

Roots of Empathy

RESEARCH SYMPOSIUM

TORONTO, CANADA

MAY 7-9, 2014

PROCEEDINGS



Roots of Empathy
Racines de l'empathie

www.rootsofempathy.org

Introduction

The 2014 Roots of Empathy Research Symposium was a riveting and inspiring gathering in Toronto, Ontario. Cultural thinker and writer Dr. Roman Krznaric's powerful presentation on empathy and democracy launched the symposium in support of Roots of Empathy's mission to build a more caring, peaceful, and civil society through the development of empathy in children and adults. Dr. Ric (Eric) Young moderated the captivating panel conversation as Dr. Gwynne Dyer, Nicholas Parker (MBA), and Dr. Paul Thagard discussed the role of empathy in a democracy from their unique perspectives.



Dr. Ric (Eric) Young, Dr. Paul Thagard, Dr. Gwynne Dyer, and Nicholas Parker, MBA

The keynote address by Dr. Philip Zelazo on executive function and implications for promoting empathy in childhood opened the symposium. Remarkable addresses by Dr. Stephen W. Porges, Dr. Paul Thagard, Dr. Sue Carter, Dr. Susanne Denham, Dr. Leslie Atkinson, Dr. Michael Inzlicht, and Dr. Raymond Mar engaged the attendees and led to insightful dialogues around the topics of self-regulation, empathy, neuroendocrinology, social-emotional development, attachment, and empathy and narrative fiction.

Roots of Empathy values the lens of research as the organization continues to provide empathy-based programming to children on three continents. We would like to thank HopeLab for their generous contribution toward the 2014 Roots of Empathy Research Symposium.



*Mary Gordon
Founder/President*



*Lisa Bayrami, PhD
Director of Research*

Executive function, reflection, and neuroplasticity: Implications for promoting empathy in childhood

PHILIP DAVID ZELAZO, PhD

*Institute of Child Development
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Executive function encompasses brain processes involved in top-down regulation of attention, thought, emotion and action. Executive function involves translating knowledge into practice and develops and differentiates over the course of childhood into 3 facets seen in adults:

- Cognitive function
- Working memory
- Inhibition control

Essentially, executive function is a set of foundational skills that set the stage for children to be able to learn. While not empathy per se, the development and display of empathy is supported by executive function skills such as paying attention, resisting distractions, keeping relevant aspects of the context in mind, flexibility in considering others' perspectives, and inhibiting avoidance responses. Executive function also plays a critical role in the process of problem-solving.



Philip David Zelazo

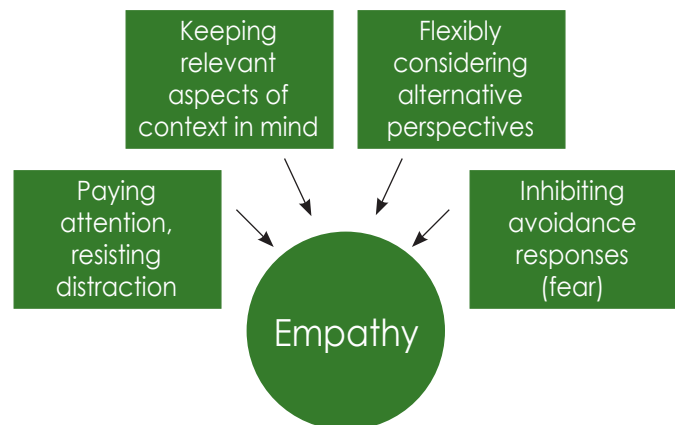
*Executive function measured in childhood is
a robust predictor of self and social awareness, school readiness, academic achievement, and
a wide range of developmental outcomes extending into adulthood.*

One of the key principles of developmental neuroscience is the concept of brain malleability, or neuroplasticity. There may be a benefit to attempting to boost executive function prior to the sharp increase in demands that will be placed on the child's executive function skills with the entrance into kindergarten.

Effective executive function interventions must engage children in a goal-directed activity that requires reflection and continually challenges the child's skill through increasing levels of difficulty. The intervention must also involve the opportunity for repeated practice.

Reflection training has the goal of allowing the child to practice stepping back, reflecting and formulating a higher-order rule. This has been studied using the dimensional change card sort (DCCS), a widely accepted measure of executive function in children. In 3 experiments with children who had previously failed the DCCS, reflection training improved performance on the DCCS as well as flexible perspective training (theory of mind) and neural activity.¹

Figure 1. Executive function skills that support the development and display of empathy



We are currently conducting a research intervention program in homeless and highly mobile children who experience prolonged toxic stress and may not have the same opportunities to develop executive function skills compared to their more advantaged peers. Promoting executive function is attempted with a three-pronged approach of small classroom groups, parent training, and tailored individual executive function training.

Summary

Executive function provides a foundation for empathy and empathic behaviour. We know that the development of executive function occurs rapidly in early childhood, suggesting that this is a period of relatively high malleability. This represents a window of opportunity for interventions. The ability to intervene and assist the development of executive function has positive consequences that are potentially far-reaching.

1 Espinet, Anderson, Zelazo (2013)



Classroom teacher, Tom Veenstra, and grade 7 and 8 students, Daniel Bukhari, Jodan Davis, Tonusri Saha, and Farid Dastmalchi (left to right), from Market Lane P.S. shared their powerful reflections on experiencing the Roots of Empathy program, leaving many attendees in tears.

The Polyvagal Theory: Neural mechanisms mediating social behaviour, emotional regulation, and health

STEPHEN W. PORGES, PhD

Professor

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Stephen W. Porges

Connectedness: A biological imperative

Individuals have a need to interact with and to feel connected to others. Face-to-face interaction, body postures and gestures provide clues of safety or danger to our nervous system. Our nervous system, through a process labeled as neuroception, evaluates risk in the environment and shifts our physiological state to adaptively deal with these cues. Neuroception is the nervous system's detection of safety and risk /danger in others without awareness. Through detection of cues of safety (via neuroception), mammals have an ability to co-regulate their physiological state with another. This connectedness provides the neurobiological mechanism to link social behaviour and both mental and physical health. As such, social behaviour is a "neural exercise" that supports neurophysiological states that promote mental and physical health. This is part of the underlying process occurring in Roots of Empathy, the enabling of a self-regulation and co-regulation of bodily and physiological states through social interaction.

The quest for safety

Feelings of safety are emergent and depend on a neural state related to connectedness. Opportunities to co-regulate physiological and behavioural states functionally minimize hypervigilance and optimize the social behaviours and cognitive processes required during educational processes. Environmental triggers of defense are related to both physical aspects of danger (e.g., low frequency sounds, movement from behind the child) and metaphorical features of isolation (e.g., socially marginalized). Based on our neuroception, our reactions either:

- Promote defensive strategies of mobilization (fight/flight) or immobilization (shutdown, dissociation), or
- Dampen defensive systems and facilitate social behaviour

Behavioural features that signal safety to our nervous system include face-to-face engagement, prosodic features of vocalizations, and reciprocity (facial expression and vocalizing/listening). These safety signals inform our nervous system that it is safe to immobilize without fear and that we no longer need to be vigilant about activities occurring near us. Faulty neuroception of positive cues may shift biobehavioural states, distort social awareness, and displace spontaneous social behaviours with asocial behaviours and defensive reactions.

Roots of Empathy supports a developmental trajectory towards more optimal outcomes.

The Neural Love Code

The neural love code is a set of biological rules that fulfill the body's need to engage another and to find safety in proximity to another. The neural love code has two sequential phases:

- Phase I –negotiating safety in psychological space (i.e., face-to-face interactions using features of the social engagement system (e.g., facial expressions, prosodic voice, head gestures)
- Phase II – enabling physical contact and immobilization without fear (touching and feeling safe during physical contact)

Social behaviour is a neural exercise that builds resilience and supports neurophysiological states that support mental health.

When the conditions of the neural love code are met, the body is able to optimize the ability to rest, relax, sleep, digest, and perform bodily functions. The neural love code supports a physiological state that facilitates optimal mental and physical health and explains the health benefits of social support/reciprocity.

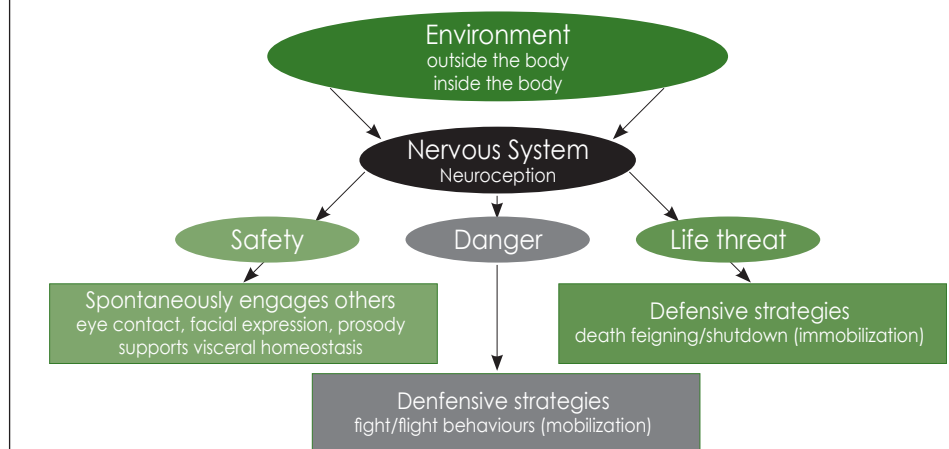
Immobilization with fear is a defense construct that has often been missed in psychology/psychiatry. While challenges in our environment often trigger “fight/flight” responses mediated by the sympathetic nervous system, some challenges may result in an “immobilization” response mediated by the vagus. However, the vagal pathways involved in immobilization with fear are different than the vagal pathways involved in the social engagement system. The vagal pathways involved in defense are unmyelinated and originate in the dorsal nucleus of the vagus. The vagal pathways involved in the social engagement system are myelinated and originate in the nucleus ambiguus. Thus, not all vagal pathways are restorative; some are defensive and potentially lethal. This differentiation in function between the vagal pathways led to a “vagal paradox” that was resolved with the conceptualization of the Polyvagal Theory.

The Polyvagal theory has 3 main tenets: (Figure 1)

- Evolution provides an organizing principle to understand neural regulation of the human autonomic nervous system
- Three neural circuits form a phylogenetically-ordered response hierarchy that regulates behavioural and physiological adaptations to safe, dangerous, and life-threatening environments
- Neuroception of danger, safety or life-threat is the trigger for these adaptive neural circuits

Neuroception allows our nervous system to detect and evaluate a situation as safe, dangerous, or life-threatening. Feeling safe is a necessary prerequisite for strong social relationships to be established and for social support to be effective. The principles to establish relationships are similar to play and can be thought of as a neural exercise. Typical features will include reciprocity, face-to-face interaction, and/or prosodic vocalizations that will act to dampen any potential defensive reactions to proximity and touch.

Figure 1. The quest for safety: Emergent properties of physiological state



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The Polyvagal Theory raises the question of the possibility of a new paradigm. If social behaviours are not learned, are they emergent properties of specific neurophysiological states? And importantly, could intervention strategies be focused on manipulating or supporting these neurophysiological states.

We have to shift the neurophysiological state to calm to enable opening of the portals of learning.

The principle underlying Roots of Empathy is that the program changes the physiological state of the children...and they become more spontaneously social and engaging.

This is your brain on empathy

PAUL THAGARD, PhD

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What is empathy?

Empathy uses words and language to develop an analogy between the feelings of others and your own. However, empathy is also a physiological, brain process.

Empathy requires emotional imagery, which is a brain driven process. Emotional imagery is the mental capacity to construct images based on experiences (e.g. pictures, sounds, pain etc.).

Neural mechanisms

The concept of empathy as a brain process is based on the synthesis of 2 theories of emotion, as cognitive appraisal and as physiological perception. The synthesis of these 2 theories is accomplished by neural networks that are capable of symbolic processes using semantic pointers.¹

There are 4 main neural mechanisms postulated to be involved in the brain process for empathy:

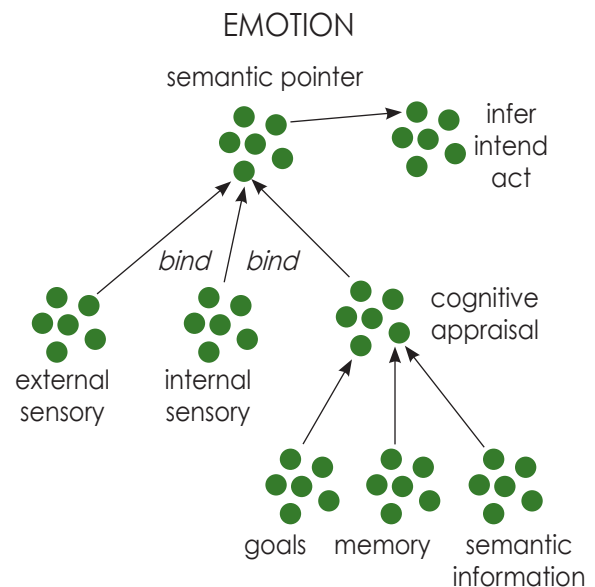
- Representation of visual images by populations of neurons
- Binding of representations into more complex representations
 - This allows the ideas to be put together and then taken apart for transformation.
- Transformations of representations by operations on images
 - This provides the ability to modify an image of your own emotions and project it onto someone else.
- Competition among representations to become conscious
 - Semantic pointers are the mechanism used to bring representations to consciousness.
 - Semantic pointers allow deeper meaning by retaining conceptual representations including perceptual, motor and emotional information.
 - Semantic pointers also help to control the flow of information through a cognitive system to accomplish its goals.
 - Semantic pointers allow us to infer or reverse and unpack all the information that bundles together so that we can subsequently infer, and form an intention or act.

Figure 1 depicts emotion as a neural process that pulls together information from multiple sources.



Paul Thagard

Figure 1.



Modes of Empathy

There are 2 modes of empathy: automatic and deliberate.

Automatic empathy is fast, unconscious and nonverbal. It can be explained by two mechanisms; mirror neurons and emotional contagion. Mirror neurons are where observation leads to a pattern of firing in your brain similar to the pattern of firing in another person's brain, for example when looking at pain in another. Emotional contagion is the mimicry of facial expressions and body language that leads to similar emotions (i.e., patterns of neural firing).

Deliberate empathy, on the other hand, is slow, conscious and verbal. This is when you imagine yourself in the place of others and use your own past experience to infer what they are experiencing.

Increasing Empathy

Increasing empathy has the goal of achieving emotional imagery (brain state) that corresponds to another person. Increasing automatic empathy means placing yourself in situations that engage mirror neurons and emotional contagion. This is what the baby in the Roots of Empathy classroom accomplishes.

Increasing deliberate empathy requires using your knowledge of people and situations to construct an image of the situation of others. Analogy can be used to retrieve and adapt your own experiences to understand what someone else is going through.

The Roots of Empathy program combines both automatic and deliberate empathy and facilitates them working in coordination.

Summary

Empathy is a brain process that requires emotional imagery and is not just conveyed with language. The 4 main brain mechanisms responsible for emotional imagery are representation, binding, transformation, and competition among semantic pointers. The Roots of Empathy program targets both automatic and deliberate empathy through the presence of a baby in the classroom and the communication skills of the Roots of Empathy Instructor.

¹ Eliasmith (2013)

Oxytocin and the evolutionary “Roots of Empathy”

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Empathy: An evolutionary concept

The role of empathy in human society can be viewed as an evolutionary concept. Empathy is one of several positive emotions that can increase survival and enhance reproduction.¹ The driver for evolutionary change is increased survival. Empathy, in a complex mammalian population, improves social support and safety, as well as access to mates, enhanced care of offspring, and hence an improved likelihood of genetic survival. The mammalian nervous system has evolved to function optimally in a supportive social environment, where social behaviour provides what Myron Hofer called “hidden regulators” of physiological and behavioural homeostasis. The absence of social interactions and bonds may lead to substitutions such as the abuse of drugs or food, or reactions like depression, illness, or even death.



Sue Carter

The role of oxytocin

Social stimuli and support can come from many sources (e.g. partners, children). Care of infants can be an important social stimulus and while the reciprocal benefits are not limited to biological offspring or relatives, the evolutionary prototype for social support and bonding is the mother-child interaction. These social bonds first appear in association with birth and lactation, and are tied to the functions of oxytocin, a simple mammalian peptide that is central to the biology of social behaviour, social bonds and social support, and sexual behaviour. In this context it can be viewed as a physiological metaphor for safety, with consequences for survival, reproduction and the evolution of modern humans.

Historically, the role of oxytocin was best understood in the context of birth and lactation. It also has major effects on the mother, reducing reactivity to stress and providing a buffer between the pregnancy and post-partum physiological states. This is supported by the higher basal heart rates, systolic blood pressure and greater reaction to cortisol in bottle-feeding mothers compared to those who breastfeed their infants. An enhanced immune response is also seen in breastfeeding mothers.²

Oxytocin's effects on the uterus, aiding in the delivery of the large cranium of the human infant, and on the mammary glands for lactation led to its classical description as a "female reproductive" hormone. Over the last twenty years, it has been realized that oxytocin is released into the bloodstream within the nervous system as well as at the posterior pituitary gland, and affects social behaviour, the autonomic nervous system and the immune system, preparing the body to adapt in the face of challenge.

Oxytocin works in concert with vasopressin, from which it differs by two of its nine amino acids. These hormones can both be traced to a common ancestral molecule that predates the evolution of vertebrates. The development of mammalian traits of social behaviour are linked to the development of oxytocin and vasopressin along the evolutionary path from reptile to mammal. In the context of evolution, oxytocin permitted the evolution of the mammalian nervous system, and eventually the evolution of the human nervous system.³ While vasopressin is associated with defensive traits such as territoriality, vigilance and activation of the sympathetic nervous system, oxytocin is associated with more prosocial effects, such as relaxation and recovery, sharing, and effects on the parasympathetic nervous system.⁴

Summary

Insights into the role of oxytocin provide us with a deeper understanding of the biological basis of human emotion and the role of factors such as social support in our health and wellbeing. Beyond the historically recognized roles in birth and infant nutrition, oxytocin may be a factor in the body's capacity to protect or heal the wounds of physical or emotional stresses. These roles support oxytocin as a physiological metaphor for safety, with systemic interactions throughout the body that are only now being recognized.

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- 1 Carter (1998)
 - 2 Carter & Altemus (1997)
 - 3 Carter (2014)
 - 4 Carter & Porges (2013)



Mariah Tate (HopeLab) and Lalita Suzuki (Omidyar Group)

Social-emotional competencies and preschoolers' early school success

SUSANNE DENHAM, PhD

University Professor

George Mason University

In recent years there has been a growing awareness that there are other aspects to children's readiness for school beyond cognitive. When children can engage in sustained, positive interaction with peers in the learning environment and respond in a regulated way to other demands of the learning environment they are better equipped to learn.¹ This behaviour driven by social emotional learning (SEL, Table 1) and how it relates to school readiness has become a focus of research.

The cognitive aspects of self-management can be divided into cool and hot executive control. Cool executive control has been defined as the ability to "intentionally or deliberately hold information in mind, manage and integrate information and resolve conflict/competition between stimulus representation and response options."² Cool executive control is exhibited when a child pays attention during instructions and demonstrations; this requires sustained concentration and engaging working memory. Hot executive control is the ability to suppress a dominant response and enact a less automatic but more adaptive response to attain a goal in a given situation; for example when a child refrains from indiscriminately touching test materials and letting the examiner finish explaining before starting the task.



Susanne Denham

Table 1. Social-Emotional Learning (SEL)

Self- and other awareness	<ul style="list-style-type: none"> • Emotion knowledge
Self-management	<ul style="list-style-type: none"> • Emotional, cognitive/attentional, behavioural regulation • Emotional expressiveness
Social problem-solving	<ul style="list-style-type: none"> • Encoding and interpreting social situations • Deciding how they fit with one's goals • Deciding how one would feel and respond behaviourally in the situation
Relational skills	<ul style="list-style-type: none"> • Taking turns • Co-operation • Listening • Help-seeking

SEL and school readiness

Assessment tools have been developed to assess preschoolers level of SEL and the association with school readiness. The preschool self-regulation assessment (PSRA)³ has shown that ratings of positive engagement, confidence, positive emotion and overall emotion regulation predict Head start children's approaches to learning, social behaviour and achievement over time. Additionally, cool executive control skills were associated with decreased behavioural problems.

Preschoolers' emotion understanding of self and others changes between 3-5 years of age. Typical preschoolers understand different emotional expressions and use emotion language in response to different situations/causes. As they develop more sophisticated skills, by age 5, children begin to recognize that some people can feel differently than what they feel. The Affect Knowledge Test (AKT) assesses preschoolers' emotion knowledge, and predicts concurrent and later attitudes towards learning, classroom adjustment and kindergarten achievement. Assessed SEL abilities at 5 years of age predict academic and social competence at 9 years of age. Generalizing, children who do well on the AKT, do well at school and with peers.

The Challenging Situations Task (CST) assesses children's social perceptions of their own emotions and behaviours when provoked by peers. Children are asked to pick from pictorial choices focusing on how they feel and what they would do in a challenging peer situation. The choices a child makes, especially sad and socially competent choices, relate to the level of emotion knowledge, teacher ratings of classroom behaviour, and early school success. In earlier research, children at risk for behaviour problems were not likely to make socially competent choices, and boys with diagnosable behaviour problems twice as likely to choose aggressive solutions in the CST.

Children also develop in their expression of emotion and its regulation during the preschool years. For example, their emotional expressiveness becomes more nuanced, with blended emotions and stable emotional styles in evidence, as well as the increasing voluntary and successful management of emotions.

New evidence is presented that (1) direct and indirect longitudinal pathways exist from these SEL skills and later preschool and kindergarten classroom adjustment, as well as kindergarten pre-academic achievement and (2) that profiles of these SEL skills can be derived, showing that the skills work together, with differential prediction of teachers' views of early school success. Based on past and the currently presented body of evidence that SEL is an important predictor of school readiness and achievement, teaching SEL to children is the next logical step. In particular, programming is needed that focuses on emotions, and is directed to vulnerable groups such as boys and children living in poverty.

1 Denham, Brown & Domitrovich (2010)

2 Blair & Urshache (2011)

3 Smith-Donald, Raver et al. (2007)



Grade 7 and 8 students from Market Lane P.S.

Overcoming the limits of empathy by cultivating self-control

MICHAEL INZLICHT, PhD

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Empathy can be broadly defined as the capacity to understand and share other's feelings. Empathy can be further categorized as automatic or deliberate (Figure 1). Deliberate empathy involves perspective taking/role playing and the ability to imagine oneself in the shoes of another person. Automatic empathy is quick and involuntary, when someone "catches" another's emotional state or matches the body positions and actions of another person (motor resonance). The perception action mechanism (PAM) is at the heart of neurally-based empathy models and states that the perception of a given behaviour in another automatically activates one's own neural representations of that behaviour.

Is empathy less natural for some?

Individuals have varying levels of empathy and empathy is less natural for some people versus others. People with high reward-seeking, goal-oriented behaviour may show less "auto empathy."¹ Extending this concept, a recent study investigated whether power impacted the expression of automatic empathy.² People in a position of high power demonstrated less motor resonance (related to automatic forms of empathy) with others while those with low power displayed more "action-catching" or automatic empathy.

Is empathy less readily extended to some?

Research has found that although the PAM occurs spontaneously and effortlessly, social factors seem to moderate it. Empathy increases with identification, similarity, and liking of other people, meaning that ingroups may be especially salient empathy targets. Conversely, individuals tend to show less automatic empathy to those they identify as belonging to an outgroup.³

Increasing empathy with deliberation and effort

Empathy can however increase with deliberation and effort. In an experimental setting, when a person is directed to take the perspective of a member of an outgroup, empathy can then be increased towards the outgroup.⁴ Changing perspective by deliberate imitation has also been shown to decrease prejudice.⁵

Deliberation however is effortful and requires self-control, which seems limited. The theory of self-control proposed by Baumeister and his colleagues gives self-control two important qualities:

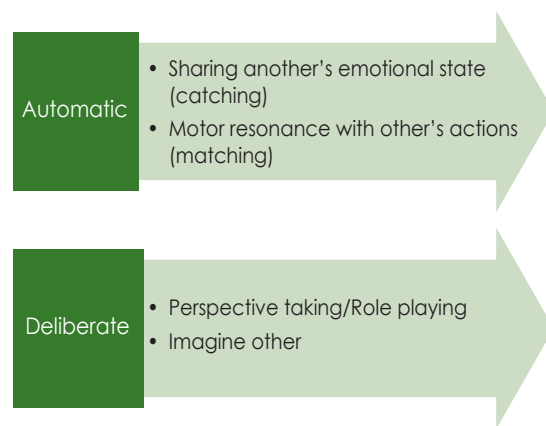
- Self-control is a central resource that underlies many behaviours and has the capacity to regulate thoughts, emotions and behaviours
- Self-control seems like an exhaustible and limited resource that quickly diminishes after use. We say *seems limited* because the limits may be more psychological than actual⁶
 - Self-control has a refractory period that is similar to fatigue

Self-control "depletion" hinders a person's ability to engage in helping behaviour and perspective taking. We can increase a person's ability to engage in deliberate forms of empathy by increasing people's motivations and willingness to engage in effortful control.



Michael Inzlicht

Figure 1. Empathy



Self-control motivation can be enhanced by autonomy, self-affirmation and mindfulness. All three of these ways to foster control may do so by increasing acceptance, by reducing defenses to self-threat and by increasing non-judgment.

Autonomous motivation is characterized by openness to the self and experience, including negative aspects of the self. Self-affirmation is thought to reduce defensiveness and increase openness to self-threat, while mindfulness is characterized by a form of attention that is both present and non-judgmental. Critically, all three of these have been shown to improve self-control performance⁷, and as such may be promising avenues via which to increase empathy.

Summary

Empathy is natural and intuitive but may be more natural for some and more readily extended to some people and groups. It is possible to increase empathy with deliberation but this is effortful and requires a level of self-control. It is possible to potentially overcome the limits of empathy by cultivating self-control, which can be accomplished via autonomous motivation, mindfulness and self-affirmation.

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- 1 Tullett, Harman-Jones & Inzlicht (2012)
 - 2 Hogeveen, Inzlicht & Obhi (2014)
 - 3 Gutsell & Inzlicht (2010)
 - 4 Gutsell & Inzlicht (in preparation)
 - 5 Inzlicht, Gutsell & Legault (2012)
 - 6 Inzlicht, Schmeichel, & Macrae (2014)
 - 7 Inzlicht & Legault (2014)

Empathy and narrative fiction

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How can we foster empathy? Could narrative fiction possibly be used as a tool to foster and develop empathy? We will explore the theoretical arguments and empirical research on both adults and children pertaining to these questions.

When defining narrative fiction, content is the determining factor as structure can be quite variable. The requirement for a text to be considered narrative fiction is that the content be fabricated and social in nature, pertaining to the thoughts and emotions of individuals, often in interaction.

We comprehend narrative fiction using basic cognitive processes, including mental simulation, embodied cognition and drawing on memories and experience.¹⁻⁴ If we understand stories through an embodied experience, and stories are fundamentally social in nature, then there may be positive social outcomes that result from engaging with fiction. These outcomes could result from the exercising of social-cognitive processes or exposure to the social content of stories.

Empirical research has begun to explore whether we can learn social truths and social processes from fiction. Studies based on children are broadly consistent with the idea that this may be the case. Children acquire a theory-of-mind between the ages of 3-6, allowing them to understand that others may have different thoughts and emotions compared to their own. At around the same age, they gain the ability to follow the mental perspective of a fictional character.^{5,6}

Storybooks may be a good source of social information for children as they are social in nature. In fact, over 75% of books read to preschoolers include some mental state language, with references to mental states appearing frequently, approximately once every 3 sentences.^{7,8}



Raymond Mar

Are all books and media equal?

Narrative storybooks are more likely to elicit discussion about mental-states compared to didactic storybooks.¹² While movies seem similar to narrative storybooks in their ability to facilitate mental-state discussion, television has shown a null or negative association with theory-of-mind.^{13,14}

Does exposure to children's storybooks correlate with social development? One study investigated how parental recognition of children's authors and titles predicted children's performance on a battery of 5 theory-of-mind tasks. After controlling for age, gender, vocabulary and parental income, the parental ability to recognize children's authors/titles was related to the child's performance on the theory-of-mind tests.⁹ A separate study found similar results, based on parental self-report of child reading and a single theory-of-mind task.¹⁰ Additional convergent evidence was found in a study examining whether parental expertise in choosing children's books would predict teacher rankings of children's empathy and socio-emotional development. A positive correlation was observed between parental expertise and children's empathy and socio-emotional development, which persisted even after controlling for maternal education.¹¹

Although the above studies demonstrate correlation, they do not prove causation. However, we know from other research that these effects are not simply due to the text itself. One factor to consider is the characteristics of the joint parent-child reading context. While reading to children, parents make use of mental-state terms. In fact, joint-reading involves a lot of discussion of mental-states, more so than everyday conversations. These discussions in turn predict better social understanding in children.

These findings support many of the foundational principles that underlie the Roots of Empathy program, highlighting the importance of this carefully-designed and highly beneficial intervention.

Research in adults has demonstrated similar results. Overall, narrative fiction correlates with improved mental-inference ability. Brief highlights are summarized below:

- When assessing adults' ability to infer mental-states from photographs, narrative fiction was a positive predictor even after controlling for age, English ability, intelligence and expository nonfiction exposure¹⁵
- The positive correlation between narrative fiction and mental-inference ability has been replicated by multiple studies,^{16,17} and some new experimental evidence has shown that exposure to narrative fiction causes greater empathy.¹⁷

Summary

There is burgeoning evidence that narrative fiction may help foster empathy and understanding in children and also in adults. This is an exciting area of research that is beginning to grow. These findings support many of the foundational principles that underlie the Roots of Empathy program, highlighting the importance of this carefully-designed and highly beneficial intervention.

- 1 Gerrig (1993)
- 2 Oatley (1999)
- 3 Barsalou (1999)
- 4 Larsen & Seilman (1988)
- 5 Wimmer & Perner (1983)
- 6 O'Neil & Shultis (2007)
- 7 Cassidy et al. (1998)
- 8 Dyer et al. (2000)
- 9 Mar et al. (2010)
- 10 Adrian et al. (2005)
- 11 Avram & Aviram (2009)
- 12 Nyhout & O'Neil (2013)
- 13 Mar et al. (2010)
- 14 Nathanson et al. (2013)
- 15 Mar et al. (2006)
- 16 Mar et al. (2009)
- 17 Kidd & Castano (2014)



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