

Hold Me! The Importance of Physical Contact with Infants¹

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ABSTRACT: This paper addresses the beneficial psychological and physiological effects of touching, carrying, and holding infants. Through an overview of research, scientific evidence is provided that substantiates the importance of close physical contact in each of the three major states of consciousness: awake, asleep, and crying. A historical and cross-cultural perspective is also included. Implications and recommendations are made for child rearing by modern parents in industrialized nations.

During the 1950s, experimental psychology in the United States was dominated by an extreme school of thought called *Behaviorism*. Psychologists who embraced this theory believed that all behaviors were motivated by rewards and punishments. They assumed that babies became attached to their mothers because the mothers provided milk, which is a reinforcing stimulus (or reward) because it alleviates the uncomfortable state of hunger. A researcher at the University of Wisconsin, Harry Harlow, decided to test this theory, and designed a very simple but clever experiment (Harlow, 1958). He raised infant monkeys without their mothers, but provided them with a choice of two artificial mothers: one of them was made of wire and had a nipple that provided milk when the infant monkeys sucked. The other mother did not provide any milk, but was made of soft terry cloth. Which one would the infant monkeys prefer? Which one would they cling to the most? Surprisingly for the behaviorists, the infant monkeys much preferred the terry cloth mother, although she did not provide them with any food. This was one of the first experiments that directly tested

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and challenged the behaviorist assumptions. The implications were that there is something more important than food. This, of course, came as no surprise to parents who are bonded with their infants and who know intuitively that infants like to be held and cuddled. This paper reviews the research demonstrating the importance of touching and holding infants in each of the three major states of consciousness: awake, asleep, and crying.

PHYSICAL CONTACT WITH INFANTS WHO ARE AWAKE

During the 13th century, it was believed that human beings had an innate language. To discover what it was, King Frederick II of Sicily designed an ingenious but brutal experiment, which is the first documented psychology experiment ever performed. He arranged for foster nurses to raise several infants, each one in a room by itself. The nurses fed, bathed, and changed the infants, but did not stay and interact with them because they were forbidden to speak to them. The goal was to discover what language the children would speak if they had not heard any language spoken. Unfortunately, however, King Frederick never found the answer to his question because all of the infants died. The 13th century historian who described this experiment said, "They could not live without the petting and the joyful faces and loving words of their foster mothers" (Gardner, 1972). It is now believed that the infants in this experiment died of stress caused by deprivation of physical contact.

There was a spectacularly high death rate in 18th and 19th century foundling homes and orphanages in Europe and the United States. The term *marasmus* (meaning "wasting away") was used to describe these infants as their health deteriorated in spite of good nutrition. In 1915, ninety percent of the infants in Baltimore orphanages died within a year of admission (Gardner, 1972). In the 1940s, a third of the infants in United States orphanages were still dying in spite of good food and meticulous medical care. During this period, child-rearing methods in the United States were influenced by the leading expert of the time, Dr. Luther Holt, who warned of the dangers of handling children too much (Holt, 1919). The less wealthy orphanages, where the staff followed their maternal instincts and were not up-to-date on this modern advice, often had lower mortality rates than the wealthier orphanages! (Sapolsky, 1994).

A less severe form of this is a condition called "stress dwarfism" or "deprivation dwarfism" when children show stunted growth because

of deprivation of physical contact. In infants, this condition is generally called "failure to thrive." Infants and children who fail to grow because of insufficient physical contact, although they are receiving adequate food and health care, are now assumed to be suffering from the effects of prolonged stress.

Researchers have discovered some mechanisms by which stress inhibits growth (Sapolsky, 1994). One hormone secreted during stress is cortisol. This hormone from the adrenal cortex serves the purpose of mobilizing energy reserves to help the body defend itself in case of physical danger. Combined with the sympathetic nervous system's fight or flight response, this is highly adaptive when there is an immediate threat to survival. But in the long run, excessive amounts of cortisol are counterproductive, because it also inhibits bone growth and reduces the calcium supply to the bones. Cortisol also lowers the immune response, which helps to explain the high mortality rate in orphanages with inadequate mothering care.

Other studies have shown that bottle-fed infants who are held during feedings digest their milk better than those who are not held (Brazelton, 1992). This could be another contributing factor to the phenomenon of "deprivation dwarfism" in institutionalized infants, who are often propped up with a bottle for feeding because of insufficient staff.

Inhibition of growth and lower immune response are only some of the problems for children who survive these institutions. It has been known for decades that children raised with very little physical contact show developmental delays in cognitive and social skills (Spitz, 1945; Provence and Lipton, 1962; Kaler and Freeman, 1994). It is now believed that this is partly caused by another side-effect of cortisol. Excessive amounts of cortisol can damage a part of the brain called the hippocampus, leading to impairments in learning and memory. Romanian orphans, who have suffered from severe neglect, have high levels of cortisol, and these correlate inversely with cognitive abilities: the children with the highest levels of cortisol were found to have the lowest levels of intellectual ability (Carlson et al., 1995).

Studies have shown that even brief separations between human infants and their mothers can affect cortisol levels. Nine month-old infants who were briefly separated from their mothers in an experimental situation had an increase in cortisol levels, indicating a physiological stress response (Gunnar et al., 1992). However, when the infants were left with a warm, responsive caretaker, the cortisol levels did not increase as much.

In addition to the stress response with elevated cortisol levels, animal researchers have discovered many changes in the brains of infant

mammals who are separated from their mothers, including a reduction in opiate receptor density, and a decrease in catecholamines and serotonin (Van der Kolk, 1987). It is likely that early experiences of neglect (with insufficient holding) can cause a permanent shift in these neurotransmitter systems in human infants, making the infants vulnerable to depression and anxiety later on in life. It is also possible that drug addictions in adolescents and adults are attempts to reestablish normal levels of brain chemicals.

The British psychoanalyst, John Bowlby, was the first person to use the term "attachment" to refer to a child's bond to his mother. He proposed that attachment behaviors, such as smiling at the mother, clinging to her, and crying when she leaves, reflect the instinctive tendency of babies to seek and maintain proximity to their mothers (Bowlby, 1958). Mary Ainsworth's studies of attachment behaviors in 12 month-old babies have shown that securely attached babies typically protest during separations from their mothers in an unfamiliar setting, and seek physical contact with their mothers during reunion (Ainsworth et al., 1971).

While the absence of touch is one of the greatest stressors that we can suffer, active touch can greatly enhance development. In one experiment, institutionalized infants were touched for two ten-minute periods for ten days, in addition to their usual routine care. They made better progress in areas such as language and social development than infants who were not given this extra handling (Casler, 1965). Several studies have shown that touching enhances the development of premature infants as well. In another study, premature infants in incubators were touched for fifteen-minute periods three times a day, for ten days. They gained weight nearly 50 percent faster than premature infants who were not given this extra handling (the control group), even though the number of feedings and calorie intake was the same for both groups. The infants who received extra touching were also more alert and awake longer than the control group, and they were released from the hospital six days earlier than the control group (Field et al., 1986).

Touching and holding can also reduce the effect of pain. Infants who were held by their mothers in whole body, skin-to-skin contact during a standard heel lance procedure cried significantly less than infants who were not held (Gray et al., 2000).

There is a fairly new practice called "Kangaroo Care" in hospital nurseries for premature infants. The mothers are asked to hold their infants in skin-to-skin contact against their chest for several hours a day. Even normally gestated human infants are born at a very im-

mature stage of development, and they are totally helpless. Like kangaroos, development is not fully completed at birth, and the brain continues to grow at a rapid rate. During the first year after birth, babies thrive on stimulation that is similar to what they experienced in the womb. This implies the need for a womb-like environment that includes close holding with gentle movements and a heartbeat sound. The Kangaroo Care method was first developed in Colombia, and then quickly spread to Europe where scientific testing has produced encouraging results. This practice is spreading to the United States, but still remains fairly limited (Ludington-Hoe et al., 1994).

Researchers have studied the physiological changes that occur when infants are touched. Interestingly, cortisol levels of preterm infants decrease during massages, indicating that touching has an immediate beneficial physiological effect on the body (Acolet et al., 1993).

The more babies are held, the less they cry. In an interesting study of the effects of increased carrying on infants, mothers who were asked to carry their infants an extra two hours per day reported one hour less crying per day at six weeks of age than a control group of mothers who had been asked to provide only increased visual stimulation (Hunziker and Barr, 1986). In another study with low birth weight infants, those who had experienced skin-to-skin contact with their mothers cried significantly less at six months of age (Whitelow et al., 1988). Of course, it is important to respond to infants when they are crying (see below), but it is also important to give infants plenty of physical closeness even when they are *not* crying. This seems to help reduce the overall stress level and therefore the *need* to cry.

In many indigenous cultures of the world, infants are held most of the time. In these cultures, the amount of crying is less than for infants in Western cultures, who spend considerable time alone (Barr et al., 1991). In her book, *The Continuum Concept*, Jean Liedloff wrote of the first year after birth as the "in-arms phase" of development, during which infants have an innate, biological expectation for continuous physical contact. Liedloff lived with the Yequana Indians in Venezuela, and attributed their peacefulness as adults to the practice of filling their babies' early needs for being held (Liedloff, 1975).

PHYSICAL CONTACT WITH INFANTS WHO ARE ASLEEP

All land mammals sleep in close proximity to their mothers. During the millions of years of prehistoric times, human infants probably slept with their mothers. In traditional tribal cultures today, the prac-

tice of sleeping with infants is still quite common. However, in technologically advanced countries this practice has been largely abandoned in favor of cradles and cribs. In many homes, the infant does not even sleep in the same room as the parents.

When and why did the natural practice of sleeping with infants become lost in Western cultures? During the 13th century in Europe, the priests first began recommending that mothers stop sleeping with their infants. Although the primary reason for this advice was probably the rise of patriarchy and the fear of too much feminine influence on infants (especially male infants), the reason given for this advice was the fear of smothering the infants, commonly known as "overlying." It is now believed that most of the cases of infant deaths in the Middle Ages were caused by illness or infanticide. It is extremely unlikely that a mother who sleeps with her infant will roll over and inadvertently smother her child, unless she is under the influence of alcohol or drugs.

By the 14th and 15th centuries, the advice not to sleep with infants began to take effect (Renggli, 1992). The age at which infants were put to sleep in cradles for the night, rather than in their mothers' arms, became gradually younger. After the industrial revolution in the 18th century, the notion of "spoiling" became widespread, and mothers were warned not to indulge or cuddle their infants too much for fear of creating dependent, demanding monsters. With the discovery of the germ theory of disease, hospital central nurseries were invented, resulting in a serious disruption in early bonding. From day one, infants were expected to sleep alone, separate from their mothers. Then came the decline of breastfeeding, which deprived mothers of the hormones oxytocin and prolactin. These hormones normally create a strong desire in mothers to be physically close to their babies.

A Swiss psychotherapist, Franz Renggli, has analyzed the paintings of Mary and the infant Jesus during the late Middle Ages and Renaissance in Europe. He discovered that the separation between mothers and infants that began during the late Middle Ages in Europe is reflected in these paintings. Until the 15th century, most paintings show the infant Jesus on Mary's lap, in close physical contact. Beginning in the 15th century, the infant Jesus is sometimes shown separated from his mother: either in a cradle or on the ground. Renggli calls these babies on the ground the "Bodenkinder" literal translation—floor children (Renggli, 1992). For example, a painting by Filippo Lippi, done in 1459, shows the infant Jesus lying naked on some grass while Mary stands nearby, her eyes half closed and her hands

in prayer. Both of their faces are sad, and there is neither physical contact nor eye contact between them. The infant is sucking a finger.

When the baby Jesus is shown on his mother's lap, there are often unnatural, sexual poses and gestures, almost as if Mary were relating to her son as a little lover. Renggli's theory is that the gradual separation between mother and child that took place during the late Middle Ages caused a deep disturbance in the mother/child relationship, resulting in an erotization or sexualization when contact did occur. Because the natural needs for closeness and touching were not being met, the mothers eroticized their relationship with their children, seeking to fulfill in unnatural ways their own unmet childhood needs for contact. According to this theory, the sexual abuse of young children became widespread as a direct consequence of decreased mother/infant contact. This disturbed mother/child relationship was part of the unconscious of the artists who painted the pictures, so they naturally portrayed Mary and Jesus according to their own personal experiences of mothering.

Renggli claims that the disturbed mother/infant relationship is the cause of a mass psychosis that gripped Europe during the late Middle Ages, as evidenced by the Inquisition, persecution of the Jews, witch trials and burnings, wars, and self-flagellation parades (during which people walked from town to town whipping themselves). He even suggests that the bubonic plague epidemics that began in the 14th century were the result of decreased immune system response in people who were stressed because of insufficient early physical contact. These epidemics ended only with improved sanitation and rat control, after three hundred years.

The mass psychosis has continued into modern times, a twentieth century example being World War II and the holocaust. However, according to Renggli, human beings are able to maintain a semblance of normalcy and repress their deep wounds and early unmet needs with the use of drugs such as alcohol, caffeine, nicotine, and tranquilizers, as well as illegal drugs. In fact, psychiatrists have observed that childhood deprivation predisposes people to addictive behaviors (Van der Kolk, 1987). Without these crutches to keep emotions in check, many people would have trouble repressing their aggressive or psychotic tendencies. Renggli thinks that the craziness that was so blatant during the late Middle Ages has not really disappeared at all, but has become repressed. There is a desperate longing in every human being, a deep-seated, unmet need for physical contact and love. The root of this is the deplorable practice of insufficient maternal/infant contact, especially the practice of forcing babies to sleep alone.

Could it be that the high prevalence of teen pregnancies reflects a need to be held more than a desire for sex? Many teenage mothers report that they did not really want sex at all, but just wanted to be held. The expression "to sleep with someone," implies to have sex with the person. Perhaps this expression reflects a universal, unfilled childhood need to sleep next to one's parents and to be held during the night. It is possible that, when infants' needs for nighttime closeness are met, there will be a dramatic reduction in teenage pregnancies, and in all forms of compulsive sexuality.

Researchers have studied the sleep patterns of infants who share a bed with their mothers, compared with those of infants who sleep alone. Infants who sleep with their mothers experience more arousals than solitary-sleeping infants, and they also spend less time in deep sleep. This is presumably because of the mother's sounds and movements during her own sleep. This nighttime stimulation has been proposed as a possible protection against sudden infant death (SIDS), because one theory of SIDS is that the infants who die are sleeping so soundly that they are unable to arouse themselves and continue breathing during a long breath-holding episode—apnea (McKenna, 1995). Cross-cultural studies have shown that, in cultures where infants are held regularly and where mothers sleep with their infants, SIDS rates are low compared to those cultures where these practices are not followed (Rognum, 1995). The researchers do not claim that sleeping alone causes SIDS, but they do suggest that letting infants sleep with their mothers could be a protective factor for those infants who are at risk for dying of SIDS.

The practice of sleeping with infants and young children is becoming more widely recommended and accepted in Western, industrialized nations, as parents begin to trust their natural inclinations to share their beds with their infants. Tina Thevenin's book, *The Family Bed*, first published in 1976, was one of the first books in the United States to recommend that parents sleep with their infants and children (Thevenin, 1987). There are now many books that recommend this choice.

PHYSICAL CONTACT WITH INFANTS WHO ARE CRYING

Until the widespread adoption of cradles and cribs during the night, it probably did not occur to parents to ignore their crying babies. Their cries were always responded to. Moreover, babies who were frequently

held and cuddled probably cried less than modern infants who spend much of their time alone.

There are centuries of harmful advice for parents of crying infants. During the 18th century in Germany, crying in infants was considered to be an indication of willfulness and wickedness, and parents were advised to punish these outbursts (Miller, 1983). Dr. Schreber, a well-known German physician and educator in the 19th century, advised parents to use mild corporal punishment to get babies to stop crying and go to sleep (Schatzman, 1973).

At the beginning of the twentieth century in the United States, Dr. Luther Holt, the leading child-rearing expert mentioned above, wrote a book entitled *The Care and Feeding of Children*, which was the child-rearing bible of the time. It was first published in 1894 and was still in print in 1935. Several generations were raised according to his advice. Although Holt did not recommend corporal punishment for crying babies, he strongly urged parents to ignore babies and not pick them up.

His book is a series of questions and answers. One question is, "How is an infant to be managed that cries from temper, habit, or to be indulged?" The very wording of this question already reveals the author's bias. Holt's answer was: "It should simply be allowed to 'cry it out.' This often requires an hour, and, in some cases, two or three hours. A second struggle will seldom last more than ten or fifteen minutes, and a third will rarely be necessary." (Holt, 1919) The major fear during that time was that of "spoiling" infants by giving them too much attention when they cried. Unfortunately, similar advice still appears in many books published today.

Responding to a crying baby builds a solid foundation for a sense of trust and powerfulness. It is impossible to spoil babies by responding to their cries. Researchers have discovered that sensitive responsiveness to infants' cries leads to secure attachment in the infants by one year of age. On the other hand, infants whose parents delay in responding to their cries become demanding and clingy by one year of age, and are described as being insecurely attached (Bell and Ainsworth, 1972).

Not all crying, however, is an indication of a present need or discomfort. In my books I propose a stress-release theory of infant crying (Solter, 1998, 2001). Recent studies have shown that saliva cortisol levels are typically high at birth, and then gradually decline until they level off at about six months of age (deZegher et al., 1994; Lewis and Ramsay, 1995). This indicates that stress levels are high in infants at birth and for several months afterwards. This is probably largely a result of prenatal and perinatal traumatic experiences (including ma-

ternal stress, anxiety, or depression), combined with other factors such as frustrations and overstimulation. Human infants are extremely vulnerable and easily stressed.

When infants continue to cry after all immediate needs have been met, this crying can serve as a stress-release mechanism. Physiological and biochemical research has shown that crying helps to reverse the effects of the stress response by lowering blood pressure and releasing stress hormones from the body through tears (Karle et al., 1973; Woldenberg et al., 1976; Frey and Langseth, 1985). However, *infants should never be left alone to cry*. When infants cry to release stress, continued holding is extremely important, because it lets the infants know that they are loved and understood. Everybody needs a shoulder to cry on, and infants are no exception. Infants who are allowed to cry as needed while being held do eventually stop crying on their own. They are then extremely relaxed and content.

Some parents, because of their own childhood experiences of being punished or ignored while crying, find it exceedingly difficult to respond in a nurturing manner to their crying infants. They feel compelled to stop the crying at any cost. In fact, crying is a potent trigger for abuse (Weston, 1968). However, with emotional support and correct information about infants' needs, parents can learn to respond compassionately to their crying infants. If all women could have a positive birth experience with opportunities for early bonding with their infants, and were encouraged to breastfeed their babies, there would probably be a dramatic increase in mothers' ability to respond appropriately and lovingly to their crying babies.

There are several kinds of therapies that use holding with crying. William Emerson's therapeutic work with infants involves holding and crying, and this has led to considerable improvement in infants' sleep, eating, and behavioral problems resulting from prenatal or perinatal trauma (Emerson, 1993). A controversial form of therapy called "Holding therapy" is used for children who have suffered from a serious rupture in attachment bonds with their primary caretakers through abuse, neglect, parental alcoholism, or frequent separations. The usual clinical term for this syndrome is that of "attachment disorder." The children cry and rage while being held, and gradually learn to love and trust (Keck and Kupecky, 1995). Research has shown that holding therapy is very effective in reducing violence (Myeroff et al., 1999). Psychiatrist Martha Welch has reported success with mother-child holding therapy for autistic children (Welch, 1983). She also recommends holding for normal infants and children. In her book, *Holding Time*, she suggests that mothers hold their infants and children every

day, and allow them to express feelings of grief and rage while being held. She claims that this holding with emotional release will contribute to a healthy bond between mother and child, and will also help to repair a damaged bond (Welch, 1988).

CONCLUSION

All these various studies in psychology, physiology, and cultural anthropology, indicate that holding and physical closeness are extremely beneficial for infants during the three major states of consciousness: waking, sleeping, and crying. In other words, babies need to be held nearly all of the time.

It is clear that twentieth century child-rearing methods in industrialized countries have failed to meet this vital need, resulting in extensive psychological harm. This damage is so pervasive, yet so unrecognized, that it is considered to be an essential component of the human psyche.

There is a growing movement known as "attachment parenting" among parents in the United States who recognize the need of infants for physical contact. Parents who practice attachment parenting have reacted against the tradition of using equipment, such as bottles, cribs, strollers, or play pens, that separates babies from the mother's body. Mothers who practice attachment parenting generally carry their babies in a sling during the day, sleep with them at night, nurse them on demand, and avoid separations. They always respond immediately to their infant's cries. I consider this trend to be a healthy one, and hope that it becomes widespread.

Providing appropriate love and physical contact, however, is not enough to guarantee secure attachment and emotional health. Because of the impact of perinatal trauma, as well as the inevitable stresses during infancy, babies are in need of a special kind of therapeutic attention that allows them to restore emotional and physiological homeostasis following stressful events. I have started a movement called "Aware Parenting," which combines the philosophy of attachment parenting with the recognition of infants' need for stress-release through crying, while being held and loved. This approach, described in my three books, provides parents with all the tools and information needed to raise emotionally healthy children (Solter, 1989, 1998, 2001).

Human beings are not very different in our attachment needs from our close cousins, the great apes, who spend many months after birth

clinging to their mothers. A major difference, however, is that baby apes are able to grasp their mothers' fur and hold on while the mother runs, climbs, feeds, or sleeps. Human infants today have two reflexes that are remnants of the days when they had to cling to their mothers for survival: the moro reflex and the palmar grasp reflex. However, there is no maternal fur for modern human infants to grasp, so they are at the total mercy of their mother's and father's willingness to pick them up and hold them. This is why I firmly believe that, if infants could talk, we would hear them frequently pleading, "Hold me!"

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