

Roots of Empathy

RESEARCH SYMPOSIUM

TORONTO, CANADA

MAY 15-16, 2012

PROCEEDINGS



Roots of Empathy
Racines de l'empathie

www.rootsofempathy.org

Introduction

The Roots of Empathy Research Symposium was an exhilarating meeting in Toronto, Ontario, Canada. The symposium offered high-calibre, leading-edge presentations from international scientists with participation from Canada, United States, Poland, Republic of Ireland, and the United Kingdom.

Areas of discussion included the linkage of social-emotional development to neuroscience, development of prosocial behaviours, reduction of aggressive behaviours including bullying, mental health, development of self-regulation, and the attachment relationship.

Furthermore, scientists shared the outcomes of over a decade of international studies conducted on the Roots of Empathy program. International scientists currently conducting behavioural and neurophysiological research on the Roots of Empathy and Seeds of Empathy programs also shared the scope of their research, reflecting the increasing evidence-base of the programs.

The panel discussion on day two provided opportunities for dialogue among research scientists from different fields of expertise, social and emotional learning, attachment, neuroscience, and neuroendocrinology of social behaviour. This rich sharing of research will inform our mission of building a more caring, peaceful, and civil society by raising levels of empathy in children and adults. We value the lens of research as the organization continues to offer empathy-based programs to children on three continents.

Mary Gordon
Founder/President

Lisa Bayrami, Ph.D.
Research Manager



Hon. Laurel Broten, Minister of Education



Lisa Bayrami

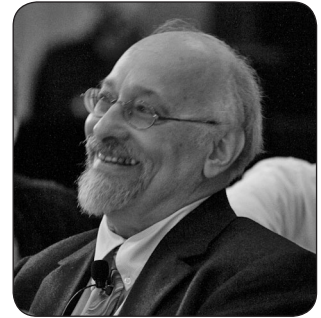
Modern attachment theory; the enduring impact of early right brain development on affect regulation

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There is a paradigm shift occurring in the developmental model of attachment theory with the convergence of 3 themes. The first is a shift in psychology and neuroscience from cognition to emotion. The second shift revolves around rising awareness of the biological concept of self-regulation, particularly affect regulation. Lastly, the field of developmental neuroscience is now focusing on the early development and growth of the right brain during the last trimester through the second year of life. Studies are now shifting from the verbal cognitive functions of the left brain in the second and third year to the early developing emotional right brain in the first year of life.

Due to the massively accelerated brain development during this period, infant and toddlers have unique, essential emotional mental health needs. In 2011 Leckman and March overviewed the phenomenal progress of the past three decades in the developmental neurosciences:

“Over the past decade...it has become abundantly clear...that the *in utero* and immediate postnatal environments and the dyadic relationship between child and caregivers within the first years of life can have direct and enduring effects on the child’s brain development and behaviour.”¹

There is also growing recognition of the essential impact of epigenetics on brain development. Not all brain development is genetically encoded but instead requires the epigenetic social experiences provided by the mother-infant attachment bond. In effect, early brain maturation requires social experience.

Over the last two decades my interdisciplinary research has focused on how the mother-infant attachment relationship facilitates or inhibits experience-dependent maturation of affect regulation circuits in the “emotional” right brain.²

The following is a brief overview of this work, including some thoughts on empathy, a function of the right brain.

“There is now agreement that the essential task of the first year of human life is the co-creation of a secure attachment bond of emotional communication between the infant and his/her primary caregiver.”³

The empathic caregiver

In order to optimally process dyadic attachment communications, the infant seeks proximity to the mother who is subjectively perceived by the infant as predictable, consistent and emotionally available. This secure, primary attachment to a psychobiologically attuned empathic caregiver, allows the caregiver to minimize negative affect and maximize positive affect. The empathic caregiver will then be able to down-regulate negative states by calming and soothing in addition to up-regulate positive states such as joy, interest and excitement. This shapes the child’s ability to communicate emotions. Not only does the mother’s regulation of both stressful negative emotions and positive emotions play an important role in infant brain development, ultimately, the mother is influencing the critical period wiring of infant brain circuits, such that the self-organization of the developing brain occurs in the context of a relationship with another self, another brain.⁴

“Empathy lies at the core of what it means to be human.”

Non-verbal, right hemisphere, emotional communication is an essential component of the attachment relationship. These communications between mother and infant rely on voice, face and gesture. There is evidence for this right hemisphere to right hemisphere communication in:

- Visual-facial attachment communication⁵
- Auditory-prosodic communication⁶
- Tactile-gestural communication⁷

Adaptive right brain survival functions, such as communication, regulation of central and autonomic arousal, and regulation of stress response are initially imprinted in right brain-to-right brain attachment communications during the human brain growth spurt of infancy. These early developing right brain circuits are shaped by attachment experiences. If early attachment trauma occurs, it can compromise functions including attachment, capacity to play, affect regulation, and empathy. This imprints a permanent physiological reactivity of the right brain and a susceptibility to later disorders of affect regulation, expressed as a deficit in the capacity to cope with future social-emotional stressors.

The right hemisphere undergoes growth spurts at later stages and these present opportunities for further social-emotional development. Thus, the early forming right brain attachment system can be shaped by later relationships. If in childhood or adolescence, an individual is exposed to a social context that provides the emotional sensitivity, communication, and regulation of an attachment bond, right brain plasticity allows for further development of “the emotional brain.”

“The Roots of Empathy program attempts to expand the right hemisphere brain function in children and adolescents.”

There is now consensus that current advances in our understanding of how social forces shape early brain development is “one of the most important discoveries in all of science that have major implications for our field”.¹ For the rest of the lifespan the early developing right brain is dominant for processing of social-emotional information, coping with stress, self-regulation, and for the essential human functions of creativity, morality, and empathy. This information is now being incorporated into psychology, psychiatry, education, and child development, and to the developmental models that underlie Roots of Empathy.

1 Leckman & March. (2011); 2 Schore. (2011); 3 Schore & McIntosh. (2011); 4 Schore. (1996); 5 Grossmann et al. (2007);

6 Schore. (2012); 7 Schore. (2012).



Maurice Meehan, Keith Gordon, and Felix Warneken

The origins of altruism

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As humans, there are certain altruistic and cooperative behaviours that we take for granted. What are the origins of these behaviours? What are their origins in evolution and ontogeny? Our hypothesis is that human socialization practices build upon a biological predisposition for altruism.

Evidence for ontogeny

Do young children start out selfish and then learn to be altruistic only because they are taught so by adults? Recent research focuses on the early stages of altruistic behaviours in infants and toddlers who have not been exposed to long periods of socialization.

Interestingly, we know that young children display helping behaviours. When children are in an experimental situation where they cannot achieve their own individual goal, they show a motivation to act on behalf of others.

In a 2006 study, 18-month-olds were observed in an experimental situation where either help was needed or not needed.¹ No reward or praise was offered to the toddlers. The children spontaneously offered to help when no task completion was observed prior. This implies that the toddlers were able to infer the other person's problem and were motivated to help.

Further studies have shown that young children will selectively choose to help "nice" over "mean" people. Direct reciprocity was demonstrated by young children who preferentially help a person who has displayed good intentions.² Indirect reciprocity has been observed in 3-year-olds who avoid helping others who are mean towards a third party.³

"Material rewards are superfluous and can even have an undermining effect."

This helping behaviour will continue even when there is a cost to the child such as when it requires an effort or disengagement from an attractive play activity.

This altruistic behaviour is intrinsically motivated in children as young as 20 months: material rewards are superfluous and can even have an undermining effect.⁴ We have demonstrated that parental surveillance or encouragement are not necessary to elicit these helping behaviours.⁵

While there is some evidence that chimpanzees do not exhibit altruistic tendencies in the form of food sharing⁶, our research has shown that human-raised chimpanzees exhibit altruistic behaviour toward their human caregiver⁷, and semi-free ranging chimpanzees will help a human stranger as well as other chimpanzees.⁸ Rewarding behaviour is not necessary to elicit helping and the helping was sustained even when the costs are slightly raised.⁸

Taken together, there is evidence that human altruistic behaviours have deep roots in ontogeny and evolution. Children's social-cognitive understanding of others' goals and their altruistic motivation enable acts of helping. Furthermore, studies in young toddlers have shown that this propensity to altruistically help others emerges in early childhood. There are also crucial aspects of human altruism seen in chimpanzees and culture can facilitate these basic forms of altruism.

1 Warneken & Tomasello. (2006); 2 Dunfield & Kuhlmeier. (2010); 3 Vaish et al. (2010); 4 Warneken & Tomasello. (2008);

5 Warneken & Tomasello. (in press); 6 Silk et al. (2005), Jensen et al. (2006), Vonk et al. (2008), Brosnan et al. (2009);

7 Warneken & Tomasello. (2006); 8 Warneken et al. (2007).

The origins and early development of empathy

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Our current and ongoing research is a longitudinal study of the developmental origins of child empathy and prosocial behaviour in young children. A sample of 47 mother-infant dyads (n=25 male) were assessed when the child was 1, 2, 3 and 5 years of age for measures of attachment using a maternal Q-set. Empathy was assessed only at age 5 via an observational procedure, while prosocial behaviour and self-awareness were assessed from a maternal questionnaire.

Our results found that girls showed higher levels of prosocial behaviours at age 5 but there were no gender differences with respect to empathy. At all ages, the security of attachment measured by the Q-set was a stable predictor for empathy and prosocial behaviour at age 5. Self-awareness, only at age 2, was also a predictor for empathy and prosocial behaviour at age 5.

In a second study, direct observation of 2-5 year old children (n=120) interacting with a 6-month old baby¹ found that 2-3 year old children of both genders were equally likely to approach the baby. At age 4-5, gender differences were apparent, with girls generally more likely to approach the baby compared to boys. Interestingly, with adult involvement in the interaction between the child and baby, the gender differences disappeared.

To assess the extent of gender differences in children's empathy, a second study² collected parental reports of their children's expressions of empathic nurture related to infants, pets, and the elderly. This study included preschoolers, 2nd graders and 5th graders (n=701). Girls were found to show more interest in and care for babies at all ages but the level of knowledge about babies and their care was equal between boys and girls. No gender differences existed for interest in and care for pets and the elderly.

The frequency of play with pets was correlated with time spent with babies and the elderly, and with pretending to be a baby or parent in play, or showing concern when a baby cries for both boys and girls.

Although boys may need more encouragement, the implication of these studies is that the development of empathic concern and nurture of others can be fostered in both boys and girls by contact with babies, pets, and/or the elderly.

¹ Fogel et al. (1987); ² Melson & Fogel. (1996).



Sue Carter and Alan Fogel

Empathy – across time and across the world

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Changes over time in empathy

Recent research in college students has shown a rise in self-esteem, individualism and narcissism and decreased participation in community organizations.¹⁻⁴ This raises the question, is there empirical evidence for increasing social disconnection in recent years?

“Our recent cross-temporal meta-analysis of American college students (N= 13,737 students) found a 48% decrease in empathic concern and 34% decrease in perspective taking since 1979.”

Broadly, empathy can be defined as “to experience perspectives and feelings more congruent with another’s situation than one’s own”.⁵ There are two components involved in empathy, empathic concern, which is more emotional in nature versus perspective taking, which is more cognitive.⁶

Our recent cross-temporal meta-analysis of American college students (N= 13,737 students) found a 48% decrease in empathic concern and 34% decrease in perspective taking since 1979.⁷ It is however important to keep these results in context, namely that these numbers represent averages, are limited to American college students and most importantly, do not indicate the students were unable to connect, but rather “less able” to connect.

Age differences in empathy

There is some evidence that different age brackets show varying capacities for empathy.⁸ In 2 cross-sectional surveys, subjects were grouped into birth year cohorts and the empathic concern and perspective taking means were compared between cohorts. We found that Americans born in the 1980s or later show the lowest level of empathy. Those born in the 1910s and 1920s also show low levels of empathy. These findings were consistent across gender, race and educational backgrounds.

Cultural differences in empathy

Americans born in the 1980s (both college students and a broader national sample) report lower levels of empathy but are these patterns specific to the United States? An online survey of over 100,000 subjects in 63 countries investigated cultural differences in empathy.⁹ An empathy index that combined empathic concern and perspective taking into one measure was calculated for each country, and also controlled for sample size, gender and age. Distinct differences between the countries were noted with Canadians (n=6313) ranking 14 out of the 63 countries surveyed.

Considering that empathy is associated with more prosocial, and less antisocial behaviour, the changes we observe in empathy over time are likely to have important future consequences.¹⁰ The scope of these consequences will depend on whether such changes continue, but we hope that the trend toward declines in empathy will reverse itself in future years.

1 Twenge. (2006); 2 Twenge & Campbell. (2001); 3 Twenge et al. (2008); 4 Putnam. (2000); 5 Decety & Lamm. (2006);

6 Interpersonal Reactivity Index (IRI), Davis. 1983; 7 Konrath et al. (2011); 8 O’Brien et al. (in press); 9 Konrath & O’Brien. (2011). unpublished data; 10 Konrath et al. (2011).

Empathy – generating SYNC

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Some people, especially some social entrepreneurs are facilitating social empathy. This concept is becoming more mainstream and being talked about in diverse industries.

Mirror Neuron Systems (MNS)

Mirror neurons were serendipitously discovered by Vittorio Gallese. Many studies, using different experimental methodologies have since demonstrated the existence of a mechanism in the human brain that directly maps action perception and execution and is defined as the Mirror Neurons System (MNS).^{1,2} The MNS is not only involved in imitation of simple movements but also in imitation learning of complex skills and the capacity to share and understand emotions and sensations of others.³⁻⁵

Through brain mirroring, the “other” becomes the “self” as their action is represented in our MNS in an identical way. This embodied simulation is a form of empathy and the boundary between “me” and “you” becomes blurred.

SYNC

Mirror neurons drive the process of intentional attunement. This SYNC is a brain-to-brain coupling, whereby two brains couple like a radio signal regardless of the content of the communication.⁶⁻⁸

One of the transmitters of this attunement is language. Interestingly, the actual language is not the coupler but rather the rhythm of the spoken word. The rhythm of language is consistent at 3-8 mHz across all languages.⁹ Those who are in synchrony are not only perceived to be more similar but also evoke more compassion and altruistic behaviour than asynchronous others.¹⁰

Social SYNC

Social SYNC is group empathy. Examples of social SYNC in nature can be found in a swarm of fireflies who, with no leader, adapt their frequency to swarm and flicker in synchrony. A human example of social SYNC is the applause of a crowd which rapidly becomes synchronized.

This raises the question, are there ways to facilitate group SYNC? Some individuals are instinctively able to feel their way into a group and have an intangible knack for social empathy. Currently, researchers are attempting to define if group empathy is related to mirror neurons and if specific brain structures (i.e., group mirror neuron systems) exist which enable tuning in to the groups or societies and establishing empathetic group relationships.

1 Gallese. (2003); 2 Gallese. (2009); 3 Gallese. (2003); 4 Gallese. (2009); 5 De Vignemot & Singer. (2006); 6 Gallese. (2008); 7 Gallese. (2009); 8 Gallese. (2011); 9 Hasson et al. (2012); 10 Valdesolo & DeSteno. (2011).



Ryszard Praszkiel and Alan Fogel

Early interpersonal relations: empathy in the making

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Adults are role models for infants. Infants are born learning, and one chief mechanism that underlies learning prior to language is observing and imitating those around them.^{1,2} Children are ready imitators but it is also important and adaptive that they can regulate who, what, and when to copy.³ For example, children attend to adult emotions and this represents an important influence on their imitative learning. They also monitor the interest adults have in people and things by monitoring their line of sight. This has been demonstrated experimentally:

- Infants under 2 years of age watch and listen to the interactions of other people, and learn whether it is a good idea for them to imitate. If an adult scolds another person for doing an action (for example a forbidden behaviour), young children learn from that and refrain from imitating that act, which is called “emotional eavesdropping.”⁴
- Infants also learn by following other people’s line of sight to objects. Infant attention is drawn to the objects that are visually monitored by adults and infants encounter valuable information. Infants learn a great deal about people and things through such joint attention.⁵

When we now consider that young children bring this early social attention and imitation to the school setting, we immediately see that children are sensitive to social expectations and categories, and the pernicious effects of stereotypes that they encounter become apparent. Stereotypes are ‘images inside the head’ that tend to group different people together and to ignore variations among individuals. In the USA, there is a widespread stereotype of boys being superior in their aptitude for math ability compared to girls. Evidence shows that males outperform girls on the SAT-math test at 18-years of age. Is this due to an innate aptitude or cultural influence? New research is emphasizing the role of culture.

Scientists have discovered that children exhibit knowledge of the culture’s stereotypes about boys and math as early as second grade.⁶ This science shows that children not only ‘catch’ stereotypes from the culture but that they begin to internalize these



Allan Schore, Ryszard Praszkie, and Andrew Meltzoff

stereotypes. The evidence shows that stereotypes begin to influence children's self-concepts about themselves as early as elementary school. There is a developmental progression found in children, which is as follows:

- Preschool age: "I am a girl", "I am a boy" = Gender self-concept
- Grade 2: "Girls don't do math" = Cultural stereotype
- Grade 3: "I don't do math" = Math self-concept

There is a cognitive change that results from stereotype exposure, and girls internalize "girls don't do math" to "I don't do math" and this generally occurs by grade 3. The stereotype that was applied to the group to which one belongs, now begins to influence the self.

This internalization of a stereotype is observed in other cultures as well. In Singapore, girls outperform boys in math, however, new research in Seattle is suggesting that girls who have internalized the stereotype of not doing well in math, are nonetheless, poor performers. The Institute for Learning & Brain Sciences is working on theory and practice that can alter the pernicious effects of stereotypes on children's development.

New techniques in infant neuroscience

The University of Washington Institute for Learning & Brain Sciences is bringing together, developmental scientists, social psychologists, neuroscientists, linguists, educators and bioengineers.⁷ Our goal is to develop new techniques for conducting neuroscience research in young children, with implications for designing better programs for preschoolers and K-12 educational practices that excite children's creativity and social-emotional awareness and fan a passion for learning.

The University of Washington Institute has the world's first magnetoencephalography (MEG) machine dedicated to infants and children.⁸ It measures the magnetic field changes on the outside of the brain from the neurons firing inside the brain. It is 100% safe and silent and adapted perfectly for testing young infants and school age children. This innovation allows us to image the child's brain in a safe, non-invasive manner while the child is awake and doing actions, feeling emotions, or learning new facts or behaviours. This work complements our ongoing developmental neuroscience research using other brain technologies to examine the development of language, reading, and social-emotional skills.⁹⁻¹² Our goal is to use the new MEG machine to evaluate neural changes that correlate with development and with participation in particular social-emotional programs such as Seeds of Empathy and Roots of Empathy, which have representation in the Seattle area. In this way we seek to integrate state-of-the-art developmental brain science with programs that are designed to help children's social-emotional development.

1 Meltzoff & Moore. (1977); 2 Meltzoff. (2007); 3 Meltzoff et al. (2009); 4 Repacholi & Meltzoff. (2007); 5 Brooks & Meltzoff. (2002); 6 Cvencek et al. (2011); 7 <http://ilabs.washington.edu/>; 8 <http://ilabs.washington.edu/meg-brain-imaging/>; 9 Raizada et al. (2008); 10 Meltzoff et al. (2009); 11 Marshall & Meltzoff. (2011); 12 Saby et al. (2012).



Niobe Way, Mary Gordon, and Lise Eliot

The healing power of love: an oxytocin hypothesis

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What are love and social bonds? A biological point of view.

For social mammals including humans, social interactions and selective social bonds are essential for survival and reproduction. Furthermore, the mammalian nervous system is designed to work in a social environment and social behaviour is necessary for physiological and behavioural homeostasis.

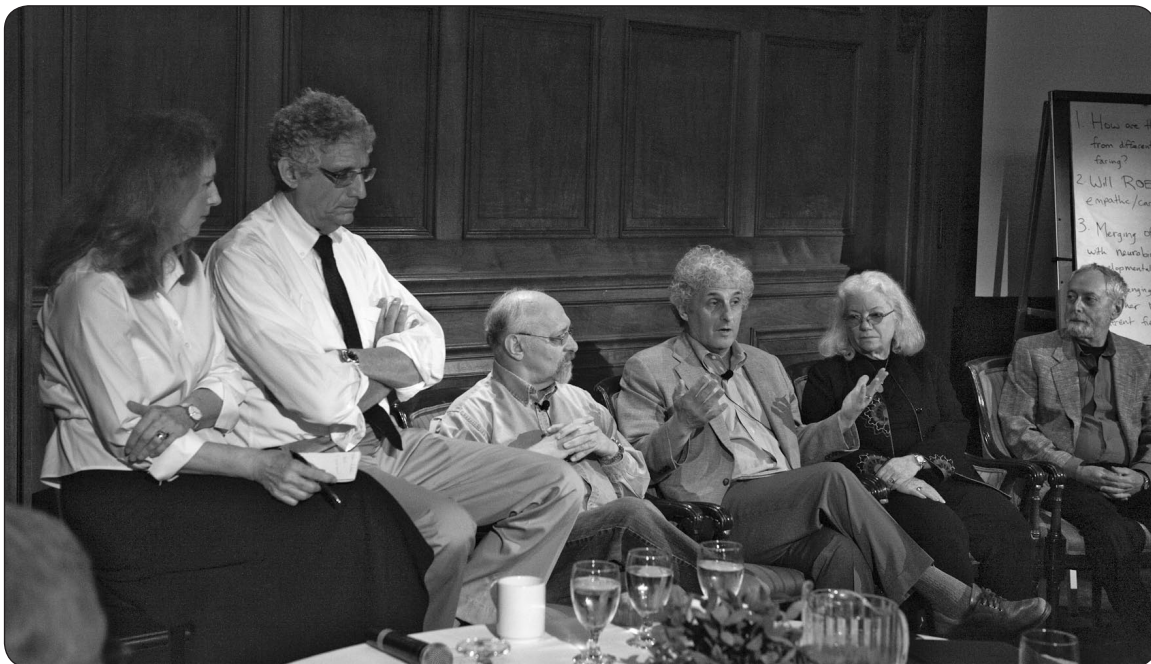
The evolutionary prototype for love, social bonds and support in mammals is the mother-child/parent-child interaction. The mother-infant bond is seen across species but the care of infants is not limited to mothers.

However, not everyone is prepared to parent and the neuropeptide hormone, oxytocin facilitates the transition to parenthood. Oxytocin plays an important role in the birthing process and is essential for lactation. The hormonal changes that accompany lactation allow the female to manage stress more effectively. This can be seen experimentally. For example women who are breastfeeding have lower heart rates and lower blood pressure compared to women who are bottle feeding their infants.¹

What is oxytocin?

Oxytocin is a 9 amino acid peptide that is central to social behaviour. Vasopressin is the sibling hormone to oxytocin, differing by 2 amino acids. Although very similar in structure these two hormones act in contrasting ways.

For example, oxytocin allows us to be immobile without feeling fear. In the absence of oxytocin, mammals may show anxiety and overreact to stressful experiences. Oxytocin enables behaviours that are essential for social engagement, and permit social bonds to form. In addition, oxytocin appears to play an important role in emotion regulation. Thus, the functions of the oxytocin system may help to explain the capacity of the presence or absence of social bonds to influence emotional reactivity.



Mary Gordon, Stuart Shanker, Allan Schore, Andrew Meltzoff, Sue Carter, and Alan Fogel

Vasopression, on the other hand, is associated with mobility and hypervigilance. Vasopressin also facilitates escape behaviours in the face of danger. Vasopressin plays a critical role in self-defense and territorial. Defensive behaviours can be adaptive, but in excess may interfere with the capacity to express positive social behaviours.

Research in the prairie vole, a mammalian model that shows long-lasting social bonds and a human-like autonomic nervous system, has revealed several important functions for oxytocin. For example:

- oxytocin is essential for pair bonding,
- oxytocin helps to regulate stress-response including the release of cortisol,
- exposure to oxytocin in early life can have developmental consequences for social behaviour and emotional reactivity across the lifespan.

The role of oxytocin is not yet fully understood but it does appear to be both protective in the face of challenges and also to have direct healing roles including the capacity to increase neurogenesis, possibly healing both body and brain. The actions of oxytocin appear to be a physiological metaphor for safety. Furthermore, this simple molecule has a remarkable ability to affect many systems. Oxytocin does exhibit a positive feedback mechanism, and under some conditions, a small amount of oxytocin may release even more oxytocin. This mechanism may help to explain the capacity of positive experiences, including those seen during Roots of Empathy experiences, to have long-lasting positive consequences.

In spite of the many positive effects of oxytocin that have been discovered, many questions remain to be explored. Of particular importance to children is the fact that the long term effects of oxytocin exposure have received little attention and are not well understood. There is growing evidence from animal research that exposure in the neonatal period normally has life-long and dose-dependent consequences helping to program the young organism for later life. However, in excess the consequences of oxytocin, especially of exogenous origins, may be detrimental. For example, synthetic exogenous oxytocin (Pitocin) is widely used in Western medicine during labour and delivery, although virtually no research is available to examine the consequences of this use. As we understand more fully the neural systems that are regulated by oxytocin, we will also gain a new awareness of the mechanisms through which social interactions can improve human life.

1 Altemus et al. (2001).



Jean Clinton and Allan Schore

The first R: relationships

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Dr. Fraser Mustard asked the simple but complex question: "Why do some people get sick and others don't?" We now know that what happens during early childhood development is a determinant of future health.

The Masai meet and ask each other one question; How are the children? We are not asking this question. The 2007 Unicef Innocenti Report ranked Canada 21st in child well-being, including mental health.¹ We know that 25% of children between the ages of 4-18 have a significant mental health disorder.² It is evident that we have a big issue, but we are not asking the right questions and changing how we support families.

One of the first steps is the recognition that the 0 to 2 year old period is critical and significantly different from development later on. The human obstetrical dilemma, where the head must emerge while there is still physical room, means that the human infant is born with a brain that is "premature." The brain continues to develop and mature during this period of intense growth.

"The consequences of childhood toxic stress have been investigated and evidence shows significant health consequences in adulthood such as increased risk of heart disease and depression."

The back and forth interaction between an infant and parent or a breastfeeding infant and their mother is a brain building activity. Evidence has shown that there are critical periods for brain development and if the brain is not stimulated, it fails to develop to its potential

Stress and children

There are three kinds of stress: positive, tolerable and toxic.³ Positive stress brings on briefly increased heart rates and mild increases in stress hormones. Tolerable stress provokes serious, temporary stress responses but is buffered by supportive relationships. Toxic stress is defined as the "prolonged activation of stress response systems in the absence of protective relationships".

Stress triggers the brain, by way of the amygdala to increase the stress response and the release of adrenalin and cortisol. Cortisol is known to affect the parts of the brain that regulate stress, store memory and are involved in planning and executing complex functions.

The consequences of childhood toxic stress have been investigated and evidence shows significant health consequences in adulthood such as increased risk of heart disease⁴ and depression.⁵

The strategic insight from this information is that the burden of mental health problems will be driven by the level of vulnerability in social-emotional development in the early years. Intervention strategies should focus on reducing vulnerability early in life.⁶

1 Unicef Innocenti Report, available online at: <http://www.unicef-irc.org/publications/series/16/>; 2 Mental Health Commission of Canada Evergreen Framework; 3 Center on the Developing Child, Harvard University developingchild.harvard.edu/index.php/resources/...and.../wp3/; 4 Dong et al. (2004); 5 Chapman et al. (2004); 6 Hertzman. (2011).

Why and how gender makes a difference in the fostering of empathy

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While there may be small gender differences in social and emotional capacities and interests, we, as a culture, firmly believe that there are large gender differences. We define manhood in terms of emotional stoicism, autonomy, and strength, while we define womanhood as relational, empathic, and emotionally sensitive, with each sex having both sets of qualities to some degree but one sex being “naturally” more likely to have them. Thus, we raise our children and teach our students in ways that reinforce these stereotypes. Yet, according to my research and others (see Way, 2011), these gender stereotypes are misrepresenting what it means to be a boy or a man and also misrepresenting what it means to be human. Our research with hundreds of ethnically diverse high school boys followed over 4 to 5 year periods suggest that the vast majority of boys are deeply empathic and emotionally sensitive, especially with their closest male friends, and have the same social and emotional desires as girls. The key themes of our research are:

Shared secrets

- Boys from different walks of life greatly valued their male friendships and saw them as critical components to their emotional wellbeing.
- Boys indicated that the intimacy or sharing of secrets in their friendships is what they *liked most* about their friendships and how they defined a best friend.

Importance for mental health

- Boys not only had intimate friendships, but they believed that this intimacy was essential for their health and wellbeing.

Experiences of loss

- In late adolescence, as their bodies are almost fully grown and their minds are increasingly attuned to cultural messages about manhood and maturity, boys lose their close friendships and/or begin to lose trust in their closest friends.
- Boys continue to desire such intimacy with same-sex peers in late adolescence but express fear that they will be perceived as “gay” if they continue to have close male friendships.

What are the implications?

My research adds to the growing body of research in the social sciences¹ that is reframing how we understand what it means to be human. Rather than focusing exclusively on our competitive and selfish nature, scientists from across the disciplines are revealing our empathic and social nature and showing its links to long term health and wellbeing.² My research supports this paradigm shift in the sciences by revealing that boys are human too and have the same social and emotional needs and capacities as girls. Furthermore, it suggests that maintaining gender stereotypes about such needs and capacities does serious damage to boys and men. My research underscores that which we already know, which is, that what makes us human is our ability to deeply connect with others and that entails much empathy and, thus, we must foster these critical life skills.

¹ De Waal. (2010); ² Way. (2011).

Neuroplasticity and children's gender development

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Sex differences in brain anatomy and physiology are real but are much more subtle than they are portrayed in popular media. There are gender differences in brain size and the rate of maturation¹ with male brains an average of 11% larger and female brains finishing their growth 1-2 years earlier. However, there is no evidence of different brain circuits between males and females—both sexes have more or less the same neural hardware.² We are coming to understand that while prenatal testosterone and other innate factors play some role in brain development, the role of culture and learning appear stronger.

Except for our most basic reflexes (like coughing and blinking) that are controlled by the brain stem, none of our mental abilities is hard-wired. Rather, the rule is, “neurons that fire together wire together” and such neuroplasticity determines how our cognitive and emotional circuits develop. The concept of “use it or lose it” is best demonstrated in children with strabismus. Affected children squint to prevent double vision resulting in a permanent brain re-wiring if the strabismus is not corrected before the age of 8, and optimally, before age 2.³

The different ways in which boys and girls spend their time wires their brains differently.⁴ “Boy play” promotes visual-spatial skills, while “girl play” promotes relational and literacy skills. Social gender learning is shaped by family, peers, teachers and the larger culture, as well as children’s own motivation to identify and exemplify with one or the other gender.

A 2-week experiment in a preschool classroom demonstrated how rapidly children can be influenced with respect to social categories. Gender salience was artificially increased through labeling gender, such as separating bulletin boards for boys and girls and grouping by gender. After 2 weeks, children in such experimental classrooms exhibited decreased gender flexibility and increased identification with same group and rejection of the out-group.⁵

“While boys and girls are reared differently with regard to emotional expression and social sensitivity, there is nothing inherently different in their neural pathways to make one sex more emotional or socially-sensitive than the other.”

Minor social-emotional differences between the sexes have been observed in measures of empathy in children and adolescents ($d = 0.16$).⁶ As infants, boys cry as much or more than girls, but this changes by middle childhood,⁷ when boys have learned that crying is considered unmasculine. Nonetheless, brain measures have detected little difference between men and women during social-emotional experiences such as recognizing facial expressions in other people⁸, or witnessing other individuals in pain.⁹ In other words, while boys and girls are reared differently with regard to emotional expression and social sensitivity, there is nothing inherently different in their neural pathways to make one sex more emotional or socially-sensitive than the other.

Looking at the body of evidence as a whole, we can see that the real differences between the sexes are neither large nor hardwired, but subtle and, importantly, shaped by children’s culture and experiences while growing up.

1 Lenroot et al. (2007); 2 McCarthy & Arnold. (2011); 3 Nigel. (2009); 4 Eliot. (2009); 5 Hilliard & Liben. (2010); 6 McClure. (2000); 7 Jellesma & Vingerhoets. (2012); 8 Derntl et al. (2009); 9 Lamm et al. (2011).

Effects of the *Roots of Empathy* program on children's social and emotional understanding and behaviours

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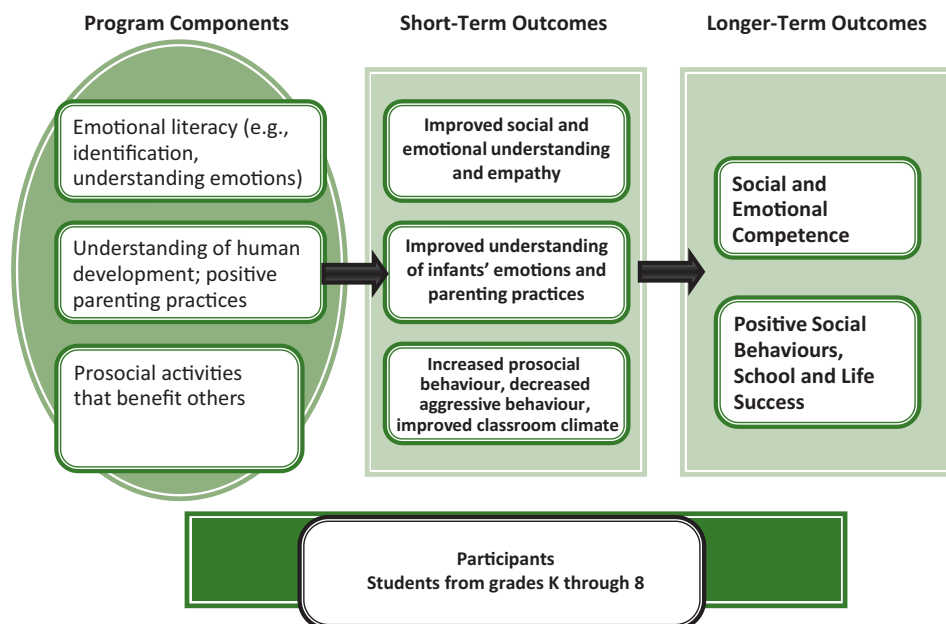
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The objective of Social Emotional Learning (SEL) is to foster the development of children's social and emotional competence. SEL as described by CASEL includes 5 competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making.¹

The evidence-based Roots of Empathy (ROE) program has program components that target both short-term and long-term outcomes relevant to SEL.

Roots of Empathy Logic Model



Research program

The Roots of Empathy research program at UBC has to date encompassed research across 3 continents and 4 separate trials with over 1,600 children.^{2,3}

These studies employed rigorous experimental designs (e.g., pre- and post-tests, control groups). The study populations consisted of diverse samples of children, with participation rates of over 90% of those children invited to participate. Across all studies, high implementation fidelity was observed with over 96% adherence rate to the ROE curriculum.

The outcomes measured across the studies can be divided into 5 categories:

- Social and emotional understanding
- Well-being
- Classroom connectedness
- Understanding of infants' emotions and parenting
- Prosocial and aggressive behaviours

Roots of Empathy was found to be equally effective in producing positive outcomes for both boys and girls. The key findings from the trials can be summarized into 5 categories with highlights below:

- Increased social and emotional understanding
 - The randomized controlled trial (RCT) showed a significant improvement ($p < 0.05$) in perspective-taking and friendship quality following participation in the Roots of Empathy program, compared to control groups.
- Decreased aggression
 - Both teacher-rated aggression (Isle of Man and Australian trial) and peer-rated aggression (RCT) significantly decreased after participation in Roots of Empathy, compared to control groups.
- Increased prosocial behaviours
 - Significant improvements were seen in the Roots of Empathy group compared to controls on both peer assessments and teacher-rated measures.
- Improved classroom climate
 - Measures of classroom autonomy and supportiveness showed significant improvement after participation in Roots of Empathy.
- Increased understanding of infants' emotions and positive parenting practices
 - Children who participated in Roots of Empathy had a significant change in their beliefs about infant crying and were able to ascribe emotion words to a crying infant and suggest relational solutions.

These positive findings are in direct concordance with the Roots of Empathy program goals. The positive findings demonstrated some consistency across grade levels, settings, informants, and measures implemented.

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- *Multi-site evaluation (N=585)* • *Randomized controlled trial (N=446)*
 - *Evaluation on the Isle of Man (N=301)* • *Evaluation in New South Wales, Australia (N=278)*
-

Although we now know that Roots of Empathy is an effective program in promoting children's social and emotional competence, future studies need to move beyond the "black box" approach to program evaluation and move to an approach that can elaborate on the underlying mechanisms and processes through which the changes in the outcomes operate. Biological models drawing from Sue Carter's work on oxytocin (see page 11) along with sociological models, such as those proposed by Irvin Staub⁴, hold promise for advancing our understanding of the mechanisms through which the ROE curriculum instigates positive social, emotional, and behavioural change in children.

1 Collaborative for Academic, Social and Emotional Learning, available online at casel.org; 2 Schonert-Reichl et al. (2012); 3 Schonert-Reichl. (2011); 4 Staub. (1988, 2003, 2005).



Stuart Shanker and Rob Santos

The story of the randomized program evaluation of Roots of Empathy (ROE) in Manitoba (or “How to win friends and influence policymakers”)

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When the Roots of Empathy (ROE) program was initially launched in the province of Manitoba, the Healthy Child Committee of Cabinet directed an evaluation of its' effectiveness.

Because ROE demand exceeded supply, for fairness and equity, a lottery assigned eight school districts (SDs) to either participate in ROE in the 2002-2003 school year ROE or a wait-list control group, guaranteed to receive ROE in the subsequent school year, approximating a cluster, randomized, controlled trial.

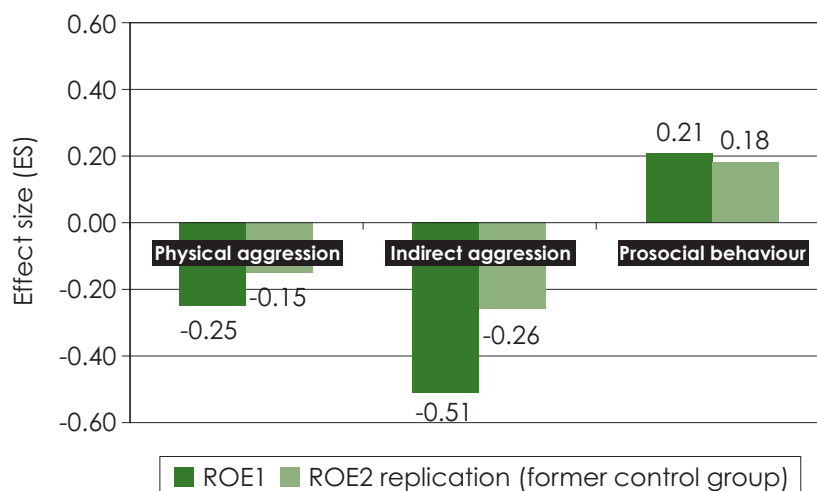
The initial group that received ROE (5 SDs, 17 schools, 24 classrooms, 445 students in Kindergarten, Grade 4 and Grade 8) and wait-list control group (3 SDs, 10 schools, 12 classrooms, 315 students) were compared immediately after intervention, and followed up for 3 years (ROE1). The following 2003-2004 school year, a new cohort of 265 students (within the same 3 SDs, 10 schools, 12 classrooms in the wait-list control group) received ROE, and were followed up for 2 years, and compared to the 315 students from the previous year.

Outcome measures were physical aggression, indirect aggression and pro-social behaviour. ROE had a statistically significant, immediate effect in reducing teacher-rated physical aggression and indirect aggression, and increasing pro-social behaviour in children. The mean average effect size was 0.25, comparable to models/demonstrations of similar programs (0.21) and better than routine practice (0.10).^{1,2} This represents a nearly 50% reduction in aggression, from 15% to 8%.

These effects were replicated when the wait-list control group received ROE the following school year (ROE2), although with a smaller impact on aggression.

However, there were almost no statistically significant effects on student-rated outcomes and, consistent with the literature, these were only modestly correlated with teacher-rated outcomes.

ROE benefits were generally maintained up to 3 years after program completion in both groups, although pro-social gains may fade in boys and older children.



Immediate effects of ROE (teacher-rated)

Based on this evidence, ROE expanded and is currently being used in over 200 classrooms across Manitoba, including First Nations schools. MCHP recently received a \$2 million Canadian Institutes of Health Research grant to investigate the long-term physical and mental health, social and educational outcomes of children's programs in Manitoba, including Roots of Empathy.

1 Wilson et al. (2003); 2 Wilson & Lipsey. (2007).

A cluster randomised controlled trial and cost-effectiveness analysis of Roots of Empathy program among 8-9 year olds in Northern Ireland

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The current study is a cluster randomized controlled trial investigating the outcomes associated with the Roots of Empathy program and is being conducted by an interdisciplinary research team comprising academics and researchers from Queen's University Belfast, the University of York and the University of Glasgow. This large-scale trial involves over 1,200 students in Year 5 (Grade 3/4) in 74 schools across Northern Ireland. Alongside the trial, a qualitative implementation evaluation and a cost-effectiveness analysis are also being conducted.

The 74 participating schools were randomly allocated to either receive the Roots of Empathy program for one school year (2011-2012) or to act as a 'wait list control' and receive the program in the following school year (2012-2013).

The trial aims to determine the impact of the Roots of Empathy program on a number of social and emotional outcomes, primarily children's prosocial and aggressive behaviours, which are being measured from the child, parent and teacher perspectives. The evaluation will address the following research questions:

1. What is the impact of the program at post-test and up to three years following the end of the program on a number of specific social and emotional wellbeing outcomes for participating children?
2. Does the program have a differential impact on children depending on: their gender; the number of siblings they have; and their socio-economic status and/or the socio-economic profile of the school?
3. Does the impact of the program differ significantly according to variations in implementation fidelity found?
4. What is the cost-effectiveness of the program in reducing cases of aggressive behaviour and increasing prosocial behaviour among school-aged children?

Follow up data will be collected on the same students for a three-year period following the Roots of Empathy program year. An interim report will be available in December 2012 with a final report expected in December 2015, when the children will be 11-12 years of age. The National Institute for Health Research (UK) under the Public Health Research Programme is funding this research and the trial is registered with ISRCTN, which is a system for the unique identification of randomized controlled trials worldwide (ISRCTN07540423 www.iscrtn.org).



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Roots of Empathy

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