

# ***The Experience of Touch: Research Points to a Critical Role***

**By Daniel Goleman**

THE experience of being touched, new research shows, has direct and crucial effects on the growth of the body as well as the mind.

Touch is a means of communication so critical that its absence retards growth in infants, according to researchers who are for the first time determining the neurochemical effects of skin-to-skin contact.

The new work focuses on the importance of touch itself, not merely as part of, say, a parent's loving presence. The findings may help explain the long-noted syndrome in which infants deprived of direct human contact grow slowly and even die.

Psychological and physical stunting of infants deprived of physical contact, although otherwise fed and cared for, had been noted in the pioneering work of Harry Harlow, working with primates, and the psychoanalysts John Bowlby and Renee Spitz, who observed children orphaned in World War II.

The new research suggests that certain brain chemicals released by touch, or others released in its absence, may account for these infants' failure to thrive.

The studies on the physiology of touch come against a backdrop of continuing research on the psychological benefits of touch for emotional development.

In some of the most dramatic new findings, premature infants who were massaged for 15 minutes three times a day gained weight 47 percent faster than others who were left alone in their incubators - the usual practice in the past. The massaged infants also showed signs that the nervous system was maturing more rapidly: they became more active than the other babies and more responsive to such things as a face or a rattle.

"The massaged infants did not eat more than the others," said Tiffany Field, a psychologist at the University of Miami Medical School, who did the study. "Their weight gain seems due to the effect of contact on their metabolism."

The infants who were massaged were discharged from the hospital an average of six days earlier than premature infants who were not massaged, saving about \$3,000 each in hospital costs, Dr. Field said.

Eight months later, long after their discharge, the massaged infants did better than the infants who were not on tests of mental and motor ability and held on to their advantage in weight, according to a report by Dr. Field in *The Journal of Pediatrics*.

"The standard policy in caring for premature infants has been a minimal-touch rule," Dr. Field said. Word of her continuing findings and others that support them has led to a change in this policy in some hospitals.

Babies born prematurely are kept in incubators and fed intravenously. They had been touched as little as possible because they had been observed becoming agitated when someone approached or handled them. The agitation sometimes put a dangerous strain on their tiny lungs, putting the infants in danger of hypoxia, an inability to oxygenate the blood.

However, Dr. Field found that a light massage of the babies' backs, legs and necks and gentle movement of their arms and legs proved to have a tonic effect, immediately soothing them and eventually speeding their growth.

Dr. Field had decided to try massages because of findings by Saul Schanberg of the department of pharmacology at Duke University. Beta-Endorphin Inhibited

The strongest evidence is from studies of other mammals, but it seems to apply to humans. Dr. Schanberg's studies of infant laboratory rats showed that a particular pattern of touch by the mother rat - particularly licking - inhibited the infant rat's production of beta-endorphin, a chemical that affects the levels of insulin and growth hormone.

The slowed production of beta-endorphin did not depend on the presence of the mother; researchers were able to induce it by simulating the stroke of the mother's rough tongue with a wet paintbrush.

While levels of beta-endorphin decreased in response to licking, the levels rose when the infants were taken from their mothers. If the separation persisted, the infant rats' growth was stunted.

But resumption of the mother's touch, even when simulated with a brush, again lowered the beta-endorphin levels and quickened growth.

"We believe that the brain effects we found in rats will also hold for humans, because the basic neural and touch systems are the same," Dr. Schanberg said. Primitive Survival Mechanism

He hypothesizes that the touch system is part of a primitive survival mechanism found in all mammals. Because mammals depend on maternal care for survival in their early weeks or months, the prolonged absence of a mother's touch - more than 45 minutes in a rat, for instance - triggers a slowing of the infant's metabolism, and thus a lowering of its need for nourishment. Such a reaction heightens its chances of surviving until it is once again in contact with the mother.

While the slower metabolism is beneficial in the short term, it stunts growth if very prolonged. According to Dr. Schanberg, part of the response in rats, which includes huddling down and becoming still, is a change in metabolism that conserves the store of energy and slows the rate of growth. The mother's touch, however, reverses the process, so that growth resumes at normal rates.

In related findings, physical contact with the mother appears essential to reducing the release of hormones by an infant when subjected to stress, according to Seymour Levine, a psychologist in the department of psychiatry at Stanford University Medical School. When infant rats or monkeys are separated from their mothers, activity in the pituitary-adrenal system rises, a response that is also typical for humans under stress. In Dr. Levine's studies, physical contact with the infant's mother lowered this stress response. Beyond Mere Proximity

Contact and touch have a significant role in the infant's ability "to regulate its own responses to stress," Dr. Levine said. His work does not allow him to separate touch in itself from the more general effect of the mother's presence, but he theorizes that in humans a touch-induced reduction of stress hormones may account for the soothing effects of skin-to-skin contact.

In an article published in a recent issue of *Child Development*, Dr. Schanberg and Dr. Field review data indicating that it was touch, rather than mere proximity or motion, that regulated infants' growth rate.

Other research suggests that all babies benefit from touch, not just the premature infants Dr. Field studied. Research by Theodore Wacks, a psychologist at Purdue, showed that infants who experienced more skin-to-skin contact had an advantage in mental development in the first six months of life. *The Best Kind of Touch*

Such findings have encouraged the formation of some infant massage groups outside of hospitals, for parents to learn the best ways to massage their babies. The best stroke for an infant, Dr. Field said, is gentle, firm and slow. If the touch is too light, it can overstimulate and even irritate an infant.

Different areas of an infant's body respond differently to touch. If a parent wants to soothe an infant, gentle strokes or light massage on its back and legs will relax it. On the other hand, stroking a baby's face, belly or feet tends to stimulate it.

"In most parts of the world, people massage babies," said Dr. Field. "The Western countries are about the only place this is not routine."

The primacy of touch in infancy, experts say, is tied to touch's being the most mature sensory system for the first several months of life.

"It's the first way an infant learns about the environment," said Kathryn Barnard, a professor of nursing at the University of Washington. "About 80 percent of a baby's communication is through its body movement. It's easier to read a baby's communication with skin-to-skin contact." *Conveying Subtle Needs*

Babies resort to crying when their needs become urgent, while they use movements to show more subtle feelings and needs, Dr. Barnard said.

Her research has shown that the more a mother holds her baby the more aware she is of the baby's needs. And Dr. Barnard found that those infants who were held more showed superior cognitive development as long as eight years later, apparently because they were more alert.

"We touch each other too little," Dr. Field said. "Body contact is very beneficial between parents and children right up to adolescence." *Psychological Development*

While a warm touch is part of loving contact and is difficult to separate from it, research is suggesting that touch has an importance over and above other expressions of affection and that its presence has consequences for psychological development.

For instance, physical contact is the ultimate signal to infants or small children that they are safe. When a small child is frightened, for instance, the most effective way to calm him is for

someone he trusts to hold him; simply being there or reassuring him is not enough, touch researchers believe.

In addition, "how - and whether -parents touch their children may influence how they feel about their bodies," said Sandra Weiss, a professor in the department of mental health and community nursing at the University of California medical school at San Francisco.

In a study of how families of children 7 to 10 years old play together, Dr. Weiss found that rough-housing seemed to give children more positive feelings about themselves and a more accurate sense of their bodies. To measure the perceptions, the children are asked what they like about their bodies, then they are asked to draw a body.

"The physical play gives a child the message, 'I like to be close to you; it's fun to be around you,' " Dr. Weiss said. "It affects both their feelings about themselves and about how they are put together." Individual Differences

People differ, however, in the intensity of physical contact they find comfortable. While some of the difference may be an innate property of the person's nervous system, some of it may be shaped by the experience of being touched or not being touched.

Work in rats by Marion Diamond, a professor of anatomy at the University of California at Berkeley, showed that those who had more tactile experience had better-developed nerve cells in the area of the cortex that processes the sensations of touch. Lack of that experience, however, led to a decrease of the richness of connection and size of those brain cells.

"People who touch little, as opposed to those who like to cuddle," Dr. Diamond said, "probably experience the same effect. Those who have had little physical contact over the years might become hypersensitive to such touch, so that they found it physically uncomfortable."

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