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Children's sharing with collaborators versus competitors: The impact of theory of mind and executive functioning☆

Elizabeth S. Nilsen*, Alanna Valcke

University of Waterloo, Canada

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ABSTRACT

While children show an appreciation for fairness, their sharing does not always reflect such principles. This work examined how contextual factors (competition/cooperation; self/other perspective) and socio-cognitive skills impact children's sharing. Children (4- to 6-year-olds and 7- to 9-year-olds) set up games played either with (cooperative) or against (competitive) peers. The set up involved allocating resources necessary to completing the task (e.g., blocks used to build towers). Children also completed measures of executive functioning and mentalizing skills. Children who focused on the perspective of their social partner prior to allocating resources shared fewer items than those who reflected on their own perspective. Fewer items were shared in the competitive (versus cooperative) context and younger (versus older) children shared fewer items. Age moderated the relationship between executive functioning and sharing: younger children with more proficient executive skills tended to share more items, whereas this pattern did not emerge in the older group.

Introduction

As disappointing as it may be for many children, resources (e.g., toys, items of food, stickers) are not limitless and, thus, there are numerous situations in which they must decide who is the recipient of particular desired items. Though young children may know what is considered to be fair, actually behaving according to such principles is a more difficult challenge that may require the support of cognitive skills. Past work has charted the development of children's sharing behaviour (e.g., Brownell, Iesue, Nichols, & Svetlova, 2013; Brownell, Svetlova, & Nichols, 2009; Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; Paulus & Moore, 2012; Rheingold, 1982; Warneken & Tomasello, 2006). However, the contextual factors that influence sharing, as well as the mechanisms underlying such behaviour, have received less focus (Paulus, 2014). The present investigation sought to explore these factors by examining children's sharing within a cooperative context, where a researcher informed them they would be working collaboratively with a peer, as well as within a competitive context, where the researcher told them they would be competing against a peer. To understand the degree to which reflecting on one's own versus a social partner's goals may impact behaviour, children reflected on what they/their partner wanted to happen. Children's ratings of fairness, predictions of the peer's actions, and sharing behaviour in both contexts were examined in relation to their mentalizing skills and executive functioning (EF). Uncovering the nature of prosocial behaviour, such as sharing, within early childhood is important given its strong relations to later social and academic success (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000).

Contextual factors that impact sharing

There are a number of situations that children will encounter within their broader social environment. These include cooperative contexts, in which their goal is convergent or shared with another individual, as well as competitive ones, in which their goals are at odds with those of another individual. Social competence entails recognizing the social context and mobilizing appropriate behaviours for this context. Past work has shown that children show sensitivity to these varied situations at a young age and moderate their behaviour accordingly. For instance, 5 to 8 year old children show more cooperative behaviours (e.g., sharing game items) with peers during a collaborative task versus during a competitive task (Huyder & Nilsen, 2012). While not a manipulation of the context per se, work examining cultural factors also highlights the influence of the backdrop on which social behaviour is

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* Corresponding author at: Psychology Department, University of Waterloo, 200 University Avenue West, Waterloo, Ontario N2L 3G1, Canada.
E-mail address: enilsen@uwaterloo.ca (E.S. Nilsen).

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embedded. For example, preschool-age children (aged 3–5 years) from more collectivist cultures (e.g., China, Peru, Fiji) show more spontaneous sharing and less self-interested biases than do preschoolers from more individualistic backgrounds (e.g., America, Brazil; Rao & Stewart, 1999; Rochat et al., 2009).

The context in terms of social partner also impacts children's sharing behaviour, with 3- to 8-year-old children sharing more with a classmate versus a stranger (with this pattern strengthening with age; Fehr, Bernhard, & Rockenbach, 2008; also see Fehr, Glätzle-Rützler, & Sutter, 2013). Indeed, children infer friendship when they see someone preferentially distributing resources to an individual (Liberman & Shaw, 2017). Together, this research suggests that it may be the case that children are more willing to share resources with an individual whom they see as a collaborator as opposed to someone whom they see as a competitor. Adding to this assumption, children are less likely to share when it is seen as costly (Paulus, 2014), as would be the case in a competitive context. Moreover, 3-year-olds are more likely to share with someone with whom they have recently collaborated to obtain resources (Hamann, Warneken, Greenberg, & Tomasello, 2011). Research with adults highlights an interesting pattern whereby individuals are more likely to share with people they are collaborating with than competing against. However, the act of thinking about the other person's perspective differentially influences their behaviour in that thinking about a collaborator's motivations increases the sharing of resources, whereas thinking about the motivations of a competitor increases more selfish behaviours (i.e., the latter pattern is termed “reactive egoism”; Epley, Caruso, & Bazerman, 2006). Thus, in some contexts, thinking about another's actions may lead to less sharing behaviour. Consistent with this notion, children who were better able to predict the behaviour of a character in a false belief task were more likely to show “poaching” behaviour in a competitive context (Priewassler, Roessler, & Perner, 2013). While such findings speak to contextual factors that influence sharing, they also highlight that there may be individual differences in children's skills which influence their sharing.

Skills associated with sharing

Socially competent behaviour requires that children appreciate and use cues within their social environment, identify their own goals as well as the goals of their social partners, and coordinate their behaviour accordingly (Huyder & Nilsen, 2012). Thus, for children to demonstrate context-appropriate behaviour, they must be able to reason about the intentions of social partners, as well as possess the skills to make use of such information to guide behaviour (Nilsen & Fecica, 2011). Given this, it is likely that a complex set of skills is required for children to engage in context appropriate sharing behaviour, such as mentalizing skills (Theory of Mind, or ToM) and EF. Such associations are considered in the present study, and the relevant literature for each area is discussed below.

ToM allows for children to attribute independent mental states to others and use information about others' intentions to interpret and predict their actions (Ashiabi, 2007; Bosacki & Astington, 1999; Decety, Jackson, Sommerville, Chaminade, & Meltzoff, 2004). While there are different aspects of the general capacity of ToM (e.g., intuitive versus reflective; decoding versus reasoning; cognitive versus affective, etc.; Hughes, 2011; Sabbagh, 2004), there is the general recognition that appreciating another's thoughts and emotions is crucial to a child's ability to interact with peers (Bosacki & Astington, 1999; Grueneisen, Wyman, & Tomasello, 2015; Hughes, Fujisawa, Ensor, Lecce, & Marfleet, 2006; Hughes & Leekam, 2004; Razza & Blair, 2009). This pattern includes children's sharing behaviour. For example, 5- to 10-year-olds' ToM skills (i.e., first- and second-order false belief) were found to relate to increased cooperative behaviours within both ultimatum and prisoner's dilemma games. More specifically, in the ultimatum game, wherein children were asked to allocate candy to themselves and their partner, children who passed false belief tasks proposed higher offers than those who failed (Sally & Hill, 2006; Takagishi, Kameshima, Schug, Koizumi, & Yamagishi, 2010). Young preschoolers who showed more advanced ToM skills spontaneously shared more often and shared more items than preschoolers who had weaker skills (Wu & Su, 2014). Moreover, 3- to 9-year-old children who had more sophisticated ToM more accurately inferred the intentions of a resource allocator who was naïve to the (in)equity present (Li, Rizzo, Burkholder, & Killen, 2017). However, a reverse pattern of results has also been demonstrated wherein children who passed a false belief task were found to share significantly less resources during a dictator game than those children who failed a false belief task (Cowell, Samek, List, & Decety, 2015). Thus, while ToM may enable children to recognize and behave according to equal distribution in some contexts, it may also allow children to appreciate that in other contexts there is no consequence for hoarding their resources.

In addition to ToM, the development of prosocial behaviours rests on the ability to regulate one's own negative emotions (Decety & Svetlova, 2012). It follows then that children's capacities for prosocial actions is related to their ability to regulate themselves (Eisenberg et al., 1996). Indeed, children's EF (i.e., their higher-order, self-regulatory cognitive processes that facilitate goal-directed behaviour; Carlson, 2005; Hughes, 1998; Pennington & Ozonoff, 1996) has been found to play a role in promoting social competence (Decety et al., 2004; Nigg, Quamma, Greenberg, & Kusche, 1999; Riggs, Jahromi, Razza, Dilworth-Bart, & Müller, 2006). For instance, better inhibitory control in children relates to more cooperation with peers (Ciairano, Visu-Petra, & Settanni, 2007; Giannotta, Burk, & Ciairano, 2011) and fewer competitive behaviours (Huyder & Nilsen, 2012). With respect to sharing behaviour more specifically, children who were reported to have better inhibitory control skills at 30 months old shared more stickers when they were 5 years old (Paulus et al., 2015).

The skills that facilitate sharing behaviour may also depend on the person with whom the child is sharing. For instance, Yu, Zhu, and Leslie (2016) found that 3- to 9- year-old children's ToM was an important prerequisite for sharing towards a stranger, but was not a significant predictor of sharing behaviour towards friends. Similarly, Paulus et al. (2015) found that children's goal encoding at 7 months old predicted their sharing towards a disliked other at 5 years old, but not sharing with a friend.

Current study

In sum, children modify their social behaviour according to situational context (i.e., cooperative versus competitive; e.g., Huyder, Nilsen, & Bacso, 2017), however, the impact that such contextual factors have on children's resource sharing has not been directly examined. Moreover, it is unclear whether asking children to reflect on their own or a social partner's intentions will influence their sharing behaviour within each context, as has been found with adults (Epley et al., 2006). ToM and EF have been found to facilitate children's sharing behaviour (e.g., Paulus et al., 2015; Takagishi et al., 2010). However, these individual differences have not been examined in relation to sharing within different situational contexts. Also, studies which examined individual differences focused on one particular skill rather than exploring a number of EF skills and/or EF while controlling for ToM or vice versa. Although, there are a few instances of studies that measure both EF and ToM (e.g., Cowell et al., 2015; Paulus et al., 2015). Finally, no work to date has explored whether there are differences in the strength of relations between (socio)cognitive skills and sharing at different developmental stages.

Addressing gaps in the existing literature, the present work had a number of research objectives. The first aim was to examine whether the context (i.e., cooperative or competitive) and the degree to which children focused on their own or their social partner's perspective influenced their sharing behaviour. To meet this aim, children completed a resource allocation task wherein they were asked to decide who,