

*Digital Comprehensive Summaries of Uppsala Dissertations
from the Faculty of Social Sciences 234*

Playing games

*Exploring children's other-oriented, self-oriented and
strategic social behaviors*

MALIN ERIKSSON



ACTA UNIVERSITATIS
UPSALIENSIS
2025

ISSN 1652-9030
ISBN 978-91-513-2398-5
urn:nbn:se:uu:diva-550464



UPPSALA
UNIVERSITET

Dissertation presented at Uppsala University to be publicly examined in 12:228, Blåsenhus, Von Kraemers allé 1A/1C, Uppsala, Monday, 14 April 2025 at 10:15 for the degree of Doctor of Philosophy. The examination will be conducted in Swedish. Faculty examiner: Docent Ingrid Olsson (Institutionen för pedagogik, didaktik och utbildningssociologi).

Abstract

Eriksson, M. 2025. Playing games. Exploring children's other-oriented, self-oriented and strategic social behaviors. *Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences* 234. 63 pp. Uppsala: Acta Universitatis Upsaliensis. ISBN 978-91-513-2398-5.

From an early age, children display other-oriented (prosocial and cooperative behaviors), self-oriented (competitive and antisocial behaviors) and strategic social behaviors. In order to increase knowledge about strategic social behavior, the nature of competition and whether playing traditional board games can moderate other- and self-oriented behaviors, three studies were conducted within the framework of this thesis. All three studies used games to assess behavior.

In Study I, 4-, 6- and 8-year-olds allocated candies to a “rich” and a “poor” adult that alternated their ability and intention to reciprocate. Spontaneous helping was also measured in a subsequent task. The aim of this study was to measure children’s strategic social behavior and its association with prosocial behavior. The results showed that 4-year-olds shared more candies with the rich adult. Children who did not spontaneously help an adult in need shared more candies with the rich adult.

In Study II, 3- to 6-year-olds built caterpillars together and could either help or hinder each other in this process. Hindering each other was operationalized as competitive behavior. The aim of this study was to investigate whether family background, socio-cognitive and moral factors were associated with children’s competitiveness. The results showed that children who were more generous and prosocially oriented competed less. In contrast, children with better moral rule cognition competed more. Boys, who were rated by teachers as more competitive, had fathers that rated themselves as competitive.

In Study III, 4- to 6-year-olds played either cooperative or competitive board games and interacted in subsequent activities, in which children’s prosocial, cooperative, competitive and antisocial behaviors were measured. The aim of this study was to investigate whether cooperative board games would increase other-oriented behaviors and decrease self-oriented behaviors, and vice versa for competitive board games. The results showed that children displayed high levels of cooperative and prosocial behaviors regardless of which type of board game they played. Cooperative board games did not decrease self-oriented behaviors. We also found that children who played competitive board games competed more in subsequent activities. However, children enjoyed playing cooperative board games more than competitive board games.

Keywords: preschoolers, children, strategic social behavior, prosocial behavior, helping, social cognition, resource allocation, competition, other-referenced competition, family background, parents, SES, moral behavior, peer relations, antisocial behavior, board games

Malin Eriksson, Department of Psychology, Box 1225, Uppsala University, SE-75142 Uppsala, Sweden.

© Malin Eriksson 2025

ISSN 1652-9030

ISBN 978-91-513-2398-5

URN urn:nbn:se:uu:diva-550464 (<http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-550464>)

Tack för att du aldrig gav upp

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I Kenward, B., Hellmer, K., Söderström Winter, L., & Eriksson, M. (2015). Four-year-olds' strategic allocation of resources: Attempts to elicit reciprocation correlate negatively with spontaneous helping. *Cognition*, 136, 1-8.
- II Eriksson, M., Stenberg, G., & Kenward, B. *Exploring preschoolers' competitiveness: The roles of family background, socio-cognitive and moral factors*. Manuscript in preparation.
- III Eriksson, M., Kenward, B., Poom, L., & Stenberg, G. (2021). The behavioral effects of cooperative and competitive board games in preschoolers. *Scandinavian Journal of Psychology*, 62(3), 355-364.

Reprints were made with permission from the respective publishers.

The contributions of Malin Eriksson to the studies were as follows:

Study I: Co-planned and co-designed the study, collected 1/2 of the data in Experiment 1 and 1/3 in Experiment 2, coded data in both experiments and was as the last author highly involved in the manuscript writing process.

Study II: Co-planned and co-designed the study, collected 1/3 of the data, coded a substantial amount of data, made additional analyzes of the data, and wrote the manuscript with contributions from co-authors.

Study III: Co-planned and co-designed the study, collected 1/3 of the data, coded data, analyzed the data, and wrote the manuscript with contributions from co-authors.

Table of Contents

INTRODUCTION	9
Other- and self-oriented behaviors	12
Prosocial and cooperative behaviors	14
Competitive and antisocial behaviors	16
Strategic social behavior	20
Summary	22
AIM OF THE THESIS	23
METHODS	24
Participants	24
Measures	24
Resource allocation.....	24
Behaviors	24
Morality	26
Executive functioning.....	26
Peer relations	27
Socio-economic status	27
Enjoyment of board games	27
STUDY I - Strategic allocation of resources and spontaneous helping in 4-, 6- and 8-year-olds.....	28
Introduction and aims.....	28
Methods.....	29
Design and general procedure	29
Results	30
Discussion	33
STUDY II - Preschoolers' competitiveness: Family background, socio-cognitive and moral factors	34
Introduction and aims.....	34
Methods.....	34
Design	34
General procedure.....	35
Results	36
Discussion	38

STUDY III - Behavioral effects of cooperative and competitive board games in preschoolers	39
Introduction and aims	39
Methods	40
Design	40
General procedure	40
Results	41
Discussion	42
GENERAL DISCUSSION	43
Key findings	43
Strategic social behavior and helping behavior	44
The nature of competitive behavior	45
Other- and self-oriented behaviors across different situations	48
Limitations and strengths	50
Conclusions and future directions	51
Acknowledgements	53
References	54

INTRODUCTION

Imagine a sunny day at the playground. You and your daughter are having a great time making sandcastles together. Suddenly, another child comes along, searching for a shovel, and you realize that all the shovels are taken. What would you do? There is a good chance you would encourage, or even insist, that your daughter give her shovel to the other child, especially if you have used it for some time. Your child would, perhaps with some resistance, give away the shovel. This would make the other child happy, and you would feel content knowing you had done a good deed.

Suddenly, you hear a mother calling for her child. She is in clear distress and instinctively you approach her and ask if she needs help searching for her child. Other parents quickly join in and start searching for the missing child, who is found five minutes later in a bush. You feel a bit startled about the whole situation, but glad you could help.

Later on, at the top of the slide, two older children push your child aside while racing up the stairs. This bad behavior annoys you, and you tell your daughter that this behavior is under no circumstances acceptable. They loudly start a fight over which one of them should go down the slide first and one of them hits the other. One of them points to the left and says "Hey, look! It's the ice cream truck!" and when the other child looks away, she goes down the slide, to the other child's despair.

You and your child go back to the sandpit again, but unfortunately, all the shovels and buckets are now taken. You make eye contact with the parent of the child who earlier on received a shovel from your child. You silently expect the other parent to encourage her child to share a shovel with your child, in return for your generosity earlier on. However, all you get from the other parent is a broken shovel and a small frog-shaped mold. You are clearly disappointed and discontent with that, but you smile and thank the other parent, who seems to be completely unaffected by her own rude behavior.

Shortly afterwards, a handsome man comes along with his daughter, searching for a shovel. The other, previously rude, parent sees this and without hesitating, gives away her child's shovel and a bucket. Witnessing this makes you even more irritated, but you do not say anything. You do not want to make a scene and embarrass yourself in front of the other parents. Instead, you and your child go to the swings for a while, and then you go home for lunch.

During that long hour and a half, you have, without consciously being aware of it, performed prosocial acts such as sharing, helping and cooperating, witnessed competition, antisocial behavior, and experienced strategic social behavior. Putting these behaviors into a real-life context makes it hard to imagine a world without them. It is such a natural part of our social life to engage in these behaviors that we do not think consciously about it when we perform them and that other people do too. These behaviors, even toward complete strangers, just seem to come so natural to us.

The general aspiration of this thesis was to investigate the developmental trajectories of children’s social behavior, in particular children’s other-oriented, self-oriented and strategic social behaviors. Other-oriented behaviors include prosocial and cooperative behaviors and self-oriented behaviors include competitive and antisocial behaviors. The behavioral dimensions prosocial – antisocial, cooperation – competition can be seen as each other’s polar opposites and are often examined independently. Strategic social behavior can include both other- and self-oriented behaviors (see Figure 1).

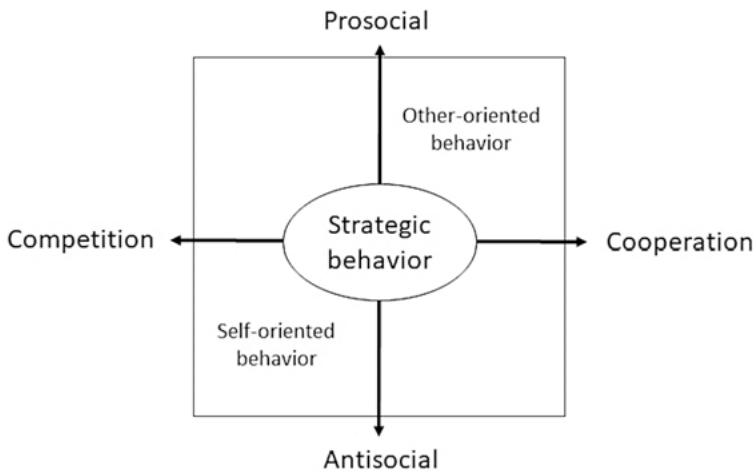


Figure 1. The behavioral dimensions prosocial-antisocial and cooperation-competition as polar opposites. Strategic social behavior can involve both other- and self-oriented behaviors.

Within the framework of this thesis, three different empirical studies were conducted in which children’s other-oriented, self-oriented and strategic social behaviors were examined. Other- and self-oriented behaviors are normally occurring and part of children’s behavioral and social repertoire to various degrees. Prosocial behaviors, such as helping and sharing, begin to develop early in childhood, during the second year of life (Paulus, 2016), and are mostly other-oriented in nature (e.g., Svetlova et al., 2010). Around 3 years of

age, children start to grasp cooperative and competitive behaviors (Etel & Slaughter, 2019; Schmidt et al., 2016), and with increasing age, children can fine-tune their social interactions with others, displaying prosocial behavior, cooperation and competition in both free play and structured activities. Aggressive behavior is normally occurring in toddlerhood, but then decreases during the preschool years (Tremblay, 2002).

Strategic social behavior may seem prosocial in nature, but have, for example, the real purpose of maximizing one's own share of resources. It has been shown that children around 5 years of age begin to act strategically prosocial (see Grueneisen & Warneken, 2022 for a review), and there is evidence that children can combine other- and self-oriented behaviors to gain access to resources (Hawley, 1999). However, is it the case that children can be strategically social and, if they can, when does this behavior develop? Moreover, do children who act in a strategically social manner spontaneously help others in need? These questions were explored in Study I, in which 4-, 6- and 8-year-olds' strategic and spontaneous helping behaviors were examined in a laboratory setting.

Competitive behavior may have social implications for children. For example, children who engage in competition may be disliked by peers (Tassi & Schneider, 1997). Regarding competition, however, there is currently little knowledge about the underlying factors that may influence preschoolers' competitive behavior, specifically family background, socio-cognitive and moral factors. These factors were investigated in Study II. Study II was conducted in preschools and included 3- to 6-year-olds.

Competitive behavior has been related to destructive behavior, such as aggression in children (Bay-Hinitz et al., 1994), and there is a risk that antisocial behavior in children can have a negative impact, both academically and socially (Ettekal & Mohammadi, 2020; Schuberth et al., 2019; Webster-Stratton & Reid, 2004). Thus, it is important to reduce self-oriented behavior. Children may be taught to be more other-oriented by engaging in cooperative activities. Playing traditional board games is a common activity for children both at home and in preschools. However, board games have seldom been used to moderate social behaviors in children, even though board games may have methodological advantages (e.g., Davis-Temple et al., 2014).

Study III, therefore, investigated whether traditional cooperative board games, played by 4- to 6-year-olds within a preschool environment, could increase other-oriented behaviors (prosocial and cooperative behaviors) and decrease self-oriented behaviors (competitive and antisocial behaviors) outside the board game situation. The purpose of the games was not only to gain knowledge about preschoolers' social interactions, but also to determine whether they may function as pedagogical tools that help children learn that cooperation can make it easier to reach shared goals. Study III also investigated whether playing competitive board games increases self-oriented behaviors and decreases other-oriented behaviors.

Taken together, children's other-oriented, self-oriented and strategic social behaviors undergo rapid development during the first years of life. Social behaviors such as reciprocity, resource allocation and fairness are important components of both prosocial, cooperative and competitive behaviors.

Other- and self-oriented behaviors

As a species, humans are helpful (Warneken & Tomasello, 2009) and rely heavily on cooperation in order to function (Warneken, 2018). Thus, to survive, it has been crucial for us to be part of a collective and to collaborate with others. It has been assumed that the ability to cooperate is deeply rooted in humans (Chajes et al., 2022), which manifests itself in that other-oriented behavior develops rapidly during the first 2 years of life (Paulus, 2016), with relatively limited social experiences (Warneken & Tomasello, 2009). Children are socialized early on to adopt prosocial values and norms and are encouraged to help and cooperate with others, and they receive social rewards and adult praise for doing so (Warneken & Tomasello, 2009).

A cornerstone of cooperation and of situations in which resources are allocated is direct reciprocation (Vaish et al., 2018; Vogelsang & Tomasello, 2016), which can be defined as mutual giving and receiving between individuals (Warneken & Tomasello, 2009). As children reach preschool age, they begin to increasingly understand the value of resources. Resources may be, for example, materials (e.g., toys and crafting materials) or social benefits (e.g., social status). Human beings are inclined to strive to have as much resources as possible, and reciprocity is a way for individuals to gain access to more resources over time (Vogelsang & Tomasello, 2016).

Resource allocation is influenced by individual and situational factors, such as age (Blake & McAuliffe, 2011) and recipient (Moore, 2009). From around 3 years, children begin to guide their prosocial behavior based on previous social experiences with others (Tomasello et al., 2009), i.e., retrospective reciprocity (Grueneisen et al., 2023). They become more selective in their prosocial behavior (Warneken, 2018), perhaps to avoid free riders (Grueneisen & Warneken, 2022). For example, 3-year-olds share more with others who have previously benefited them (Vaish et al., 2018).

Reciprocation is often associated with prosocial behavior and viewed as necessary to sustain cooperation over time, as cooperation is based on a commitment to reciprocate (Fehr & Fischbacher, 2004). However, reciprocity is also seen in situations where children act with the aim of benefiting themselves, e.g., that a child shares more with someone who has the intention to reciprocate (Vaish et al., 2018). Thus, reciprocity can also be used as a tool to gain access to more resources. As children become more selective in their prosocial behavior based on previous interactions, they may also use prosocial behavior to meet their own needs (Grueneisen & Warneken, 2022).

How resources are allocated is a central part of both cooperation (Warnken, 2018) and competition. Resources acquired through cooperation must be allocated in a way that satisfies the need of all contributors (Engelmann et al., 2021). Humans engage in both scramble competition, which means that the quickest individual gets possession of the resource first, and contest competition, meaning that the strongest does (Engelmann & Tomasello, 2019). Competing for limited resources and distributing resources normally evokes conflict among children (Green & Rechis, 2006; Nichols et al., 2020). Environments that contain limited resources, e.g., preschools, naturally cause within-group competition (Pellegrini, 2008).

To solve these conflicts, humans have evolved the concept of fairness. Fairness can be defined as negative reactions to distributions that disfavor or favor the individual (Engelmann & Tomasello, 2019). Fairness stabilizes cooperation and helps us avoid competition over resources and maintain social relationships, and it offers a solution concerning how resources should be allocated between collaborating individuals. By balancing the demands and needs of multiple individuals, rules of fairness function as a cooperative solution to conflicts associated with competition (Engelmann & Tomasello, 2019).

An individual who behaves in an entirely self-oriented manner (i.e., a defector or “cheater”) is at risk of being excluded from future cooperative interactions (Cosmides & Tooby, 2013). Consequently, this individual loses access to the supply of available resources offered by the collective. To solve this problem and regain access to these resources, the self-oriented individual can choose to behave in an other-oriented way. Some individuals may solve this problem by behaving prosocially, giving the appearance of having prosocial intentions, but with the real purpose of maximizing their own share of the resources.

Others solve the problem of controlling resources by using dominance (Charlesworth, 1996) and combining prosocial and antisocial behavior (Hawley, 1999). These may be high-status individuals, as those who have many resources also have greater chances of survival, and in theory, the opportunity to share these resources with others. However, engaging in antisocial behavior can make the individual unpopular with friends (Malti et al., 2016), and in a worst-case scenario, exclude the individual from the peer group. Hence, antisocial behavior is not a sustainable strategy over time.

In this thesis, I will investigate children’s other- and self-oriented behavior and strategic social behaviors. During the next sections, I will give a theoretical perspective on prosocial, cooperative, competitive, antisocial and strategic social behaviors.

Prosocial and cooperative behaviors

Prosocial behavior

Prosocial behavior is an important part of human behavior (e.g., Paulus & Moore, 2012), and much of the research conducted has explored the development of prosocial behavior and its consequences for children's social lives. Because prosocial behavior has been studied intensively over the past few decades, I will only summarize the most basic findings.

Prosocial behavior is an other-oriented behavior that can be defined as behaviors that benefit others, such as helping, sharing and comforting (e.g., Malti et al., 2016; Paulus, 2018), and such behaviors should not result in gains for the one acting prosocially (Warneken & Tomasello, 2009). All three forms of prosocial behavior generally start to emerge between 1 and 2 years of age (Paulus & Moore, 2012). Thus, children can engage in a variety of prosocial behaviors early on during development. It has been suggested that children are generally prosocially oriented (Svetlova et al., 2010).

Helping refers to behaviors that assist others in achieving their goals. Sharing refers to allocation of one's own resources. Comforting refers to behaviors that alleviate others' distress and negative emotions (Paulus, 2018). To comfort others, the child needs to have an understanding of others' negative emotions (Warneken & Tomasello, 2009). Sharing behavior presupposes an understanding of inequality in access to resources. In its earliest form, sharing behavior may be driven by the motivation to interact and affiliate with others (Paulus, 2018).

To engage in instrumental helping, which is the earliest form of helping behavior (e.g., Hammond et al., 2017), the child needs to have developed an understanding of others' goal-directed behavior, which includes recognizing others' goals (Warneken & Tomasello, 2009). Children also need to set a side their own goals in favor of someone else's goals (Malti et al., 2016).

Children can have different motives for behaving prosocially (Paulus & Moore, 2012; Paulus, 2018). The earliest motivation for engaging in instrumental helping may be the desire to engage in joint activities with parents (Rheingold, 1982), in which infants assist their parents when parents care for them (e.g., helping parents trying to brush their own teeth) (Hammond et al., 2017). Young children may also engage in instrumental helping due to a tendency to "catch" others' goals, making them their own (i.e., goal contagion), or due to the need to complete others' actions and achieve their goals (i.e., goal slippage) (see Paulus, 2018).

Previous research has struggled to find a consistent relationship between the developmental trajectories of different forms of prosocial behavior (e.g., Thompson & Newton, 2013). Instead, research suggests that prosocial behavior may be a heterogenic set of behaviors that gradually becomes integrated during children's social development (Paulus, 2018). Individual differences in

children's socio-cognitive abilities and motivations can thus lead to great variability in children's prosocial orientation (Paulus, 2018).

Prosocial behaviors have mainly been described as being synonymous with altruism (i.e., behaviors benefiting others), but even though prosocial behaviors are other-oriented in nature, they are not always genuinely altruistic (Svetlova et al., 2010). In fact, positive emotions elicited by prosocial actions may also be rewarding and motivate further prosocial behavior (Svetlova et al., 2010). In general, all prosocial behaviors may be motivated by an aversion to others' distress (Hammond et al., 2017).

Cooperative behavior

Cooperative behavior is an other-oriented behavior and generally defined as actively working together to achieve a common goal (e.g., Malti et al., 2016). This goal can be formed initially or develop during the course of cooperation (Etel & Slaughter, 2019). Cooperation enables an individual to produce and gain more resources and behavioral outcomes than if that individual was to operate alone (Etel & Slaughter, 2019; Warneken, 2018).

According to an evolutionary perspective, cooperation has evolved due to the driving force to produce offspring and ensure survival (Cosmides & Tooby, 2013). Hence, cooperation has always been important to humans in order to build a society that functions. To initiate cooperation, we need to suppress selfish tendencies and choose to cooperate (Vaish et al., 2018). Moreover, to ensure reciprocation, we also need to have the ability to detect potential cooperators and avoid cheaters (Cosmides & Tooby, 2013; Vaish et al., 2018).

The earliest form of cooperation is collaboration. At a bare minimum, collaborators must be mutually responsive to each other's intentions (Tomasello et al., 2009). Infants begin collaborating with adults and around the second year of life; when children improve their ability to coordinate actions (Warneken, 2018), they start collaborating with peers (Brownell et al., 2006; Warneken, 2018). To take the next step toward cooperation, children must unify their own and their peers' intentions in relation to a goal (Brownell et al., 2006).

Cooperative behavior starts to emerge at 3 years (Etel & Slaughter, 2019) as children's social communication skills develop (Malti et al., 2016). For example, 3-year-olds become more in tune with other children's actions and desires (Brownell et al., 2006). Cooperation with peers may begin with games in which children imitate each other (coordinating actions), and as children develop, they start taking into consideration, understanding, and influencing each other's intentions, goals and behavior (Brownell et al., 2006). Coordinating actions in cooperation involves several components, e.g., turn-taking, maintaining focus on the shared activity, and responding to social cues (Etel & Slaughter, 2019).

Children's cognitive (Fawcett & Garton, 2005), social and academic performance (see Van Velsor, 2017) are positively affected by collaborative and cooperative group work in school. Considering the positive effects of collaboration and cooperation on children's social development, collaborative learning is often used in the school environment (Fawcett & Garton, 2005).

Traditional competitive and cooperative board games are often used in preschools and at home, and cooperative board games are sometimes marketed commercially as increasing prosocial development. In fact, when playing cooperative board games, in contrast to competitive board games, children make more positive comments to their playmates and are more focused on the game (Pepler et al., 2013).

Even though traditional board games have been shown to have methodological advantages (Barton et al., 2018; Bay-Hinitz et al., 1994; Davis-Temple et al., 2014; Fang et al., 2016), few developmental studies have used traditional board games to moderate behavior, such as prosocial, cooperative, competitive and antisocial behaviors. For example, it has been suggested that board games may facilitate interactive play (Davis-Temple et al., 2014) and that board games are a powerful learning tool (Hromek & Roffey, 2009). Accordingly, Study III tested whether cooperative board games can increase preschoolers' prosocial and cooperative behaviors and decrease competitive and antisocial behaviors outside the board game situation.

There are children at school who show social difficulties and educators have the opportunity to detect these children early on (Bagdi & Vacca, 2005; Hemmeter et al., 2006). Given that some children in school exhibit social difficulties, it is important that cost-effective and simple methods are developed that teachers can use to promote other-oriented behavior and reduce self-oriented behavior in children.

Competitive and antisocial behaviors

Competitive behavior

Competitive behavior has most commonly been explained from an evolutionary perspective, thus based on the assumption that humans are driven by self-interest (Green & Rechis, 2006), survival and reproduction in an environment with limited resources (Charlesworth, 1996).

Children begin to grasp competition around the age of 3 (Schmidt et al., 2016). The earliest form of competition starts to emerge in situations where the child differentiates between winning and losing in competitive tasks like completing a task first (Schmidt et al., 2016). Engaging in structured competitive games or play requires that the child focus on its own as well as others' point of view and goals (Priewasser et al., 2013). Some studies have shown that competition can be favorable under certain conditions (Sheridan & Wil-

liams, 2006). For example, competitive games are often played with cooperative intentions, such as agreeing on a set of rules and collectively striving to win the game (Schmidt et al., 2016).

However, it has also been suggested in several studies that competition can be destructive in educational, prosocial and social situations (Lam et al., 2004; Pappert et al., 2017; Tassi & Schneider, 1997). Studies have found that within-cooperation (i.e., competition among children in a group) (Majolo & Maréchal, 2017) and prosocial behavior (e.g., Pappert et al., 2017; Toppe et al., 2019) can be negatively affected by competition. Studies have found that when children play competitive board games, in contrast to cooperative board games, they make more negative comments about other players. Children also tend to gaze away from the game situation and completion of the game takes longer (Peppler et al., 2013). Competitive board games may also increase aggressive behavior and decrease cooperative behavior in children (Bay-Hinitz et al., 1994).

The uncertainty about whether competitive behavior has positive or negative consequences for children stems from the fact that competition comes in different forms and has been defined in various ways (Green & Rechis, 2006). Competition can be viewed as individuals' goals and behaviors, as well as the characteristics of the particular context, or both (Green & Rechis, 2006). This suggests that there are individual differences in our tendency to compete, and that individuals who compete in one situation may not compete in others (Weinberger & Stein, 2008). Likewise, some individuals are not interested in winning (Udvari & Schneider, 2000). Furthermore, in research on competition, it has not always been clear whether competitive behavior is viewed as a personality trait or a situational phenomenon (Udvari & Schneider, 2000). Different forms of competition may have different implications for children's socio-cognitive development. According to Tassi and Schneider (1997), previous research viewing competition as a unidimensional behavior limits our understanding of its social implications. Thus, to understand the social and developmental impact of competition, it is important to address its diversity (Udvari & Schneider, 2000) and properly investigate its origins, motivations and consequences.

Other-referenced competition is a form of competition that refers to competing with the motive or goal to outdo or perform better than others (Tassi & Schneider, 1997). Other-referenced competition may explain why competition arises in social situations in which there is no obvious incentive to compete. Tassi and Schneider (1997) investigated competitiveness in children by using peer measures. They found that children who engage in other-referenced competition may be considered aggressive and disliked by the peer group. Children who engage in other-referenced competition may brag about their victories, which can lead to others disliking them (Udvari & Schneider, 2000). Other-referenced competitors may also be more likely to bend rules and cheat in order to win (Udvari & Schneider, 2000). In fact, Paquette et al. (2013)

suggested that preschoolers' other-referenced competition was associated with lower social competence and greater aggression.

Because research has shown that competition negatively affects children's prosocial behavior and peer relations, it is important to further investigate how prosocial orientation, resource allocation, and peer relations are affected by competition. In Study II, the associations between socio-cognitive abilities (prosocial orientation, resource allocation, and peer relations) and competitiveness were investigated.

Other social abilities that seem to be associated to competition are morality and conscience. Some studies have shown that moral rule cognition (i.e., the sense of what is right or wrong) is associated with resource allocation, in which children with higher moral understanding are more successful at gaining access to resources (Hawley, 2003). Furthermore, studies have shown that children may allocate more resources to their in-group if the group norm is competitive. Thus, in-group competition may be affected by moral goals related to group welfare (McGuire et al., 2018). Conscience (i.e., the internalization of moral norms) has been related to resource allocation (Ongley & Malti, 2014) and negatively related to social dominance (Hawley & Geldhof, 2012). In general, however, very little is known about how moral understanding and conscience are associated to competition in children. Most of the research conducted has focused on the relationship between morality and resource control (Hawley & Geldhof, 2012). Resource allocation has a central role in competitive behavior, which makes it plausible that moral aspects affect competition. Higher moral rule cognition may lead to increased competitive behavior or less competitive behavior due to an understanding that competition leads to unequal outcomes. Children with a strong sense of conscience may refrain from competition due to a belief that competition may affect others negatively. Study II therefore investigated the relationship between competition, moral rule cognition and conscience.

Family background factors may also be associated with children's competitiveness. To increase their children's longitudinal welfare, parents pass on their preferences, values and attitudes to their children (Zumbuehl et al., 2021). Although parents have a great impact on their children's lives and continuously guide their children by making choices of different magnitudes (Tungodden & Willén, 2023), research on how parents' own competitiveness and socio-economic status (SES) influence their children's competitiveness is scarce. In one of the few studies conducted, Khadjavi and Nicklisch (2018) found no relationship between parents' and their children's competitiveness. However, they found that parents' ambition for their children's later success in their professional life predicted their children's competitiveness.

It has been suggested that parents with higher SES invest more in their children's welfare (Zumbuehl et al., 2021) and may also increase their children's future wealth (Fagereng et al., 2021). In particular, parents' competitive choices (in a noncompetitive and competitive incentive scheme game) may be

related to their children's educational outcome, and these choices may even be gender specific (Tungodden & Willén, 2023). However, few studies have investigated the relationship between children's competitiveness and parents' SES. Almås et al. (2016) found that male adolescents with low SES fathers were less competitive. Low SES may also predict intra-competitiveness (competition directed toward the same sex) (Buunk et al., 2014) in adolescents; however, this effect may be most prominent among girls.

Considering the relatively few studies examining the relationship between family background, socio-cognitive and moral factors and competitiveness in children, and due to few studies focusing on younger children regarding SES factors, Study II aimed to contribute to the literature by investigating these factors. Our main tool to investigate competition was to engage preschoolers in a social game with the novel property of manipulating the incentive to compete. This game was played in preschoolers' environment.

Study III investigated whether competitive board games can increase competitive and antisocial behaviors and decrease prosocial and cooperative behaviors outside the board game situation.

Antisocial behavior

Antisocial behavior is a self-oriented behavior that can be defined as problematic social behaviors that either violate social norms and rules or cause discomfort or negative emotions in others. When investigating antisocial behaviors in preschoolers, aggressive behavior is commonly used as a parameter of the child's level of antisocial behavior (Hughes et al., 2000; Tremblay, 2002). Aggression can involve physical (e.g., hitting) (Ettetal & Mohammadi, 2020; Tremblay, 2002) as well as verbal violations, such as starting fights and saying mean things (Ettetal & Mohammadi, 2020). It can also involve antisocial behaviors, such as teasing, bullying, rule breaking, violent acts and talk (Hughes et al., 2000). Aggression is a normally occurring behavior in children, and the highest rates are seen between 2 and 3.5 years of age (Tremblay, 2002). Aggression then declines during the preschool years (Tremblay, 2002).

Children who use both antisocial and prosocial behaviors to benefit themselves in social exchange situations may be successful at gaining access to resources (Hawley, 1999; Green & Rechis, 2006). However, children who display high levels of aggression are at risk of developing severe social difficulties, increased antisocial behavior, and negative life outcomes (Schuberth et al., 2019). For example, aggressive, high-conflict children are less accepted and more rejected by peers (Ettetal & Mohammadi, 2020) and are at risk of academic problems (Webster-Stratton & Reid, 2004). Difficulties understanding others' emotions at 4 years are linked to the development of aggression, which in turn can lead to an increase in more severe antisocial behaviors at age 8 (Schuberth et al., 2019). Thus, aggression during the preschool years is a predictor of antisocial behavior later in childhood (Schuberth et al., 2019).

Because children who display antisocial behaviors are at great risk of developing serious behavioral problems, it is crucial to detect these traits early on (Webster-Stratton & Reid, 2004; Zumbach et al., 2021) in order to prevent (Zumbach et al., 2021) and counteract them. An optimal time to prevent antisocial behavior and future academic failure is in preschool and early school age when children are highly malleable (Webster-Stratton & Reid, 2004) in their fundamental social development.

Increasing preschoolers' and school-aged children's social skills and other-oriented behaviors (e.g., Frey et al., 2008) may decrease aggression and other problem behaviors. Hence, learning how to regulate emotions and to inhibit aggressive behavior are linked to positive social adjustment (Calkins & Fox, 2002). In fact, even co-occurring prosocial behaviors in predominantly antisocial children may increase peer acceptance (Ettekal & Mohammadi, 2020).

Considering the negative consequences of antisocial behaviors for children's social development, it is important to further investigate the positive effects that other-oriented behavior may have on decreasing antisocial behavior in children. Thus, Study III investigated whether cooperative board games decreased antisocial behavior in children and whether competitive board games, on the contrary, increased antisocial behavior.

Strategic social behavior

In theory, it has been assumed that other- and self-oriented behaviors alone are not evolutionarily sustainable (Cosmides & Tooby, 2013). Choosing a strategy that is completely altruistic requires that others be equally altruistic for that strategy to be successful. To some extent, to avoid obliterating themselves, humans need to be self-oriented. Children learn that others reciprocate when they themselves act in an other-oriented manner, which motivates further prosocial behavior. However, children also learn that others can take advantage of them when they act with prosocial intentions. Consequently, children begin making judgements about potential recipients of their other-oriented acts around 3 years of age (Tomasello et al., 2009).

Although some individuals seem to be more prone to behave other- or self-oriented, it is doubtless the case that no human is entirely other- or self-oriented. Instead, we are likely to adapt to and alternate between these behaviors depending on circumstances and situations. For example, reciprocating with the motive of benefiting oneself may be considered a sophisticated way of gaining access to resources, without having to compete or use coercive strategies. Although strategic social behavior can be self-oriented, it can also be an important social ability that enables mutual social exchange (Grueneisen & Warneken, 2022). The balance therefore consists of maximizing one's own resources by alternating between or combining self- and other-oriented behaviors in a way that prevents social rejection.

Children can behave prosocially due to self-oriented concerns (e.g., Hawley, 1999). As mentioned before, children begin to act in a strategic prosocial manner around 5 years of age (see Grueneisen & Warneken, 2022 for a review) and can behave strategically in order to elicit future reciprocation (Warneken et al., 2019), i.e., prospective reciprocity (Grueneisen et al., 2023). When acting other-oriented, the individual focusses on others' goals and/or welfare. On the other hand, when acting in a strategic social manner, the individual benefits others in an instrumental way in order to meet own goals (Grueneisen & Warneken, 2022). Children's cognitive ability to plan and thinking about the future (Grueneisen et al., 2023), predictions of reciprocal actions (Futamura & Shima, 2024) and delay of gratification (Grueneisen et al., 2023) have been positively linked to strategic social behavior in children. Around 5 years, children adapt their behavior, by sharing more and stealing less, if they know they are being observed by a peer (Engelmann et al., 2012). This suggests that children can alter their prosocial behavior strategically, depending on the social context.

As other-oriented behavior increasingly become a greater part of children's social compass, some children may alternate between using other- and self-oriented behaviors (Hawley, 1999). This means that children can use multiple social strategies, such as prosocial behavior, coerciveness and social dominance, to gain access to resources (Hawley, 1999). In studies on children's social dominance, social dominance has been operationalized as the number of aggressive wins in a dyadic competition for resources (Pellegrini et al., 2007). Prosocial behavior and cooperation may also be used as a tool to compete against others (Charlesworth, 1996).

Children who use multiple strategies have been viewed as socially competent (Green & Rechis, 2006; Hawley, 1999, 2002; Vaughn et al., 2003; Vaughn & Santos, 2007). Social competence entails using multiple strategies to gain access to resources, considering one's own as well as others' needs (Green & Rechis, 2006) while maintaining a balance between prosocial and aggressive behaviors (Vaughn & Santos, 2007). After clashes of aggression toward peers, cooperation and reconciliation can be used to restore and maintain relationships and alliances (Ljungberg et al., 1999; see Pellegrini et al., 2007).

Taken together, children can behave in a strategic social manner and combine different other- and self-oriented behaviors to gain access to resources. Although it has been well established that children develop prosocial abilities early on during development and that children are generally prosocially oriented, less is known about whether children can behave prosocially with the real purpose of maximizing their own share of resources, i.e., strategic social behavior.

To increase our knowledge about strategic social behavior in children, and how children balance their own and others' needs, it is important to establish when children start using strategic social behavior in social situations. In

Study I, strategic social behavior was explored in two experiments. We specifically investigated whether and at what age children use prosocial behavior to gain access to resources in a candy sharing game. We also investigated whether strategic children are more self-oriented in general by looking at the relationship between strategic social behavior and spontaneous helping.

Summary

From an early age, children can engage in other-oriented, self-oriented and strategic social behaviors. Prosocial behaviors (helping, sharing and comforting) generally start to emerge during the second year of life (Paulus & Moore, 2012). Although prosocial behaviors are often motivated by concern for others, acting prosocially does not require genuinely altruistic and prosocial motivation (Svetlova et al., 2010). Instead, children may behave in a strategic social manner and alternate between other- and self-oriented behavior to gain access to resources (Hawley, 2003). It is important to investigate whether, and when, strategic social behavior begins to develop in children and the relationship between children's strategic social behavior and spontaneous helping behavior.

Other-referenced competition may have negative social implications for children (Tassi & Schneider, 1997). However, this form of competition and its origins have not been well studied in children. Thus, to increase our knowledge about the social and developmental impact of competition, it is important to specifically investigate possible associations between factors such as family background, socio-cognitive and moral factors and other-referenced competition.

Furthermore, improving preschoolers' other-oriented behaviors may decrease self-oriented behaviors (e.g., Frey et al., 2008). Because children who display aggressive behavior are at great risk of developing serious behavioral problems, it is crucial to detect these traits early on (Zumbach et al., 2021) and to counteract them. One way to counteract self-oriented behavior in children may be to play traditional cooperative board games.

AIM OF THE THESIS

The overarching aim of this thesis was to explore different aspects of children's other-oriented (prosocial and cooperative behaviors), self-oriented (competitive and antisocial behaviors) and strategic social behaviors. This thesis is based on three empirical studies. Study I was conducted in a laboratory setting. Study II and Study III were conducted in preschools and used a multi-informant approach when assessing behavior. I have chosen to examine the behavior of preschool and school-aged children. Research on children's other-oriented, self-oriented and strategic social behaviors during this developmental period has the potential to provide insight into how these behaviors develop. All three studies used different games to assess behavior. In these games, children interacted with adults or peers.

The purpose of the empirical studies was to investigate children's social development and contribute with more knowledge about children's strategic social behavior, factors that may be associated with competition in children and whether it is possible to moderate other- and self-oriented behaviors in children by using traditional board games.

Study I

To explore strategic social behavior, Study I investigated whether, and at what age, children begin to allocate resources strategically and whether children who are more prone to do so are less likely to engage in spontaneous helping.

Study II

To explore the origins of competition in children, Study II explored the relationship between family background, socio-cognitive and moral factors and children's competitiveness.

Study III

Finally, to explore the effect of games on other- and self-oriented behaviors, Study III investigated whether playing traditional cooperative board games could increase preschoolers' other-oriented behaviors and decrease self-oriented behaviors outside the board game situation. This study also investigated whether competitive board games increased self-oriented behaviors and decreased other-oriented behaviors.

METHODS

Participants

Across all three studies, 246 children between the age of 3 and 8 years participated (46% girls). Eight preschools, with a total of 15 classrooms, participated. In Study I, a total of 100 children participated in two experiments. In Experiment 1, there were 52 participants (44% girls) between 4 and 8 years. In Experiment 2, there were 48 participants (44% girls), all of whom were 4 years. In Study II, there were 81 participants (46% girls) between 3 and 6 years. In Study III, there were 65 participants (48% girls) between 4 and 6 years.

Measures

Resource allocation

Study I consisted of two experiments in which strategic resource allocation was measured. In both experiments, participants played a candy-sharing game, in which a “vending machine,” a plastic cup with tokens, eggs and candies, was used. Participants played the candy-sharing game with two adults, one who was token “rich” and one who was token “poor.” Participants took turns and could in each round “buy” a plastic egg containing one or two candies. One candy was always kept, but if the player received two candies, one candy had to be given to one of the other players. Resource allocation was measured by counting the number of candies shared with the rich versus poor adult. Participants were instructed to give away their last token to one of the two adults after the game ended.

Behaviors

Prosocial behavior

Across all three studies, children’s prosocial behavior was measured. In Study I, prosocial behavior was measured by investigating children’s spontaneous instrumental helping in a situation in which the poor adult accidentally knocked over the rich adult’s cup of tokens. In Experiment 1, helping was scored if the participant had begun picking up the tokens within 45 seconds. In Experiment 2, helping was scored if the participant, on their own initiative, had put the cup back on the table with all tokens. Spontaneous helping was coded later from

video. In Study I, before participants left the room, they could donate a voluntary number of their candies to another anonymous child.

In Study II, a dictator game (Gummerum et al., 2010) was conducted to assess sharing behavior; children allocated 10 stickers between themselves and another anonymous child. Children's prosocial orientation was also rated by teachers using a 6-point Likert scale, and by parents using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

In Study III, children played cooperative and competitive board games together. After playing board games, prosocial behavior was observed in four behavioral tasks: puzzle, building, drawing and crafting. In the puzzle task, each participant in a group of four children was verbally assigned to build one of the four seasons, which consisted of six pieces. In the building task, participants were instructed to build a house together with building blocks. In the drawing task, participants were instructed to draw a castle together, and in the crafting task, participants were instructed to craft monsters together. Prosocial behavior was operationalized as helping, sharing, comforting, interacting in a mutually fun playful manner, exhibiting positive physical contact and complementing. Proportion of helpful choices was also measured in four structured game-like tasks: treasure island, the ambiguous activity task, prisoner's dilemma (Matsumoto et al., 1986) and a social values task (Domino, 1992; Knight & Kagan, 1977; McClintock et al., 1977). We included both free and structured game-like tasks to detect short-term generalization effects. In each task, groups of four children participated; these were the same groups that played board games together. Frequency and strength of prosocial, cooperative, competitive and antisocial behaviors were coded later from video.

Cooperative behavior

In Study II, cooperative orientation was rated by teachers using a 6-point Likert scale. In Study III, cooperation was rated by teachers using a 6-point Likert scale and observed in the four behavioral tasks (puzzle, building, drawing and crafting). Cooperation was operationalized as actively working together to achieve a common goal and negotiating or suggesting how to carry out a common-goal task together.

Competitive behavior

In Study II, competitive behavior was rated by teachers using a 6-point Likert scale and by parents using a 5-item competitiveness subscale from the Work and Family Orientation questionnaire (WOFO; Gill et al., 1988; Helmreich & Spence, 1978). In this questionnaire, parents rated their own and their children's competitive behavior. Competitive behavior was also measured by using a novel task, the ambiguous activity task. In this task, children built caterpillars together and could either help or hinder their peers in completing their caterpillars. Caterpillars consisted of a plastic body with five body pieces that

were initially placed inside a box with two compartments: one “easy” side in which participants could see their pieces and one “hard” side in which they could not see their pieces. Participants took turns retrieving body pieces from the box, and if they received another participant’s body piece, they had to retrieve it from one of the two compartments. If the participant chose to retrieve another participant’s body piece on the hard side, this was coded as competitive behavior.

In Study III, competitive behavior was rated by teachers using a 6-point Likert scale, in a pre-test situation using a social values task and observed in the four behavioral tasks (puzzle, building, drawing and crafting). Competition was operationalized in behavioral tasks as explicitly comparing themselves favorably to another child and exhibiting implicit competitive behavior such as boasting.

Antisocial behavior

In Study II, antisocial orientation was rated by teachers using a 6-point Likert scale. In Study III, antisocial behavior was rated by teachers using a 6-point Likert scale and observed in the four behavioral tasks (puzzle, building, drawing and crafting). Antisocial behavior was operationalized as teasing, spiteful behavior, sabotage or violence, negative comments on another child or their efforts, coercive behavior, stealing, betrayal, interrupting and unreasonably ignoring or unreasonably arguing against reasonable suggestions and requests from other children.

Morality

In Study II, a standard vignette was used (Gummerum et al., 2010) to measure moral rule cognition and conscience. Participants were told two short hypothetical vignettes with a cartoon drawing featuring a moral violation. Participants were asked whether the protagonist was right to commit the act (moral rule cognition) and how the child would feel if he/she had committed the act (conscience).

Executive functioning

In Study III, a “day-night” Stroop task was used (Gerstadt et al., 1994) to measure interference control. The participant was shown paper cards with different symbols that were each other’s symbolic opposites. When shown a card participants were instructed to verbally state its symbolic opposite (e.g., to say “day” when exposed to the symbol “night”).

Peer relations

In Study II, parents rated their children on the SDQ peer relationship problems subscale (Goodman, 1997). In Study II and Study III, children's peer relations were measured using a sociometry task (Dunnington, 1957). The sociometry task measures peer acceptance versus rejection by other children in the peer group. Participants were individually shown a class photograph and asked to nominate three children as best friends or preferred playmates. Thereafter, they were asked to nominate three children they did not enjoy playing with.

Socio-economic status

In Study II, parents reported their highest achieved education level on a 6-point scale and their pre-tax yearly income.

Enjoyment of board games

In Study III, enjoyment of each board game was assessed immediately after each board game session using a 5-point Likert scale. Participants were instructed to individually rate how much they enjoyed playing the game.

STUDY I - Strategic allocation of resources and spontaneous helping in 4-, 6- and 8-year-olds

Introduction and aims

It has been suggested that children can behave strategically and that children can combine different other- and self-oriented behaviors to gain access to resources (Hawley, 1999). However, there is currently less knowledge about whether children can engage in strategic behavior, such as prosocial behavior with the real purpose of maximizing their own share of resources, i.e., strategic social behavior. The first aim of this study was to explore when strategic social behavior first starts to emerge. We conducted an experiment investigating 4-, 6- and 8-year-olds strategic resource allocations in a candy-sharing game. The rationale for investigating our youngest age group (4-year-olds) was primarily that the procedure would be too challenging for children younger than 4 years due to difficulties understanding others' verbal intentions (Apperly & Butterfill, 2009). Our 6- and 8-year-olds could be either strategic due to their more developed cognitive skills (Steinbeis et al., 2012) or less strategic due to their commitment to fair distribution (e.g., Gummerum et al., 2008).

In a second experiment, we investigated 4-year-olds' strategic social behavior. Experiment 2 was designed to replicate the results from Experiment 1 with 4-year-olds. Experiment 2 also controlled for the rich and the poor adult's intentions to reciprocate. We predicted that children would prefer to allocate candies to a rich adult who had access to tokens (necessary to "buy" candies) (Experiments 1 and 2), and who had stated an intention to reciprocate (Experiment 2). In Experiment 2, we predicted that children would favor the rich adult in the reciprocal condition.

Young children are believed to be driven by genuine concern for others when engaging in prosocial behavior (Warneken & Tomasello, 2009), such as spontaneously helping an adult in need. Less is known, however, about the relationship between prosocial behavior and self-oriented concerns. The second aim was therefore to investigate the relationship between strategic resource allocation and individual tendencies to spontaneously help an adult in need. We predicted that children who allocated more candies to the rich adult would engage less in a spontaneous instrumental helping task, as there was little motive for strategic social behavior in this task.

Methods

Design and general procedure

Experiment 1 had a between-subjects design with three conditions that were age groups: 4-, 6- and 8-year-olds. The study design consisted of the following steps: an introduction phase, a candy-sharing game, a spontaneous helping task, a final allocation task, and a dictator game task (see Figure 2).

Dependent variables were resource allocation (number of candies allocated to the rich adult, allocation of the final token and number of donated candies to an anonymous child) and spontaneous helping (helping/not helping). The independent variables were age group and resource allocation (in relation to spontaneous helping).

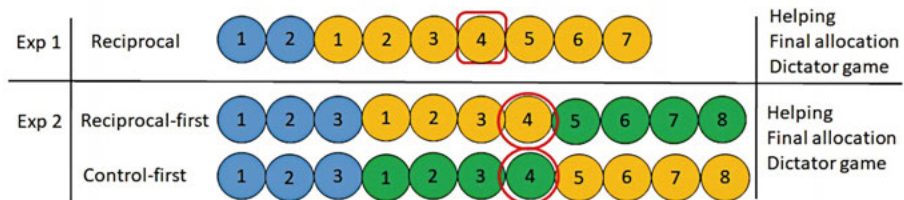


Figure 2. An illustration of the design and general procedure in Experiments 1 and 2. In Experiment 1, both adults shared candies with the participant during round four. In Experiment 2, there was a condition switch at round four.

Before Experiment 1 began, participants observed two adults and an adult model playing the candy-sharing game in two rounds. One adult was token “rich” and one was token “poor.” In each round, the model received two candies and shared one candy each with the adults without justifying these choices. The adults reciprocated while verbally stating; “I usually share with those who share with me, and [the model] shared with me, so I’m sharing with [the model].” The adult received an egg with one candy inside when not shared with.

In Experiment 1, seven rounds were played. In each round, the child received two candies and had to share one candy with one of the two adults. Because the poor adult had run out of tokens, he/she had to skip his/her turn in each round, which meant that the poor adult had no ability to reciprocate. The rich adult could buy candies and reciprocate, but received only one candy in each round. These circumstances changed during round four, in which the poor adult found a token in his/her pocket. In this round, both adults received an egg containing two candies inside, one of which they shared with the participant, stating that “[the participant] shared with me.”

After the last round, the participant's tendency to help spontaneously was tested. When both adults rushed out of the room to answer an urgent text message, the poor adult accidentally knocked the rich adult's cup of tokens onto the floor. Participants could choose to help by picking up the tokens. When the game ended and the participants were about to leave the room, they were asked to allocate their final token to either the poor or rich adult.

Experiment 2 had a between-subjects design with two conditions: reciprocal first and control first (see Figure 2). In this experiment, only 4-year-olds were included. The design and dependent variables were identical to Experiment 1. The independent variables were conditions and test phase (before and after the switch in round four) and resource allocation. In Experiment 2, an additional test round was added in which the model received an egg with one candy inside, but the adults received two each. Depending on condition, adults shared their additional candy with the model (Reciprocal-first condition) or with each other (Control-first condition).

After the demonstration rounds, the model left the room and the participant took her place. The poor adult had now run out of tokens and could not buy candies from the candy machine. In Experiment 1, the model left her remaining tokens and candies with the participant. In Experiment 2, the child started out with some tokens and no candies.

The participants were assigned to one of two conditions in Experiment 2. A total of eight rounds were played. In the Reciprocal-first condition, the adults first stated that they had the intention to share with the participant. In round four, they changed their mind and stated that they from now on would share only with their best friend, who was the other adult. In the Control-first condition, adults initially stated that they would share with each other and then changed their mind during the fourth round, stating that they would now share with the participant. As in Experiment 1, the participant's tendency to spontaneously help was measured. The participants were also asked to allocate their final token.

Results

Experiment 1

Participants allocated more candies to the rich adult than to the poor¹. This allocation pattern did not depend on age². Younger participants, however, did show a greater deviation from equal division between the rich and the poor

¹ $t(51) = 2.19, p = .033, d = .30$.

² $t(45) = 1.65, p = .106$ (generalized least squares model), unstandardized beta = $-.21$, 95% CI $[-.47, .04]$. 4-year-olds ($M = 4.5, SD = 2.1$), 6-year-olds ($M = 3.8, SD = 1.3$) and 8-year-olds ($M = 3.6, SD = 0.9$).

experimenters³ (see Figure 3). At the end of the experiment, the final token was in most cases allocated to the poor adult⁴. Participants who did not help in the spontaneous helping task allocated more candies to the rich adult. Age did not have an effect on helping behavior⁵. The relationship between allocating to the rich adult and spontaneous helping did not depend on age⁶.

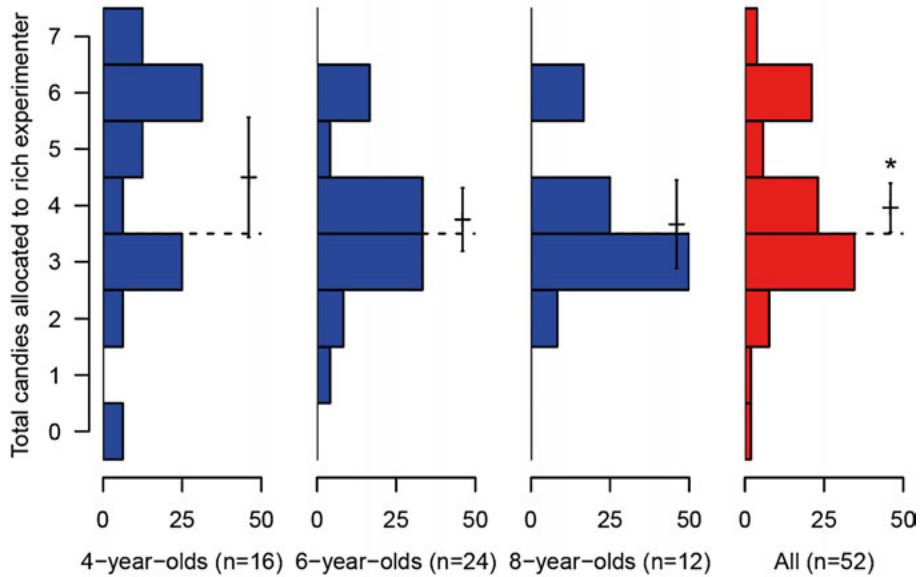


Figure 3. Percentage frequency histograms of candies allocated to the rich adult in Experiment 1, with means and associated 95% CI. The asterisk indicates significant deviation from equal number of candies between the rich and poor adults ($p < .05$) (Kenward et al., 2015).

Experiment 2

Participants in the Reciprocal-first condition favored the rich adult more than did participants in the Control-first condition⁷. More specifically, participants in the first test-phase reciprocal condition allocated more candies to the rich

³ Negative correlation between age and the absolute difference from 50:50 distribution, $F_{1,50} = 7.13$, $p = .010$, $R^2 = .12$ (linear regression).

⁴ 88% of participants gave their final token to the poor adult. Participants were less likely to favor the rich adult in the final token allocation than they were to favor the rich adult with most candies in the sharing game, $p < .001$ (McNemar test).

⁵ $t(45) = 2.93$, $p = .005$, $d = .88$ (generalized least squares model). Age was controlled for and had no effect, $t(44) = .23$, $p = .820$.

⁶ Wald $Z = 1.38$, $p = .169$ (binary logistic regression).

⁷ $t(45) = 2.29$, $p = .027$, $d = .66$.

adult⁸. After the switch, from reciprocal to control phase, participants allocated fewer candies to the rich adult⁹ (see Figure 4).

We could not detect a change in allocation patterns before and after the switch for participants in the control condition. After the switch in both conditions, there were no signs of strategic allocation. Thus, we compared spontaneous helping in the first test-phases only. Participants in the Reciprocal-first condition, who did not spontaneously help, had allocated more candies to the rich adult¹⁰. In the Control-first condition, there was no relation between allocation and helping¹¹.

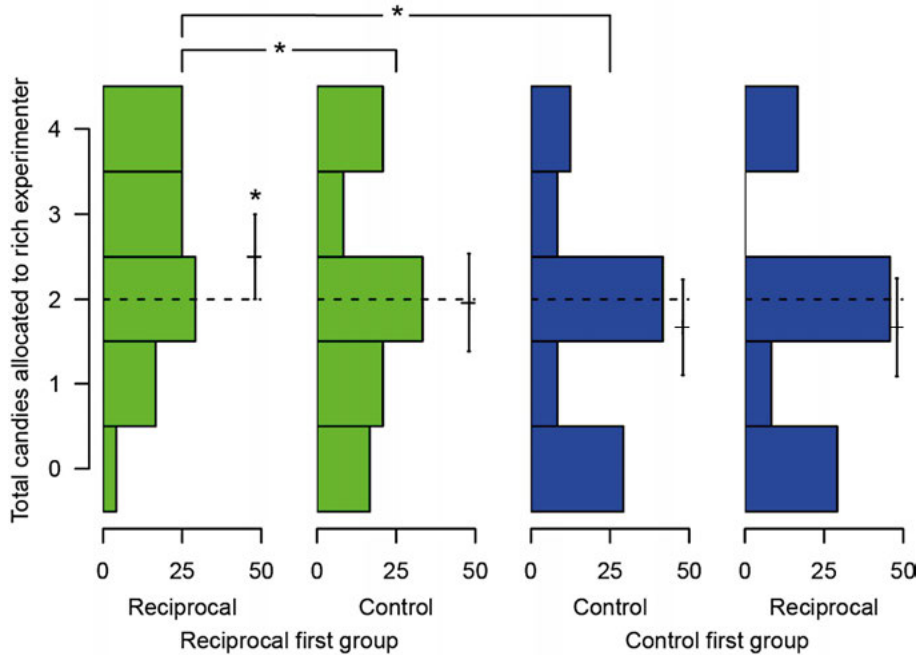


Figure 4. Percentage frequency histograms of candies allocated to the rich adult in Experiment 2, with means and associated 95% CI. $n = 24$ per group. Asterisks indicate significant deviation from equal number of candies between the rich and poor adults within conditions, and significant between-condition comparisons ($p < .05$) (Kenward et al., 2015).

⁸ $t(23) = 2.08, p = .049, d = .42$.

⁹ $t(23) = 2.07, p = .050, d = .42$.

¹⁰ 40% of the participants who did not help had allocated more candies to the rich adult than those who did help, $M_{\text{NotHelped}} = 3.10, 95\% \text{ CI } [2.47, 3.73]$; $M_{\text{Helped}} = 2.23, 95\% \text{ CI } [1.57, 2.89]$; $t(20) = 2.12, p = .047, d = .88$; $t(9) = 3.97, p = .003, d = 1.26$.

¹¹ $M_{\text{NotHelped}} = 1.70, 95\% \text{ CI } [.74, 2.66]$; $M_{\text{Helped}} = 1.60, 95\% \text{ CI } [.76, 2.44]$; $t(17) = .18, p = .861$ (50% of the participants who helped).

Discussion

In this study, adults' ability (Experiments 1 and 2) and intention (Experiment 2) to reciprocate was related to children's resource allocation. After the rich adult explicitly changed her intention to reciprocate, children who initially favored the rich adult stopped doing so. These results indicate that, by 4 years, children can choose targets for resource allocation strategically by favoring an individual who has the ability and intention to reciprocate.

Children had no previous interaction with the adults or knowledge about the candy-sharing game prior to the experiment. This indicates that children spontaneously invented a strategy with the expectation to gain as much resources as possible. This strategy could have been formed during the experimental session or by adopting known strategies from previous social interactions.

Children who favored the rich adult in Experiment 2 stopped doing so after the condition switch, which indicates that 4-year-olds can re-evaluate their initial strategy (Rubin & Rose-Krasnor, 1992) and allocate resources more equally. However, this change in distribution pattern could also be a negative reaction to the rich adult's shifting intention to reciprocate.

In comparison to 4-year-olds, the majority of 6- and 8-year-olds in Experiment 1 allocated resources as equally as possible, which is consistent with previous research on distributive justice (Gummerum et al., 2008; Paulus & Moore, 2012; Rochat et al., 2009). The results suggest that deviation from fair distribution starts to develop after the preschool years, even in other-oriented individuals.

In both experiments, spontaneous helping was negatively associated with favoring the rich adult. Prosocial behavior can be motivated by other-oriented and strategic concerns. The results showed that 4-year-olds, in comparison to older children, were more motivated by strategic concerns. However, across all age groups and experiments, children who spontaneously helped were less strategic.

Different forms of prosocial behavior may have different developmental trajectories and underlying motivations (Dunfield & Kuhlmeier, 2010; Thompson & Newton, 2013). However, our results indicate that preschoolers may have a general other-orientation and that there may be an overlapping relation between behaviors that benefit others.

STUDY II - Preschoolers' competitiveness: Family background, socio-cognitive and moral factors

Introduction and aims

The factors underlying competitive behavior in children are not fully understood. In this study, we focused on competition motivated by outdoing others, so-called other-referenced competition (Tassi & Schneider, 1997). Other-referenced competition can be defined as competing in situations in which there is no clear incentive to compete. Although competitive behavior has been associated with a range of individual traits and situational factors in children, little is known about the relationship between competitiveness in children and family background, socio-cognitive and moral factors.

In this study, we investigated the relationship between competitiveness and family background factors (parents' competitiveness and socio-economic factors; parental income and education), socio-cognitive factors (prosocial orientation, resource allocation and peer relations) and moral factors (moral rule cognition and conscience). The aim of the study was to explore whether these factors were associated with competitive behavior in preschoolers.

We predicted that children's competitiveness would be negatively associated with prosocial orientation, resource allocation and conscience, but positively associated with parents' competitiveness (with possible gender interactions). Regarding moral rule cognition, peer relations, parental income and education, we took an explorative approach.

Methods

Design

The study design consisted of the following steps: a pre-test phase, with teacher and parent ratings and an individual pre-test, a test phase with the ambiguous activity task (in two sessions), and a test to assess understanding of that task (see Figure 5).

Dependent variables were children's competitiveness measured with teacher and parent ratings and observed in the ambiguous activity task.

Independent variables were family background factors (parents' self-rated competitiveness, parental income and education (SES)), socio-cognitive factors; prosocial orientation (teacher- and parent-rated), resource allocation, peer relations (sociometry and parent-rated peer problems), and moral factors (moral rule cognition and conscience).

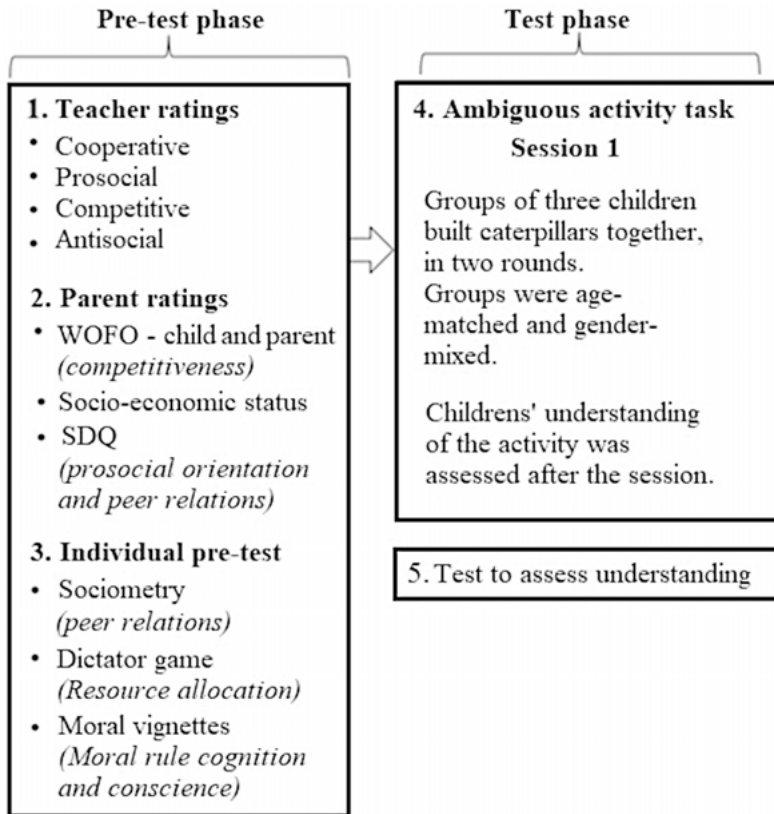


Figure 5. Design of Study II.

General procedure

As soon as parents registered their consent for their children to participate, they received an online questionnaire by email. Teachers who were familiar with the participants filled in a paper questionnaire at the beginning of data collection. Participants were interviewed by an adult for approximately 10 minutes. The interview started with the sociometry task, followed by the dictator game task and the moral vignettes. The interview was audio-recorded.

Approximately one month after the interview, participants took part in the ambiguous activity task (Session 1). Groups of three, that were age-matched and gender-mixed, took part in the ambiguous activity task in a secluded room

at the preschool. Each group built caterpillars twice (each participant collected 10 pieces), in sessions taking approximately 10-20 minutes to complete. Sessions were video-recorded. After finishing the activity, each participant was interviewed individually to assess understanding of the activity. One to three months after the first session, children built caterpillars again at the preschool in new age-mixed groups (Session 2) to establish test-retest reliability.

Results

Teacher and parent competitiveness ratings were positively associated¹². Teacher ratings were positively associated with observed competitiveness¹³.

Linear mixed models (LMM) revealed that mothers' competitiveness¹⁴ was negatively associated with teacher-rated competitiveness. Fathers' competitiveness¹⁵ was positively associated with teacher-rated competitiveness. There was also a positive interaction between fathers' competitiveness and child's gender¹⁶, but not between mothers' competitiveness and child's gender¹⁷ (see Figure 6). There was also a positive association between mothers' income and observed competitiveness¹⁸.

Resource allocation was negatively associated with teacher-rated competitiveness¹⁹. Observed competitiveness was also negatively associated with resource allocation²⁰ with a main effect of age²¹. Parent-rated prosociality was negatively associated with observed competitiveness²² with a main effect of age²³. Moral rule cognition was associated with observed competitiveness²⁴ with a main effect of age²⁵.

¹² $r = .38, p = .003$

¹³ $r = .38, p = .004$

¹⁴ $F_{1,6} = 5.03, p = .031, \beta = -.128, 95\% \text{ CI for beta } [-.254, -.010]$

¹⁵ $F_{1,6} = 16.7, p = .000, \beta = .266, 95\% \text{ CI for beta } [.152, .380]$

¹⁶ $F_{1,6} = 5.45, p = .025, \beta = .192, 95\% \text{ CI for beta } [.026, .358]$

¹⁷ $F_{1,6} = .466, p = .499, \beta = -.059, 95\% \text{ CI for beta } [-.233, .116]$

¹⁸ $F_{1,9} = 4.65, p = .044, \beta = .159, 95\% \text{ CI for beta } [.005, .312]$

¹⁹ $F_{1,3} = 7.90, p = .006, \beta = -.234, 95\% \text{ CI for beta } [-.400, -.068]$

²⁰ $F_{1,3} = 4.50, p = .039, \beta = -.053, 95\% \text{ CI for beta } [-.102, -.003]$

²¹ $F_{1,3} = 9.30, p = .004, \beta = .266, 95\% \text{ CI for beta } [.091, .441]$

²² $F_{1,3} = 5.36, p = .026, \beta = -.092, 95\% \text{ CI for beta } [-.173, -.012]$

²³ $F_{1,3} = 22.7, p = .000, \beta = .374, 95\% \text{ CI for beta } [.215, .533]$

²⁴ $F_{1,3} = 5.25, p = .026, \beta = -.363, \text{ for binary value 0, } 95\% \text{ CI for beta } [-.682, -.045]$

²⁵ $F_{1,3} = 11.1, p = .002, \beta = .232, 95\% \text{ CI for beta } [.092, .372]$

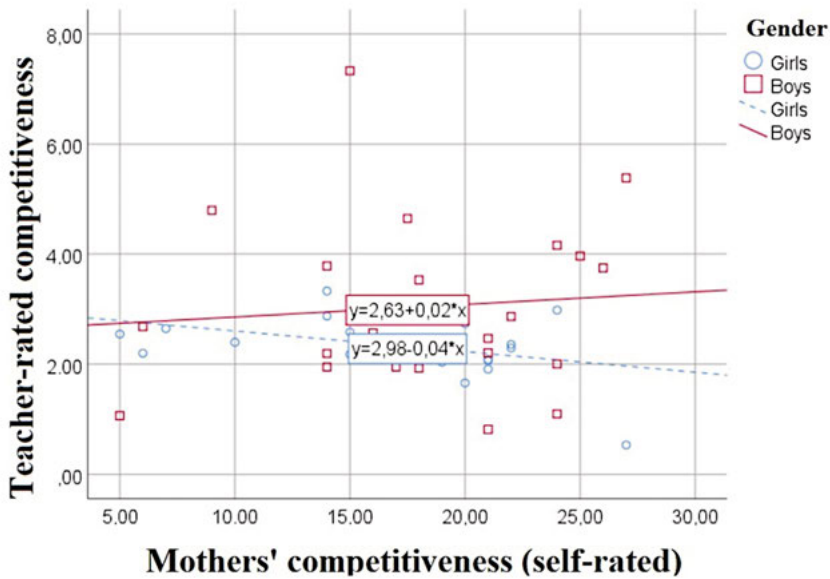
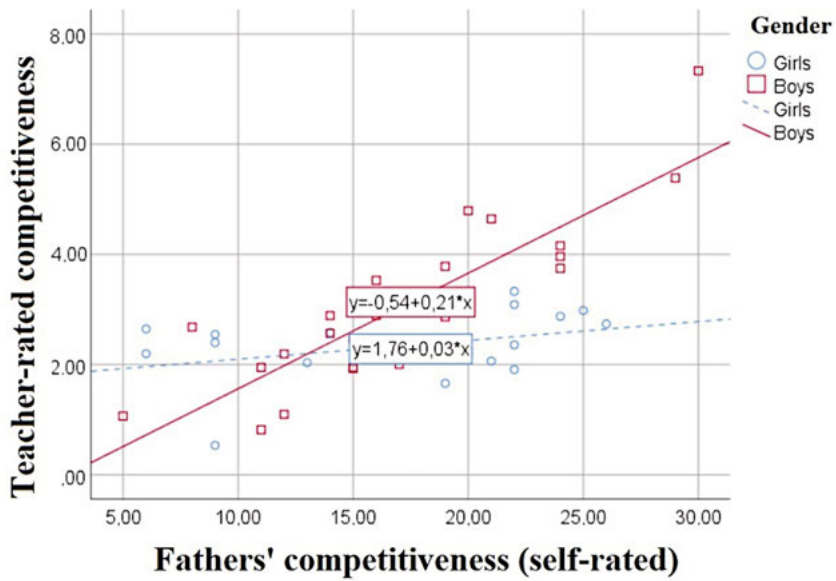


Figure 6. The interaction between teacher-rated competitiveness (based on LMM values), fathers' and mothers' self-rated competitiveness and child's gender.

Discussion

This study revealed a connection between fathers' self-rated competitiveness and their sons' teacher-rated competitiveness. The more competitive the fathers, the more competitive the sons. Our results indicate that boys may be socialized by competitive fathers to be more competitive. There may also be biological or genetic components to these results.

In contrast, we found a negative association between mothers' and children's competitiveness. One plausible explanation for this result is that mothers may have different socialization goals than fathers have, such that mothers focus more on building relationships (Hastings & Grusec, 1998) and on fostering their children to compete less. There was also a positive association between mothers' income and observed competitiveness. The finding that children of high-income mothers competed more in our ambiguous activity task could be explained by high SES parents cultivating a greater willingness to compete (Almås et al., 2016).

The results also showed that parent-rated prosociality and resource allocation were associated with observed competitiveness. These results indicate that children who are more concerned for others, reflected by a prosocial orientation and generosity, are less competitive. The results also showed that children with higher moral rule cognition competed more in our ambiguous activity task, which indicates that competitive children may use moral understanding as a tool to their own advantage in a competitive situation.

STUDY III - Behavioral effects of cooperative and competitive board games in preschoolers

Introduction and aims

The educational environment fosters children's social development (Schonert-Reichl et al., 2012) and gives children opportunities to engage in social behaviors, such as prosocial and cooperative behaviors. Cooperation and collaborative group work in schools have positive effects on children's cognitive (Fawcett & Garton, 2005) as well as social and academic performance (Van Velsor, 2017). Competition, in contrast, has been related to negative consequences for children's academic development and peer relationships (Lam et al., 2004; Pappert et al., 2017; Tassi & Schneider, 1997) as well as antisocial behavior (Hawley, 1999). One way to reduce antisocial behaviors in schools is to teach children other-oriented behavior such as cooperation and prosocial behaviors (e.g., Frey et al., 2008).

In this study, we used traditional board games as a method to investigate children's social behaviors. Some studies suggest that cooperative board gaming increases prosocial and cooperative behaviors in children (Bay-Hinitz et al., 1994; Zan & Hildebrandt, 2003) and that competitive board gaming leads to more aggressive behavior and less cooperative behavior (Bay-Hinitz et al., 1994). The aim of this study was to explore the behavioral effects of cooperative and competitive board gaming in preschoolers.

We predicted that children who played cooperative board games, in comparison to children who played competitive board games, would behave more cooperatively and prosocially and less competitively and antisocially in subsequent semi-structured free play and structured game-like behavioral tasks. In Study III, we tried to detect short-term generalization effects. We also explored enjoyment of cooperative and competitive board games and whether enjoyment differed as a function of whether the game was won or lost.

The ability to inhibit impulses has been related to children's prosocial (Hughes et al., 2000), cooperative (Ciairano et al., 2007; Giannotta et al., 2011), competitive (Huyder & Nilsen, 2012) and antisocial behaviors (Hughes et al., 2000). For example, inhibitory control has been associated with less competition in a cooperative context (Huyder & Nilsen, 2012). Thus, we controlled for interference control in our analyses.

Methods

Design

This study had a between-subjects design with two conditions: cooperative and competitive board games. The study design consisted of the following steps: a pre-test phase (with teacher and an individual pre-test, with multiple tests), an experimental phase (in which children played either cooperative or competitive board games), assessment of enjoyment of board games and, finally, test sessions (with free or structured tasks) (see Figure 7).

Dependent variables were behaviors (cooperative, prosocial, competitive and antisocial behaviors) and helpful choices in the subsequent tests and enjoyment of games. Independent variables were condition (cooperative or competitive board games), teacher ratings of behavior, social values (competitiveness), sociometry (popularity), and Stroop task (interference control).

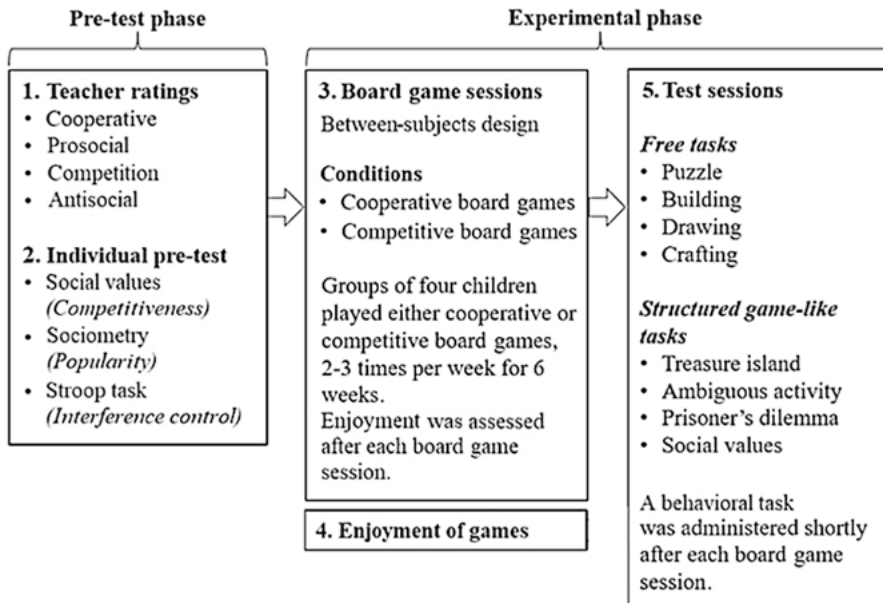


Figure 7. Design of Study III.

General procedure

A pre-test phase (including teacher ratings and individual pre-test) and an experimental phase (including board-gaming sessions in which participants played either cooperative or competitive board games in groups of four with eight subsequent behavioral tasks) were conducted.

Participants were first matched in pairs based on individual tendencies to compete (competitiveness measured in pre-test social values task). Each

matched pair was then randomly split between two conditions and allocated to a group within that condition (cooperative or competitive board games). Within-condition groups were balanced based on age, gender, and sociometric scores. Matched pair randomization is a common procedure for randomization to experimental groups because it reduces sampling error (e.g., it avoids accidentally placing older children in one group and younger children in another).

Participants played board games at the preschool approximately two to three times a week during a 6-week period. On average, participants played board games six times and participated in approximately the same number of behavioral tasks. Behavioral tasks were distributed equally across conditions.

Results

Linear mixed models (LMM) showed that condition was a significant predictor of competitive behavior²⁶, with children competing more in subsequent tasks after playing competitive board games²⁷. Condition was not a significant predictor of cooperative behavior²⁸, prosocial behavior²⁹, antisocial behavior³⁰, or helping choices³¹. To measure the strength of the multiple null results, we conducted *t*-tests and estimated Bayes factor. These analyses confirmed a significant difference in competitive behavior between conditions³² and a moderate Bayes factor in support of a difference in competitive behavior between conditions³³. Regarding enjoyment of games, the results showed a significant effect of condition³⁴, game outcome³⁵ and a significant interaction between condition and game outcome³⁶.

²⁶ $F_{1,5} = 4.91, p = .028$

²⁷ $\beta = 0.42, 95\% \text{ CI for beta } [0.04, 0.79]$

²⁸ $p = .681, \beta = -0.09, 95\% \text{ CI for beta } [-0.56, 0.37]$

²⁹ $p = .844, \beta = 0.04, 95\% \text{ CI for beta } [-0.36, 0.45]$

³⁰ $p = .862, \beta = 0.04, 95\% \text{ CI for beta } [-0.43, 0.52]$

³¹ $p = .476, \beta = -0.05, 95\% \text{ CI for beta } [-0.22, 0.10]$

³² $t(58) = 2.94, p = .005$

³³ $\text{BF}_{10} = 8.61$ (moderate evidence for H_1)

³⁴ $F_{1,8} = 5.24, p = .023$

³⁵ $F_{1,8} = 16.6, p = .000$

³⁶ $F_{1,8} = 6.06, p = .014$

Discussion

In this study, we predicted that children who played cooperative board games would display more other-oriented behaviors and less self-oriented behaviors in subsequent tasks. The results showed that children who played cooperative board games did not display more other-oriented behaviors. One plausible reason for this result could be possible difficulties in transferring and generalizing other-oriented behavior from one situation to another (e.g., Abikoff, 2009; Carruthers et al., 2020; Packer, 2001). In addition, teachers rated children in our sample as high on cooperative and prosocial behaviors. Thus, the lack of difference between conditions could also be due to ceiling effects in our sample. However, ceiling effects cannot explain why competitive board games did not reduce other-oriented behaviors.

We also predicted that children who played competitive board games would display more self-oriented behaviors and less other-oriented behaviors in subsequent tasks. Although children seemed to compete more after playing competitive board games, we could not replicate a previous study (Bay-Hinitz et al., 1994) suggesting that playing competitive board games leads to behavior that is more aggressive and less cooperative.

Although it was not part of our initial hypothesis, we also found an effect of gender, in which girls were more prosocial than boys when engaging in our subsequent tasks. One plausible explanation for these results could be related to cultural conditions (Wan et al., 2019).

Our conclusion based on these results is that the behavioral effect of cooperative board games is weak in a sample of children who are already highly other-oriented. We found no differences between conditions regarding other-oriented behaviors, indicating that children may benefit socially from playing both cooperative and competitive board games. However, children enjoyed playing cooperative board games more than competitive board games, which may be the main benefit of cooperative board games.

GENERAL DISCUSSION

The overarching aim of this thesis was to explore other-oriented (prosocial and cooperative behaviors), self-oriented (competitive and antisocial behaviors) and strategic social behaviors in children.

Key findings

In Study I, we found that 4-year-olds, but not 6- and 8-year-olds, allocated candies strategically by favoring a rich adult who could reciprocate candy sharing and had the intention to do so. Children who did not spontaneously help an adult in need allocated more candies to the rich adult. Based on these results, we concluded that children from the age of 4 are capable of strategically allocating resources and that there is a relationship between strategic and other-oriented behaviors, such that strategic children are less inclined to help others.

In Study II, we found that children who were rated as more prosocially oriented by parents competed less in our ambiguous activity task. Additionally, we found that children who were rated as less competitive by teachers were more generous. In contrast, children with higher moral rule cognition competed more. Boys who were rated by teachers as more competitive had fathers who rated themselves as competitive. The main conclusion from these results is that children's prosocial orientation is a strong indicator of how prone preschoolers are to competing against others. These results also suggest that family background has an impact on the development of competitive behavior in preschoolers.

In Study III, we found that our sample of children displayed high levels of cooperative and prosocial behaviors in our subsequent tasks, regardless of which type of board game they played. Cooperative board games did not decrease self-oriented behaviors. We also found that children who played competitive board games competed more in subsequent tasks. However, children enjoyed playing cooperative board games more than competitive board games. The results suggest that board games, regardless of type, could have positive effects on preschoolers' social behavior.

Strategic social behavior and helping behavior

In Study I, we investigated whether, and at what age, children begin to allocate resources strategically and whether children who are more prone to do so are less likely to engage in spontaneous helping.

Based on the results, we concluded that sharing behavior directed at the rich adult was rooted in the motivation to gain as much candies as possible. If sharing behavior derived from an altruistic motivation, children would reasonably have shared more candies with the poor adult. The adults did not express a negative affect, and thus it is not likely that children were motivated by empathic concerns when sharing with the rich adult or not sharing with the poor adult.

In Experiment 1, we saw that 6- and 8-year-olds tended to share more equally than 4-year-olds. However, children as young as 18 months years have some understanding of fairness (Geraci & Surian, 2011). By 4 years, children begin displaying an aversion to someone receiving less resources (i.e., disadvantageous inequity aversion; see Pappert et al., 2017 for a review). So why did 4-year-olds in Study I not favor the poor adult, or at least allocate resources more equally? Perhaps our 4-year-olds did not fully grasp norms of fairness, but if this was the case, they might as well have favored the poor. The fact that they did not do so indicates that they had strategic concerns.

Children can punish others by withholding resources and help (Salali et al., 2015; Vaish et al., 2010). One alternative reason for not sharing candy with the poor adult could thus be that children punished the poor adult for not sharing resources. Children may even perceive the poor adult as a free rider, joining the game without contributing. What speaks against this explanation, however, is that the poor adult clearly stated reciprocal intentions, which is a strong driving force for helping and sharing behaviors in children (Dunfield & Kuhlmeier, 2010; Vaish et al., 2018). Prior to the fourth round, the rich adult had not shared with the child, yet there were still children who continued to share with the rich adult. This is a strong indication that reciprocal intentions, combined with the ability to reciprocate, play a profound role in children's sharing behavior.

Children, as young as 3 years, are more generous toward an individual who has initially been generous to them (see Vogelsang & Tomasello, 2016 for a review). In Study I, the adults were equally generous, sharing one candy each with the child during the fourth round. Before the fourth round, both adults did state the intention to share with the child, but only the rich adult had the ability to do so. Thus, generosity as a motive could not explain why children shared more candies with the rich adult.

Infants are more likely to help an adult if they have engaged in reciprocal play rather than parallel play (Barragan & Dweck, 2014). In Study I, we assumed that children (in the reciprocal condition) conceived of the interaction with the adults as reciprocal due to a stated intention to reciprocate. And if

they did, this should have led to children being more helpful. However, some children did not help, which implies that some children may have either interpreted the situation as non-reciprocal, or that some children were so driven by self-oriented concerns that this overruled reciprocal interaction and consequently also their other-oriented concerns. As previously mentioned, children are very sensitive to others' intentions to share resources. In Study I, both adults stated a clear intention to reciprocate. Thus, it is more plausible that the reason why some children did not help is because they were generally more self-oriented – they did not help because there was no strategic value in helping.

Younger children tend to be selfish when they must share resources with others (Vogelsang & Tomasello, 2016). Studies have also found that when 4- and 5-year-olds are confronted by a rich and a poor individual, children are more generous toward the rich individual (Li et al., 2014). Thus, our result may reflect an age-specific phenomenon, in that children around 4 years have started to grasp the ability to strategically allocate resources. However, if the results simply reflect an age-specific phenomenon, it is hard to explain why the same 4-year-olds did not help in our spontaneous helping task, as helping is a behavior that develops very early. In fact, in studies investigating strategic social behavior, “sizable proportions” of children acted prosocially in control conditions in which there were no strategic incentives (see Grueneisen & Warneken, 2022 for a review). Thus, it is more likely that the 4-year-olds who favored the rich adult were more self-oriented, not just because of age but because they were less other-oriented in general.

The nature of competitive behavior

In Study II, we investigated the relationship between family background, socio-cognitive and moral factors and competitiveness. The aim of the study was to explore whether these factors were associated to competition in preschoolers. The results showed that family background, socio-cognitive and moral factors were associated to preschoolers' competitiveness. I will now discuss these findings in more detail.

The results from Study II showed that prosocial orientation and resource allocation were indeed negatively associated with competitiveness. Teachers rated children who allocated more resources to an anonymous child as less competitive and children who were rated as prosocial by parents were less competitive in the ambiguous activity task.

Studies investigating the relationship between competition and prosocial behavior have found that competitiveness reduces prosociality in children (Majolo & Maréchal, 2017; Pappert et al., 2017) and that competition increases aggression (Bay-Hinitz et al., 1994). Our results indicate that a higher

degree of prosociality reduces competitive behavior in children. When competing, partners have opposite goals, and one must reduce the goal achievements of others relative to one's own. Thus, children who have a general concern for others may refrain from competition, or they may have a less strong driving force to compete.

It is interesting that the results from Study II follow the same pattern as those from Study I – if children displayed a higher degree of concern for others (reflected by helping and adult in need, allocating more resources to an anonymous child and higher parent-rated prosociality), they were less inclined to engage in self-oriented behavior (share resources strategically and compete).

It has been suggested that there is not a consistent relationship between the developmental trajectories of different forms of prosocial behavior (e.g., Thompson & Newton, 2013). Prosocial behavior may rather be a heterogenic set of behaviors that gradually becomes integrated during children's social development (see Paulus, 2018 for a review). The fact that children who were more other-oriented in Study I and Study II tended to be less self-oriented indicates that children's general prosocial orientation may be relatively fixed. However, future studies need to investigate this further.

It is also important to note that the children in Study II had two choices in each turn: either hindering their peers from completing or helping their peers to complete their caterpillars. Hindering peers (competitive behavior) was the main focus of our study, however, choosing to help may reflect the choice to refrain from competition or helping as part of a prosocial behavior. Thus, competing less may not only mean that children are less self-oriented; it could also mean that children are more other-oriented.

In one of the few studies on the relationship between other-referenced competition and peer relations, Tassi and Schneider (1997) found that this particular type of competition was associated with lower peer status in children. Another study, conducted by Paquette et al. (2013), showed that other-referenced competition was associated with lower social competence and greater aggression. Our results showed that observed competitiveness was negatively associated with parent-rated prosociality, but that there was no relationship between peer relations (sociometry and parent-rated peer problems) and competitiveness. The reason we did not see a relationship between observed competitiveness and peer relations may perhaps be that our measure of other-referenced competition was a structured activity, while Tassi and Schneider (1997) primarily used peer ratings to assess competitiveness. In a structured activity it may be socially acceptable to compete.

The results from Study II showed no relationship between conscience and competitiveness. The fact that conscience was unrelated to competitiveness may again be due to our observational measure of competitiveness – competing in a structured activity may simply not be considered morally wrong.

While very few studies have investigated the relationship between morality and competition, some have found that moral rule cognition is related to resource control (Hawley, 2003; Hawley & Geldhof, 2012; Hawley, 2014) and that bi-strategic children, those who use both coercive and prosocial strategies to meet own goals, display the highest level of moral rule cognition (Hawley & Geldhof, 2012). The fact that children with better moral rule cognition competed more in our ambiguous activity task implies that children may use their moral judgement as a tool in competitive situations. When children compete, they have opposite goals. To compete one must hinder others in completing their goals, in favor of oneself and one's own goals. Children with better moral understanding may perhaps find it easier to overlook the goals of others in favor of themselves and their own goals, which may lead to more competition.

In Study II, we investigated the relationship between family background factors and competitiveness. Parents have a great impact on their children's lives (Tungodden & Willén, 2023) and pass on preferences, values and attitudes to their children (Zumbuehl et al., 2021). However, little is known about how parents' own competitiveness and SES factors influence their children's competitiveness. In one of the few studies conducted on how parents' own competitiveness is related to their children's competitiveness, Khadjavi and Nicklisch (2018) found no relationship between parents' competitiveness and their children's competitiveness.

In contrast, we found an association between parents' own competitiveness and their children's competitiveness. The strong association between fathers' and sons' competitiveness was striking. It is plausible that there is a socialization process involved, in which competitive fathers foster their sons to compete. This is in line with Khadjavi and Nicklisch's (2018) study showing that parents' ambitions concerning their children's success are related to their children's competitiveness. There may also be biological or genetic components to these results, although any literature on genetic factors related to competition is thus far highly limited.

The fact that mothers' competitiveness was negatively associated with children's competitiveness supports the notion that a competitive orientation is shaped through a socialization process, in which parents may enhance or suppress their children's competitive tendencies. Mothers may have different socialization goals compared to fathers, focusing more on relational, personal and emotional development (Hastings & Grusec, 1998; Si Han & Pei Jun, 2013), which may lead to less competitive behavior in their children. Competitive mothers may counteract their children's competitive behavior more effectively than do competitive fathers (or less competitive mothers).

The only SES factor that was associated with observed competitiveness was mothers' income, such that there was a positive association between mothers' income and observed competitiveness. The explanation for this result could be that mothers with a higher income raise their children to compete (Almås et al., 2016).

Other- and self-oriented behaviors across different situations

In Study I, children who spontaneously helped allocated less candies to the rich adult. This is interesting, as it indicates that children may have a more general other- or self-orientation that extends from one situation to another. In Study II, we also found a relationship between other- and self-oriented behaviors. In this study, children who were more other-oriented were less inclined to engage in other-referenced competition. Thus, across two studies, we found that other-oriented behaviors are related to self-oriented behaviors, in Study I in the form of favoring a rich adult, and in Study II in the form of competing against peers.

Study III investigated whether playing traditional cooperative board games could increase preschoolers' other-oriented behaviors and decrease self-oriented behaviors outside the board game situation. This study also investigated whether playing competitive board games increases self-oriented behaviors and decreases other-oriented behaviors. In addition, we investigated the enjoyment of cooperative and competitive board games and whether enjoyment differed depending on whether the game was lost or won.

In contrast to Study I and Study II, we could not detect a relationship between other- and self-oriented behaviors in Study III. In Study III, we tried to detect short-term generalization effects, which were defined as the behavioral effects the previous situations have on children's other- and self-oriented behaviors in new situations (behavioral tasks). We included both free and structured game-like tasks to detect short-term generalization effects.

Children who played cooperative board games, in comparison to those who played competitive board games, did not behave in a more other-oriented or less self-oriented manner in subsequent tasks. Why did other-oriented behaviors in Study III fail to generalize from one situation to another? One plausible explanation is the difficulties inherent in detecting generalization effects (Abikoff, 2009; Carruthers et al., 2020; Packer, 2001). For example, it could be that the board games and test situations were not similar enough for role and event schemas to transfer from one situation to another. However, we could not detect a difference between conditions regarding helping behavior either, even though we measured helping in a structured game-like task, which implies that generalization from one situation to another may be difficult to achieve. Although board games can have methodological advantages in other areas (Davis-Temple et al., 2014), playing cooperative board games may not be sufficient as a method to moderate social behavior in preschoolers – from a short-term perspective. Our results may also be due to ceiling effects in our sample, in which children were already highly other-oriented prior to board gaming. Consequently, playing cooperative board games would not have made children more other-oriented.

It could also be that cooperative and competitive board games are equally good at eliciting other-oriented behaviors in children. Competition may indeed have positive effects (Rosol, 2012; Sheridan & Williams, 2006). Playing board games, regardless of their type, could thus have positive effects on children's social behavior. Children engage more in cooperation with their in-group members in a competitive setting (Majolo & Maréchal, 2017). Perhaps children in each playgroup had developed a sense of in-group membership, making them more other-oriented toward each other, despite playing competitive board games. The fact that we could not detect any differences between conditions regarding other-oriented behaviors could also indicate that both types of board games are equally efficient at eliciting other-oriented behaviors in children.

However, we found that self-oriented behavior tended to generalize from one situation to another; playing competitive board games made children more competitive in subsequent tasks. In Study III, competition was operationalized as explicitly comparing oneself to another child and implicitly as boasting. In competitive board games, children are constantly comparing their own to others' progress, causing a competitive climate among players. It is plausible that this competitive climate was transferred to the subsequent tasks, making children more competitive while engaging in different activities with each other.

The fact that playing competitive board games increased competition in subsequent tasks is in line with Bay-Hinitz et al. (1994), who showed that competition leads to more self-oriented behavior. However, children did not display an increase in antisocial behavior in Study II. This is in line with Zan and Hildebrandt's (2003) study, in which children did not display aggressive behavior during competitive board gaming. They argued that groups of children might be less aggressive toward each other while playing competitive board games if they are more cooperative prior to board gaming, which the children in our sample were. Thus, we could not replicate Bay-Hinitz et al. (1994), although we found that children were more competitive after competitive board gaming.

Our results also showed that children enjoyed playing cooperative board games more than competitive board games. This was true regardless of whether the games were won or lost. The results also showed that children enjoyed competitive board games less if the game was lost. Cooperative board games are probably more enjoyable because children work together toward a common goal, an activity that, in line with Pepler et al., (2013), may cause more positive communication and focus on the game. Orlick (1981) also found that children enjoyed cooperative games more than competitive games and that children are affected by wins and losses, which is in line with our results. In cooperative board games children lose together. Thus, the reduction in enjoyment that stems from losing a board game may be lessened when playing a cooperative board game, which is why cooperative board games are more enjoyable than competitive board games.

Limitations and strengths

All three studies have limitations that should be taken into account when interpreting the results. The main limitations of Study I were the small sample sizes and the low effect sizes for some of our result. Children could only choose to share with one of the two adults, and thus it is not clear whether children would have been strategic if allocation had been optional. Another limitation, which could have affected the generalization of our results, is that our data were collected in a laboratory setting.

The main limitation of Study II was that our measures of competitiveness did not correlate with each other and that the different measures, respectively, targeted socio-cognitive versus family background factors. This may possibly be related to the complexity of competitive behavior. There may also be limitations regarding the degree of generalization of our observational measure of competitiveness in Study II. Our teacher ratings may have targeted a range of different situations in the preschool environment, but it is not clear which situations. Parent ratings had low validity in general. Another limitation in Study II was that some participants were excluded from further analysis of the observational measure of competitiveness, and some did not attribute emotions to themselves in the conscience task. However, these participants tended to be younger, which may explain the lack of comprehension and difficulties in attributing emotions. Study II had relatively few participants with low SES, which may have limited our understanding of how competitiveness and SES factors are inter-related. Lastly, we had relatively low test-retest reliability for our observational measure of competitiveness, probably due to mixed age groups.

The main limitation of Study III was a low ICC for competitive behavior. One possible explanation for the low ICC may be that competitive behavior was quite rare in our sample of children. Given the complexity of competitive behavior, our operationalization and coding of competition may also be limited to a type of competition that was not represented in our subsequent tasks.

All three studies have strengths as well. The main strength of Study I was that we alternated intention and ability to reciprocate, which enabled us to get a more nuanced picture of which factors influence strategic social behavior in children. We also tested several age groups, which yielded insight into when strategic social behavior starts to emerge in children.

In Study II, no instructions were given to children in our ambiguous activity task regarding whether or not to compete. Children could choose freely between hindering each other from completing and helping each other to complete their caterpillars. This gave us the opportunity to investigate children's tendencies to compete with the motivation to outdo others.

A common main strength of Study II and Study III was that we investigated children's behavior in preschools, in their already existing peer groups. Other- and self-oriented behaviors are often measured independently; however, in

Study III, we measured these behaviors simultaneously in different social activities familiar to children. This allowed us to assess children's behavior in naturalistic situations.

One main strength of Study III was that we used traditional board games to assess behavior. In a world in which children are increasingly exposed to digital games, it is valuable to assess behavioral outcomes in situations in which children interact in real life.

Conclusions and future directions

Study I demonstrated that the ability and intention to reciprocate are strong predictors of how children allocate resources. After the rich adult explicitly changed her intention to reciprocate, children who initially favored the rich adult stopped doing so. These results indicate that, by 4 years, children can choose targets for resource allocation strategically by favoring an individual who has the ability and intention to reciprocate. In both experiments, spontaneous helping was negatively associated with favoring the rich adult. This suggests that children who are other-oriented may be less strategic.

Extending Study I, it would have been interesting to do a longitudinal study investigating whether children who are strategic continue to be strategic over time and in different contexts. How children develop a balance between other- and self-oriented and strategic social behaviors should also be considered in future studies. It would also be interesting to investigate whether parents influence their children's strategic tendencies, similar to what we can see in Study II where family background influences competitive behavior. Lastly, this study could be replicated in a preschool environment.

In Study II, family background (parents' competitiveness and SES) had an impact on children's competitiveness, especially for boys. Children who were more prosocially oriented were less competitive, and children with better moral rule cognition were more competitive. The results motivate a multidimensional approach when investigating preschoolers' competitiveness. Future studies should take into account the impact of family background, socio-cognitive and moral factors when investigating competitive behavior in preschoolers.

Extending Study I and Study II, it would also be interesting to further investigate the relationship between personality traits, strategic behavior, and competitiveness in children, as studies on adults have found that personality traits are related to competitiveness (Ross et al., 2003). In research on competition, it has not always been clear whether competitive behavior is viewed as a personality trait or a situational phenomenon (Udvari & Schneider, 2000). For example, Study I and Study II could be replicated and personality traits could be assessed prior to a task in which competitiveness is observed.

In Study III, the results showed that cooperative board gaming had no effect on other- and self-oriented behaviors. Competitive board games did, however, increase competitive behavior. Children did not become more aggressive after playing competitive board games, which previous studies have suggested. The results also showed that children enjoyed playing cooperative board games more than competitive board games. The purpose of the board games was not only to gain knowledge about preschoolers' social interactions, but also to discover whether they may function as pedagogical tools that help children learn that cooperation can make it easier to reach joint goals. We concluded that children's enjoyment of playing cooperative board games may be the primary benefit of cooperative board games and that the behavioral effects of cooperative board games are weak, at least in highly other-oriented children. Future studies could investigate the effects of playing board games in a sample of more self-oriented children.

Acknowledgements

Jag vill framför allt tacka min huvudhandledare Gunilla Stenberg för att hon har stöttat mig under alla dessa år. Utan hennes stöd hade jag aldrig orkat hela vägen ut. Jag har även fått mycket stöd och feedback från min biträdande handledare Leo Poom, vilket jag är väldigt tacksam för. Tack Ben Kenward för att du introducerade mig till detta forskningsområde. Jag vill också tacka Gustaf Gredebäck för att du, från första början, uppmuntrade mig att söka till forskarutbildningen och var min handledare när jag skrev magisteruppsatsen. Jag vill också tacka min man David för att du har peppat mig att skriva klart avhandlingen och inte ge upp. Jag vill även tacka alla barn, föräldrar och pedagoger som har deltagit i de olika studierna. Det har varit underbart roligt att få träffa alla barn. Datainsamlingarna har varit höjdpunkterna under denna långa resa. Jag vill också tacka alla studenter som har varit involverade i studierna som experimentledare. Det har varit roligt och väldigt givande att samarbeta med er, speciellt Kahl Hellmer, du är en otrolig glädjespridare. Tack!

References

- Abikoff, H. (2009). ADHD psychosocial treatments: Generalization reconsidered. *Journal of Attention Disorders, 13*(3) 207-210.
<https://doi.org/10.1177/1087054709333385>
- Almås, I., Cappelen, A. W., Salvanes, K. G., Sørensen, E. Ø., & Tungodden, B. (2016). Willingness to compete: Family matters. *Management Science, 62*(12), 1753-1767.
<https://doi.org/10.1287/mnsc.2015.2244>
- Apperly, I. A., & Butterfill, S. A. (2009). Do humans have two systems to track beliefs and belief-like states? *Psychological Review, 116*(4), 953-970.
<https://doi.org/10.1037/a0016923>.
- Bagdi, A., & Vacca, J. (2005). Supporting early childhood social-emotional well-being: The building blocks for early learning and school success. *Early Childhood Education Journal, 33*(3), 145-150.
<https://doi.org/10.1007/s10643-005-0038-y>
- Barragan, R. C., & Dweck, C. S. (2014). Rethinking natural altruism: Simple reciprocal interactions trigger children's benevolence. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 111*(48), 17071-17074.
<https://doi.org/10.1073/pnas.1419408111>
- Barton, E. E., Pokorski, E. A., Sweeney, E. M., Velez, M., Gossett, S., Qiu, J., Flaherty, C., & Domingo, M. (2018). An empirical examination of effective practices for teaching board game play to young children. *Journal of Positive Behavior Interventions, 20*(3), 138-148.
<https://doi.org/10.1177/1098300717753833>
- Bay-Hinitz, A. K., Peterson, R. F., & Quilitch, H. R. (1994). Cooperative games: A way to modify aggressive and cooperative behaviors in young-children. *Journal of Applied Behavior Analysis, 27*(3), 435-446.
<https://doi.org/10.1901/jaba.1994.27-435>
- Blake, P. R., & McAuliffe, K. (2011). 'I had so much it didn't seem fair': Eight-year-olds reject two forms of inequality. *Cognition, 120*(3), 215-224.
<https://doi.org/10.1016/j.cognition.2011.04.006>
- Brownell, C. A., Ramani, G. B., & Zerwas, S. (2006). Becoming a social partner with peers: Cooperation and social understanding in one- and two-year-olds. *Child Development, 77*(3), 803-821.
<https://doi.org/10.1111/j.1467-8624.2006.00904.x>
- Buunk, A. P., Stulp, G., & Ormel, J. (2014). Parental social status and intra-sexual competitiveness among adolescents. *Evolutionary Psychology, 12*(5), 1022-1037. <https://doi.org/10.1177/147470491401200511>

- Calkins, S. D., & Fox, N. A. (2002). Self-regulatory processes in early personality development: A multilevel approach to the study of childhood social withdrawal and aggression. *Development and Psychopathology, 14*(3), 477-498.
<https://doi.org/10.1017/s095457940200305x>
- Carruthers, S., Pickles, A., Slonims, V., Howlin, P., & Charman, T. (2020). Beyond intervention into daily life: A systematic review of generalisation following social communication interventions for young children with autism. *Autism Research, 13*(4), 506-522. <https://doi.org/10.1002/aur.2264>
- Ciairano, S., Visu-Petra, L. & Settanni, M. (2007). Executive inhibitory control and cooperative behavior during early school years: A follow-up study. *Journal of Abnormal Child Psychology, 35*(3), 335-345.
<https://doi.org/10.1007/s10802-006-9094-z>
- Chajes, J. R., Grossmann, T., & Vaish, A. (2022). Fairness takes time: Development of cooperative decision making in fairness context. *Journal of Experimental Child Psychology, 216*, 105344.
<https://doi.org/10.1016/j.jecp.2021.105344>
- Charlesworth, W. R. (1996). Co-operation and competition: Contributions to an evolutionary and developmental model. *International Journal of Behavioural Development, 19*(1), 25-39.
<https://doi.org/10.1177/016502549601900103>
- Cosmides, L., & Tooby, J. (2013). Evolutionary psychology: New perspectives on cognition and motivation. *Annual Review of Psychology, 64*, 201-229.
<https://doi.org/10.1146/annurev.psych.121208.131628>
- Domino, G. (1992). Cooperation and competition in Chinese and American children. *Journal of Cross-Cultural Psychology, 23*(7), 456-467.
<https://doi.org/10.1177/0022022192234003>
- Davis-Temple, J., Jung, S., & Sainato, D. M. (2014). Teaching young children with special needs and their peers to play board games: Effects of a least to most prompting procedure to increase independent performance. *Behavior Analysis in Practice, 7*(1), 21-30.
<https://doi.org/10.1177/1098300720985287>
- Dunfield, K. A., & Kuhlmeier, V. A. (2010). Intention-mediated selective helping in infancy. *Psychological Science, 21*(4), 523-527.
<https://doi.org/10.1177/0956797610364119>
- Dunnington, M. J. (1957). Investigation of areas of disagreement in sociometric measurement of preschool children. *Child Development, 28*(1), 93-102.
<https://doi.org/10.2307/1126004>
- Engelmann, J. M., Herrmann, E., & Tomasello, M. (2012) Five-year olds, but not chimpanzees, attempt to manage their reputations. *PLoS ONE, 7*(10), e48433. <https://doi.org/10.1371/journal.pone.0048433>
- Engelmann, J. M., & Tomasello, M. (2019). Children's sense of fairness as equal respect. *Trends in Cognitive Science, 23*(6), 454-463.
<https://doi.org/10.1016/j.tics.2019.03.001>

- Engelmann, J. M., Zhang, Z., Zeidler, H., Dunham, Y., & Herrmann, E. (2021). The influence of friendship and merit on children's resource allocation in three societies. *Journal of Experimental Child Psychology*, 208, 105149. <https://doi.org/10.1016/j.jecp.2021.105149>
- Etel, E., & Slaughter, V. (2019). Theory of mind and peer cooperation in two play contexts. *Journal of Applied Developmental Psychology*, 60, 87-95. <https://doi.org/10.1016/j.appdev.2018.11.004>
- Ettekal, I., & Mohammadi, M. (2020). Co-occurring trajectories of direct aggression and prosocial behaviors in childhood: Longitudinal associations with peer acceptance. *Frontiers in Psychology*, 11, 581192. <https://doi.org/10.3389/fpsyg.2020.581192>
- Fagereng, A., Mogstad, M., & Ronning, M. (2021). Why do wealthy parents have wealthy children? *Journal of Political Economy*, 129(3), 703-756. <https://doi.org/10.1086/712446>
- Fang, Y., Chen, K., & Huang, Y. (2016). Emotional reactions of different interface formats: Comparing digital and traditional board games. *Advances in Mechanical Engineering*, 8(3) 1-8. <https://doi.org/10.1177/1687814016641902>
- Fawcett, L. M., & Garton, A. F. (2005). The effect of peer collaboration on children's problem-solving ability. *British Journal of Educational Psychology*, 75(2), 157-169. <https://doi.org/10.1348/000709904X23411>
- Fehr, E., & Fischbacher, U. (2004). Social norms and human cooperation. *Trends in Cognitive Sciences*, 8(4), 185-190. <https://doi.org/10.1016/j.tics.2004.02.007>
- Frey, A. J., Lingo, A., & Nelson, C. M. (2008). Positive behavior support: A call for leadership. *Children & Schools*, 30(1), 5-14. <https://doi.org/10.1093/cs/30.1.5>
- Futamura, I., & Shima, Y. (2024). Young children's behaviour predictions in direct reciprocal situations. *European Journal of Developmental Psychology*, 21(1), 36-46. <https://doi.org/10.1080/17405629.2023.2250125>
- Geraci, A., & Surian, L. (2011). The developmental roots of fairness: Infants' reactions to equal and unequal distributions of resources. *Developmental Science*, 14(5), 1012-20. <https://doi.org/10.1111/j.1467-7687.2011.01048.x>
- Gerstadt, C. L., Hong, Y. J., & Diamond, A. (1994). The relationship between cognition and action: Performance of children 3 1/2-7 years old on a Stroop-like day-night test. *Cognition*, 53(2), 129-153. [https://doi.org/10.1016/0010-0277\(94\)90068-X](https://doi.org/10.1016/0010-0277(94)90068-X)
- Giannotta, F., Burk, W. J., & Ciairano, S. (2011). The role of inhibitory control in children's cooperative behaviors during a structured puzzle task. *Journal of Experimental Child Psychology*, 110(3), 287-298. <https://doi.org/10.1016/j.jecp.2011.04.015>
- Gill, D. L., Dziewaltowski, D. A., & Deeter, T. E. (1988). The relationship of competitiveness and achievement orientation to participation in sport and nonsport activities. *Journal of Sport and Exercise Psychology*, 10(2), 139-150. <https://doi.org/10.1123/jsep.10.2.139>

- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.
<https://doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Green, V. A., & Rechis, R. (2006). Children's cooperative and competitive interactions in limited resource situations: A literature review. *Applied Developmental Psychology*, 27(1), 42-59.
<https://doi.org/10.1016/j.appdev.2005.12.002>
- Grueneisen, S., & Warneken, F. (2022). The development of prosocial behavior - from sympathy to strategy. *Current Opinion in Psychology*, 43, 323-328.
<https://doi.org/10.1016/j.copsyc.2021.08.005>
- Grueneisen, S., Leimgruber, K. L., Vogt, R. L., & Warneken, F. (2023). Prosociality and delay of gratification support the development of calculated reciprocity. *Cognition*, 234, 105369.
<https://doi.org/10.1016/j.cognition.2023.105369>
- Gummerum, M., Hanoch, Y., & Keller, M. (2008). When child development meets economic Game Theory: An interdisciplinary approach to investigating social development. *Human Development*, 51(4), 235-261.
<https://doi.org/10.1159/000151494>
- Gummerum, M., Hanoch, Y., Keller, M., Parsons, K., & Hummel, A. (2010). Preschoolers' allocations in the dictator game: The role of moral emotions. *Journal of Economic Psychology*, 31(1), 25-34.
<https://doi.org/10.1016/j.joep.2009.09.002>
- Hammond, S. I., Al-Jbouri, E., Edwards, V., & Feltham, L. E. (2017). Infant helping in the first year of life: Parents' recollection of infants' earliest prosocial behaviors. *Infant Behavior and Development*, 47, 54-57.
<https://doi.org/10.1016/j.infbeh.2017.02.004>
- Hastings, P. D., & Grusec, J. E. (1998). Parenting goals as organizers of responses to parent-child disagreement. *Developmental Psychology*, 34(3), 465-479.
<https://doi.org/10.1037/0012-1649.34.3.465>
- Hawley, P. H. (1999). The ontogenesis of social dominance: A strategy-based evolutionary perspective. *Developmental Review*, 19(1), 97-132.
<https://doi.org/10.1006/drev.1998.0470>
- Hawley, P. H. (2002). Social dominance and prosocial and coercive strategies of resource control in preschoolers. *International Journal of Behavioral Development*, 26(2), 167-176. <https://doi.org/10.1080/01650250042000726>
- Hawley, P. H. (2003). Strategies of control, aggression, and morality in preschoolers: An evolutionary perspective. *Journal of Experimental Child Psychology*, 85(3), 213-235. [https://doi.org/10.1016/S0022-0965\(03\)00073-0](https://doi.org/10.1016/S0022-0965(03)00073-0)
- Hawley, P. H. (2014). Ontogeny and social dominance: A developmental view of human power patterns. *Evolutionary Psychology*, 12(2), 318-342.
<https://doi.org/10.1177/147470491401200204>

- Hawley, P. H., & Geldhof, G. J. (2012). Preschoolers' social dominance, moral cognition, and moral behaviour: An evolutionary perspective. *Journal of Experimental Child Psychology, 112*(1), 18-35.
<https://doi.org/10.1016/j.jecp.2011.10.004>
- Helmreich, R. L., & Spence, J. T. (1978). The work and family orientation questionnaire: An objective instrument to assess components of achievement motivation and attitudes toward family and career. *Catalog of Selected Documents in Psychology, 8*(2).
- Hemmeter, M. L., Ostrosky, M., & Fox, L. (2006). Social and emotional foundations for early learning: A conceptual model for intervention. *School Psychology Review, 35*(4), 583-601.
<https://doi.org/10.1080/02796015.2006.12087963>
- Hromek, R., & Roffey, S. (2009). Promoting social and emotional learning with games: "It's fun and we learn things". *Simulation & Gaming, 40*(5), 626-644.
<https://doi.org/10.1177/1046878109333793>
- Hughes, C., White, A., Sharpen, J., & Dunn, J. (2000). Antisocial, angry, and unsympathetic: "Hard-to-manage" preschoolers' peer problems and possible cognitive influences. *Journal of Child Psychology, Psychiatry and Allied Disciplines, 41*(2), 169-179.
<https://doi.org/10.1017/S0021963099005193>
- Huyder, V., & Nilsen, E. S. (2012). A dyadic data analysis of executive functioning and children's socially competent behaviors. *Journal of Applied Developmental Psychology, 33*(4), 197-208.
<https://doi.org/10.1016/j.appdev.2012.05.002>
- Khadjavi, M., & Nicklisch, A. (2018). Parents' ambitions and children's competitiveness. *Journal of Economic Psychology, 67*, 87-102.
<https://doi.org/10.1016/j.joep.2018.05.004>
- Knight, G. P., & Kagan, S. (1977). Development of prosocial and competitive behaviors in Anglo-American and Mexican-American children. *Child Development, 48*(4), 1385-1394.
<https://doi.org/10.2307/1128497>
- Lam, S., Yim, P., Law, J. S. F., & Cheung, R. W. Y. (2004). The effects of competition on achievement motivation in Chinese classrooms. *British Journal of Educational Psychology, 74*(2), 281-296.
<https://doi.org/10.1348/000709904773839888>
- Li, V., Spitzer, B., & Olson, K. R. (2014). Preschoolers reduce inequality while favoring individuals with more. *Child Development, 85*(3), 1123-1133.
<https://doi.org/10.1111/cdev.12198>
- Ljungberg, T., Westlund, K., & Forsberg, A. J. L. (1999). Conflict resolution in 5-year-old boys: Does post conflict affiliative behavior have a reconciliatory role? *Animal Behavior, 58*(5), 1007-1016.
<https://doi.org/10.1006/anbe.1999.1236>

- Majolo, B., & Maréchal, L. (2017). Between-group competition elicits within-group cooperation in children. *Scientific Reports*, 7, 43277. <https://doi.org/10.1038/srep43277>
- Malti, T., Ongley, S. F., Peplak, J., Chaparro, M. P., Buchmann, M., Zuffianò, A., & Cui, L. (2016). Children's sympathy, guilt, and moral reasoning in helping, cooperation, and sharing: A 6-year longitudinal study. *Child Development*, 87(6), 1783-1795. <https://doi.org/10.1111/cdev.12632>
- Matsumoto, D., Haan, N., Yabrove, G., Theodorou, P., & Carney, C. C. (1986). Preschoolers' moral actions and emotions in Prisoner's Dilemma. *Developmental Psychology*, 22(5), 663-670. <https://doi.org/10.1037/0012-1649.22.5.663>
- McClintock, C. G., Moskowitz, J. M., & McClintock, E. (1977). Variations in preferences for individualistic, competitive, and cooperative outcomes as a function of age, game class, and task in nursery school children. *Child Development*, 48(3), 1080-1085. <https://doi.org/10.2307/1128365>
- McGuire, L., Rizzo, M. T., Killen, M., & Rutland, A. (2018). The development of intergroup resource allocation: The role of cooperative and competitive in-group norms. *Developmental Psychology*, 54(8), 1499-1506. <https://doi.org/10.1037/dev0000535>
- Moore, C. (2009). Fairness in children's resource allocation depends on the recipient. *Psychological Science*, 20(8), 944-948. <https://doi.org/10.1111/j.1467-9280.2009.02378.x>
- Nichols, O. I., Vaughn, B. E., Coppola, G., Shin, N., Monteiro, L., & Krzysik L. (2020). Relations between preschooler social competence and coping tactics during resource-based conflicts. *Social Development*, 29(4), 1051-1070. <https://doi.org/10.1111/sode.12451>
- Ongley, S. F., & Malti, T. (2014). The role of moral emotions in the development of children's sharing behavior. *Developmental Psychology*, 50(4), 1148-1159. <https://doi.org/10.1037/a0035191>
- Orlick, T. D. (1981). Positive socialization via cooperative games. *Developmental Psychology*, 17(4), 426-429. <https://doi.org/10.1037/0012-1649.17.4.426>
- Packer, M. (2001). The problem of transfer, and the sociocultural critique of schooling. *Journal of the Learning Sciences*, 10(4), 493-514. https://doi.org/10.1207/S15327809JLS1004new_4
- Pappert, A.-T., Williams, A., & Moore, C. (2017). The influence of competition on resource allocation in preschool children. *Social Development*, 26(2), 367-381. <https://doi.org/10.1111/sode.12202>

- Paquette, D., Gagnon, M. N., Bouchard, L., Bigras, M., & Schneider, B. H. (2013). A new tool to explore children's social competencies: The Preschool Competition Questionnaire. *Child Development Research*, Article ID 390256, 10 pages. <https://doi.org/10.1155/2013/390256>
- Paulus, M. (2016). Friendship trumps neediness: The impact of social relations and others' wealth on preschool children's sharing. *Journal of Experimental Child Psychology*, *146*, 106-120. <https://doi.org/10.1016/j.jecp.2016.02.001>
- Paulus, M. (2018). The multidimensional nature of early prosocial behavior: A motivational perspective. *Current Opinion in Psychology*, *20*, 111-116. <https://doi.org/doi:10.1016/j.copsy.2017.09.003>
- Paulus, M., & Moore, C. (2012). Producing and understanding prosocial actions in early childhood. *Advances in Child Development and Behavior*, *42*, 271-305. <https://doi.org/10.1016/B978-0-12-394388-0.00008-3>
- Pellegrini, A. D., Roseth, C. J., Mliner, S., Bohn, C. M., Van Ryzin, M., Vance, N., Cheatham, C. L., & Tarullo, A. (2007). Social dominance in preschool classrooms. *Journal of Comparative Psychology*, *121*(1), 54-64. <https://doi.org/10.1037/0735-7036.121.1.54>
- Pellegrini, A. D. (2008). The roles of aggressive and affiliative behaviors in resource control: A behavioral ecological perspective. *Developmental Review*, *28*(4), 461-487. <https://doi.org/10.1016/j.dr.2008.03.001>
- Peppler, K., Danish, J., & Phelps, D. (2013). Collaborative Gaming: Teaching children about complex systems and collective behavior. *Simulation & Gaming*, *44*(5), 683-705. <https://doi.org/10.1177/1046878113501462>
- Priewasser, B., Roessler, J., & Perner, J. (2013). Competition as rational action: Why young children cannot appreciate competitive games. *Journal of Experimental Child Psychology*, *116*(2), 545-559. <https://doi.org/10.1016/j.jecp.2012.10.008>
- Rheingold, H. L. (1982). Little children's participation in the work of adults, a nascent prosocial behavior. *Child Development*, *53*(1), 114-125. <https://doi.org/10.2307/1129643>
- Rochat, P., Dias, M. D. G., Guo, L. P., Broesch, T., Passos-Ferreira, C., Winning, A., & Berg, B. (2009). Fairness in distributive justice by 3- and 5-year-olds across seven cultures. *Journal of Cross-Cultural Psychology*, *40*(3), 416-442. <https://doi.org/10.1177/0022022109332844>
- Rosol, S. B. (2012). Adding constructive competition to enhance a cooperative learning experience: A quest for kudos. *Journal of Management Education*, *37*, 562-591. <https://doi.org/10.1177/1052562912451738>
- Ross, S. R., Rausch, M. K., & Canada, K. E. (2003). Competition and cooperation in the five-factor model: Individual differences in achievement orientation. *The Journal of Psychology*, *134*(4), 323-337. <https://doi.org/10.1080/00223980309600617>

- Rubin, K. H., & Rose-Krasnor, L. (1992). *Interpersonal problem solving and social competence in children*. In: Van Hasselt & M. Hersen, M. (Eds), *Handbook of Social Development. A Lifespan Perspective* (pp.283-323). Springer, Boston, MA.
https://doi.org/10.1007/978-1-4899-0694-6_12
- Salali, G. D., Juda, M., & Henrich, J. (2015). Transmission and development of costly punishment in children. *Evolution and Human Behavior*, 36(2), 86-94.
<https://doi.org/10.1016/j.evolhumbehav.2014.09.004>
- Schmidt, M. F. H., Hardecker, S., & Tomasello, M. (2016). Preschoolers understand the normativity of cooperatively structured competition. *Journal of Experimental Child Psychology*, 143, 34-47.
<https://doi.org/10.1016/j.jecp.2015.10.014>
- Schonert-Reichl, K. A., Smith, V., Zaidman-Zait, A. & Hertzman, C. (2012). Promoting children's prosocial behaviors in school: Impact of the "Roots of Empathy" program on the social and emotional competence of school-aged children. *School Mental Health: A Multidisciplinary Research and Practice Journal*, 4(1), 1-21. <https://doi.org/10.1007/s12310-011-9064-7>
- Schuberth, D. A., Zheng, Y., Pasalich, D. S., McMahan, R. J., Kamboukos, D., Dawson-McClure, S., & Brotman, L. M. (2019). The role of emotion understanding in the development of aggression and callous-unemotional features across early childhood. *Journal of Abnormal Child Psychology*, 47(4), 619-631. <https://doi.org/10.1007/s10802-018-0468-9>
- Sheridan, S., & Williams, P. (2006). Constructive competition in preschool. *Journal of Early Childhood Research*, 4(3) 291-310.
<https://doi.org/10.1177/1476718X06067581>
- Si Han, Y., & Pei Jun, W. (2013). Parental involvement in child's development: Father vs. mother. *Open Journal of Medical Psychology*, 2(4B), 1-6.
<https://doi.org/10.4236/ojmp.2013.24B001>
- Steinbeis, N., Bernhardt, B. C., & Singer, T. (2012). Impulse control and underlying functions of the left DLPFC mediate age-related and age-independent individual differences in strategic social behavior. *Neuron*, 73(5), 1040-1051.
<https://doi.org/10.1016/j.neuron.2011.12.027>
- Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: from instrumental to empathic to altruistic helping. *Child Development*, 81(6), 1814-1827. <https://doi.org/10.1111/j.1467-8624.2010.01512.x>
- Tassi, F., & Schneider, B. H. (1997). Task-oriented versus other-referenced competition: Differential implications for children's peer relations. *Journal of Applied Social Psychology*, 27(17), 1557-1580.
<https://doi.org/10.1111/j.1559-1816.1997.tb01613.x>
- Thompson, R. A., & Newton, E. K. (2013). Baby altruists? Examining the complexity of prosocial motivation in young children. *Infancy*, 18(1), 120-133.
<https://doi.org/10.1111/j.1532-7078.2012.00139.x>

- Tomasello, M., Silk, J. B., Dweck, C. S., Skyrms., B & Spelke, S. E. (2009). *Why We Cooperate*. Cambridge: MIT Press.
<https://doi.org/10.7551/mitpress/8470.001.0001>
- Toppe, T., Hardecker, S., & Haun, D. B. M. (2019). Playing a cooperative game promotes preschoolers' sharing with third-parties, but not social inclusion. *PLoS ONE*, *14*(8), e0221092.
<https://doi.org/10.1371/journal.pone.0221092>
- Tremblay, R. E. (2002). Prevention of injury by early socialization of aggressive behavior. *Injury Prevention*, *8*(4), IV17-IV21.
https://doi.org/10.1136/ip.8.suppl_4.iv17
- Tungodden, J., & Willén, A. (2023). When parents decide: Gender differences in competitiveness. *Journal of Political Economy*, *131*(3), 751-801.
<https://doi.org/10.1086/721801>
- Udvari, S. J., & Schneider, B. H. (2000). Competition and the adjustment of gifted children: A matter of motivation. *Roeper Review*, *22*(4), 212-216.
<https://doi.org/10.1080/02783190009554040>
- Vaish, A., Carpenter, M., & Tomasello, M. (2010). Young children selectively avoid helping people with harmful intentions. *Child Development*, *81*(6), 1661-1669. <https://doi.org/10.1111/j.1467-8624.2010.01500.x>
- Vaish, A., Hepach, R., & Tomasello, M. (2018). The specificity of reciprocity: Young children reciprocate more generously to those who intentionally benefit them. *Journal of Experimental Child Psychology*, *167*, 336-353.
<https://doi.org/10.1016/j.jecp.2017.11.005>
- Van Velsor, P. (2017). Let's all play together nicely: Facilitating collaboration in children's groups. *The Journal for Specialists in Group Work*, *42*(4), 299-315.
<https://doi.org/10.1080/01933922.2017.1338809>
- Vaughn, B. E., & Santos, A. J. (2007). An evolutionary/ecological account of aggressive behavior and trait aggression in human children and adolescents. In P. H. Hawley, T. D. Little, & P. C. Rodkin (Eds.), *Aggression and adaptation: The bright side to bad behavior* (pp. 31-63).
- Vaughn, B. E., Vollenweider, M., Bost, K., Azria-Evans, M. R., & Snider, J. B. (2003). Negative interactions and social competence for preschool children in two samples: Reconsidering the interpretation of aggressive behavior for young children. *Merrill-Palmer Quarterly*, *49*(3), 245-278.
<https://doi.org/10.1353/mpq.2003.0017>
- Vogelsang, M., & Tomasello, M. (2016). Giving is nicer than taking: Preschoolers reciprocate based on the social intentions of the distributor. *PLoS ONE*, *11*(1). <https://doi.org/10.1371/journal.pone.0147539>
- Wan, Y., Fu, H., & Tanenhaus, M. K. (2019). Effects of coordination and gender on prosocial behavior in 4-year-old Chinese children. *Psychonomic Bulletin & Review*, *26*(2), 685-692. <https://doi.org/10.3758/s13423-018-1549-z>
- Warneken, F. (2018). How children solve the two challenges of cooperation. *Annual Review of Psychology*, *69*, 205-229. <https://doi.org/10.1146/annurev-psych-122216-011813>

- Warneken, F., & Tomasello, M. (2009). The roots of human altruism. *British Journal of Psychology*, *100*(2), 455-471.
<https://doi.org/10.1348/000712608X379061>
- Warneken, F., Sebastián-Enesco, C., Benjamin, E. N., & Pieloch, A. K. (2019). Pay to play: Children's emerging ability to use acts of generosity for selfish ends. *Journal of Experimental Psychology*, *188*, 104675.
<https://doi.org/10.1016/j.jecp.2019.104675>
- Webster-Stratton, C., & Reid, M. J. (2004). Strengthening social and emotional competence in young children – The foundation for early school readiness and success: Incredible years classroom social skills and problem-solving curriculum? *Infants & Young Children*, *17*(2), 96-113.
<https://doi.org/10.1097/00001163-200404000-00002>
- Weinberger, N., & Stein, K. (2008). Early competitive game playing in same and mixed gender peer groups. *Merrill-Palmer Quarterly*, *54*(4), 499-514.
<https://doi.org/10.1353/mpq.0.0006>
- Zan, B., & Hildebrandt, C. (2003). First graders' interpersonal understanding during cooperative and competitive games. *Early Education and Development*, *14*(4), 397-410. https://doi.org/10.1207/s15566935eed1404_1
- Zumbach, J., Rademacher, A., & Koglin, U. (2021). Conceptualizing callous-unemotional traits in preschoolers: Associations with social-emotional competencies and aggressive behavior. *Child and Adolescent Psychiatry and Mental Health*, *15*(24). <https://doi.org/10.1186/s13034-021-00376-4>
- Zumbuehl, M., Dohmen, T., & Pfann, G. (2021). Parental involvement and the intergenerational transmission of economic preferences, attitudes and personality traits. *The Economic Journal*, *131*(638), 2642-2670.
<https://doi.org/10.1093/ej/ueaa141>

Acta Universitatis Upsaliensis

Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences 234

Editor: The Dean of the Faculty of Social Sciences

A doctoral dissertation from the Faculty of Social Sciences, Uppsala University, is usually a summary of a number of papers. A few copies of the complete dissertation are kept at major Swedish research libraries, while the summary alone is distributed internationally through the series Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences. (Prior to January, 2005, the series was published under the title “Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences”.)

Distribution: publications.uu.se
urn:nbn:se:uu:diva-550464



ACTA UNIVERSITATIS
UPSALIENSIS
2025