



# How to encourage empathy from birth

## Neurological roots and the importance of responsive practice

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Studies in social neuroscience<sup>1</sup> and brain imaging<sup>2</sup> that have investigated the neural basis of human empathy reveal that the development of empathy is rooted in early infancy, well before the emergence of verbal abilities and more complex capacities in social understanding (Tousignant, Eugène & Jackson, 2017). The key focus of this article is to demonstrate how

experiences and interactions in the earliest months of life impact on neural circuits, overall brain development and, in particular, the development of empathy and altruist motivation in children from birth. Guidance on supporting empathy in early childhood education and care practice through responsive reciprocal relationships is also offered.

1 Social neuroscience is an interdisciplinary science that uses the methodologies and tools developed to measure brain function to study the ways in which human beings influence and are influenced by other human beings.

2 Images of brain activity acquired through scans and other tools.

## Nature is Nurtured

Growing evidence from genetics, neuroscience and molecular biology proposes that, while the gene remains as the elementary blueprint for the developing architecture of the brain, environmental influences affect how neural circuitry is built (Shonkoff & Fisher, 2013). In other words, the age-old debate of whether a child develops as a result of his biological or genetic inheritance (nature) versus whether a child develops as a result of the environment (nurture) is redundant. We now know that both play a role. Indeed, it could be said that a child's nature is nurtured. Some of the most influential evidence comes from early American research on brain development which shows that early experience determines how the neural circuits in the brain are connected (Bertenthal & Campos, 1987). Children who are played with, spoken to and allowed to explore enriched surroundings are more likely to develop improved neural connections, which aid later learning (Karr-Morse & Wiley, 1997).

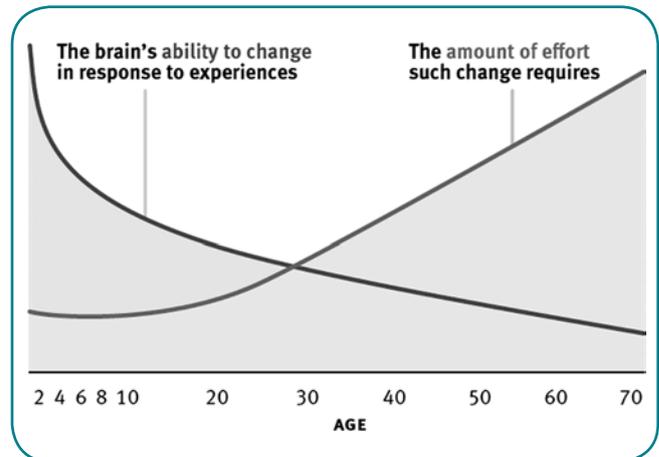
*Brain and biological pathways in the prenatal period and in the first 1000 days of life affect physical and mental health for the rest of our lives. During the first three years of life, children's long-term capacities to think, to trust, to feel concern for others, to understand and construct ideas are being fundamentally shaped. Neuroscience has highlighted the fundamental importance of early experiences on the developing brain and the associated risks of poor-quality experiences and environments during the first three years.*

(Nugent, 2015, p.2)

The brain develops earlier than the rest of the body. It reaches nearly 50 per cent of its adult weight in the first six months, 75 per cent by age two and a half and 90 per cent by age five. Parts do not all grow at the same rate. They are not determined completely by genes. For example, the part responsible for co-ordination of muscular movement grows very fast from just before birth and through the first year, with the connections that allow the eye to focus peaking at around three months. In the second part of the first year, the part of the brain responsible for thinking and logic grows very fast, so that 50 per cent of intellectual growth is achieved by age four (Perry, 1995; Karr-Morse & Wiley, 1997).

The major difference between brain development in a child versus an adult is a matter of degree: the brain is far more impressionable (neuroscientists use the term plastic) in early life than in maturity. This plasticity has both a positive and a negative side. On the positive side, it means that young children's brains are more open to learning and enriching influences. On the negative side, it also

means that young children's brains are more vulnerable to developmental problems should their environment prove especially impoverished or un-nurturing.

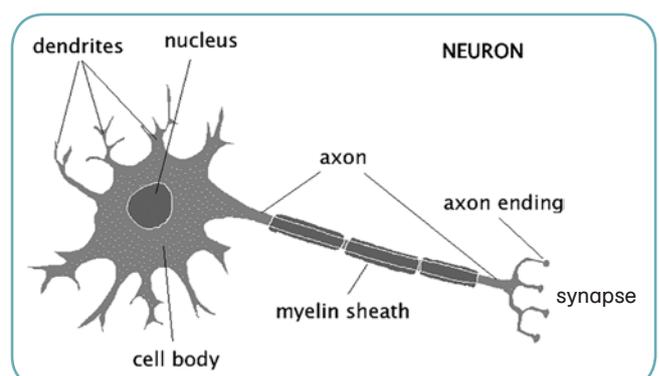


**Figure 1** Earlier is better than later (CDC, 2016)

The conceptual graph in Figure 1 was created by Pat Levitt in collaboration with the Center on the Developing Child (CDC) at Harvard and is drawn from multiple studies on humans and animals. The graph illustrates that the brain's plasticity is strongest in the first few years after birth. A key message here is that providing the right ingredients for healthy development from the start produces better outcomes than trying to fix problems later (CDC, 2016). However, it should also be noted that the brain remains plastic; interventions later in life are possible.

### How experience help shapes the brain

Babies are born with all the neurons that are needed to thrive. It is their experiences that shape how their brains develop. Neurons are special cells in the brain that both receive and send messages to each other. The part of the neuron that receives information is called the dendrite and the part that transmits is called the axon. There are many dendrites but just one axon. Information from one neuron flows to another neuron across a miniscule space called the synapse (connector).



**Figure 2** Model of a neuron



All sensory information (from seeing, hearing, feeling and so on) is transformed into an electrical impulse. The information is received by the dendrites and sent through the axon to the next neuron, through neurotransmitters across the synapse. Over time, a fatty substance called a myelin sheath forms over the axon, which allows the message to pass more quickly. However, the formation of the myelin sheath takes many years. A baby processes information 16 times more slowly than an adult, which is why you must wait and allow a baby time to respond in a 'conversation' with you (Robinson, 2009).

By the time a child is aged three, the brain has formed 1,000 trillion connections – about twice as many as adults have. The stimulation babies and young children receive determines which synapses form in the brain, that is, which pathways become hardwired. Through repetition these brain connections become permanent. Conversely, a connection that is not used at all or often enough is unlikely to survive. For example, for a baby, when sensory information received from outside (through sight, touch, hearing and so on) and from internally (heart rate, breathing – which in turn can change due to external events) reaches the brain, lots of connections are made between different groupings of neurons (Robinson, 2009). At birth a baby receives a lot of information and has to try to make sense of it. The connections that fire repeatedly are strengthened (hardwired); others, not used, get pruned away (the expression 'use it or lose it' is sometimes applied here). This pruning or selection of active neural circuits takes place throughout life, but is far more common in early childhood (Zero to Three, 2016). Providing babies with consistent responses and familiar routines allow positive patterns to emerge; the 'baby needs familiarity and repetition to begin to sort out his world, organising his brain' (Robinson, 2009, p. 8).

The part of the brain that deals with memories and coincides with the child's growing awareness of and attachment to caregivers develops between six and eight months. What happens at that time becomes organised into the unconscious internal working model of relationships. In other words, the experience young babies have of forming relationships at this time influences all future relationships and ability to develop social skills, including empathy.

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## Impact of Neglect on Developing Empathy

A key finding from brain research is that the brain is uniquely constructed to benefit from experience and from positive care during the first years of life. These findings, that early childhood experiences profoundly shape the infant brain, are changing the way we respond to the needs of children. In the course of the first three years a totally dependent person will build an incredibly complex brain that supports the flourishing of an independent person. We know that an active and healthy brain, supported by safe and enriching environments and appropriate nutrition in early-life, enables the retention of brain functions across a lifespan (Arias & Shapko, 2015).

On the other hand, there is now evidence that shows that severe neglect appears to be at least as great a threat to health and development as physical abuse – possibly even greater. For example, clear evidence exists for the changes in brain function as a result of child abuse and neglect (Glaser, 2000). These changes are associated with a stress response. The findings from neurobiological studies shed light on the numerous behavioural and emotional challenges that children who have been abused and neglected demonstrate (Glaser, 2000). This suggests that sustained disruption of responsive and reciprocal (serve and return) interactions in early relationships may be more damaging to the developing architecture of the brain than physical trauma, yet it often receives less attention.

We have known for a long time that the interactive process most protective against violent behaviour begins in the first year after birth (Karr-Morse & Wiley, 1997). We need to think about all situations where very young children may be distressed and the impact of our response. For example, if a baby is left crying when his parent leaves him in an early childhood setting, we need to think about the message that baby, and indeed other children, get if the response is 'leave him, he'll get over it'. To the baby it feels like abandonment. His deep-seated feelings of distress are not addressed, there is no connection made to his feelings, relationship built nor empathy for his anguish experienced.

The seminal work of Meltzoff (1999) has alerted us that babies are born to learn, and they learn at first by imitating us. The learning progression begins by babies 'seeing a person as someone who behaves as they do, to seeing a person as someone who shares deeper equivalences (such as goals, desires, and intentions) – and further along the developmental pathway – as someone deserving empathy and moral rights equivalent to one's own' (Meltzoff, 1999, p.9). Where the relevant synapses (connections) are damaged by neurochemicals

resulting from chronic stress, the child may be left without the ability to connect, to trust and, ultimately, to experience empathy. However, we also know that positive experiences of receiving care impacts on the later development of empathy. 'Children learn what it means to care, to be cared for, to be worthy of care, how to care for and about others' (Benson McMullen, Buzzelli & Ra Yu, 2016, p.259).

## How to Support the Development of Empathy in Young Children

Empathy 'involves the ability to share and understand another's affective state' (Tousignant et al., 2017, p.5). Based on studies in neuroscience, Tousignant et al. (2017) conceptualise the 'complex interpersonal phenomenon' of empathy as multidimensional and consisting of five main elements:

1. Affective sharing (being able to vicariously experience the emotional state of another)
2. Self-other distinction (distinguishing own feelings and those of another)
3. Perspective-taking (projecting oneself into the perspective of another to understand that perspective)
4. Emotion-regulation (ability to regulate own emotions in order to offer an appropriate empathic response)
5. Altruistic motivation (the wish to improve another's experience deriving from the interaction of the previous four elements)

All of these elements are present in babies. The researchers provide evidence from a range of studies that at ten weeks of age, for example, babies respond to their carers' expressions (joy, fear, distress) and can mimic those expressions (i.e. affective sharing). Babies at two to six months learn that their behaviour can affect the emotional response of their carer (self-other distinction). Babies at 18 months can infer what kind of food the researcher liked based on their emotional expressions (perspective-taking). Babies at 22 and 23 months are able to inhibit an emotional response (emotion regulation). Finally, in the second year of life, babies comfort, help, share and cooperate (altruistic motivation). All of this is heavily reliant on interactions with carers who are attuned to the baby. In order for empathy to flourish in young children they must experience attachment relationships with others.

## Supporting attachments and developing empathy through a key person approach

The importance of babies' attachment to their parents has long been acknowledged. Attachment is understood to be a complex process and its theory is credited to Bowlby.

*Attachment theory is a way of conceptualising the propensity of human beings to make strong affectional bonds to particular others and of explaining the many forms of emotional distress and personality disturbance, including anxiety, anger, depression, and emotional detachment, to which unwilling separation and loss give rise*

(Bowlby, 1988, p.5)

Attachment can be described as a sense of 'felt security'. Felt security provides a basis for the development of a secure attachment between baby and primary carers, which in turn develops the sense of an autonomous self (Martin, Snow & Sullivan, 2008).

Attachment for parents and their babies is similar to being in love, caring deeply about the baby, never wanting anything negative to happen to it. When parents and their babies are attached, parents are seen holding, cuddling, rocking the baby, smiling, talking to the child attentively, watching and responding to cues for hunger or distress. We now know that babies can form many attachments. In early childhood settings this can be secured through a key person approach. In this approach, each baby and family is assigned a key person who has a special responsibility for the baby and the relationship with the baby's family. The key person builds the initial attachment relationship with the baby, providing security and stability, and this is broadened to other staff when the baby has settled in well.

Babies must have formed attachment relationships in order to develop empathy. Secure attachment history is related to the growth of self-reliance, the capacity for emotion regulation, the emergence of social competence and resilience (coping skills) among other things (Fleer & Linke, 2016; Sroufe, 2005). Nurturing carers build loving, warm, sensitive, reciprocal relationships with babies in order for babies to build a sense of well-being and empathy. In other words, nurturing carers engage in responsive practice.

## Engaging in responsive practice

Engaging in responsive practice requires sensitivity to individual baby's needs, thoughts and feelings. It involves acceptance of what they express (through sounds, body language or speech), non-directive facilitation of their interests combined with uninterrupted time to explore. Responsive practice requires (Girolametto & Wietzman, 2002; Lally, 2009):



- ◆ Carers to appreciate what babies are doing, at the time they are doing it, and not superimpose their own interests and agenda on babies.
- ◆ Security through the baby knowing their demands will be met reliably, calmly and predictably.
- ◆ One-to-one responsive interactions (those in which carers follow the baby's lead).
- ◆ Sociable, loving, warm and physically responsive carers who:
  - » can tune in to a baby's verbal and non-verbal communications and needs
  - » enjoy being with babies
  - » delight in babies' found discoveries
  - » are encouraging
- ◆ Acute powers of observation. A responsive carer observes babies to see what kind of discoveries they are engaged in. Through watching babies in the discovery process, carers find the best ways to relate to their play.
- ◆ Reading cues and adapting. The carer lets the baby's interests be the guide. She reads and responds to baby's behaviour, delights in the types of learning in which the baby is engaged, and expands, provokes and encourages the learning.
- ◆ Slowing down. A responsive carer lets the baby set the pace for learning, following the baby's lead and

not offering guidance or assistance too early, lest an opportunity for new learning be eliminated.

- ◆ Mirroring and encouraging babies to consider what might happen ('What happens when I drop this ball from my highchair?').
- ◆ Taking into consideration the temperament of the baby, their level of sensitivity, adaptability, distractibility, persistence, the child's 'developmental equipment', and the baby's history and current mood, and accommodating to those factors before taking action.

Responsive practice that supports the development of empathy is achieved when babies experience carers studying and interacting with them; trying to find out how best to understand their communications, their interests and meet their needs.

In conclusion, what happens to a child during the early months and years radically affects his ability to develop empathy. Experiences have a direct effect on the number of connections made in the brain's circuitry. We now know, through neurobiological research, that the brain is not a discreet cognitive organ but a 'social brain' that is strongly connected to affective and other environmental conditions (Fox & Rutter, 2010). A robust body of research has confirmed that the magic in everyday moments – showing affection, comforting, and playing with children – helps build strong healthy brains and the development of empathy.

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