

## DISCOVERING LOVE

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

Sometimes it seems that research psychologists have gone too far. How can something such as love be studied scientifically? Well, however you define love, you'll have to agree that it influences a huge amount of our behavior. If we make that assumption, then it follows that psychologists would have to be interested in what it is, where you get it, 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 primary caregiver) have an important influence on your abilities to love and be close to others later in life. After all, if you think about it, what was your first experience with love? 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 Freudians believed that it was the focus around the importance of the breast and the instinctive oral tendencies during the first year of life (the famous oral stage). Later, the behaviorists countered that notion with the view that all human behavior is associated with our so-called primary needs, such as hunger, thirst, and avoidance of pain. Since the mother can fill these needs, the infant's closeness to her is constantly reinforced by the fact that she provides food for the infant. Consequently, the mother becomes associated with pleasurable events and, therefore, love develops. In both of these conceptualizations, love was seen as something secondary to other instinctive or survival needs. However, Harlow discovered that love and affection may be primary 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, it is obvious that such research could not be done on humans. Since 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 previous studies, infant monkeys were raised carefully by humans in the laboratory so that they could be bottle-fed better, 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 seen in the baby monkeys as early as one day old and was even 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 there must be some basic need in these infant monkeys for close contact with something soft and comforting in addition to primary biological needs such as hunger and thirst. In order to test this theory, Harlow and his associates decided to "build" different kinds of experimental monkey mothers.

## METHOD

The first surrogate mother they built consisted of a smooth wooden body covered in sponge rubber and terry cloth. It was equipped with a breast in the chest area that delivered milk and contained a light bulb inside for 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 in a similar way as to the cloth mother. This wire mother also came equipped with a working nursing

breast and also was able to provide heat. 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 nursing 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 five months of their lives. The results were striking, but 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 various objects that caused a fearful reaction in them, such as a wind-up drum-playing toy bear. (To a baby monkey this bear, which is as big as the monkey itself, is 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 placing young monkeys in a small, unfamiliar room containing various objects (wooden blocks, blankets, containers with lids, a folded piece of paper) that, under normal conditions, monkeys like to play with and manipulate. 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 mother, and then reunited in the open-field situation.

## RESULTS

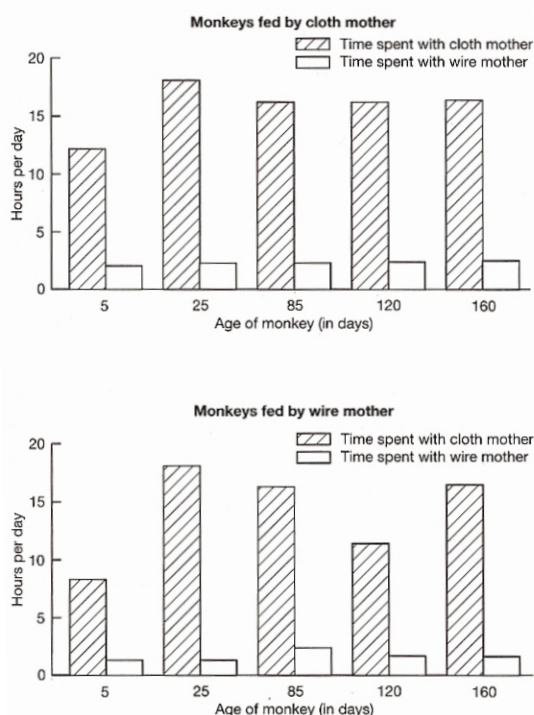
In the original experiment, you will remember that all the monkeys had access to both the cloth mother and the wire mother. For half the monkeys the cloth mother provided the milk and for the other half the wire mother did so. By now you've probably guessed that the monkeys preferred the cloth mother (wouldn't you?), but what was so surprising was the extreme strength of this preference even among those monkeys who received their milk from the wire mother. Contrary to the popular theories at the time of this research, the fulfilling of biological needs such as hunger and thirst was of almost no importance in the monkeys' choice of a mother. The huge influence of contact comfort in producing an attachment between infant and mother monkey was clearly demonstrated. Figure 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 who were fed by the wire mother would only leave the comfort of the cloth mother to nurse briefly and then return to the cloth-covered surrogate immediately.

The two groups of monkeys that were raised with only a cloth or wire mother further demonstrated the importance of contact comfort. While both groups of these infants ate the same amount and gained weight at the same rate, the infants in the wire mother condition 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. Whenever the monkeys found themselves 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 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, they all sought the security of the soft, cloth-covered surrogate.

You may have noticed in humans that when children feel safe and secure because of the presence of a parent, 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 or open-field tests were designed to simulate this behavior in the monkeys in relation to the surrogate mothers. When placed into this 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).



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

However, when the infant monkeys were placed into 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 from object to object, screaming and crying. When the wire mother was present, they behaved exactly the same as in the no-mother condition. 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 five to six 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 only lasted about three minutes and that such exploration may have occurred if the sessions had been extended.

## DISCUSSION

As Harlow points out, the studies reported in this article demonstrate the overwhelming importance of contact comfort in the development of attachment between infant monkeys and their mothers. In fact, 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 about his findings, "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).

There is little question that Harlow believed that his results could be applied to humans, a question that is discussed shortly. In fact, he offered the possibility of his findings' practical applications to humans. He contended that as socioeconomic demands on the family increase, women would be entering the workplace with increasing frequency. This was of concern to many at the time of Harlow's research, since it was widely believed that the mother's presence for nursing was necessary for attachment and proper child rearing. He went on to state that, since the key to successful parenting is contact comfort and not the *mammalian capabilities* of women, the American male is able to participate on equal terms in the rearing of infants. This view may be widely accepted today, but when Harlow wrote this in 1958, it was revolutionary.

## CRITICISMS AND SIGNIFICANCE OF THE FINDINGS

Harlow's claims notwithstanding, do you think it's appropriate to view humans as having the same attachment (or love) processes as monkeys? There has been some research to support the view that the attachment of human babies to their caregivers does indeed go well beyond simply fulfilling biological needs. It has been shown that greater skin-to-skin contact between a mother and her very young infant enhances attachment (Klaus & Kennell, 1976). However, the attachment process develops much more slowly in humans: over the first six months compared with the first few days for monkeys. In addition, only approximately 70% of children appear to be securely attached to an adult at one year old (Sroufe, 1985).

There are many people, past and present, who would offer criticisms of Harlow's work based on 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, there are sensible arguments on both sides. One of the ways science judges the ethics of such 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 issues of institutionalized children, adoption, and child abuse.

Unfortunately, many children in our culture 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 their own various illnesses and other physical difficulties (hospital settings). Harlow's research has influenced the kind of care we try to provide for those children. There is now general acceptance that basic biological care in institutional settings is inadequate and that infants need to be in 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. While such attempts at filling attachment needs will never replace real parental care, they are clearly a vast improvement over simple custodial care.

The work of Harlow offered encouragement and optimism for nonmaternal caregivers to be effective parents. Since 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 proper person to provide care. Now fathers could feel more adequate to assume a larger role in the process. But beyond this, other nonparental caregivers, such as babysitters or day care-center workers, when necessary, could be seen as acceptable options. Moreover, these discoveries greatly enhanced the prospect of adoption, since it was recognized that an adoptive parent could offer a child just as much contact comfort as a biological parent could.

Finally, Harlow's early studies shed light on the terrible problem of child abuse. One surprising aspect of such abusive relationships is that in nearly all cases, the abused child seems to love and to be firmly attached to the abusive parent. According to a strict behaviorist interpretation, this is difficult to understand. But if attachment is the strongest basic need, as Harlow suggested, then this would far outweigh the effects of the abusive punishment. 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 on the influence of touch, bonding, attachment, and the effects of human contact on emotional and physical health. One such study examined the connection between

social isolation (lack of opportunities for close, meaningful, social contact with others) and physical health among adults who live in life situations marked by loneliness (Cacioppo & Hawkley, 2003). Findings indicated that adults lacking in social contact experienced 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 with healthy social connections.

Another study citing Harlow 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 a baby's need for physical contact and touch with other, equally compelling safeguards against 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 (see LaTorre, 2000). 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 the nature of love. It is unmistakable, however, that his discoveries changed the way we view the connection between infant and mother. Perhaps, if this research has permeated, at least a little, into our culture, some good has come from it. For example, Harlow tells the story of 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).

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Feldman, R., & Eidelman, A. (1998). Intervention programs for premature infants: How and do they affect development? *Clinics in Perinatology*, 25(3), 613-629.

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