Chapter V

HUMAN DEVELOPMENT

The human development branch of psychology is concerned with the complex set of developmental changes virtually everyone goes through from birth to death. It is one of the largest and most complex specialties in the behavioral sciences. Although we grow up to be unique individuals, a great deal of our development is similar and predictable and occurs according to certain relatively fixed schedules. Included among the most influential areas of research in developmental psychology are the processes of attachment or bonding between infant and mother, the development of intellectual abilities, and the changes relating to the aging process.

Some of the most famous and influential research ever conducted in psychology is discussed in this section. Harry Harlow's work with monkeys demonstrated the importance of early infant attachments in later psychological adjustment. The sweeping discoveries of Jean Piaget formed the entire foundation of what we know today about cognitive development; a small sample of his research is included here in detail so that you may glimpse the ingenuity of his methods and clarity of his reported findings. Next is a famous body of research by Lawrence Kohlberg focusing on how moral character develops and why some people appear to behave at a higher moral level than others. In addition, because human development is a lifelong process, a discussion of the well-known article by Ellen Langer and Judith Rodin (often referred to as "the plant study") is included to illustrate how everyone, no matter their stage in life, needs to feel in control of their own choices, activities, and destinies.

Reading 17: DISCOVERING LOVE

Harlow, H. F. (1958). The nature of love. *American Psychologist, 13,* 673–685.

Sometimes you may think, that research psychologists have gone too far. How can something such as love be studied scientifically? However you define love,

you'll have to agree that it exerts a great deal of influence over human behavior. It follows then that psychologists would have to be interested in what love is, where it comes from, and how it works.

Harry Harlow (1906–1981), a developmental psychologist, is considered by many to have made the greatest contribution since Freud in studying how our early life experiences affect adulthood. Most psychologists agree that your experiences as an infant with closeness, touching, and attachment to your mother (or other primary caregiver) have an important influence on your abilities to love and be close to others later in life. If you think about it, what was your first experience with love? For most of you, it was the bond between you and your mother beginning at the moment of your birth. But what exactly was it about that connection that was so crucial? The Freudian interpretation was that it was the focus around the importance of the breast and the instinctive oral, feeding tendencies during the first year of life (Freud's *oral stage*). Later, the behavioral school countered that notion with the view that all human behavior is associated with the situation in which it occurs and its consequences. Because the mother can fill an infant's basic needs, the infant's closeness to her is constantly reinforced by the fact that she provides food and care for the infant. Consequently, the mother becomes associated in the infant's mind with pleasurable events and, therefore, this thing we call "love" develops. In both of these conceptualizations, love was seen as developing *from* other instinctive or survival needs. However, Harlow discovered that love and affection may be built-in basic needs that are just as strong as or even stronger than those of hunger or thirst.

One way to begin to uncover the components of the love between an infant and mother would be to place infants in situations where the mother does not provide for all of the infant's needs and where various components of the environment can be scientifically manipulated. According to previous theories, we should be able to prevent or change the quality and strength of the bond formed between the infant and mother by altering the mother's ability to meet the infant's primary needs. For ethical reasons, however, such research cannot be done on humans. Because Harlow had been working with rhesus monkeys for several years in his studies of learning, it was a simple process to begin his studies of love and attachment with these subjects. Biologically, rhesus monkeys are very similar to humans. Harlow also believed that the basic responses of the rhesus monkey relating to bonding and affection in infancy (such as nursing, contact, clinging, etc.) are the same for the two species. Whether such research with nonhuman subjects is ethical is addressed later in this section.

THEORETICAL PROPOSITIONS

In Harlow's earlier studies, infant monkeys were raised carefully by humans in the laboratory so that they could receive well-balanced nutritional diets and be protected from disease more effectively than if they were raised by their

monkey mothers. Harlow noticed that these infant monkeys became very attached to the cloth pads (cotton diapers) that were used to cover the bottoms of their cages. They would cling to these pads and would become extremely angry and agitated when the pads were removed for cleaning. This attachment was observed in the baby monkeys as young as 1 day old and became stronger over the monkeys' first several months of life. Apparently, as Harlow states, "The baby, human or monkey, if it is to survive, must clutch at more than a straw" (p. 675). If a baby monkey was in a cage without this soft covering, it would thrive very poorly even though it received complete nutritional and medical care. When the cloth was introduced, the infant would become healthier and seemingly content. Therefore, Harlow theorized that these infant monkeys must have some basic need for close contact with something soft and comforting in addition to primary biological needs such as hunger and thirst. To test this theory, Harlow and his associates decided to "build" different kinds of experimental, surrogate monkey mothers.

METHOD

The first surrogate mother they built consisted of a smooth wooden body covered in sponge rubber and terrycloth. It was equipped with a breast-like structure in the chest area that delivered milk, and the body contained a light bulb inside to give off warmth. They then constructed a different kind of surrogate mother that was less able to provide soft comfort. This mother was made of wire mesh shaped about the same as the wooden frame, so that an infant monkey could cling to it as to the cloth mother. This wire mother came equipped with a working nursing breast device and also was able to provide warmth. In other words, the wire mother was identical to the cloth mother in every way except for the ability to offer what Harlow called *contact comfort.*

These manufactured mothers were then placed in separate cubicles that were attached to the infant monkeys' living cage. Eight infant monkeys were randomly assigned to two groups. For one group, the cloth mother was equipped with the feeder (a nursing bottle) to provide milk, and for the other group, the wire mother was the milk provider. I'm sure you can already see what Harlow was testing here. He was attempting to separate the influence of feeding from the influence of contact comfort on the monkeys' behavior toward the mother. The monkeys were then placed in their cages and the amount of time they spent in direct contact with each mother was recorded for the first 5 months of their lives. The results were striking; we'll get to those shortly.

Following these preliminary studies, Harlow wanted to explore the effects of attachment and contact comfort in greater detail. Common knowledge tells us that when children are afraid they will seek out the comfort of their mothers (or other primary caregivers). To find out how the young monkeys with the wire and cloth mothers would respond in such situations, Harlow placed in their cages objects that caused a fearful reaction, such as a wind-up drum-playing toy bear (to a baby monkey, this bear, which is nearly as

big as the monkey itself, was very frightening). The responses of the monkeys in these situations were observed and recorded carefully.

Another study Harlow developed was called the *open field test* and involved young monkeys placed in a small, unfamiliar room containing various objects such as wooden blocks, blankets, containers with lids, and a folded piece of paper. Under normal conditions, monkeys like to play with and manipulate these objects. The monkeys who were raised with both the cloth and wire mothers were placed in the room with either the cloth mother present, no mother present, or the wire mother present. The idea here was to examine the tendency of the young monkeys to adapt to and explore this strange situation with or without the presence of the mother.

Finally, Harlow wanted to find out if the attachments formed between the monkeys and their surrogate mothers would persist after periods of separation. When the monkeys reached 6 months of age and were on solid food diets, they were separated for short periods from the surrogate mother and then reunited in the open-field situation.

RESULTS

In the original experiment, all the monkeys had access to both the cloth mother and the wire mother. For half the monkeys, the cloth mother provided the milk, and for the other half the wire mother did so. By now you've probably guessed that the monkeys preferred the cloth mother (wouldn't *you*?), but what was so surprising was the intense strength of this preference even among those monkeys who received their milk from the wire mother. At the time of this research, the prevailing view was that fulfilling biological needs such as hunger and thirst was the primary motivator of animals' (and humans') behavior. However, in Harlow's studies these needs appeared to exert a relatively insignificant influence on the monkeys' choice of a mother. Instead, a fundamental need for contact comfort was most significant in producing an attachment between infant and its mother. Figure 17-1 graphically illustrates this effect.

After the first few days of adjustment, all the monkeys, regardless of which mother had the milk, were spending nearly all their time each day on the cloth mother. Even those monkeys feeding from the wire mother would only leave the comfort of the cloth mother to nurse briefly and then return immediately to the cloth-covered surrogate.

The two groups of monkeys that were raised with either a cloth or wire mother further demonstrated the importance of contact comfort. Although both groups of these infants ate the same amount and gained weight at the same rate, the infants feeding from the wire mother did not digest the milk as well and experienced frequent bouts of diarrhea. This suggests that the lack of the soft mother was psychologically stressful to these infants.

The results of the frightening-object tests provided additional evidence of the young monkeys' attachment to the cloth mother. When the monkeys were faced with something frightening, they would run to the cloth mother and cling to it for comfort and protection. As the monkeys' age increased, this

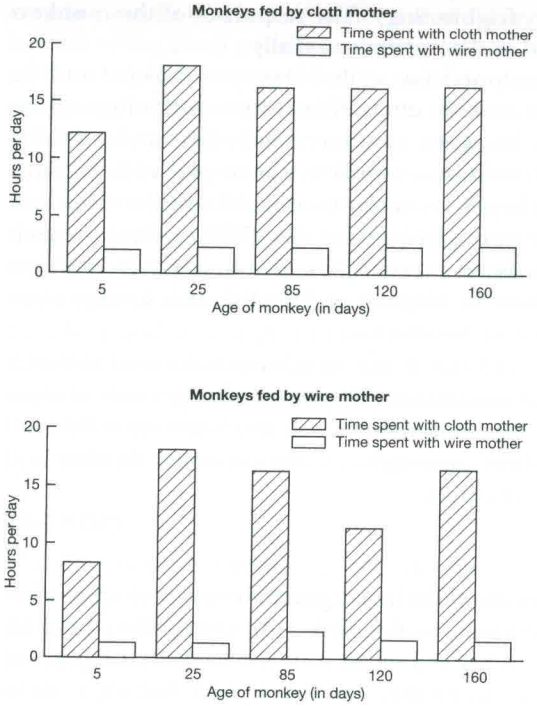

FIGURE 17-1 Amount of time spent each day on the cloth and wire mothers.

response became even stronger. Again, it made no difference whether a monkey had received its milk from the wire or the cloth mother; when afraid, all sought the security of the soft, cloth-covered surrogate.

You may have noticed in humans that when children feel safe and secure because a parent is near, they are more curious and more willing to explore their environment. Often, they will investigate everything around them, provided they are still able to see the parent. Harlow's "strange-situation" and "open-field" tests were designed to simulate this behavior in the monkeys. When placed in the strange room, all the monkeys immediately rushed to the cloth mother, clutched it, rubbed their bodies against it, and manipulated its body and face. After a while these infants "began to use the mother surrogate as a source of security, a base of operations. . . . They would explore and manipulate a stimulus and then return to the mother before adventuring again into the strange new world" (p. 679).

However, when the infant monkeys were placed in the same room without the soft mother, their reactions were completely different. They would freeze with fear and engage in emotional behaviors such as crying, crouching, and thumb sucking. Sometimes they would run to the part of the room where the mother usually was and then run crying from object to object. When the wire mother was present, they behaved exactly the same as if no mother were present. This was once again true of all the monkeys, regardless of the nursing condition (cloth vs. wire) in which they had been raised.

In the last part of this study, the monkeys were separated from the mother for various periods of time after they stopped nursing and were on solid-food diets (about 5 to 6 months of age). After the longest separation (30 days), when the monkeys were reunited with the cloth mother in the same open-field situation, the monkeys rushed to the mother, climbed on it, clutched it tightly, and rubbed their heads and faces on its body. They then played with the surrogate mother, which included biting and tearing at the cloth cover. The main difference was that the monkeys did not leave the mother to explore and play with the objects in the room as they had done before. Apparently, according to Harlow, the need for contact comfort was greater than the natural tendency for exploration. It should be pointed out, however, that these reunions were brief, and more exploration may have occurred if the sessions had been extended.

DISCUSSION

As Harlow pointed out, these studies demonstrate the overwhelming importance of contact comfort in the development of the close attachment between infant monkeys and their mothers. This factor in bonding appears to be considerably more important than the mother's ability to provide life-sustaining milk to the infant.

One of the many reasons this research changed psychology is that the findings went against the grain of the popular beliefs of the behaviorists at that time, who focused on the reinforcement qualities of feeding as the driving force behind the infant–mother bond. However, as Harlow stated, "the primary function of nursing as an affectional variable is that of ensuring frequent and intimate body contact of the infant with the mother. Certainly, man cannot live by milk alone" (p. 677).

Harlow (and many others) were convinced that his results could be applied to humans, an issue to be discussed shortly. In fact, he offered his findings' practical applications to humans. He contended that as socioeconomic demands on the family increased, women would begin to enter the workplace with increasing frequency. This was of concern to many at the time of Harlow's research because it was widely believed that the mother's presence and nursing were necessary for attachment and proper child development. He went on to state that, because the key to successful parenting is contact comfort and not the "mammary capabilities" of women, a man is capable of participating equally in the rearing of infants. This view may be generally accepted today, but when Harlow wrote this article in 1958, it was revolutionary.

CRITICISMS AND SIGNIFICANCE OF THE FINDINGS

Harlow's claims notwithstanding, do you think it is appropriate to view humans as having the same attachment (or "love") processes as monkeys? Some research supports the view that the attachment of human babies to their caregivers does indeed go well beyond simply fulfilling biological needs. Studies

have shown that greater skin-to-skin contact between a mother and her very young infant enhances attachment (e.g., Klaus & Kennell, 1976). However, the attachment process develops more slowly in humans: over the first 6 months compared with the first few days for monkeys. In addition, only approximately 70% of children appear to be securely attached to an adult caregiver at 1 year of age (Sroufe, 1985).

Many people, past and present, would criticize Harlow's work because of the ethics of performing such experiments on infant monkeys. The question raised is this: Do we as humans have the right to subject monkeys (or any animal) to potentially harmful situations for the sake of research? In the case of Harlow's research, rational arguments may be found on both sides of this issue. One of the ways science judges the ethics of research is by examining the potential benefits to people and society. Whether you feel that this study was ethical or not, the findings have affected humans in several positive ways. Some of these relate to institutionalized children, adoption, and child abuse.

Unfortunately, many children are forced to spend portions of their lives in institutional settings, either because their parents are unable to keep and care for them (orphanages) or because of various illnesses and other physical difficulties (hospital settings). Harlow's research has influenced the kind of care we try to provide for these children. Virtually all child development professionals accept that basic biological care in institutional settings is inadequate and that infants need physical contact with other humans. Institutionalized children need to be touched and held by staff members, nurses, and volunteers as much as possible. Also, when not precluded by medical conditions, these children are often placed in situations where they can see and touch each other, thereby gaining additional contact comfort. Although such attempts at filling attachment needs will never replace real loving parental care, they are clearly a vast improvement over simple custodial supervision.

In addition, Harlow's work has offered encouragement and optimism that nonmaternal caregivers are perfectly able to be effective parents. Because it appeared that nursing was secondary to contact comfort in the development and adjustment of infants, the actual mother of a child was no longer seen as the only person who could provide care. Now many fathers feel more comfortable assuming larger roles in the parenting process. But beyond this, other nonparental caregivers, such as babysitters or daycare-center workers, when necessary, can be acceptable options. Moreover, these discoveries greatly enhanced views about adoption because society began to recognize that an adoptive parent could offer a child just as much contact comfort as a biological parent.

Harlow's early studies shed light on the terrible problem of child abuse. One surprising aspect of such abusive relationships is that the abused child seems to love, and to be firmly attached, to the abusive parent in nearly all cases. According to a strict behaviorist interpretation, this is difficult to understand because the abuse should be perceived as punishment and the child should withdraw from any attachment. But if the attachment itself is our

strongest basic need, as Harlow suggested, then this would far outweigh the effects of the abuse. Harlow actually tested this in later studies. He designed surrogate mother monkeys that were able to reject their infants. Some emitted strong jets of air, while others had blunt spikes that would pop out and force the baby monkeys away. The way the monkeys would respond to this treatment would be to move a small distance away until the rejection ended. They would then return and cling to the mother as tightly as ever (Rosenblum & Harlow, 1963).

RECENT APPLICATIONS

Harlow's research continues to be cited frequently in studies about touch, bonding, attachment, and the effects of human contact on humans' emotional and physical health. One such study examined the connection between social isolation (the lack of opportunities for close, meaningful, social contact with others) and physical health among adults who lived lonely lives (Cacioppo & Hawkley, 2003). Findings indicated that adults lacking in social contact experienced common, everyday life events as more stressful, were at greater risk of high blood pressure, healed from injuries more slowly, and slept more poorly than people whose lives contained healthy social connections.

Another study citing Harlow's work demonstrated how skin-to-skin contact (cleverly referred to as *kangaroo care*) is critically important in the survival and development of *premature* infants and in establishing the infant–mother bond following premature births (Feldman & Eidelman, 1998). This is an important finding, in that hospitals caring for high-risk premature infants must work to balance the babies' needs for physical contact and touch, with other, equally compelling concerns over potentially life-threatening infections that a premature baby's undeveloped immune system might be unable to fight.

Harlow's ideas have also been applied to psychotherapeutic settings. As humanistic and holistic approaches to counseling have developed over the past 40 years, the healing qualities of touch have played an increasingly central role. As one psychotherapist explains:

> I have found that when touch is focused and intentioned, particularly in touch therapies such as acupressure and therapeutic touch, it becomes an important aspect in the therapeutic interaction. It deepens awareness and supports change. Rather than creating confusion, touch therapies when used appropriately enhance the psychotherapeutic interaction instead of detracting from it. The key word here is appropriate. Touch is a very powerful tool and should not be used lightly. (LaTorre, 2000, p. 105)

CONCLUSION

It would be a mistake to assume that Harlow had a monopoly on the definition of "love." It is unmistakable, however, that his discoveries changed the way we view the connections between infant and mother. Perhaps, if this research has permeated, even a little, into society, some good has come from it.

One small example indicating that this has happened is a story Harlow told in his own words about a woman who, after hearing Harlow present his research, came up to him and said, "Now I know what's wrong with me! I'm just a wire mother" (p. 677).

Cacioppo, J., & Hawkley, L. (2003). Social isolation and health with an emphasis on underlying mechanisms. *Perspectives in Biology and Medicine, 46*, S39–S52.
Feldman, R., & Eidelman, A. (1998). Intervention programs for premature infants: How and do they affect development? *Clinics in Perinatology, 25*(3), 613–629.
Klaus, M. H., & Kennell, J. H. (1976). *Maternal infant bonding*. St. Louis, MO: Mosby.
LaTorre M. (2000). Integrative perspectives. Touch and psychotherapy. *Perspectives in Psychiatric Care 36*, 105–106.
Rosenblum, L. A., & Harlow, H. (1963). Approach-avoidance conflict in the mother surrogate situation. *Psychological Reports, 12*, 83–85.
Sroufe, A. (1985). Attachment classification from the perspective of the infant-caregiver relationships and infant temperament. *Child Development, 56*, 1–14.

Reading 18: OUT OF SIGHT, BUT *NOT* OUT OF MIND

Piaget, J. (1954). The development of object concept. In J. Piaget, *The construction of reality in the child* (pp. 3–96). New York: Basic Books.

How did you develop from an infant, with a few elementary thinking skills, to the adult you are now, with the ability to reason and analyze the world in many complex ways involving language, symbols, and logic? Your first reaction to this question may very likely be to say, "Well, I learned how to think from my experiences and from the teaching I received from adults throughout my life."

Although this explanation seems intuitively correct to most people, many developmental psychologists believe that much more is involved in acquiring intellectual abilities than simple learning. The prevailing view about intellectual development is that it is a process of maturation, much like physical development, that occurs in a predictable fashion from birth through adulthood.

Do you look at an infant and see a person who, with enough learning, is capable of adult physical behaviors? Of course not. Instead, you know that the child's behavior will become increasingly complex over time through a process of physical maturation. You know that until the child achieves a certain level of development, all the learning in the world cannot produce certain behaviors. For example, consider the behavior of walking. You probably think of walking as a learned behavior. But imagine trying to teach a 6-month-old to walk. You could place the infant on an Olympic-level schedule of 8 hours of practice every day, but the child will not learn to walk. Why? Because the child has not yet reached the physical maturity to perform the behaviors needed to walk.

Intellectual, or cognitive, development occurs in much the same way. Children simply cannot demonstrate certain thinking and reasoning abilities until they reach an appropriate stage of cognitive development, no matter how much learning they may have experienced. Psychology owes its understanding of this conceptualization of cognitive development in large part to the work of Swiss psychologist Jean Piaget (1896–1980).

Piaget is one of the most influential figures in the history of psychology. His work not only revolutionized developmental psychology but also formed the foundation for most subsequent investigations in the area of the formation of the intellect. Piaget was originally trained as a biologist and studied the inborn ability of animals to adapt to new environments. While Piaget was studying at the Sorbonne in Paris, he accepted a job (to earn extra money) at the Alfred Binet Laboratory, where the first human intelligence tests were being developed. He was hired to standardize a French version of a reasoning test that originally had been developed in English. It was during his employment in Paris that Piaget began to formulate his theories about cognitive development.

THEORETICAL PROPOSITIONS

The work at the Binet Laboratory was tedious and not very interesting to Piaget at first. Then he began to detect some interesting patterns in the answers given by children at various ages to the questions on the test. Children at similar ages appeared to be making the same mistakes. That is, they appeared to be using similar reasoning strategies to reach similar answers. What fascinated Piaget was not the correct answers but the thinking processes that produced the similar *wrong* answers. Based on his observations, he theorized that older children had not just learned more than the younger ones but were *thinking differently* about the problems. This led him to question the prevailing definition of intelligence at the time (the IQ score), in favor of a model that involved a more complete understanding of the cognitive strategies used in common by children at various ages (Ginzburg & Opper, 1979).

Piaget devoted the next 50 years of his life and career to studying intellectual development in children. His work led to his famous theory of cognitive development, which for decades was a virtually undisputed explanation of how humans acquire their complex thinking skills. His theory holds that during childhood, humans progress through four stages of cognitive development that always occur in the same sequence and at approximately the same ages. These are summarized in Table 18-1.

Perhaps as important as his theory were the techniques Piaget used to study thinking abilities in children. At the Binet Laboratory, he realized that if he was to explore his new conceptualization of intelligence, he would also need to develop the methods to do so. Instead of the usual, rigid, standardized intelligence tests, he proposed an interview technique that allowed the child's answers to influence the direction of the questioning. In this way, he would be able to explore the processes underlying the child's reasoning.

One of the most remarkable aspects of Piaget's research is that in reaching many of his conclusions, he studied his *own* children: Lucienne, Jacqueline, and Laurent. By today's scientific standards, this method would be highly