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The Science of Mother Love

By Cori Young

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A growing body of scientific evidence shows that the way babies are cared for by their mothers will determine not only their emotional development, but the biological development of the child's brain and central nervous system as well. The nature of love, and how the capacity to love develops, has become the subject of scientific study over the last decade. New data is emerging from a multitude of disciplines including neurology, psychology, biology, ethology, anthropology and neurocardiology. Something scientific disciplines find in common when putting love under the microscope is that in addition to shaping the brains of infants, mother's love acts as a template for love itself and has far reaching effects on her child's ability to love throughout life.

To mothers holding their newborn babies it will come as little surprise that the 'decade of the brain' has lead science to the wisdom of the mother's heart.

According to Alan Schore, assistant clinical professor in the department of psychiatry and biobehavioral sciences at UCLA School of Medicine, a major conclusion of the last decade of developmental neuroscience research is that the infant brain is designed to be molded by the environment it encounters.¹ In other words, babies are born with a certain set of genetics, but they must be activated by early experience and interaction. Schore believes the most crucial component of these earliest interactions is the primary caregiver – the mother. "The child's first relationship, the one with the mother, acts as a template, as it permanently molds the individual's capacities to enter into all later emotional relationships." Others agree. The first months of an infant's life constitute what is known as a critical period – a time when events are imprinted in the nervous system.

"Hugs and kisses during these critical periods make those neurons grow and connect properly with other neurons." Says Dr. Arthur Janov, in his book *Biology of Love*. "You can kiss that brain into maturity."

Hormones, The Language of Love

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In his beautiful book, *The Scientification of Love*, French obstetrician Michel Odent explains how Oxytocin, a hormone released by the pituitary gland stimulates the release of chemical messengers in the heart. Oxytocin, which is essential during birth, stimulating contractions, and during lactation, stimulating the 'milk ejection reflex', is also involved in other 'loving behaviors'. "It is noticeable that whatever the facet of love we consider, oxytocin is involved." Says Odent. "During intercourse both partners – female and male – release oxytocin." One study even shows that the simple act of sharing a meal with other people increases our levels of this 'love hormone'.²

The altruistic oxytocin is part of a complex hormonal balance. A sudden release of Oxytocin creates an urge toward loving which can be directed in different ways depending on the presence of other hormones, which is why there are different types of love. For example, with a high level of prolactin, a well-known mothering hormone, the urge to love is directed toward babies.

While Oxytocin is an altruistic hormone and prolactin a mothering hormone, endorphins represent our 'reward system'. "Each time we mammals do something that benefits the survival of the species, we are rewarded by the secretion of these morphine-like substances." Says Odent.

During birth there is also an increase in the level of endorphins in the fetus so that in the moments following birth both mother and baby are under the effects of opiates. The role of these hormones is to encourage dependency, which ensures a strong attachment between mother and infant. In situations of failed affectional bonding between mother and baby there will be a deficiency of the appropriate hormones, which could leave a child susceptible to substance abuse in later life as the system continually attempts to right itself.³ You can say no to drugs, but not to neurobiology. Human brains have evolved from earlier mammals. The first portion of our brain that evolved on top of its reptilian heritage is the limbic system, the seat of emotion. It is this portion of the brain that permits mothers and their babies to bond. Mothers and babies are hardwired for the experience of togetherness. The habits of breastfeeding, co-sleeping, and babywearing practiced by the majority of mothers in non-industrialized cultures, and more and more in our own, facilitate two of the main components needed for optimal mother/child bonding: proximity and touch.

PROXIMITY, Between Mammals, the Nature of Love is Heart to Heart

In many ways it's obvious why a helpless newborn would require continuous close proximity to a caregiver; they're helpless and unable to provide for themselves. But science is unveiling other less obvious benefits of holding baby close. Mother/child bonding isn't just for brains, but is also an affair of the heart. In his 1992 work, *Evolution's End*, Joseph Chilton Pearce describes the dual role of the heart cell, saying that it not only contracts and expands rhythmically to pump blood, it communicates with its fellow cells. "If you isolate a cell from the heart, keep it alive and examine it through a microscope, you will see it lose its synchronous rhythm and begin to fibrillate until it dies. If you put another isolated heart cell on that microscopic slide it will also fibrillate. If you move the two cells within a certain proximity, however, they synchronize and beat in unison." Perhaps this is why most mothers instinctively place their babies to their left breast, keeping those hearts in proximity. The heart produces the hormone, ANF that dramatically affects every major system of the body. "All evidence indicates that the mother's developed heart stimulates the newborn heart, thereby activating a dialogue between the infant's brain-mind and heart." says Pearce who believes this heart to heart

communication activates intelligences in the mother also. "On holding her infant in the left–breast position with its corresponding heart contact, a major block of dormant intelligences is activated in the mother, causing precise shifts of brain function and permanent behavior changes." In this beautiful dynamic the infant's system is activated by being held closely; and this proximity also stimulates a new intelligence in the mother, which helps her to respond to and nurture her infant. Pretty nifty plan – and another good reason to aim for a natural birth. If nature is handing out intelligence to help us in our role as mothers we want to be awake ! and alert!

TOUCH

"The easiest and quickest way to induce depression and alienation in an infant or child is not to touch it, hold it, or carry it on your body." – James W. Prescott, PhD

Research in neuroscience has shown that touch is necessary for human development and that a lack of touch damages not only individuals, but our whole society. Human touch and love is essential to health. A lack of stimulus and touch very early on causes the stress hormone, cortisol to be released which creates a toxic brain environment and can damage certain brain structures. According to James

W. Prescott, PhD, of the Institute of Humanistic Science, and former research scientist at the National Institute of Child Health and Human Development, sensory deprivation results in behavioral abnormalities such as depression, impulse dyscontrol, violence, substance abuse, and in impaired immunological functioning in mother deprived infants.⁴ For over a million years babies have enjoyed almost constant in–arms contact with their mothers or other caregivers, usually members of an extended family, receiving constant touch for the first year or so of life. "In nature's nativity scene, ! mother's arms have always been baby's bed, breakfast, transportation, even entertainment, and, for most of the world's babies, they still are." says developmental psychologist, Sharon Heller in, *The Vital Touch: How Intimate Contact With Your Baby Leads to Happier, Healthier Development*.⁵

To babies, touch = love and fully loved babies develop healthy brains. During the critical period of development following birth the infant brain is undergoing a massive growth of neural connections. Synaptic connections in the cortex continue to proliferate for about two years, when they peak. During this period one of the most crucial things to survival and healthy development is touch. All mammal mothers seem to know this instinctively, and, if allowed to bond successfully with their babies they will provide continuous loving touch.

Touch deprivation in infant monkeys is so traumatic their whole system goes haywire, with an increase of stress hormones, increased heart rate, compromised immune system and sleep disturbances.⁶

With only 25% of our adult brain size, we are the least mature at birth of any mammal. Anthropologist, Ashley Montagu concluded that given our upright position and large brains, human infants are born prematurely while our heads can still fit through the birth canal, and that brain development must therefore extend into postnatal life. He believed the human gestation period to actually be eighteen months long – nine in the womb and another nine outside it, and that touch is absolutely vital to this time of "exterogestation."⁷

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Newborns are born expecting to be held, handled, cuddled, rubbed, kissed, and maybe even licked! All mammals lick their newborns vigorously, off and on, during the first hours and days after birth in order to activate their sensory nerve endings, which are involved in motor movements, spatial, and visual orientation. These nerve endings cannot be activated until after birth due to the insulation of the watery womb environment and the coating of vernix caseosa on the baby's skin.

Recall Dr. Janov's claim that you can kiss a brain into maturity. Janov believes that very early touch is central to developing a healthy brain. "Irrespective of the neurochemicals involved, it is clear that lack of love changes the chemicals in the brain and can eventually change the structure of that brain."

BREASTFEEDING: Liquid Love

Breastfeeding neatly brings together nourishment for baby with the need for closeness shared by mother and child; and is another crucial way that mother's love helps shape baby's brain. Research shows that breastmilk is the perfect "brain food", essential for normal brain development, particularly, those brain processes associated with depression, violence, and social and sexual behaviors.⁸

Mother's milk, a living liquid, contains just the right amount of fatty acids, lactose, water, and amino acids for human digestion, brain development, and growth. It also contains many immunities a baby needs in early life while her own immune system is maturing. One more instance of mother extending her own power, (love) to her developing child.

LIMBIC REGULATION: The Loop of Love

Another key to understanding how a mother's love shapes the emerging capacities of her infant is what doctors Thomas Lewis, Fari Amini, and Richard Lannon, authors of *A General Theory of Love*, call limbic regulation; a mutually synchronizing hormonal exchange between mother and child which serves to regulate vital rhythms.

Human physiology, they say, does not direct all of its own functions; it is interdependent. It must be steadied by the physical presence of another to maintain both physical and emotional health. "Limbic regulation mandates interdependence for social mammals of all ages." says Lewis, "But young mammals are in special need of its guidance: their neural systems are not only immature but also growing and changing. One of the physiologic processes that limbic regulation directs, in other words, is the development of the brain itself – and that means attachment determines the ultimate nature of a child's mind." A baby's physiology is maximally open-loop: without limbic regulation, vital rhythms collapse posing great danger, even death.

The regulatory information required by infants can alter hormone levels, cardiovascular function, sleep rhythms, immune function, and more. Lewis, et al contend that, the steady piston of mother's heart along with the regularity of her breathing coordinate the ebb and flow of an infant's young internal rhythms. They believe sleep to be an intricate brain rhythm which the neurally immature infant must first borrow from parents. "Although it sounds outlandish to some American ears, exposure to parents can keep a sleeping baby alive."

The Myth of Independence

This interdependence mandated by limbic regulation is vital during infancy, but it's also something we need throughout the rest of childhood and on into adulthood. In many ways, humans cannot be stable on their own—we require others to survive. Recall that our nervous systems are not self-contained; they link with those of the people close to us in a silent rhythm that helps regulate our physiology. This is not a popular notion in a culture that values independence over interdependence. However, as a society that cherishes individual freedoms more than any other, we must respect the process whereby autonomy develops.

Children require ongoing neural synchrony from parents in order for their natural capacity for self-directedness to emerge. A mother's love is a continuous shaping force throughout childhood and requires an adequate stage of dependency. The work of Mary Ainsworth has shown that maternal responsiveness and close bodily contact lead to the unfolding of self-reliance and self confidence.⁹ Because our culture does not sufficiently value interpersonal relationships, the mother/child bond is not recognized and supported as it could be.

The ability of a mother to read the emotional state of her child is older than our own species, and is essential to our survival, health and happiness. We are reminded of this each time a hurt child changes from sad/scared/angry to peaceful in our loving embrace. Warm human contact generates the internal release of opiates, making mother's love a powerful anodyne. Even teenagers who sometimes behave as if they are 'so over' the need for a mother's affection must be kept in the limbic loop. Children at this age might be at special risk for falling through the emotional cracks. If they don't get the emotional regulation that family relationships are designed to provide, their hungry brains may seek ineffectual substitutes like drugs and alcohol.

Children left too long under the electronic stewardship of television, video games, etc., are not receiving the steady limbic connection with a resonant parent. Without this a child cannot internalize emotional balance properly.

Our hearts and brains are hardwired for love, and from infancy to old age our health and happiness depend on receiving it.

As the research keeps coming in and we gain a gradually expanding vision of how mother love shapes our species, we see an obvious need to take steps to protect and provide for the mother/child bond. We can take heart knowing that all the while we carry in our genes over a million years of evolutionary refinements equipping us for our role as mothers. The answers sought by science beat steadily within our own hearts.

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Cori Young has been researching human development for nearly a decade, and is currently working on a book about birth and bonding. She is also an herbalist, and publisher of

Mother's Day, The Second Sunday In May

By James Zeller

The second Sunday in May comes every year with little fanfare. Many of us nearly forget it as Mother's day one time or another. Mother's Day can be a joy of sharing thoughtfulness, care, and consideration with Mother's Day cards, flowers, and gift ideas. But, the true gift is showing mom we love her and expressing it in a way that is meaningful to her.

Every year in America we celebrate Mother's Day on the Second Sunday of May. Although we are only half way to Christmas, a special gift is due to a special endearing person, your mother. You can tell your mom, in a very special way, how much you love her and how much you appreciate her, but showing her that you love her is what truly counts.

A bouquet of flowers for her on Mother's Day is certainly an appropriate and thoughtful gift idea. Mother's Day flowers tend to express what words cannot say and fill the home with beauty and soft fragrance. Mother's Day flowers convey tenderness and beauty to a mom who will remember moments of sweetness a bouquet of flowers will bring to mind.

We can show mom our love by taking time out of our busy lives to visit her, to call her, and to be with her. As children we experienced unconditional love from our mother. As adults we need to honor that love in reciprocation. This year, on the second Sunday in May, take time out to tell her how special she is. You may say it with a lovely Mother's Day card or a Mother's Day gift that is selected especially for her.

A Mother-in-law is also entitled to a sincere gesture of care and thoughtfulness on Mother's Day. Mother's Day can help us to strengthen this special relationship. On Mother's Day you can convey that she is truly an integral part of the family, and that you wish to give her a place in your family's daily life. Mother's Day offers an opportunity to share a few moments of consideration for your mother-in-law with caring thoughts, a Mother's Day card and a unique Mother's Day gift she would enjoy.

The ideal Mother's Day gift would be a gift idea that she would find useful and practical. It would also be elegant and exquisite. A gourmet kitchen gift or selections of imported gourmet condiments make

great gift ideas for a Mother's Day.

An excellent gift idea would be to present her with a hand blown glass teapot for her kitchen. Perhaps an oil and vinegar set from Europe would be appropriate. A gourmet gift accentuates your appreciation of her cooking and taste, and adds flavor to a time of reflection, such as tea time. Today you will find all of these Mother's Day gift ideas online. The perfect Mother's Day gift is easily found in numerous gift shops and boutiques, but remember **SHOWING** your mother that you do indeed love her, means more than any item you could send her. Mother's Day is always the second Sunday in May, halfway to Christmas, yet "a gift to give" well worth remembering.

James Zeller writes for gift related websites and blogs. One such site for unique gift ideas is

where he found a creative collection of culinary gourmet gifts perfect for

holidays such as Mother's Day.

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