interviewing children directly “permits a glimpse at a child's life from his or her unique perspective. The child is the best authority on his own feelings, even if he has some trouble verbalizing those feelings. And even in matters of fact—where adults have the advantage of a more fully developed sense of where or when and of how many—there are aspects of a child's daily life that his parents or teacher know little or nothing about.” (pp. 23–24)

Reports by Family Members, Teachers, and Peers

Our second strategy for collecting data is to solicit information from people who know the children well. These people may include parents, siblings, teachers, peers, other relatives, and sometimes other people in the community; most commonly, child development researchers seek this information from family members, teachers, and peers.

Family Members

A strength of interviews with parents and other family members—and this includes children's self-reports—is that these reports are generally based on many observations made over time in a variety of situations. As we will see, in most direct observational studies, the observer sees the participant for only a short time and in a single situation.

Another advantage of reports by family members, as well as of self-reports, is that even if individuals are not totally accurate in their reporting, their perceptions, expectations, beliefs, and interpretations of events and behaviour may be just as important as what we can only assume is objective reality (Bugental & Goodnow, 1998; Collins & Repinski, 2001; Goodnow & Collins, 1991). For example, a son may feel rejected by his father, who really loves him but who believes that men do not show emotion and that high standards and strict discipline are necessary to develop strong moral character in the young. The child's belief that his father does not find him worthy of love, rather than the father's real attitude, may well result in the development of feelings of inadequacy and low self-esteem in the son.

Researchers can use measures of such things as the images family members have of one another and the ways family members interact to differentiate problem families from families that are functioning well. If family members perceive the family and each other in very different ways, these discrepancies tend to be associated with conflict and distress (Grych & Fincham, 2001). Many family therapists focus on helping family members to discover such discrepancies in their perceptions of each other and communicate more openly as a way of reducing family conflict.

There are some clear disadvantages in soliciting parental and other family reports about a child's growth and development. For example, we cannot always take at face value what parents

tell us about their childrearing practices (Holden, 1997; Holden & Buck, 2002), in part because human memory is not completely reliable. When asked to recall details of past interactions with their children, people simply may not be able to remember exactly how they handled certain situations. Also, because people are motivated to remember themselves in the best light possible, they often tend to recall what they wish they had done rather than what they did and to remember themselves as having been more consistent, patient, and even-tempered with their children than more objective assessments might have revealed them to be.

A classic study by Robbins (1963) compared parents' retrospective reports of their child-rearing practices with the same parents' reports made regularly over the course of the first three years of a longitudinal study. Robbins found that distortions in parents' recall of events tended to cast the parents in the light of greater agreement with the opinions of then-contemporary experts, such as the paediatrician Benjamin Spock. For example, Dr. Spock, in the 1957 edition of his book, *Baby and Child Care*, disapproved of allowing a child to suck his thumb and, instead, approved of giving the child a pacifier. In Robbins's study, all mothers who gave inaccurate reports of their children's thumb sucking and even those who earlier had indicated concern to their physicians about their children's thumb sucking, denied that the children had ever sucked their thumbs. Similarly, most of the mothers who reported inaccurately on their use of pacifiers said that they had used a pacifier when the actual records showed that they had not.

When parents see their children as extensions of themselves, they are unlikely to report problems as honestly as we would hope. Few parents report their children's development as slow and, instead, recall their children as having walked and talked a little earlier than they really did and as having achieved better grades in school than they actually earned. Such parents may be telling us more about themselves than about their children. And many parents will gloss over certain aspects of their children's behaviour that others view more negatively. Thus, a father may describe his son as a rough-and-tumble "real boy" who is full of good-natured mischief, rather than the scourge of the neighbourhood, as others would have described him.

Recently, in an effort to increase the accuracy of parents' reports, investigators have devised a number of new interview strategies. For example, they may have parents report only very recent events so as to ensure more reliable memories. They may phone parents every evening and ask which from a list of specific behaviours (such as hitting, crying, yelling, or refusing to comply) their children have exhibited in the past 24 hours (Patterson, 1996; Patterson & Bank, 1989). Or they may ask parents to carry a structured diary and to record their activities with their children during specific time intervals (Hunziker & Bard, 1986; St. James-Roberts, Conroy, & Wilsher, 1998). Or they might page parents at different times of day, and ask them to record their activities or feelings or those of their children (Larson & Lampman-Petratis, 1989; Larson & Richards, 1994).

Finally, recent research has provided evidence that is somewhat more optimistic regarding the accuracy of parental reports (Vriezen & Pigott, 2002; Waschbusch, Daleiden, & Drabman, 2000). For example, Waschbusch et al. (2000) found that parents were able to accurately report a variety of aspects of their children's cognitive functioning, including reasoning skill, comprehension knowledge, as well as visual and auditory processing.

Teachers and Peers

For some questions, such as how well a child attends to classroom activities and work or how cooperative he or she is on the playground, parents may not always be good sources of information. Indeed, some parents are unaware of whether their child is the class clown or the worst nerd in the school. To learn about a child's behaviour in such settings, researchers can ask other people, such as teachers and peers.

One technique researchers often use is to ask peers to rate how well a particular child's peers accept him (Chan & Mpofu, 2001; Hugar & Shapiro, 2001). For example, investigators might ask all the youngsters in a classroom to rate each of their peers in terms of "how much I like to play with" him or her, or to describe the behaviours that lead their peers to either like or dislike them (Murphy & Schneider, 1994). The researchers then combine such ratings to yield a picture of each child's social status in the classroom (Ladd & Pettit, 2002; Rubin, Bukowski, & Parker, 1998; Terry & Coie, 1991). Sometimes, investigators may ask teachers to rate children on a specific series of dimensions, such as attentiveness, disruptiveness, dependability, and sociability. Both peers and teachers can provide important information about children's behaviours that are useful supplements to children's self-reports and the information provided by family members (Parke et al., 2001).

Although children's self-reports, parental reports, and reports by others have their limitations, researchers have found that these reports offer them the best understanding of many issues. In addition, as we will see next, these kinds of reports are often used in conjunction with other data-gathering strategies.

Direct Observation

direct observation

A method of observation in which researchers go into settings in the natural world to observe behaviours of interest.

There is often no substitute for the researcher's own **direct observation** of people, and students of child development may make such observations in naturalistic settings, such as participants' own homes or the playground, or in laboratories where they give children, and sometimes parents, some highly structured task to perform. Observational data, however, are valid only to the extent that the presence of an observer or the other demands of the situation do not distort participants' behaviour and responses.

These distorting factors are sometimes hard to avoid because children and parents often do behave differently in different kinds of settings or when they know they are being watched. Mothers, for instance, often respond to a toddler's temper tantrum quite differently at home than they do in a crowded supermarket. Studies also suggest that when families are shifted from familiar to unfamiliar settings (from the home to a laboratory, for instance) or from unstructured settings to situations in which they must perform specific tasks in a very structured fashion, they tend to express less negative emotion and to exhibit more socially desirable behaviour (Johnson & Bolsted, 1973; Lamb, Suomi, & Stephenson, 1979). Conversely, parents are less likely to exhibit stereotypical gender-role behaviour at home, where, in addition, mothers participate more actively in decision making and fathers display more emotion (O'Rourke, 1963).

Even at home, customary behaviour can be distorted by the presence of an outside observer. Parents, for instance, tend to behave in ways that enhance their images as parents and to inhibit negative behaviour when they are being watched (Russell, Russell, & Midwinter, 1991). Although this is especially true of fathers, even mothers behave in a warmer, more involved style with their children when an observer is in the home (Zegoib, Arnold, & Forehand, 1975).

Debra Pepler of York University and Wendy Craig of Queen's University (Craig, Pepler, & Atlas, 2000; Hawkins, Pepler, & Craig, 2001; Pepler & Craig, 1995) provide an interesting example of naturalistic observation methods in their work on aggression and peer interaction. To overcome some of the problems inherent in observing children in the laboratory, these researchers employed remote audiovisual observations of children on the playground in which the researcher sets up a video camera away from the children who are being observed and attaches a wireless microphone to a previously selected target child. With this set-up, the researcher is able to remain remote from the target child while still recording the child's behaviour at close range.

The strengths of using such a set-up are obvious—these authors are able to observe interactions that typically occur outside the adult view, and because children are completely free to move around when and where they wish, the method has a great deal of **external validity**, which means that the results can be easily generalized outside the immediate context of the study. On the other hand, there are ethical issues to consider with the use of such a method (ethics in research is discussed at the end of this chapter), as well as several limitations inherent in this methodology, including a lack of experimental control over the subjects, the inability to observe different children over time (which has implications for the issue of time sampling, discussed below), and the possibility that children will actually be somewhat conscious of the fact that they are wearing such equipment. In fact, Pepler and Craig found that the oldest children in their

external validity

The degree to which the results of an experiment can be easily generalized outside the immediate context of the study.

Research with very young infants has become increasingly possible through the use of a number of very clever and imaginative techniques. In these photos from Darwin Muir's laboratory, you see an example of a technique that has been used to investigate the social and emotional development of infants. In this "still-face" procedure, infants see a video-image of another person's face, with the face either being highly interactive with the infant, or showing no responsiveness to the infant. By assessing the infants' reactions to these variations, researchers have been able to explore the nature of infants' interpersonal interactions with a range of people, including parents, siblings, and strangers.



study, about 11 to 12 years old, seemed aware of the equipment, with some a bit reticent of being observed in this fashion. Nevertheless, this study, and the technique in general, provides an excellent example of the strengths and the weaknesses of direct observational techniques.

When researchers decide to observe children and their families directly, they must decide what kinds of behaviours to record (Bakeman & Gottman, 1997). If they are interested in a broad range of behaviours, they may use a **specimen record**, in which they record everything a subject does for a specified period of time. If they are interested in studying only a particular type of behaviour, such as the way a child responds to her parents' directives, they may use **event sampling**, in which they record individuals' behaviour whenever the event of interest occurs but not at other times. For example, an investigator interested in a child's response to parental directives would start recording information when a parent issued a command and stop recording when the child had clearly either obeyed or disobeyed the command.

In **time sampling**, the researcher checks off any of the behaviours listed on a sheet of paper that occur during a predetermined time period. Thus, if an investigator were going to observe a family for an hour, she might divide the hour into 120 thirty-second units, prepare a grid showing behaviours and time blocks, and then put a check beside each behaviour that occurs in each block of time. If the researcher wanted to examine a stream of behaviour, however, a better strategy would be to record events continuously and sequentially for a stated period of time (Mann et al., 1991). For example, suppose that a baby throws his cereal bowl to the floor, his mother scolds him, the baby cries, and the mother then picks the baby up and comforts him. This clear stream of behaviour gives us a model of mother-child interaction and enables us to ask such questions as: When the baby misbehaves (in this and other ways), what is the mother's most common response? How does the baby respond to her behaviour? How does she react to the baby's response?

When a child development specialist is interested in some behaviour that is unlikely to occur in a naturalistic observation setting, he may structure a situation so that the behaviour is more likely to happen; this method is called **structured observation**. Suppose that a researcher is interested in the way parents respond to their child's request for help. By giving the child tasks that are very difficult to do, the investigator may increase the likelihood that the child will ask his parents for help, thus giving the researcher an opportunity to observe the parents' responses to their child's request (Cummings et al., 2000).

Because of the limitations inherent in all of these methods of gathering data, many investigators have begun using multiple measures of the same behaviour. For example, a researcher might ask a child whether he is afraid of snakes, ask his friends if they think he is afraid of snakes, observe him closely on a field trip to the local woods, and watch his reaction when he is shown pictures of snakes or when his class adopts a snake as a classroom pet. The idea behind this approach is that of **converging operations** (Proffitt & Bertenthal, 1990), or the idea that if a variety of assessment techniques produce the same result, researchers can reasonably conclude that the findings are valid.

specimen record

A technique by which researchers record everything a person does within a given period of time.

event sampling

A technique by which investigators record subjects' behaviour only when an event of particular interest occurs, not at other times.

time sampling

A technique by which researchers record any of a set of predetermined behaviours that occur within a specified time period.

structured observation

A form of observation in which researchers structure a situation so that behaviours they wish to study are more likely to occur.

converging operations

A research strategy in which a variety of research techniques are used to investigate or converge upon a particular experimental or research result.

For THOUGHT and DISCUSSION



1. A researcher is interested in conducting a study on the impact of socioeconomic factors on parent-child interaction. To recruit subjects for this study, she obtains a list of families in three different suburbs of a large metropolitan city and randomly selects people from these lists. What potential problems are inherent in this procedure with respect to sampling issues? What might this researcher do to try and overcome some of these problems?
2. What are the advantages of direct observation relative to (self- or parental) report measures? If you could choose between the two methods, what factors would lead you to select one over the other?
3. What sense might you make of a study in which parental self-report techniques and direct observational techniques produce different results? What implications does such a finding have for the idea of converging operations?



RESEARCH DESIGN: ESTABLISHING RELATIONS AND CAUSES

Selecting a sample and a method of gathering information enables us to describe some aspect of human development in which we are interested, but what will this information do for us? To make use of it, we need to know how the various factors of development that we have described are related and interact, and to determine the reasons why development occurs as it does. We begin this section by discussing the correlational research design, which enables us to establish both the existence and the strength of relations among factors, and we then move on to the laboratory experimental design, in which researchers attempt to demonstrate causality among factors. After we explore both field and natural experimental designs, we examine an approach that combines laboratory and field designs. In the last part of this section, we discuss the case study, a design that allows for the intensive study of a single individual.

The Correlational Method

Many people have wondered whether “Sesame Street” and other educational children’s programs on TV can help young viewers perform better when they enter school. As we discussed in Chapter 1 (Box 1-1), some evidence indicates that “Sesame Street” offers young children this kind of help. To illustrate the correlational research design, let us examine one of the studies that has contributed to this evidence. Using the **correlational method**, a design that enables researchers to establish not only that one or more factors are related to each other but also the strength of these relations, John Wright and Aletha Huston (1995) studied the TV-viewing behaviour of preschool children in more than 250 families, all from low-income areas. The children were either two or four years old at the start of the study, and either five or seven years old at its conclusion. Their parents were asked to make detailed reports on how their preschoolers spent their time, including which TV shows they watched and for how long each day.

Every year, the children were given a variety of cognitive achievement tests, such as measures of mathematical skills, letter and word knowledge, and vocabulary size. The researchers found that children who watched children’s educational programs, particularly “Sesame Street,” tended to have a higher level of cognitive achievement, that is, the more such programs the children watched, the higher they scored on the tests. Regular viewing of children’s cartoons or adult TV programs, on the other hand, was negatively related to children’s performance on tests of cognitive abilities. The more time they spent watching cartoons or adult programs, the lower they scored on these tests.

Do these findings mean that watching “Sesame Street” caused these children’s high test scores? No, they do not. Why? Because any number of factors other than watching this children’s show could have caused the improved scores. For example, suppose that “Sesame Street” appeals particularly to children who have superior cognitive skills, or suppose that children who watch “Sesame Street” have parents who provide a lot of encouragement and guidance in reading, writing, math, and other school subjects. Either of these factors could be the real cause of their achievement, and watching “Sesame Street” might have little to do with it. Well, then, couldn’t the researchers have somehow taken these factors into account? In fact, they did. They made certain that all the children had the same or nearly the same level of cognitive skills, and they ensured that all the parents were equal in their level of education, socioeconomic status, and the degree to which they actively stimulated and encouraged their children to learn. The result was, as we reported, that watching more educational TV was related to higher test scores.

Surely, now we can say that “Sesame Street” was the cause of the children’s achievement. Unfortunately, we cannot. A cardinal rule in correlational research is that correlation is not the same thing as causation. A relation between two factors may be established, but the method does not tell us which factor is “causing” the other. If correlational research does not allow us to determine causation, why then do we use it? For one thing, as we will see in the next section, the controlled laboratory experiment, which can, in fact, demonstrate causality, is often more difficult to implement. For another, as we will also see, ethical concerns associated with laboratory experiments may interfere with their design or make their execution questionable. In most cases, however, researchers are careful to design experiments that are scientifically meaningful and ethically acceptable.

Before we turn to the more formal, laboratory experiment, let us look at the statistical tool used by researchers in the correlational design. Commonly known as the **correlation coefficient**, this statistic is a numerical measure, or index, of how closely two factors are related to each other.

correlational method

A research design that permits investigators to establish relations among variables as well as the strength of those relations.

correlation coefficient

A numerical measure of how closely two factors are related to each other.

The Laboratory Experiment

laboratory experiment

A research design that allows investigators, through controlling variables and treatments and assigning participants randomly to treatments, to determine cause and effect.

experimental group

In a formal experiment, the group that is exposed to the treatment, that is, the independent variable.

control group

In a formal experiment, the group that is not exposed to the treatment, that is, the independent variable.

random assignment

The technique by which researchers assign individuals randomly to either an experimental or a control group.

A more convincing way of investigating causal connections is to conduct a formal experiment. In a **laboratory experiment**, researchers are able to control so many factors that may possibly influence the variable in which they are interested that their results allow them to draw conclusions about cause and effect. First, they hold constant, or equate in some way, every possible influence except the one factor that they have hypothesized as the cause of the variable they want to study. Second, in its most simple form, investigators create two groups of subjects. The **experimental group** is then subjected to the proposed causative factor, whereas the **control group** (or comparison group) does not experience this factor. In a third manipulation designed to rule out the possibility that the people in each of the groups differ from one another in some way that could distort the results of the experiment (more highly skilled people in the experimental group, for instance, and fewer highly skilled people in the control group), researchers use the technique of **random assignment** to decide who is in the experimental or the control group. Because their assignment is purely a matter of chance, it is unlikely that the people in each group will differ from each other in any systematic fashion.

To understand how these various controls enable the laboratory experimenter to determine causality, let us look at a classic study of the relation between watching violent television programs and aggressive behaviour. Liebert and Baron (1972) randomly assigned 136 boys and girls ranging in age from five to nine years to either an experimental group or a control group. When each child arrived at the laboratory, an experimenter took him or her to a waiting room that contained a television set and suggested that the child watch TV for a few minutes until the study was ready to begin. In actual fact, what each child watched on TV was the substance of either the experimental or the control condition. The researchers believed it was necessary to deceive them into thinking that watching TV was incidental in order to keep them from guessing the true purpose of the study and thus, perhaps, altering their reactions. However, this deception raises ethical questions about the researchers' procedures, as does the manipulation we will discuss shortly.

During this portion of the study, the children in both groups first saw two brief commercials selected for their humour and attention-getting value. Then, half the children—those in the experimental group—saw three and a half minutes of a program from the TV series “The Untouchables,” in which federal agents battled organized crime in the Chicago of the 1920s. The film sequence contained a chase, two fistfights, two shootings, and a knifing. In contrast, the children in the control group watched a highly active, but nonviolent sports sequence of the same time length, in which athletes competed in hurdle races and high jumps. Finally, the children in both groups watched another 60 seconds of a tire commercial. Note that the only difference in the material that the two groups were exposed to was in the three-and-a-half-minute video they watched; one group saw violent episodes, the other no violence at all. The researchers, thus, hypothesized that if later the children in the experimental group behaved differently from those in the control group, it would be reasonable to conclude that exposure to TV violence was the cause.

In the second phase of the study, the experimenters told each of the children that he or she was to play a game in an adjoining room with another child (whom they could not see and who, in fact, was purely imaginary). The researchers seated each child before a panel that had two buttons labelled “Hurt” and “Help” and told the child that the buttons were connected to a panel in front of which the child in the other room was sitting. This child was playing a game that required turning a handle, and if the child wanted to make it easier for her “partner” to turn the handle she could press the “Help” button; on the other hand, if the participant wanted to hinder the other child, pressing the “Hurt” button would turn the handle burning hot. Of course, this entire scenario was a deception, and nothing a child did hurt anyone else. But the researchers believed that with this story line and by measuring how long and how often children pressed the “Hurt” button, they could gauge how aggressively children in both the experimental and the control groups would behave towards another child. Do you think the deceptive manipulation in this part of Liebert and Baron's study was justified? We will return to this question when we discuss the issue of ethics in research at the end of the chapter.

You can now see how an experiment assesses the relation between two factors, or variables: the **independent variable**, which is the factor the researchers deliberately manipulate, and the **dependent variable**, which is the factor the researchers expect to change as a function of change in the independent variable. Thus, changes in the dependent variable *depend* on changes in the independent variable. In this case, the independent variable was the kind of TV program the children watched, and the dependent variable was the amount of aggressiveness children might dis-

independent variable

The variable, or factor, that researchers deliberately manipulate in a formal experiment.

dependent variable

The variable, or factor, that researchers expect to change as a function of change in the independent variable.

play towards other children. Liebert and Baron discovered that children who had seen the violent “Untouchables” segment showed significantly more willingness to engage in interpersonal aggression than did children who had watched the fast-paced but nonviolent sports program. This finding supported the researchers’ hypothesis that exposure to TV violence can cause interpersonal aggression.

Note, however, that even the best-controlled laboratory experiment has limitations that prevent easy generalization from the experimental situation to the natural world. Ensuring a study’s **ecological validity**, or its accurate representation of events and processes that occur in the natural environment, is often difficult (Lewkowicz, 2001; Schmuckler, 2001), and laboratory findings do not necessarily reflect how people act in the everyday world. For example, Liebert and Baron edited their violent TV program to include more acts of violence in three and a half minutes than would normally occur in a randomly chosen TV segment of this length, even from a show that has a lot of violence. In addition, the researchers used an artificially contrived test setting and measure of aggression, something children would not normally encounter in real life (Freedman, 1986). On the basis of such an unusual situation, is it fair to make a blanket statement that watching TV violence causes people to behave in a more hostile manner towards others than they normally would?

One way to overcome some of the problem of artificiality in a laboratory study is to conduct a **laboratory analogue experiment**, in which researchers try to duplicate in the laboratory many of the features or events that occur naturally in everyday life. For instance, laboratory investigators have staged angry interactions between mothers and other adults and then videotaped the reactions of the mothers’ children (Cummings & Davies, 1994; Cummings et al., 2000). These interactions, which the researchers tried to make as realistic as possible, were like those that might take place in natural settings, such as stores, malls, streets, or the home, but because the experimenters controlled their timing and venue, they were able to measure the children’s responses as they could rarely hope to do in the natural environment.

Of course, “naturalism” is not demanded in all developmental studies. For example, experimenters usually gain important insights about people’s perceptual capacities, such as how well they see and hear, through laboratory assessments. This is because, in the laboratory, researchers can precisely control the critical features of perceptual stimuli. Because many basic perceptual skills do not vary across contexts, a laboratory is just as valid a place to assess them as anywhere else (Seitz, 1988).

Clearly, research strategies must be matched to the questions being asked. And even though correlational designs do not allow us to determine causality, researchers are often constrained to use them because some issues—for example, residential mobility, divorce, or child abuse—simply do not lend themselves to the experimental approach.

Field and Natural Approaches

When we want to avoid artificiality and some of the other problems associated with the laboratory or laboratory analogue experiment, we can sometimes conduct experiments in people’s natural environments. In field experiments, clever investigators may deliberately introduce changes in the normal environment; in natural experiments, they may take advantage of naturally occurring changes in the everyday world.

The Field Experiment

In another study of the connection between viewing TV violence and aggressive behaviour in children, Friedrich and Stein (1973) offer us an example of the **field experiment**, in which investigators deliberately bring about a change in a real-world setting and then measure the outcome in that setting. Thus, instead of bringing participants into a laboratory, these experimenters entered the participants’ world, that of a summer nursery school. During the first three weeks of the study, the researchers simply observed the children during their usual play sessions to achieve a baseline measure of the degree of aggressive behaviour each child manifested under normal circumstances. Then, for the next four weeks, they showed the children a half-hour TV program each day. Randomly assigned to three groups, some children always saw programs depicting interpersonal aggression, such as Batman and Superman cartoons; others saw programs with a message of caring and kindness towards others, such as “Mister Rogers’ Neighborhood”; and still others watched neutral shows, such as nature programs or circus movies.

To minimize **observer bias**, that is, the tendency of observers who are knowledgeable about a research design to be influenced in their evaluations by that knowledge, the researchers assessing

ecological validity

The degree to which a research study accurately represents events and processes that occur in the natural world.

laboratory analogue experiment

An experiment in which investigators try to duplicate in the laboratory features or events of everyday life.

field experiment

An experiment in which researchers deliberately create a change in a real-world setting and then measure the outcome of their manipulation.

observer bias

The tendency of researchers-observers to be influenced in their judgments by their knowledge of the hypotheses guiding the research.

The current rise in violent video games has many developmental psychologists wondering about the impact of such violence on child development. Here, some children are playing a game in which they have to shoot others. Does exposure to such violence have a negative effect on these children's development?



the children's subsequent behaviour did not know the types of programs that different children had been viewing. Friedrich and Stein found that children who had been rated high in aggressive behaviour before the TV watching started continued to show highly aggressive behaviour after exposure to the aggressive cartoons, but not after exposure to the other two kinds of shows. For children rated low in aggression during the initial assessment period, watching interpersonal aggression seemed to have no effect; they were still less likely to behave aggressively. The researchers concluded that exposure to TV violence does lead to aggression in children, but only among children already likely to behave aggressively.

One advantage of the field experiment over the laboratory experiment is that the results can be generalized more readily to natural environments. Friedrich and Stein did not edit the TV programs the children saw in any way, and these programs were among those that many of the children watched in their homes. Moreover, the children's aggressive behaviour was measured in an everyday setting, not in a situation contrived to allow or encourage them to behave aggressively. Both these factors enhance the study's generalizability to the world beyond the researchers' domain.

At the same time, the field experiment retains some important features of a laboratory experiment. Because the independent variable—the type of TV program—was still under the control of the researchers and the participants were still randomly assigned to the various groups, Friedrich and Stein could be reasonably confident that they had demonstrated a causal connection, namely, that exposure to TV violence may encourage aggressive children to behave aggressively.

The Natural Experiment

When for ethical or practical reasons researchers cannot introduce changes into the natural world, they may elect to do a **natural experiment**, in which they can measure the effects of events or changes that occur naturally in the real world. This approach is also called a *quasi-experiment* because investigators do not assign the research participants randomly to experimental conditions; instead, they select the children they study because the children are exposed to a set of conditions that are of interest to the researcher, such as enrolment in daycare or in a nutritional supplement program. One example of a natural experiment is a study conducted by researchers at the University of British Columbia that investigated the way the introduction of TV into a community affected aggressive behaviour among children (Williams, 1986). By monitoring the level of aggressiveness in children's play both before and after the debut of television in a small Canadian town, the investigator was able to show that aggressive behaviour did, in fact, increase after TV arrived in town; this study will be discussed in more detail in Chapter 14.

Because this research did not contrive the introduction of television to the town it studied, its findings may have more ecological validity than those of laboratory studies. On the other hand, because the independent variable in this study was simply the presence versus the absence of TV, we cannot really say *what* it is about TV viewing that might have been causing this effect. Children watch all kinds of programs, and this study did not attempt to examine or control what shows they chose.

natural experiment

An experiment in which researchers measure the results of events that occur naturally in the real world.

TABLE 2-1 Research Designs: Advantages and Limitations

Design	Control over Independent Variable	Control over Dependent Variable	Generalizability of Findings
Correlational method	Low	Low	Medium
Laboratory experiment	High	High	Low
Field experiment	Medium	Low	High
Natural experiment	Low	Low	High

In general, both academic investigators and researchers employed by television companies have attempted to study the nature of children's viewing and, most importantly, the effects that watching specific kinds of programs has on children's development. As Box 2-2 discusses, although this research has been instrumental in the adoption of legislation aimed at regulating the material available to children through television, most laws passed so far have had few teeth, and the responsibility for such regulation continues to lodge with parents, teachers, and caregivers.

Combination Designs in Developmental Research

No research strategy is without its limitations. We have seen that the correlational approach, which is a relatively simple design and which avoids some of the pitfalls of experimental methods, such as the ethics of manipulating people and events, exerts minimal control over variables, says nothing about cause and effect, and is very limited in generalizability. Among laboratory, field, and natural experiments, on the other hand, there is often a trade-off between the control of variables and the generalizability of findings. Table 2-1 summarizes the differences among the research designs we have examined so far.

One way to deal with the control-generalizability trade-off is to combine field and laboratory approaches in a single research design. As Figure 2-2 suggests, there are two ways to do this. (1) In a combined laboratory-field design, we can introduce the independent variable in the laboratory and measure the dependent variable in the field (upper right-hand cell), or (2) we can introduce the independent variable in the field and measure the dependent variable in the laboratory (lower left-hand cell). An example of the laboratory-field experiment would be bringing shy youngsters into the laboratory and showing them films designed to foster positive social interaction and then measuring any changes in their behaviour with peers in the classroom. An example of the field-laboratory experiment would be controlling children's TV viewing in their homes by allowing one group to watch only aggressive programs and a second group to watch only nonviolent and prosocial programs and then conducting a laboratory assessment of any changes in the two groups' levels of aggressiveness. The first design offers more precise control over the independent variable, while allowing the dependent variable to be measured in a way that is not too contrived; the second manipulates the independent variable in a natural way, while still allowing tight control over measurement of the dependent variable. Both approaches enhance the generalizability of the findings without loosening control enough to call reliability into question.

The Case Study Approach

Can we learn anything about development by studying a single child? The study of individual persons, called the **case study method**, allows investigators to explore phenomena that they do not often encounter, such as an unusual talent or a rare developmental disorder. It also facilitates more intensive investigation because the researcher's efforts are not spread across a large number of participants. In the 1800s, in one of the first recorded case studies, Charles Darwin kept a highly detailed diary of his infant son's emotional expressions, a record that became the basis for his theory of emotional development in infants and children.

		Venue in which independent variable is measured	
		Field	Laboratory
Venue in which dependent variable is measured	Field	Field experiment	Combined lab-field experiment
	Laboratory	Combined field-lab experiment	Laboratory experiment

case study method

A form of research in which investigators study individual persons.

FIGURE 2-2

Combining field and laboratory experimental approaches.

In the ordinary field and laboratory experiments, both independent and dependent variables are manipulated or measured in the same place. In the combined approaches shown in the upper-right and lower-left cells, by varying the location of these operations on the variables, experimenters have two options for balancing control with generalizability.



Child Psychology in Action

BOX 2–2

How Can We Make Better Use of Research on Children and Television?

The impact on children of the amazing growth of communications media within the 20th century cannot be denied. From early radio, movies, and comic books to television and its electronic cousins—videotapes, video games, CD-ROM, and the Internet—children have been bombarded with material of often questionable value and sometimes dangerous potential. As we have seen in this chapter and in Chapter 1, some educational programs, such as “Sesame Street,” have had a useful impact on their young audiences. Many have expressed the fear, however, that television may displace other, more valuable activities and turn children into TV addicts, rather than intelligent, inquiring, social adults (Huston & Wright, 1998). Yet, despite a considerable body of research and the growing recognition of the importance of this topic, TV programming remains essentially uncontrolled.

What has the wealth of research on children and television revealed? It has shown that some programs do help young children learn, but it has also made a strong case for the negative effects on children of watching programs that focus on violence and sex. Given such possible influences, what regulations exist that protect children from negative programming or that require the media to provide educational and informational programming?

The Canadian Radio, Television and Telecommunications Commission (CRTC), responding to public concerns following the Montréal Polytechnique shootings, commissioned two studies on the issue of violence in television. On the basis of a report by Florian Sauvageau of the Institut Québécois de Recherche sur la Culture and Laval University (Atkinson, Gourdeau, & Sauvageau, 1991) and an internal CRTC report (Martinez, 1992), the commission decided that there was a link, although not necessarily causal, between television violence and violence in society. Coincidentally, at about the same time, 13-year-old Virginie LaRivière presented a petition to the government containing over 1.5 million signatures calling for a ban on television violence.

What was Canada’s response to these concerns? One striking feature of the Canadian approach has been its insistence on minimizing direct governmental regulation, trying to balance the rights of free speech with a concern for children’s mental health, without passing laws. In attempting to achieve this aim, the CRTC, in 1993, adopted five guidelines on media violence and has put its efforts into three areas—implementing strong, self-regulatory industry codes, changing public attitudes through public awareness and media literacy programs, and providing parents with the tools to make informed programming choices for their families (CTRC, 1996).

The primary tool involved in giving parents more control over their children’s television viewing is the new “v-chip” technology, developed at Simon Fraser University’s School of Engineering. When installed in a TV set, and combined with a national classification system for all television programming, the v-chip allows parents to block programs that have ratings indicating a high violence level or offensive language. Thus, parents can determine what they think is appropriate viewing for their family.

This early work provided useful hunches, insights, and hypotheses, which later investigators pursued in a more systematic fashion.

Sometimes, a case study leads into a kind of experiment in which a researcher tries to bring about a change in a particular behaviour, most often a behaviour that is self-destructive or that involves aggressive behaviour towards other people. Consider the case of a four-year-old, whom we will call Joey. During every play period on the nursery school playground, Joey hit other children two or three times. At first, every time Joey hit another child, his teachers rushed over to stop him, often lingering with him to explain why he should not hit other people. But Joey kept right on hitting just the same. The school psychologist, who thought that Joey hit other children in part to gain the teachers’ attention, told the teachers to ignore Joey whenever he was aggressive and to instruct the other children just to walk away from these incidents. At first, Joey reacted to this new response with an increase in aggressive attacks. However, after a few days of the “silent treatment,” his rate of hitting began to drop. Then, to determine whether or not Joey’s behaviour was changing in response to the new strategy, the psychologist asked the teachers to resume paying attention to him when he hit. Sure enough, his rate of hitting increased, suggesting that his need for attention was indeed controlling the behaviour. The teachers were then instructed once again to ignore Joey’s hitting, and once more his rate of hitting dropped.

This is an example of what is called a *reversal*, or ABAB, experimental design intended to diminish an undesirable behaviour. In the **ABAB design**, A is the control, or normal, condition of the subject, and B is the experimental condition. Thus, Joey’s initial hitting behaviour is represented by the first A, and the experimental treatment—ignoring Joey’s behaviour and walking away from him—by the first B. The second A reflects the psychologist’s instruction that everyone

ABAB design

A technique in which an experimental treatment is administered, withdrawn, and re-administered in order to measure its effects. Also called a reversal design.

Of course, Canadian children do not watch only Canadian television; the CRTC estimates that about 25 percent of English language programming in Canada is from American signals (CTRC, 1996). So, to be effective, these principles, including the v-chip classification system, must be applied to American television policy as well. Unfortunately, attempts to legislate television programming in the United States have run into many difficulties. One problem is that although laws have been passed to influence commercial media, they often failed to impose specific directives, such as banning certain content or mandating certain types of child-oriented programming. And the laws that have imposed such directives have often not been enforced. For example, although the Children's Television Act of 1990 required broadcasters to provide programs that would serve children's educational and informational needs, it had little initial impact, not only because enforcement was minimal but also because some stations claimed an educational thrust for programs that few would call informative (e.g., "Teenage Mutant Ninja Turtles" and "Bugs and Tweety Show") (Kunkel & Canepa, 1994).

Similarly, the 1996 Telecommunications Act that required the installation of the v-chip in all televisions also ran into obstacles, not only due to the problem of deciding on a rating for a particular program but also due to arguments as to whether labelling programs would be counterproductive, attracting rather than turning away viewers.

So, what can parents and others do to protect their children? According to Huston and Wright, parents need to recognize their own enormous influence on children's use of

television. "What, how, and how much television parents view has a direct impact on children, not only because it provides a model but also because children are directly exposed to programs that parents are viewing." (Huston & Wright, 1998, p. 41) Setting an example is a time-honoured prescription, although, admittedly, it is not always effective and is unappealing to some adults. And perhaps today, in the swelling rapids of the media flow, it is not enough.

On the basis of research that has highlighted positive effects of co-viewing by parents and children of suitable television programs, a number of psychologists have recommended this practice. If parents or others reinforce a program's content, helping young children identify and discuss characters and events, and generally providing what Lev Vygotsky has called scaffolding (Chapter 9) for their understanding and interpretations, the children may benefit (St. Peters, 1993; Watkins et al., 1980). Research has also shown that parents can help children cope with fears aroused by specific television content (Wilson & Weiss, 1993). However, the evidence reveals that families do not engage often in such co-viewing, at least not of programs that are child oriented.

Clearly, television viewing is a family affair, and families as well as networks and the government need to take responsibility for what children watch. In Chapter 16, we revisit this issue and explore further ways of gaining control over children's television viewing.



Canadian Media Resources

return to the original condition, and the second B reflects the reinstatement of the experimental treatment as a result of Joey's having reverted to his aggressive behaviour. If the reinstatement of the experimental treatment again diminishes the undesirable behaviour—and it did—we can be pretty certain that the treatment works.

The chief limitation of the single-case approach is the impossibility of generalizing from one individual to other people in other settings. Joey's treatment might or might not work with another child; nothing in the study of a single individual gives us a clue as to the generalizability of the research.

For THOUGHT and DISCUSSION



1. Can you think of a situation that highlights the distinction between correlation and causation? Why is this distinction important?
2. What are some factors that might influence a study's ecological validity? What is the relation between ecological validity and experimental control?
3. You are speaking with some friends and telling them all about the problems that can arise with the choice of one or another of the various research methods discussed in this chapter. After listening to you talk for a while, they ask you the question, "Given all these problems, why do research at all?" How would you answer your friends?



STUDYING CHANGE OVER TIME

The study of child development makes use of certain research techniques that are intended to measure differences among individuals that are related to age and the progression of time: the cross-sectional, longitudinal, and sequential methods. Other fields use these methods as well, but because of their special usefulness in studying change over time, they are of particular relevance to developmental topics.

As we explore these different research methods, keep in mind that they are independent of both the data collection methods and the research designs chosen by an investigator. Thus, for example, a longitudinal study could use self-reports or observational data, and it could be fitted to a correlational or an experimental research design. However, longitudinal studies are usually correlational, whereas cross-sectional investigations more often use experimental research designs.

The Cross-sectional Method

cross-sectional method

A research method in which researchers compare groups of individuals of different age levels at approximately the same point in time.

The most common strategy for investigating age-related differences in development is the **cross-sectional method**, in which researchers compare different individuals representing different age levels at approximately the same point in time. This method lends itself well to the important cross-cultural research that helps us discover whether we can generalize the findings about children's development in one country, say, Canada, to children in other countries, such as Cameroon, Mexico, or Zambia. The cross-sectional method has both advantages and limitations, however, as we will see in our discussion of Rheingold and Eckerman's (1970) classic study of the growth of independence in young children.

Selecting different groups of children at different age levels, these researchers used a cross-sectional design to investigate the way children's independence differs across a range of ages. They recruited children at nine different ages—three girls and three boys at each half year of age between 12 and 60 months—and the children's mothers. Choosing a semi-naturalistic setting, they placed the mothers and children at one end of a large lawn; the mothers sat in chairs, and the children were free to roam. Observers were stationed at nearby windows to track the paths of the children's excursions.

A clear, linear relation between age and distance travelled emerged. The average farthest distance for one-year-olds was about 23 feet (6.9 metres); children two years of age ventured about 50 feet (15.1 metres); three-year-olds went 57 feet (17.3 metres); and four-year-olds ventured 68 feet (20.6 metres). For each month of age, the children went almost a foot, or a third of a metre, farther.

The significance of this study is that Rheingold and Eckerman were able to determine how independence differs across age levels by comparing the behaviours of groups of different children at different ages during the same period of time. In fact, their study was unusual in that they collected their data across a wide age range in a very short time—just a couple of months. Thus, these investigators did not have to wait until the 12-month-old infant became a four-year-old toddler to evaluate developmental advances. This advantage, of course, becomes very clear when the comparisons involve even wider age ranges. And had they spent only a little more time, they easily could have included eight-, 12-, and 16-year-olds, tracking the way independence changes in adolescence.

However, the distinctive characteristic of the cross-sectional approach, that is, its examination of different children at several age levels, has disadvantages. It yields no information about the possible past determinants of the apparently age-related changes observed because we cannot know what these children were like at younger ages. In addition, the method gives us no information about the ways in which individual children develop. How stable is independence? Is the child who is independent at one year likely to be more independent at five than a peer who exhibited little independence until he was two? Because the cross-sectional approach cannot answer these kinds of questions, we must turn to the longitudinal method to tackle these issues.

The Longitudinal Method

One of the most ambitious projects in the study of child development is the Fels Longitudinal Study, which began in 1929 and continued until the 1970s to monitor groups of children from birth to the age of 18 years, hoping to unravel some of the mysteries of development. Parents enrolling their newborns in this study agreed to have the child weighed, measured, observed, and tested until he or she was old enough to graduate from high school.

The **longitudinal method**, in which researchers study the same individuals repeatedly at various points in their lives in order to assess patterns of stability and change over time, has clear advantages over cross-sectional studies. A longitudinal design allows researchers to monitor the development of individuals, rather than of groups of people, over time and to explore possible causes of any observed patterns. Longitudinal research requires great patience, but it is a powerful method of evaluating the impact of earlier events on later behaviour, a topic of enormous interest to child psychologists. Box 2-3 provides you with an example of longitudinal research and what it can say concerning the factors and processes of child development.

But the longitudinal method also has disadvantages, many of which are related to time. It takes years to collect longitudinal data, and researchers often want to obtain information more quickly. In addition, there is the problem of losing subjects—and sometimes staff—from a lengthy longitudinal study. Over time, people move, become ill, or simply lose interest, and the result is a shrinking sample that can bias the results and reduce their reliability. Moreover, if subjects drop out of the study due to some aspect of the experiment itself, this especially can compromise the results. Finally, the sample of individuals who agree to participate in a longitudinal project may not be very representative of the general population. Would you want to be observed, measured, and questioned annually for 18 years?

Another problem is one of inflexibility. The theories and research that generate hypotheses in child development are constantly changing, but it is hard for researchers to take advantage of new insights or methods in a study that is already under way. For example, in a longitudinal study of IQ (intelligence quotient), if a new test is discovered 10 years after a study has begun, what can the longitudinal investigators do? Several options are available: researchers can start over with a new sample and a new test, or they can begin to give the new test to their 10-year-olds (the “old” sample). But then they lose the possibility of comparing the earlier results with the later findings because the test instruments are not comparable. Here is a solution: the researchers can give both the old and the new test at the same time to the same subjects and, thus, judge the comparability of the two tests. Another problem is presented by what we call *practice effects*, or the effects of repeated testing. Because the same measures may be used in several successive years, participants’ altered answers may be a result of their familiarity with the items or questions. In contrast, individuals who respond to these issues for the first time may give different answers.

A way to avoid some of these problems is to conduct a short-term longitudinal study. Here, researchers track a group of people for a more limited time period, taking a narrower focus that is usually limited to just a few key questions. For example, Joanna Blake (Blake & Dolgoy, 1993), at York University, examined the relation between infants’ communicative gestures and more general cognitive skills, looking at four infants biweekly from 9 or 10 months of age until they were about 14 months old. These authors found that the appearance of specific gestures, such as

longitudinal method

A method in which investigators study the same people repeatedly at various times in the participants’ lives.



Developmental psychologists study children at all different ages, from looking at the abilities of infants, to how preschoolers change cognitively, socially, and emotionally, and to investigating adolescent and adult development.



Risk and Resilience

BOX 2–3

Longitudinal Studies and the Transfer of Psychosocial Risk

One of the advantages of longitudinal research is that it allows one to study “intergenerational continuity and the transfer of psychosocial risk” (Serbin & Stack, 1998, p. 1159), or how the events experienced by one generation affect the lives of both that generation and their offspring. Psychologists, for example, have long recognized that children who grow up poor and who are at risk for psychosocial problems will likely become parents of a future generation also raised in poverty (Chase-Lansdale & Brooks-Gunn, 1995; Furstenberg, Levine, & Brooks-Gunn, 1990). Longitudinal research provides an opportunity to describe the lives of these successive generations, as well as a way to study how such risk is transferred across generations (Granger et al., 1998; Serbin et al., 2002; Stack & Serbin, 1998). Moreover, such studies provide a means for designing and assessing interventions that may prevent the transfer of such unwanted outcomes (Serbin & Stack, 1998).

Unfortunately, longitudinal projects like these are notoriously difficult to conduct, particularly when they span several generations. Nevertheless, one notable example of such a study is the Concordia Longitudinal Risk Project. Begun in 1976 by Jane Ledingham and Alex Schwartzman from Concordia University, this project examined almost 1,800 Francophone school children living in the lower socioeconomic, inner-city sections of Montréal, Quebec (Schwartzman, Ledingham, & Serbin, 1985). The goal of this project was to identify childhood behaviours that might predict serious psychosocial problems later in life. These researchers were primarily interested in two aspects of children’s behaviour—aggression and social withdrawal. On the basis of initial screenings, the researchers identified children who were classified as aggressive, socially withdrawn, or both aggressive and withdrawn.

“request gestures” (described in Chapter 8), were actually preceded by gains in certain forms of cognitive processing, suggesting a role for cognition in the transition to language. Others using short-term longitudinal projects, such as John Abela and his colleagues at McGill University (Abela & Taylor, 2003; Abela, Brozina, & Haigh, 2002; Abela & Veronneau-McArrie, 2002), have found that depressive symptoms in school-aged children are linked, over the short term, to response styles or self-esteem. Short-term longitudinal studies such as these have the advantage of shortening the period of data collection, avoiding dropouts in the sample, and allowing the researchers to maintain the same staff and measurement procedures.

A different drawback to lengthy longitudinal studies is the problem of generalizing to generations other than the one being studied. As times change, people become exposed to different influences. Children today, for instance, grow up with many experiences virtually unknown to children growing up in their parents’ or grandparents’ generations: for example, television, computers, two parents working outside the home, daycare, single mothers who have never married. Who is to say that findings from a much earlier longitudinal study are still applicable today? Thus, perhaps some of the patterns observed in the people who were studied are specific only to an **age cohort**, that is, members of the same generation. Recall our earlier study of children growing up in the Great Depression (see Box 1–3, p. 24). This work provides a concrete example of how development may vary as a function of the experiences of a particular generation.

And sometimes short-term longitudinal studies give different, and possibly even better, information than a straight longitudinal design. As an example, Shaie and Labouvie-Vief (1974) compared cross-sectional data with two seven-year longitudinal assessments of the cognitive abilities of adults between 21 and 70 years. Looking at the cross-sectional comparisons, these researchers found a general decline in cognitive abilities between 21 and 70 years, suggesting that intellectual skills decrease from one’s mid-20s. However, the longitudinal comparisons of the same subjects in the two seven-year follow-ups presented a different picture. According to this data, there was no decline in cognitive abilities until the subjects were roughly over 60 years; thus, cognitive skills do not appear to deteriorate until relatively late in life. What explains this difference in the implications of the longitudinal versus cross-sectional data? These researchers ascribe this difference to the possibility of generational, or cohort effects, which are described on the next page.

age cohort

People born within the same generation.

What has this project revealed about intergenerational risk in these children? One finding from this study (Serbin, Peters, McAffer, & Schwartzman, 1991) is that childhood aggression predicts high-risk sexual behaviour (e.g., gynecological problems, sexually transmitted diseases, pregnancy) in girls during adolescence, a pattern since confirmed by other researchers (Cairn & Cairns, 1994). In fact, children with high childhood aggression and social withdrawal scores actually experienced many problematic outcomes later in life, including a higher rate of teen pregnancy, more complications during delivery, and having multiple children before 24 years of age (Serbin, Cooperman, Peters, Stack, & Schwartzman, 1998). Moreover, the fact that many of the children originally identified in this project are now parents allowed Serbin et al. (1991) to discover that the childhood aggression and withdrawal scores predicted later unresponsive parenting behaviour, with mothers using more severe discipline with their children. In addition, many of the health risks observed in the original sample were transferred to the next generation. Serbin, Peters, and Schwartzman (1996),

examining the medical records of the firstborn children of these teen mothers, found that these children were at higher risk for some health problems. Interestingly, one finding was that aggressive and aggressive-withdrawn mothers differed from control mothers on the frequency of emergency room visits with their children, suggesting that they may not monitor their children's health and safety as effectively. Finally, one important factor in this intergenerational transfer of risk was the mother's education level, with higher levels of maternal education acting as a buffer against behavioural difficulties in the children of the teen mothers (Serbin et al., 1998).

Thus, not only can longitudinal designs highlight factors that are important for the transfer of risk across generations, they also can identify characteristics that might help prevent such intergenerational transfer. Clearly, despite the inherent difficulties and drawbacks of conducting longitudinal research, such designs play a critical role in understanding the processes of child development!

The Sequential Method

Another way around the problem of separating age-related changes from changes that are unique to a particular age cohort is to use the **sequential method**, which combines features of both cross-sectional and longitudinal studies. Researchers begin by selecting samples of children of different ages, as they would in cross-sectional research. Suppose, for example, we want to study the development of children's reading skills throughout childhood. We might begin by recruiting and testing three samples of children: two-year-olds, four-year-olds, and six-year-olds. This would constitute a cross-sectional study. We would then test these children again at periodic intervals, say, every two years, thus adding a longitudinal component. At each of the two-year measuring points, we could also add a new sample of two-year-olds to the pool of subjects, thus expanding the scope of the study and enabling us to compare a larger number of age cohorts. Figure 2-3 displays the design of this study.

Note the advantages of this approach. First, it allows us to examine age-related changes in children because the longitudinal feature tests the same children every two years. Second, the cross-sectional aspect allows us to examine the impact of the year of evaluation because in each such year at least three different groups of children are assessed. Third, this method allows us to examine **cohort effects**, which are the possibility that observed differences between ages are actually a result of the fact that children of the same age (age cohorts) have grown up during different historical epochs than children of a different age. With respect to the current hypothetical example, comparing the performance of the six-year-olds in 2000, 2002, 2004, and 2006 allows us to see if differences in educational practices, the widespread availability of Internet resources, or some other form of cultural-historical factor that might differ for children born in 1994 (who would be six years old in 2000) versus children born in 2000 (who would be six years old in 2006) might be responsible for differences in performance on some task. And finally, the design has a time-saving advantage. Six years after the start of the study, in 2006, we would have data on changes in reading ability, which, in terms of factors that influence these changes, actually span a period of 10 years (see Figure 2-3). This is a four-year savings over a traditional longitudinal study.

When studying change over time, developmental researchers clearly have a number of design and methodological options. What they choose depends on the particular kinds of data they want

sequential method

A research method that combines features of both the cross-sectional and the longitudinal methods.

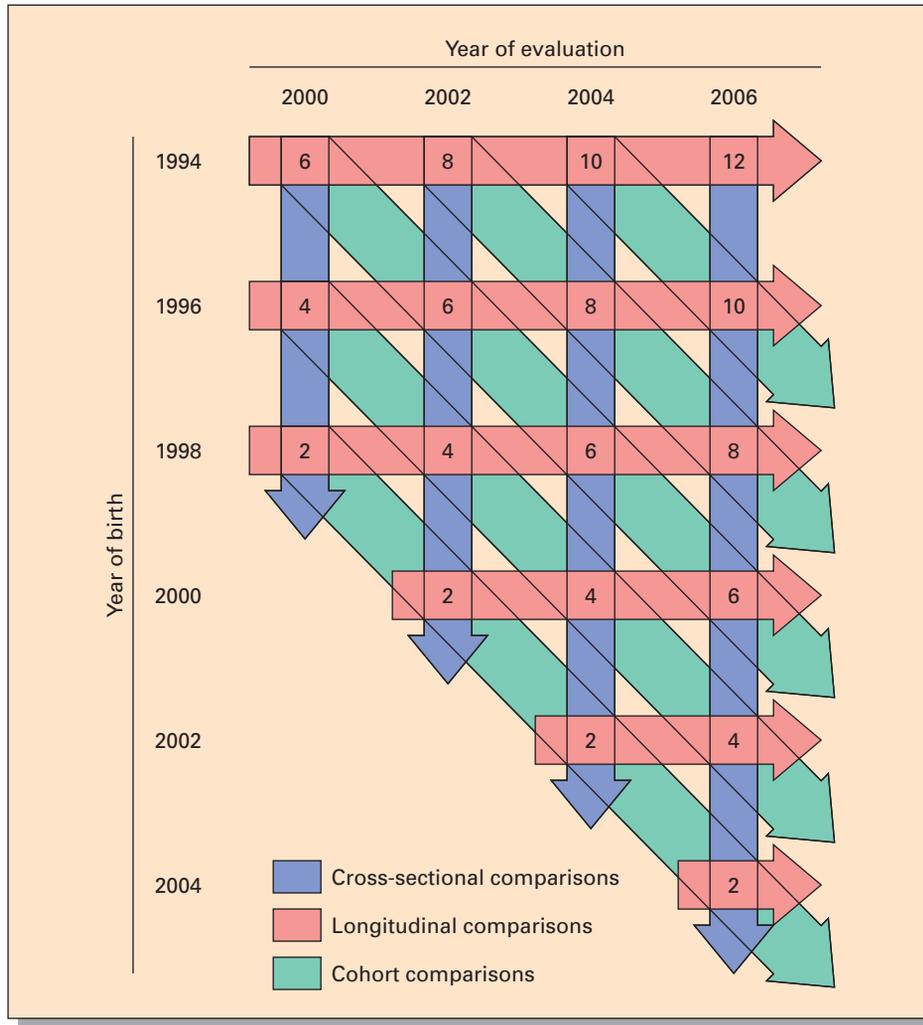
cohort effects

The possibility that observed differences between ages are actually a result of the fact that children of the same age (age cohorts) have grown up during different historical epochs than children of a different age.

FIGURE 2-3

Design for a sequential study.

This combination of the cross-sectional and longitudinal designs yields a third, historical dimension of measurement, that of comparing cohorts, or people of the same age, at different points in time. The numbers within the network of arrows representing type of comparison are the ages of the groups of children to be studied. For example, in the year 2000, we would do a cross-sectional study of three groups of children, ages two, four, and six years. In 2002, we would do another cross-sectional study, this time of children aged two, four, six, and eight years (the latter were six in our first study). In a longitudinal study, we would then compare the scores of the eight-year-olds with their own scores of two years earlier. And in a cohort study, we would compare the scores of six-year-old children at different points in time—for example, those who were six years old in 2000 and six-year-olds in 2002.



to gather, on the availability of participants, and on the time and money they have to carry out the project (see Table 2–2 for a comparison of the pluses and minuses of all three strategies). No one strategy is best in all situations. This is why different researchers use different methods, and the same researchers use different methods at different times.

TABLE 2-2 Comparative Characteristics of Methods of Studying Developmental Change Over Time

	Cross-sectional	Longitudinal	Sequential
Time required	Short	Long	Moderate
Ability to control costs	High	Low	Moderate
Ability to maintain potential pool of participants	Excellent	Very problematic	Moderate to good
Continuity of staff	High	Medium to low	Moderate to high
Flexibility in adapting to new tests and measures	High	Low	Moderate
Likelihood of practice effects	Low	High	Medium
Ability to assess research issues:			
Normative development data at different ages	Excellent	Excellent	Excellent
Impact of early events on later behaviour	Poor	Excellent	Good
Stability vs. instability of behaviour	Poor	Excellent	Good
Developmental paths of individuals	Poor	Excellent	Good
Historical or cohort issues	Excellent	Poor	Good



THE ETHICS OF RESEARCH WITH CHILDREN

Concerns with the ethics of psychological experimentation became an issue in the late 1960s, when some began to question the ethics of deceiving subjects in research (Kelman, 1967). In response to such concerns, the American Psychological Association proposed a code of ethics in 1972, which was then followed in 1974 by U.S. federal government regulations concerning human research. Within Canada, government regulations have slowly emerged, beginning first within the social sciences and humanities (Adair, 2001) and resulting in a document, in the late 1970s, by the Canada Council on the ethical principles that should be observed by researchers when experimenting with human subjects (Canada Council, 1977). Moreover, both Canada and the United States have set up institutional research ethics boards, whose job it is to review (hopefully) all proposals of research initiatives in terms of various ethical considerations.

Most recently, in Canada, the Medical Research Council, the Natural Sciences and Engineering Research Council, and the Social Sciences and Humanities Research Council (1998) issued a tri-council policy statement regarding ethical conduct in research with human subjects. According to Adair (2001), the objectives of this new joint policy were to increase awareness of ethical considerations in research with humans, to provide public accountability for the use of funds in research, to provide greater protection for both the human subjects and the researchers and institutions involved in research, and to encourage the development of uniform standards of ethical conduct across disciplines, universities, and research ethics boards. In addition, this tri-council policy has provided important position statements on newer ethical considerations in research, such as human genetic research (discussed in Chapter 3) and the use of human embryos and fetuses in research.

Even though there has been such an increase in concern regarding ethical standards and governmental regulation of ethical conduct in research, some of the original practices that might have been considered ethically questionable, such as the use of deception in research, have not been eliminated, nor are they likely to be in the near future. In fact, some (Adair, Dushenko, & Lindsay, 1985; Sharpe, Adair, & Roese, 1992) even observed an increase in the use of deception up to the mid-1980s, although the practice of deception in research is on the decline (Adair, 2001) and is also more tightly controlled because of the mandatory review processes put in place.

Of course, conducting research with children raises even more serious considerations, given that children are unable to make knowledgeable decisions as to whether or not they can choose to participate in a research study and fail to understand the implications (for potential good or ill) that such participation involves. As such, the same governmental agencies that have been concerned with ethical considerations in human research have also suggested guidelines for the participation of children in research, in an attempt to protect children from danger and harm.

Table 2-3 lists the guidelines for research with children, which have been developed by various organizations, including the American Psychological Association and the Society for Research in Child Development. One of the first rights is the right to be fully informed about the nature of a study and fully aware of its procedures. As a result of growing sensitivity to this right, fewer psychologists can be found peering into waiting rooms, watching people from behind one-way windows, and observing subjects through the lens of a hidden camera.

Another central right of subjects is the right to give consent before being included in a study. Unfortunately, very often children are too young to fully appreciate the complex issues that are involved in making informed decisions. Some investigators suggest that children under the age of eight years are too young to offer fully **informed consent**, or agreement to participate in research based on a clear understanding of the purposes and procedures to be employed in the study; others have suggested that the same holds true for older children. In cases involving such children, parents must question researchers and others and make choices for their children, thus protecting them at all times.

A third major right of research participants is the right not to be harmed. This includes protection not only from physical harm but from psychological and emotional harm as well. Children have the right not to be made to feel uncomfortable by participation in a study and a right not to be encouraged to act in ways that lessen their own view of themselves or the way other people view them. For example, in an experimental procedure called the Strange Situation, which is used to assess children's social relations with their caregivers, infants are left alone briefly, and sometimes they fuss and cry. As we will see in Chapter 7, this procedure has yielded a great deal of information about early social-emotional development, but is causing the infant distress justified?

informed consent
Agreement to participate in a research study that is based on a clear and full understanding of the purposes and procedures of that study.



Are children, even older children, able to understand these rights? Researchers at the University of Toronto (Abramovitch, Freedman, Henry, & Van Brunshot, 1995) have investigated whether children between five and 24 years of age understand what it means to give free and informed consent for participation. These researchers found that even though children understood the purpose of the study, they did not seem to understand the risks or benefits of participating and were much more likely to stop participating if the experimenter made it clear that she would not be upset if they stopped. These researchers suggest that experimenters should pay more attention to describing the risks and benefits of research to children and to making it much clearer to children that they can stop participating if they wish.

Unfortunately, it is not always easy to determine the ethical course of action in a particular situation. For instance, suppose you are a psychologist who wants to study the long-term effects of extremely premature birth. Should you inform the parents of the children you wish to include in the study of all the hypotheses you want to test? What if revealing this information could encourage the parents to act towards the baby in ways that turned the hypotheses into self-fulfilling prophecies, causing the infant to develop less favourably than he or she otherwise might? In other words, does the end justify the means? If you suspect that full disclosure might somehow cause a child harm, is restricting information justified? Or should you not do the study in the first place?

And what about the experiment by Liebert and Baron (1972) that we discussed in the section “The Laboratory Experiment”? Was it ethical to encourage the child participants in this study to choose to push the “Hurt” button and to let them believe that they were not only keeping another child from winning the game he or she was presumably playing but causing him or her actual physical harm? Even though the entire scenario was a deception and, therefore, no child was being frustrated or physically harmed, how might the child participants have viewed themselves, the researchers, their parents, and anyone else involved in the study? Might they have felt ashamed of themselves? Angry that adults would deceive them? Shocked that adults would condone such an experiment? Encouraged to go out and frustrate and harm other people because all these adults said it was okay?

In the final analysis, a careful cost–benefit analysis is usually the guiding principle. What effects, if any, might participation in the research project have on the children to be studied, and how do

TABLE 2-3 A Bill of Child Participants’ Rights in Child Development Research

1. **The right to be fully informed.** Every child has the right to full and truthful information about the purposes of a study in which he or she is to participate and about the procedures to be used.
2. **The right to give informed and voluntary consent.** Every child has the right to agree, either orally or in writing, to participate in a research project. If a child is too young to understand the aims and procedures of the study and to make an informed decision, researchers must request the informed consent of the child’s parents.
3. **The right not to be harmed in any way.** Every child has the right to know that he or she will not experience any physical or psychological harm or damage as a result of the research procedures.
4. **The right to withdraw voluntarily from research.** Every child has the right to withdraw at any time from continued participation in any research project.
5. **The right to be informed of the results of research.** Every child has the right to information about the results of the research project. If the child is too young to fully understand this information, it must be provided to the child’s parents. It is understood that sometimes information is in the form of group measures or scores on a task rather than individual scores.
6. **The right to confidentiality.** Every child has the right to know that personal information gathered as part of the research project will remain private and confidential and that it will not be shared with any other individuals or agencies.
7. **The right to full compensation.** Every child has the right to be fully compensated for her or his time and effort as a research participant, even if the child withdraws and does not complete her or his participation.
8. **The right to beneficial treatments.** Every child has the right to profit from any beneficial treatments provided to other participants in the research project. When experimental treatments are deemed beneficial—for example, participation in a program designed to enhance reading or math skills—participants in control groups, who do not receive this treatment during the research study proper, have the right to the same participation in the beneficial treatment after the project is completed.

Sources: American Psychological Association, 1992; Society for Research on Child Development Committee on Ethical Conduct in Child Development Research, 1993.

those effects weigh against the possible gains from whatever information may be obtained from the research? Developmental research is a tool for increasing our knowledge about children, and through this knowledge, children will, it is hoped, benefit. The ethics of research in child psychology is a continuing debate, and the last word is yet to be heard. As you read descriptions of studies throughout the rest of this book, think carefully about the ethical issues that surround them.

For THOUGHT and DISCUSSION



1. Throughout the text, studies are presented as having clean, all-or-nothing findings, with the results often simply presented as “x is related to y,” or “group x was significantly greater than group y.” Unfortunately, in practice, research is not nearly as clearcut, with large individual differences often occurring among children. And sometimes differences between groups, or relations between measures, although statistically significant, are small in an absolute sense. How might such intersubject variability, or the fact that differences or relations might be at best modest, influence your interpretations or conclusions concerning a given experimental result?
2. Now that you know something about the ethics of doing research, what are some of the ethical considerations raised by Pepler and Craig’s (1995) method of using remote audiovisual monitoring to observe children in the playground?

Summary

- Child psychologists use the **scientific method** in their research. They formulate hypotheses on the basis of theories, and they use measurable and replicable techniques to collect, study, and analyze data to test the usefulness of these theories.

Selecting a Sample

- Selecting a **sample** is an important first step in doing research because it determines the extent to which the researcher’s conclusions can be applied, or generalized, to people other than those who were studied. To ensure the **representativeness** of a sample, or the degree to which it accurately reflects the larger national population, it must include individuals who vary by such factors as race, gender, and social class.

Methods of Gathering Data About Children

- Soliciting **self-reports** from children, usually by means of interviews, is one way to gather information about child development issues. Although children’s self-reports can be more difficult because children tend to be less attentive, slower to respond, and less likely to understand the questions put to them, such self-reports are the only way to obtain information about such things as children’s feelings and their unique perspectives on their lives.
- Another data-gathering method is to solicit information about a child from parents, siblings, teachers, and peers. Attempts to increase the accuracy of such reports include focusing on specific, current issues in the child’s life, using structured diaries to guide observations, and “beeping” parents at various times to tell them when to record information.

- Often, of course, there is no substitute for researchers’ own **direct observation** of children. Such observations can occur in naturalistic settings, such as a child’s home, or in a laboratory. One limitation of direct observation is that when children and parents know they are being watched, they act in more socially acceptable ways than they ordinarily would.
- When researchers use direct observations, they can write down everything the participant does (**specimen record**), record only particular events (**event sampling**), or check off from a list of behaviours that occur during a predetermined period (**time sampling**). To observe a behaviour that occurs infrequently, the researcher can structure the situation to increase the likelihood of the behaviour taking place. Because of the limitations of data-gathering methods, researchers often use multiple measures of the same behaviours.

Research Design: Establishing Relations and Causes

- The **correlational method** involves examining the relation between two variables, such as children’s aggressive behaviour and the amount of aggression they watch on TV. If two factors are correlated, they are systematically related to each other, but a correlation alone does not tell us whether one factor causes the other.
- A **laboratory experiment** permits researchers to establish cause-and-effect relations by assessing a specific behaviour (such as trying to hurt another person) in a controlled setting where a certain factor of interest (such as viewing TV violence) is introduced to an **experimental group** of participants, while a **control group** is

exposed to some neutral factor. The **dependent variable** is the behaviour that is affected by manipulation of the **independent variable**.

- In a **laboratory analogue experiment**, a researcher duplicates in a laboratory many of the features of a naturalistic setting. This approach allows control over the situation while preserving some of the “naturalism” of real situations. Even less artificial is a **field experiment**, in which a researcher deliberately produces a change in a real-life setting and measures the outcome there. Another alternative is to conduct a **natural experiment**. In this case, the investigator measures the impact on children’s behaviour of some naturally occurring change.
- The various types of experiments available to researchers illustrate an important trade-off between experimental control and the generalizability of findings. No single strategy is always best. Rather, investigators are increasingly using multiple research strategies to study relations and causes.
- The **case study method** takes an in-depth look at a single child, often (but not always) one with some rare disorder, an unusual ability, or some other uncommon feature that makes him or her of special interest.

Studying Change Over Time

- The most common strategy for investigating developmental change over time is the **cross-sectional method**, in which researchers compare groups of children of different ages at a given point in time. This approach is economical in time and money, but it yields no information about change nor about the causes of any observed age-related

differences in the child participants. In the **longitudinal method**, the researcher examines the same children at different points in their lives. But longitudinal research has its own disadvantages, including high cost, gradual loss of subjects, limited flexibility in using new insights or methods once the study has begun, and the question of the applicability of the findings to other **age cohorts**.

- To overcome these limitations, researchers can use the **sequential method**, which combines features of both cross-sectional and longitudinal studies. This design enables researchers to compare groups of different ages at one point in time and to track individual children over a period of years.

The Ethics of Research with Children

- A major consideration when deciding on a research strategy is the effects of the procedures on participants. Various government and institutional review boards and professional organizations are involved in setting and maintaining guidelines for the proper treatment of human subjects in research. These guidelines include the right to be fully informed about the nature of a study and its procedures, the right to give **informed consent** before participating, and the right not to be harmed.
- But as easy as it is to list such rights of human subjects, it is not always easy to determine the ethical course of action in a particular situation. To determine if certain research procedures are ethical or not, the costs to participants must be carefully weighed against the potential benefits of increased knowledge about development.