

## Building babies' brains through parents' love

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It is all the rage these days to say that parenting during the early years has long term consequences for children. Numerous research studies empirically demonstrate this; sectors such as education, health, and social services have begun to give it much more attention; and the government has increased funding for support services. But what are the mechanisms that sustain such lasting outcomes? This was the question I explored in my presentation at the recent Touch-Learn Conference on Holistic Approaches to Supporting Parents (May, 2007; Coventry). This written piece is designed to help disseminate that information to those who couldn't be at the conference. I thought that I would focus on one of the biological mechanisms that we discussed: infant's brain development. Neuroscientists are rapidly revealing a whole range of mechanisms that sustain long-term consequences of early parenting, and brain development is an area that is particularly exciting them.

When it comes to brain development, all human infants are born premature, at least in comparison to other mammals. For example, babies take about a year to walk, while horses and cows and sheep manage it in only a few hours. Were human infants to be born with the equivalent degree of neural maturity at birth, their head would be too large to fit through the mother's birth canal. This means that the development of an infant's brain is shaped directly by the environment into which it is born, and particularly by its social environment. As Sue Gerhardt puts it, in her best selling book of 2005, entitled *Why Love Matters: How Affection Shapes a Baby's Brain*, "The human baby is incomplete; it arrives ready to be programmed by adults."

Infants are born with approximately 100 billion neurons in their brain, with 50 trillion connections (called synapses) existing between those neurons. By the age of 3, the number of connections will have increased 20-fold, to 1000 trillion synapses. New experiences create new connections. That is, the particular connections that will develop (or will not develop) between neurons depend upon the kinds of experience that the infant has. Synapses which get used repeatedly become robust; those which are seldom used wither away. So, if the gaze of the parent is usually positive, then the infant's brain associates positive expressions with the parent's attention; if the gaze is usually negative, then that's the expectation that their brain will form. In effect, the brain sustains what is first learned, because the synapses associated with that 'lesson' become robust. It also means that early 'lessons' are rather resistant to change, because the brain's structure has been created on their basis. That's fine if the lessons were positive ones, but more worrying if they were negative ones.

One way to illustrate the importance of this insight is to consider the work that is currently being done on violence reduction. Efforts to find more effective and creative ways of reducing violence have arisen out of awareness of, for instance, the extremely high rates of knife crimes in Scotland and gun violence in the USA, both of which have been described as public health hazards. A number of organisations, such as the UK's Wave Trust ([www.wavetrust.org](http://www.wavetrust.org)), the Violence Reduction Unit of Scotland ([www.actiononviolence.co.uk](http://www.actiononviolence.co.uk)), and the US National Association for the Education of Young Children ([www.naeyc.org](http://www.naeyc.org)), are now arguing that one of the most effective ways of reducing violence in adulthood is to give more attention to the early years, when social and emotional experiences are having the greatest impact on development of the brain. The frontal cortex is one of the areas of the brain particularly associated with emotion, and this area also develops most rapidly during the early years of birth to 3 years. A smaller, or less synaptically dense, frontal cortex means that you will have trouble *recognising* emotions in other people; this leads to a lack of empathy, which is arguably the root cause of violence. Moreover, you will have more trouble thinking and managing emotions at the same time; thus, in times of stress

you are less able to think clearly or calmly, thereby increasing the likelihood that you may behave in a volatile or violent manner. In short, violence and a lack of empathy in adulthood are not necessarily about an unwillingness to behave well, but are about the brain's way of making sense of the social world. We could re-shape society by shaping early brain development. Now, that's an interesting vision...

One strategy for helping to bring about this vision is to encourage a greater amount of touch between parents and infants (and indeed, between adults). This realisation certainly supports the aims of Touch-Learn and the Guild of Infant and Child Massage. Touch is effective in this regard because, amongst other outcomes, it stems the release of stress hormones. Such hormones, such as cortisol, have a very negative effect when present in too large or frequent a dose. For example, in adults, cortisol reduces the functioning of the immune system; in infants, its constant release has a corrosive effect on the development of the brain. So touch is one of the simple ways in which we really can start to bring about better brains – and happier babies and more peaceful societies.

If you would like more information on infant brain development, here are some of my current favourite books and websites:

Gerhardt, Sue. *Why Love Matters: How Affection Shapes a Baby's Brain*. Routledge publishers. 2005.

Upledger, John. *A Brain is Born: Exploring the Birth and Development of the Central Nervous System*. North Atlantic Books publishers. 2003.

Schore, Alan. *Affect Dysregulation and Disorders of the Self*. Norton publishers. 2003.

<http://www.brainwave.org.nz/>

<http://www.childtrauma.org/CTAMATERIALS/neuros~1.asp>

[http://www.quolkids.com/information/Education/early\\_years/infant\\_brain\\_research.htm](http://www.quolkids.com/information/Education/early_years/infant_brain_research.htm)

[http://www.ipce.info/library\\_3/files/glaser/glaser\\_2.htm](http://www.ipce.info/library_3/files/glaser/glaser_2.htm)

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