

Development of prosocial behavior

Prosocial behaviors are voluntary behaviors that are intended to benefit others, such as helping, sharing, caring, and comforting. They are a hallmark of social competence in children of all ages. Prosocial behaviors correlate with social adjustment in later life.

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Executive summary

- There are two main types of prosocial behavior which develop in infancy and gradually increase in early childhood: sharing and helping.
- Maturation of prefrontal cortical circuitry improves behavioral control and supports the development of sharing behavior during childhood, producing a shift from the immediate desires of reward maximization to complying with the social norms of sharing.
- Helping behavior emerges as early as 14 months and functional changes in brain development support the linkage between prosocial behaviors in early childhood and effortful control at a later age.
- Prosocial behavior and its psychological foundations are critical not only for the context of individual but also for social and global contexts. Therefore, a global preschool curriculum specifically designed to foster prosocial behavior is needed for preparing young children with competencies critical for the future.

Introduction

Prosocial behaviors are voluntary behaviors that are intended to benefit others, such as helping, sharing, caring, and comforting (Eisenberg & Mussen, 1989; N. Steinbeis, 2018). They are a hallmark of social competence in children of all ages. Prosocial behaviors correlate with social adjustment in later life (Jones, Greenberg, & Crowley, 2015). Importantly, prosocial behaviors and cooperative behaviors are conceptually associated (Eisenberg & Miller, 1987). There are two main types of prosocial behavior which develop in infancy and gradually increase in early childhood: sharing and helping (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011).

Dunfield et al. (2011) suggests that prosocial behaviors are crucial for harmonious in-group relationships, cooperation, and working together to fulfill a goal (Eisenberg & Mussen, 1989). Therefore, fostering prosocial behaviors in young children may have long-term benefits not only for individual competencies but also for group harmony and a peaceful society.

Why is prosocial behavior important?

The 21st century demands people communicate and negotiate with others for novel solutions. Prosocial behaviors in young children are an essential foundation for future competencies such as collaboration, social cohesion, harmony, and peaceful society. Importantly, prosocial behaviors during childhood predict adaptive functioning at a later age. For example, highly aggressive children with low prosocial behaviors predict behavioral adjustment problems at a later age (Gresham, Elliott, & Kettler, 2010). Therefore, building and maintaining positive relationships with others is crucial for work and life success in the future. The neurocognitive basis of prosociality arises very early in young children and needs guidance from adults to enable strengthening of the neural circuits for helping and sharing which are crucial for future competencies.

A neural system for development of prosociality

According to Piaget's theory, preschool children exhibit egocentrism or inability to differentiate between their perspective and another's (Piaget, 1954). Children at this stage are self-centered and have difficulty sharing with others. It has been proposed that sharing behavior in the first three years of life may not occur due to empathy but could be due to children's tendency towards imitation and social play (Damon, Lerner, & Eisenberg, 2006). However, from the age of three, empathetic awareness and encouragement from an adult can enhance children's helping and sharing behavior.

While some theories claim that prosocial behavior in young children is automatic and spontaneous, others propose it requires cognitive control (Eisenberg-Berg, Haake, Hand, & Sadalla, 1979; Svetlova, Nichols, & Brownell, 2010). The nature of sharing and helping can involve conflicts of interest—i.e., between what is best for oneself (egoism) and what is best for others (sociality). Performing prosocial behavior is not always easy—i.e., sharing means less for oneself while helping others can require time and effort. Therefore, cognitive control might be crucial for deciding to share or to help others. Steinbeis (2018) proposes that the prefrontal cortical circuitry plays an essential role in the decision to favor prosocial behavior. Also, advances in neuroscience research have shed light on the role of value-based decision-making in the development of prosocial behavior during childhood. For example, there is strong evidence that the maturation of prefrontal cortical circuitry

supports the development of prosocial behavior during childhood and adolescence. In this view, the neural mechanisms underlying prosociality may undergo protracted development.

Sharing

There are two brain areas involved in sharing behavior: the dorsolateral prefrontal cortex (DLPFC), which plays a role in cognitive and behavioral control, and the ventromedial prefrontal cortex (VMPFC), which plays a role in decision-making, self-control, and the cognitive evaluation of morality. It is likely that increased functional coupling between DLPFC and VMPFC helps to compute the value signal and to make a decision to share. Moreover, sharing is correlated with increased activity in the DLPFC (Spitzer, Fischbacher, Herrnberger, Grön, & Fehr, 2007) while disrupting activity in the DLPFC can reduce sharing behavior (Ruff, Ugazio, & Fehr, 2013). A recent study showed that sharing in children increased between the ages of 6–13 years and this correlated positively with activity in the left DLPFC and behavioral motor control (Steinbeis, Bernhardt, & Singer, 2012). In addition, there is evidence showing that behavioral inhibition is positively correlated with sharing in preschool and school-aged children (Aguilar-Pardo, Martínez-Arias, & Colmenares, 2013). In summary, maturation of function and connectivity of the prefrontal cortical circuitry improves behavioral control and supports the development of sharing behavior throughout childhood. DLPFC is also the key brain area that supports the decision to favor long-term goals in both children and adults (Steinbeis, Haushofer, Fehr, & Singer, 2014). Such a mechanism scaffolds the shift away from the immediate desires of reward maximization towards complying with the social norms of equal sharing.

Helping

Helping behavior emerges as early as 14 months, suggesting that the brain circuitry for prosocial behavior begins to develop from early childhood (Warneken & Tomasello, 2007). Many skills can help scaffold helping behavior in young children. For example, children with higher emotional response and emotional regulation are more likely to help others than those with low emotional response and regulation. Another contributing skill is the empathic concern or the ability to understand another's feeling (e.g., understand other's feeling of pain) which can also predict helping behavior in young children. The brain areas that activate when we are observing someone feeling pain are the bilateral anterior insular cortex and the anterior cingulate cortex (ACC) (see Figure 1) (Lamm, Decety, & Singer, 2011). Increased activity in the anterior insular cortex positively correlates with empathic concern and helping behavior (Hein, Silani, Preuschoff, Batson, & Singer, 2010).

Moreover, the connectivity between the anterior insular cortex and the ACC correlates with prosocial behavior (Hare, Camerer, Knoepfle, Doherty, & Rangel, 2010). The ACC plays a role in the processing of emotional conflict that leads to empathic concern and later induces prosocial behaviors such as helping and sharing (Etkin, Egner, & Kalisch, 2011). Additionally, activation in the anterior insular cortex and the ACC correlating with empathic concern can be observed as early as four years old (Etkin, Egner, & Kalisch, 2011; Michalska, Kinzler, & Decety, 2013). Importantly, empathic concern at a young age predicts the activation of inferior frontal gyrus (IFG) at a later age (Decety & Michalska, 2010). The IFG is a brain area which plays a role in effortful control. Therefore, these lines of evidence provide linkage between prosocial behavior in early childhood and effortful control at a later age (Steinbeis, 2018).

What can be done?

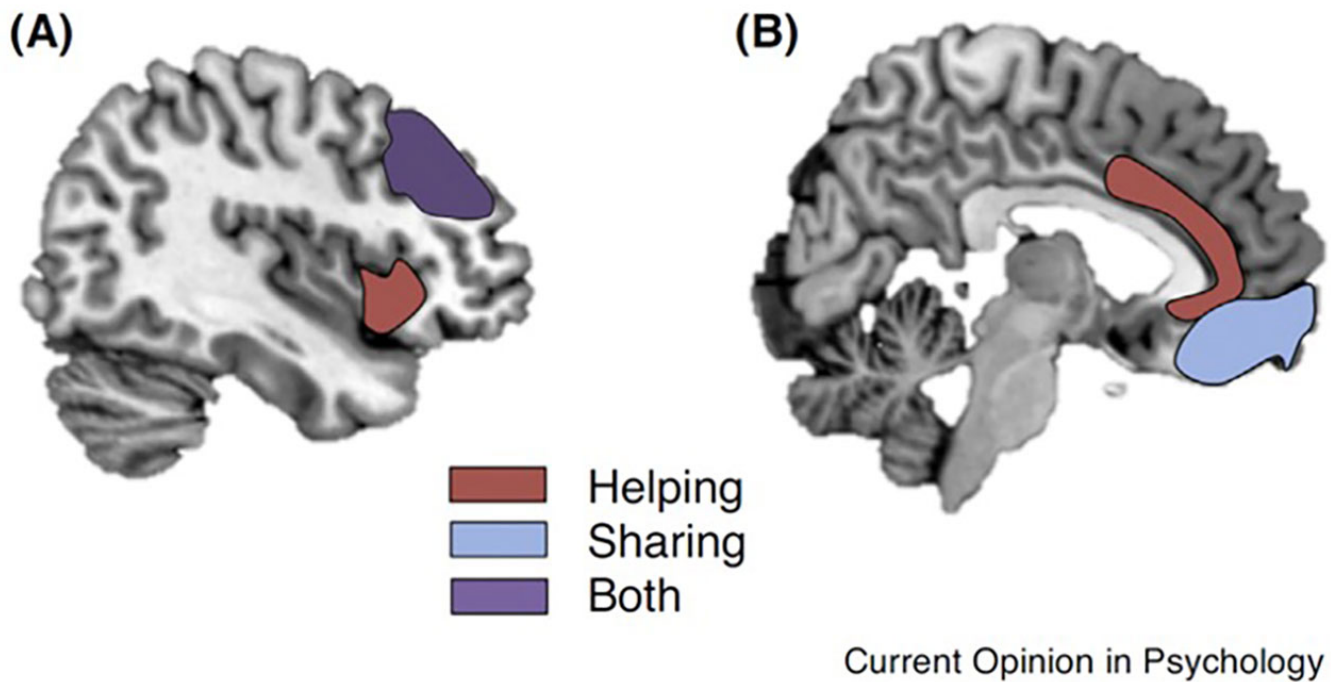


Figure 1. Brain regions involved in prosocial behavior during childhood. (A) Lateral view showing anterior insula (red) and dorsolateral prefrontal cortex (purple). (B) Medial view showing anterior cingulate (red) and ventromedial prefrontal cortex (blue) (Steinbeis, 2018).

Social skills, such as emotion recognition, empathy, generosity, helping, and sharing with others, are critical competencies that enable an individual to build and maintain positive relationships and avoid negative interactions with others (Greesham and Elliott, 1990). These skills are increasingly being recognized as a critical foundation for school readiness and academic success, as well as for work and life success in the long term (Gresham, 2014; Kathryn, 2015; McClelland & Morrison, 2003). Research findings suggest that children internalize the prosocial and moral behaviors they observe from others. Thus, teachers and friends have the potential to promote the development of prosocial behavior in young children. Classroom environments that allow children to share and help each other, or work in groups, might also help scaffold prosocial skills in young children. In conclusion, prosocial skills and their psychological foundations are critical not only for the context of individual but also social and global contexts. Therefore, a global preschool curriculum specifically designed to foster prosocial behavior is needed for preparing young children with competencies that are critical for their future.

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