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I help, therefore, I am?—longitudinal interrelations of the three-dimensional moral self-concept and prosocial behaviours in 4–6-year-old children

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Abstract

Children's moral self-concept (MSC) has been proposed to relate to prosocial behaviour. However, systematic assessments of their interrelations are scarce. The current study examines the early development, structure, stability and interrelation of three key prosocial behaviours and the corresponding dimensions of the moral self-concept. To this end, we use a longitudinal approach with three measurement points during the preschool years at ages 4, 5 and 6 years. We assess three prosocial dimensions of children's MSC through a puppet-interview. In addition, behavioural measures of children's helping, sharing and comforting were administered in a laboratory setting. By examining the longitudinal associations between MSC and prosocial behaviours, this study will provide valuable insights into the complex nature of prosocial development in early childhood.

KEYWORDS

moral development, moral self-concept, preschool age, prosocial behaviour, prosocial development

BACKGROUND

As one of the key aspects of the self, the moral self-concept refers to the beliefs and representations that individuals hold about their own prosociality (Kochanska et al., 2010; Krettenauer, 2013a). Prosocial behaviour refers to actions that benefit others, such as helping, sharing and comforting (Dunfield, 2014). Because prosocial behaviours play an important role in human development (Caputi et al., 2012;

Additional statement: I hereby confirm, if we later withdraw our paper, we agree to publish in the Journal a short summary of the pre-registered study under a section *Withdrawn Registrations*.

Carpendale et al., 2013), gaining deeper insight into the emergence of children's understanding of themselves as prosocial agents and its relation to actual prosocial behaviour is a topic of great interest in developmental science (Carpendale & Wallbridge, 2023; Krettenauer, 2013b). In particular, by examining the early development of the moral self-concept and prosocial behaviour simultaneously, we can gain insight into a potential mechanism driving early prosociality and the extent to which our beliefs about ourselves influence our actual behaviour.

Most notably, Blasi (1980), who emphasized the role of the moral self in prosocial action, brought the moral self-concept to the centre of interest in developmental research. The developing moral self-concept in childhood is thought to fill the so-called *moral judgement-action gap*. Specifically, the discussion of the moral judgement-action gap refers to the observation that, contrary to the assumptions of earlier accounts (for an overview, see Hardy & Carlo, 2011), moral judgement and actual behaviour are often not directly related. If the moral self-concept plays a role in prosocial behaviour in such a way that it enhances individuals' inclination to engage in prosocial behaviour and vice versa, it would be interesting to investigate how and when this relationship emerges.

To date, however, little is known on how the moral self-concept develops, what its structural nature is, and in what way it is related to actual prosocial behaviour.

Emergence of the moral self-concept (MSC)

The moral self-concept refers to an individual's beliefs and representations about their own prosocial behaviours. It includes their perceptions of themselves as prosocial beings, and their overall evaluation of their own moral character (Aquino, 2002; Hart, 2005; Krettenauer, 2013a). The moral self-concept is considered a key aspect of the self and is thought to play a role in shaping individuals' behaviour and decision making.

As noted above, the moral self-concept is thought to be a distinct dimension of the self. Influential approaches define the self as a multidimensional and hierarchically structured construct (Marsh et al., 2002; Marsh & Shavelson, 2010). Marsh and Shavelson's self-concept model—also known as the multidimensional self-concept model—is a theoretical framework that describes the structure and organization of the self-concept. According to this model, the self-concept consists of several self-domains, each of which represents a specific aspect of the self, such as academic ability, physical appearance or moral character. Marsh and Shavelson's self-concept model has been widely adopted and had a significant impact on the study of the self, as well as on educational and developmental psychology (Trautwein et al., 2006). It provides a useful framework for understanding the complex and dynamic nature of the self-concept and has been applied in a variety of settings to examine the development of self-concept and its impact on individual outcomes (Marsh & Yeung, 1997; Niepel et al., 2019; Perez et al., 2014). Methodologically, numerous studies have demonstrated the validity and reliability of the model in different populations and contexts (Brunner et al., 2010; Marsh et al., 2002). These studies have provided further empirical support for the model's basic premises, demonstrating evidence that individuals tend to have different self-concept domains, such as academic, athletic and moral domains. These self-concepts can be measured and distinguished from each other, and they have been found to have distinct antecedents and consequences. For example, a longitudinal study by Marsh et al. (2018) found positive effects of children's mathematics school grades at the end of primary school on their mathematics self-concept 5 years later, while their language school grades were negatively related to their mathematics self-concept. In another study, Marsh et al. (2002) measured the self-concept of 4–5-year-old children's using the Self-Description-Questionnaire for Preschoolers (SDQP), which measures six self-concept factors: Physical, Appearance, Peers, Parents, Verbal and Mathematics. The study found support for the multidimensional structure of the self even at younger ages. In summary, there is considerable empirical support for the Marsh and Shavelson's model of the multidimensional self.

Consistent with a multidimensional approach to the self-concept, it has been proposed that the moral self-concept consists of different dimensions. For example, Krettenauer (2013a) proposed a

differentiation into preference for prosocial behaviour and avoidance of antisocial behaviour. Further work has differentiated the prosocial domain into different subdomains analogous to prosocial behaviour: Helping, sharing and comforting (Gniewosz et al., 2022; Sticker et al., 2021). Results of the study by Sticker et al. (2021) confirmed the three-dimensional structure of the moral self-concept consisting of helping, sharing and comforting through confirmatory factor analysis for 4–6-year-old children in a cross-sectional design.

Following the hierarchical framework (Marsh & Shavelson, 2010; Shavelson et al., 1976), it is proposed that the moral self-concept becomes more differentiated with age and more stable over the course of development, at least at a higher hierarchical level. Another study of 3–7-year-old children reported moderate stability over a 1-month interval, examining individual differences on various self-concept scales (Eder, 1990). In addition, a longitudinal study by Putnick et al. (2020) confirmed moderate stability for a scholastic, social and physical self-concept from 4 to 14 years of age. Furthermore, other studies have assessed the stability of children's academic and non-academic self-concepts, with results showing high stability in 5–7 and 7–12-year-olds (Guay et al., 2003; Marsh et al., 1998). A longitudinal study by Gniewosz et al. (2022) examined the stability of the three-dimensional structured moral self-concept (helping, sharing, comforting). Factor analysis confirmed a stable three-dimensional model of moral self-concept between 4 and 6 years of age across three measurement points, 18 months (T1–T2) and 3 months (T2–T3) apart, for the helping and comforting dimensions of moral self-concept in terms of invariance, reliability and correlational structure. The sharing dimensions of the moral self-concept also showed invariance and reliability and short-term stability (3 months). Yet, age was confounded with the length of the measurement intervals, which limits the significance of these results. Overall, in line with Marsh and Shavelson's (2010) model, previous findings support the idea of an increasing stability of the self-concept during early development. Evidence for the long-term stability of the moral self-concept dimension during early childhood is still scarce and requires further investigation.

In summary, the moral self-concept is a distinct dimension of the self-concept, which itself consists of different moral dimensions. It is expected to emerge during the preschool years and to be stable over time.

Prosocial behaviour and its early development

Prosocial behaviours can be defined as actions that benefit others without providing immediate personal benefits to the actor (Paulus, 2018). They are thought to have multiple effects at different levels, including increased well-being at the group (Abrams et al., 2015; Anderson & Kilduff, 2009), individual (Sallquist et al., 2012) and societal level (Tomasello, 2009). Prosocial behaviour can take many forms, including sharing resources, cooperating with others, providing emotional support and engaging in altruistic acts. In this study, we focus on three types of prosocial behaviour, namely helping, sharing and comforting behaviour. These behaviours are not thought to emerge and develop simultaneously and are not necessarily correlated (Dunfield, 2014; Dunfield & Kuhlmeier, 2013; Hay & Cook, 2007; Kärtner et al., 2014; Paulus, 2018; Paulus et al., 2013; Svetlova et al., 2010). Dunfield (2014) suggests that the nature of prosocial acts varies depending on the circumstances that give rise to such behaviours. First, helping behaviour refers to the recognition of an instrumental need of another person. Someone recognizes the goal-directed behaviour and tries to help the other person achieve the goal. Second, sharing behaviour follows the recognition of an unmet material need. The recognition of an unequal access to resources leads to sharing behaviour. Last, recognizing emotional distress in another person leads to comforting behaviour. Paulus (2018) explains the lack of correlations between the different types of prosocial behaviours by invoking different socio-cognitive and underlying motivations in children.

Taken together, different kinds of prosocial behaviours differ in their goals, emotional components and age of emergence. Children from 1 to 2 years of age begin to help and recognize the instrumental needs of others (Hammond, 2014; Svetlova et al., 2010). Children tend to help others to achieve an action goal (Warneken & Tomasello, 2007). They begin to share 'fairly' and equally at a later age, from

around 3 years (Olson & Spelke, 2008). In addition, children show comforting behaviour as a response to another person's distress. By comforting another individual, children aim to reduce other person's negative emotions (Malti et al., 2009; Sierksma et al., 2015). First signs of comforting behaviour emerge around the second year of life (Zahn-Waxler et al., 1992).

Once established, different aspects of prosociality show stability over time. Kärtner et al. (2014) found longitudinal relations within helping and comforting behaviours in toddlers aged 15 and 18 months. Another longitudinal study by Radke-Yarrow and Zahn-Waxler (1984) examines how 1–2-year-old infants responded to the distress of others. Children who responded emotionally, with avoidance, or with a cognitive, non-emotional response at the age of 1–2 years were more likely to do so at the age of 7 years.

In conclusion, prosocial behaviours such as helping, sharing and comforting are important for social interactions and are essential for healthy human relationships. These behaviours begin to develop early in life, often in infancy and continue to develop throughout childhood and adolescence. Research has shown that the different types of prosocial behaviour develop relatively independently early in life.

Relation of the moral self-concept and prosocial behaviour

The way in which the moral self-concept and prosocial behaviour interact is unclear. While children behave prosocial from an early age (Hammond, 2014; Malti et al., 2009; Svetlova et al., 2010), this is not sufficient to build a moral self-concept. The development of the self-concept as a verbal and explicit construct relies on a number of other prerequisites (Damon & Hart, 1982; Harter, 2015). On the one hand, it has been proposed that children must first develop some kind of self-awareness, which occurs around the age of 24 months when children increasingly use self-descriptive statements, for example, 'I want this', 'I do' (Kagan, 1981). In addition, the moral self-concept is a linguistic concept. The ability to develop an autobiographical picture of oneself on a linguistic level does not develop until the age of 3–4 years (Lemmon & Moore, 2001). Furthermore, the frequency of social interactions in which children experience themselves as morally acting agents increases immensely as they enter kindergarten. This creates a 'gap' because linguistic, reflexive processes develop later than behaviour. From a theoretical perspective, children's inclination to engage in prosocial behaviour could be one factor influencing the development of the moral self-concept. Following the self-perception theory (Bem, 1972), one would expect that prosocial behaviour would influence the extent to which children see themselves as more or less prosocial agents. This would imply that the moral self-concept is formed by analysing one's own past prosocial behaviour. Other theoretical accounts, such as constructivism, also imply this direction of causality, especially in early development. According to constructivists (Carpendale, 2013; Kohlberg, 1971; Piaget, 1969), individuals construct their own moral self-concept through a process of self-reflection and social comparison. Through this process, individuals come to define themselves in terms of their moral values and principles and develop a sense of a moral self that, conversely, guides their subsequent behaviour (Kohlberg, 1971). According to Kohlberg (1971), the moral self-concept is a person's internalized sense of what is right and wrong. Kohlberg argued that prosocial behaviour, or actions that benefit others, is related to a person's moral self-concept. He believed that as individuals progress through the stages of moral development, their sense of moral self-concept becomes stronger and more integrated with their sense of self.

On the other hand, according to the idea of self-consistency, a moral self-concept leads to prosocial behaviour (Blasi, 1980). This position suggests that someone who cares about being a moral person will behave prosocially in order to avoid inconsistency with the demands they place on themselves. Conversely, when individuals engage in behaviours that are inconsistent with their moral self-concept, they may experience cognitive dissonance or a sense of discomfort and tension that motivates them to resolve the inconsistency. Therefore, prosocial behaviour in children should shape and strengthen their moral self-concept, regardless of the fact that the MSC develops *after* first prosocial behaviours have already appeared.

Integrating different approaches, Marsh and Craven (2006) suggest that both directions apply (reciprocal effects).Their research evidenced a positive correlation between the two constructs, meaning that individuals who have a stronger moral self-concept are more likely to engage in prosocial behaviour such that volunteering, donating money to charity and helping others in need. They argue that individuals who have a strong moral self-concept are more likely to engage in prosocial behaviour because they see themselves as someone who values helping others and promoting the common good. Furthermore, this relationship was mediated by empathy, meaning that individuals with a strong moral self-concept were more likely to feel empathy towards others and therefore more motivated to engage in prosocial behaviour. Marsh and Craven (2006) also suggest that prosocial behaviour can influence the development and strengthening of the moral self-concept. Engaging in prosocial behaviour can lead individuals to see themselves as caring, compassionate and altruistic, which can enhance their sense of moral identity. The sense of personal satisfaction and self-worth resulted from prosocial behaviours can, in turn, strengthen a person's moral self-concept. Overall, Marsh and Craven argue that prosocial behaviour can have a reciprocal relationship with moral self-concept, with each influencing and reinforcing the other over time.

Studies with adults confirmed these relations between adult's moral identity and prosocial actions (Aquino, 2002; Hardy et al., 2015; Hertz & Krettenauer, 2016). A study by Sengsavang and Krettenauer (2015) found negative correlation between the moral self-concept and antisocial behaviour in children. Christner et al. (2020) confirmed the positive relation between 5- and 9-year-old children's moral self-concept and prosocial behaviour. Even if these studies give first indications of relations between the moral self-concept and prosocial behaviours in children, no directional interpretations are possible. Most studies which recently assessed the relation between prosocial behaviour and the moral self-concept in children are cross-sectional (Christner et al., 2020; Sengsavang & Krettenauer, 2015; Sticker et al., 2021). In summary, the question of how the interrelation of the moral self-concept and prosocial behaviour develops has become a focus of attention in the scientific community. However, the direction and causality of the relation is still unclear, especially in the early stages of moral self-concept development. Evidence to date suggests a positive relationship between the two constructs from a very early stage of development.

Understanding the relationship between prosocial behaviour and the moral self-concept is important for promoting positive social and emotional development, and for cultivating a strong sense of social responsibility and empathy towards others. However, how the relation between prosocial behaviour and the moral self-concept develops early in life remains an open question.

Current study

The aim of the present study is to examine the early emergence, longitudinal stability and interrelations of children's moral self-concept and prosocial behaviour. Influential theoretical accounts have addressed the question of the intercorrelation between the two constructs (Bem, 1972; Blasi, 1980; Marsh & Craven, 2006). To date, however, there has been little empirical research on how and when the interplay between the moral self-concept and prosocial behaviour develops during childhood (see Hardy & Carlo, 2011).

While previous studies have mostly focused on cross-sectional relations between the moral self-concept and prosocial behaviour (Christner et al., 2020; Sengsavang & Krettenauer, 2015; Sticker et al., 2021), the current study will measure children's moral self-concept as well as helping, sharing and comforting behaviour within three consecutive measurement time points starting at age 4. Thus, the present work aims to be the first to empirically and longitudinally test whether and, if so, how the two measures influence each other during their early development. In addition, we aim to make a valuable contribution to the empirical testing of theoretical assumptions regarding the interplay between moral self-concept and prosocial behaviour. This will involve examining at what age the two constructs become related, which one predicts the other and how they develop in relation to each other.

First, we hypothesize to provide further evidence of the dimensional nature of the moral self-concept (i.e. helping, sharing and comforting dimensions) and prosocial behaviours (i.e. helping, sharing and comforting, respectively). Second, we aim to replicate the findings suggesting an alignment between different dimensions of the moral self-concept and the corresponding prosocial behaviours. Previous studies (Kärtner et al., 2014; Radke-Yarrow & Zahn-Waxler, 1984) have reported stability across different kinds of prosocial behaviours from very early on in development. Consistently, we hypothesize that stability in the use of prosocial behaviours will be observed in children at all three measurement points. Following theoretical assumption of Marsh and Shavelson's (2010) hierarchical model of the self-concept, we expect to observe stability of the moral self-concept on a global level as well as within the moral self-concept dimensions in our sample across measurement points.

In particular, the main aim and novel contribution of this study is to systematically elucidate the links between the moral self-concept dimensions and different forms of prosocial behaviours. By assessing both longitudinally, we aim to uncover the developmental interrelations and directional effects between them. However, based on different theoretical accounts, various forms of results are conceivable: First, following a constructivist approach and the self-perception theory, we would expect the moral self-concept to be the result of early prosocial behaviour (Bem, 1972; Kohlberg, 1971). Conversely, if the pursuit of self-consistency leads to prosocial behaviour, the moral self-concept should precede prosocial behaviour (Blasi, 1980). For children, their internalized moral norms would then form the basis of their actual behaviour (Kochanska, 2002). Accordingly, an early MSC can be expected to influence prosocial behaviour. That is, once the MSC is formed, it has a causal effect on prosocial behaviour. Third, a reciprocal relation between the two constructs is conceivable (Marsh & Craven, 2006). As these three are theoretical accounts that are open to further investigation and have received little or no empirical support, we will test these three options in separate hypotheses. This study explores the possible causal relationships between the moral self-concept dimensions and prosocial behaviours during development.

We conduct a longitudinal study to address the above research questions. Children visited our laboratory at age 4 (T1) and 5 (T2). We are currently running the third measuring point (T3; 6.5 years). We chose to assess at this age because developmental accounts suggest that children's moral self-concept becomes a coherent representation of themselves over the course of the preschool years (Kochanska et al., 2010). The measurement points bridge the period between 4 and 6.5 years of age in order to have the possibility to observe the long-term development during the preschool years and the beginning of primary school.

Children's moral self-concept is measured using a puppet-interview, which is an adjusted version of the Children's Moral Self Puppet Scale (CMSPS) by Sengsavang and Krettenauer (2015), and the self-concept measures by Marsh et al. (2002). This approach has been used in several studies of the early moral self (Baker & Woodward, 2023; Sticker et al., 2021). Prosocial behaviour is measured in three experimental setups that separately elicit helping, sharing and comforting behaviour, comparable to previous work (Dunfield & Kuhlmeier, 2013). The procedures are described in more detail within the Methods section.

Hypotheses

Accordingly, based on theoretical considerations and previous empirical findings, the following hypotheses are made:

1. Following Marsh and Shavelson's (2010) model of a multifaceted self-concept, the moral self-concept (MSC) is three-dimensionally structured into $MSC_{helping}$ (HSC), $MSC_{Sharing}$ (SSC) and $MSC_{Comforting}$ (CSC).
2. Furthermore, following the hierarchical framework (Marsh & Shavelson, 2010; Shavelson et al., 1976), we propose that the moral self-concept is stable over time.

2.1. The MSC at the global level, including all three subdimensions, is positively correlated between all three measurement points from 4 to 6.5 years.
2.2. HSC, SSC and CSC are positively correlated between all three measurement points from 4 to 6.5 years.
2.3. At the higher, global level, the MSC will show greater stability than the three subdimensions.

3. All three prosocial behaviours (helping, sharing and comforting) are stable across the three measurement points from 4 to 6.5 years.
4. The three MSC dimensions, HSC, SSC and CSC, are associated with respective behaviours, both cross-sectionally and longitudinally.
   4.1. According to self-perception theorists, earlier prosocial behaviour will influence later MSC (Bem, 1972).
   4.2. According to theorists who support the idea of self-consistency, children's MSC will lead to prosocial behaviour (Blasi, 1980).
   4.3. However, Marsh and Craven (2006) argue that prosocial behaviour may have a reciprocal relationship with MSC, with each influencing and reinforcing the other over time. Therefore, H4.3 tests for reciprocal effects of MSC and respective behaviours.

METHODS

Planned sample and exclusion criteria

The longitudinal study includes three measurement points: T1 (Mean (Age): 4.21 years, $n = 108$, 52% girls), T2 (Mean (Age): 5.43 years, $n = 133$, 57% girls) and T3 (Mean (Age): 6.5 years (expected), n (expected) = 120). The target sample size of $n = 130$ is determined using a power analysis for a Pearson correlation test, as our main question focuses on the relationships between children's moral self-concept and prosocial behaviour. For a moderate correlation of $r = .25$ (Cohen, 1988), a statistical power of 0.9 and a significance level of $\alpha = .05$, a sample size of $n = 130$ would be required for a significant result. Furthermore, a rule of thumb for structural equation modelling suggests that the ratio of cases to free parameters is between 10:1 and 20:1 (Jackson, 2003; Kline, 2023; Schumacker & Lomax, 2004). Using T1 as an example, the model with the three-dimensional structure of the MSC has a number of 9 free parameters. This suggests a sample size between $n = 90$ and $n = 180$. Finally, the sample size is justified by previous studies that had approximately the same sample size for comparable statistical analyses (Gniewosz et al., 2022; Sticker et al., 2021, 2023). To recruit mother–child pairs, contact details of families with children of the appropriate age were requested from the district administration before the start of the study. The families were invited by letter. In the invitation letter, parents were informed about the content and organizational aspects of the study, as well as about the expense allowance. If they were interested, they could contact the laboratory by e-mail or telephone to make an appointment. Children were included if they were developing normally, were the right age at the time of the test and had sufficient language knowledge to understand the instructions. The ethical background of most families is Caucasian. Eighty-three per cent of mothers and 79% of fathers reported to have accomplished the highest level of education. T1 and T2 are completed. The number of participants in T1 was lower than in T2 due to contact restrictions during the COVID-19 pandemic, which resulted in temporary laboratory closures during data collection for T1. Assessment of T3 is currently running and will be completed in the course of April 2023. No data of this study or parts of it have been published elsewhere. The study follows ethical guidelines and was approved by the Ethics Committee of the Department of Psychology, Ludwigs-Maximilians-Universität München, Munich. A separate consent form was completed by the mothers for each measurement point. We will exclude children if any of the following criteria apply: (1) if participants give the same response to all questions within the puppet-interview ('straightliners'; see Kim et al., 2019; Lavrakas, 2008), (2) experimenter errors or (3) procedural errors occur.

Procedure and design

Participants are tested individually in the laboratory of the Ludwigs-Maximilians-Universität München, a larger European university. Sessions are videotaped. The current study is part of a larger assessment that includes a number of different tasks beyond those covered here. In order to avoid spill-over effects, it was warranted that there are no consecutive tasks that could potentially influence each other. Therefore, it is ensured that the prosocial behaviour tasks and the puppet-interview do not directly follow each other.

Measures

MSC – puppet-interview

The puppet-interview is used to assess children's self-concept at T1, T2 and T3. We draw on measures developed by Christner et al. (2020) and Marsh et al. (2002). The puppet-interview is a well-established method to examine young children's self-concept (Reese et al., 2007; Sengsavang & Krettenauer, 2015). Previous studies had provided ample statistical evidence that the items form consistent and coherent factors (Gniewosz et al., 2022; Sticker et al., 2021). Items that were not related well to the other items were removed. In particular, we assess the three previously mentioned prosocial dimensions (i.e. helping, sharing and comforting) as well as two additional dimensions: verbal self-concept and physical self-concept. To capture the moral self-concept dimensions, we use an interview by Christner et al. (2020), who created a child-friendly moral self-interview based on the Children's Moral Self Puppet Scale (CMSPS) by Sengsavang and Krettenauer (2015). The verbal and physical items were adapted from Marsh et al. (2002). See Appendix A: Table A1 for all items in the puppet-interview. We will check for a good model fit of the puppet-interview with the respective scales on group level through calculating confirmatory factor analysis (CFA).

In the following, the puppet-interview is explained using an example from the assessment of the moral self-concept. For the interview, the experimenter holds two identical puppets side by side. One of the puppets expresses a prosocial statement and the other puppet expresses the opposite—a non-prosocial statement (e.g. 'I like to share my toys' vs. 'I don't like to share my toys'). Then the puppets turn to the child and the experimenter asks, 'What about you?'. The child answers whether he or she is more like the puppet that expressed a prosocial statement or more like the puppet with the opposite view. When the child has chosen one of the puppets, the experimenter asks whether he or she is 'a lot like this puppet or a little like this puppet.'. Our puppet-interview consists of 16 items which are distributed over five scales: The three moral scales of *helping (HSC)*, *sharing (SSC)* and *comforting (CSC)* (3 items each), and two other scales, a *verbal self-concept (VSC)* scale (3 items) and a *physical self-concept (PSC)* scale (4 items). From T2 onwards, further helping items focusing on the peer-context were included, but will not be considered in this study in order to keep the instrument the same across measurement points.

Coding

Responses are on a 5-point Likert scale for each item: 1 = a lot like the negating puppet; 2 = a bit like the negating puppet; 3 = not like either of the puppets or equal identification; 4 = a bit like the affirmative puppet; and 5 = a lot like the affirmative puppet. Dimensional self-concept scores are derived from the mean value of all items on a scale (cf. Marsh et al., 2002; Sengsavang & Krettenauer, 2015; Sticker et al., 2021).

Prosocial behaviour (PB)

Prosocial behaviour is measured in three experimental setups, which separately elicit helping, sharing and comforting behaviour. All three types of prosocial behaviour are assessed in T1, T2 and T3.

Sharing tasks (public and anonymous)

Both sharing tasks are based on a mini-dictator game (Gummerum et al., 2010) and modelled on a procedure developed by Smith et al. (2013). In these behavioural tasks children can decide how many of their four valuable goods (stickers at T1; rubbers at T2; stamps at T3) they want to share with an absent child. The types of resources were varied to maintain their worth to the children. In the following, the procedure is described in detail using stickers as an example. The experimenter explains to the child: 'Look, these are 4 stickers. They are yours now. You can share them with another child. This is [experimenter places picture of other gender-matched child] Nina/Niko [exemplary names]. You can share one, two, three, four, or none of your stickers with Nina/ Niko. You can decide, how many stickers you want to give to the other child. Whatever you want to share with Nina/ Niko goes in this box [experimenter places a box next to the picture of the other child]. What you want to keep for yourself goes in this envelope [experimenter places an envelope on the other side of the table]. Let me know when you've finished.' In the public task, the experimenter watches the child distribute the goods. In the anonymous sharing scenario, the experimenter feigns searching for items in the cupboard behind her until the child declares that they have completed their task.

Coding. Children's sharing behaviour for each task is represented by the number of items in the box (0–4 items).

Helping task

We assess children's helping behaviour using a slightly modified version of Kenward et al.'s (2015) spontaneous helping procedure. The task varies between measurement points by using different objects for the procedure in order to avoid transfer effects. Pencils were used in T1, cloth marbles were used in T2, and colouring pictures are used in T3. In T1, the experimenter left the room under false pretences. When she leaves, she placed an open box with pencils on the edge of a table next to the door, so that the box fell directly to the floor. The experimenter pretends not to notice and leaves the room without further comment. The child is then left alone in the room for 1 min. The procedure is the same for T2 and T3: The experimenter and the child sit at a table. The experimenter says, 'Now let me think about what we need for our next game…'. The experimenter stands up with a clipboard in the hand, looks thoughtfully in the air, then turns to the cabinet. As she does so, she knocks over the cloth marbles/colouring pictures with the clipboard. The experimenter pretends not to notice what happened. She rummages through the documents in the cupboard for 30 s as if she is looking for something and does not react to the child. When the experimenter turns around again, she waits to see if the child says anything. Only after 10 s does she say: 'Oh the cup/ box fell over.'. She then kneels down to collect the objects (slowly, so that the child has the opportunity to help).

Coding. Different aspects of helping behaviour will be scored from the videos. First, we will code whether the child informed the experimenter about the mishap from '0'—'Experimenter was not informed at all' to '4'—'Child immediately informs the experimenter about the mishap'. Actual helping behaviour will be coded on a global helping scale. Children score a '0' for 'no reaction', '1' for 'low-key helping behaviour', '2' for 'moderate helping behaviour' and '3' for 'strong helping behaviour'. For the detailed coding scheme, see Appendix B. The coding will be conducted twice to check for reliability of the task for each measurement code. An interrater reliability of Cohen's kappa >.8 is aimed for.

Comforting task

The procedure for assessing children's comforting behaviour is an adapted version of Young et al.'s (1999) pain simulation task. The setting involves the experimenter pretending to accidentally injure herself. In T1, the experimenter hammers her knee on the leg of a table, in T2, the experimenter pinches her finger in a clipboard, and in T3, the experimenter trips over her chair and injures her shin. This was done in order to avoid transfer effects. The rest of the procedure remains identical for all three measurement points. The accident is followed by an 'ouch!' from the experimenter. In addition, the experimenter demonstrates her pain by making a face, rubbing her foot and verbalizing what happened (after 10 s: 'I banged my foot.', after another 10 s: 'That hurts really badly'). The pain is strongly expressed at the beginning and slowly diminishes within a minute. The experimenter ends the task by saying: 'Now it's better. It doesn't hurt anymore'.

Coding. Following previous research (Robinson et al., 1994; Young et al., 1999; Zahn-Waxler et al., 1992), we will rely on a global comforting score, as this score covers a variety of comforting behaviours and tendencies. The coding scheme is the same for all three measures. The global score for comforting behaviour ranges from 1 to 7. See Appendix C for the detailed coding scheme. The coding will be done twice to check the reliability of the task for each measurement code. An interrater reliability of Cohen's kappa >.8 is targeted.

Statistical analyses

Statistical analyses will be performed using RStudio (RStudio Team, 2019). The raw data and R codes for the analyses will be made available online. A specification of the hypotheses, associated statistical models and expected results is provided in Table 1.

Factorial structure and stability of the MSC

First, to test hypothesis 1, multiple confirmatory factor analyses (CFAs) will be computed to test the three-dimensional structure of the moral self-concept. Thus, we will test whether a three-factorial model fits the data better compared to a one-factorial model separately for each measurement point. If the results of the factor analysis support the one-dimensional structure instead of the three-dimensional structure, further analyses including the MSC are computed with a global MSC.

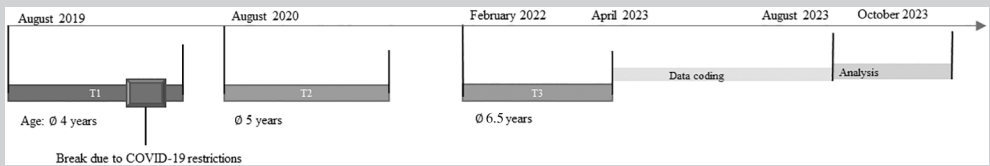
To calculate a global MSC score (MSC_{Global}), following previous studies (Sticker et al., 2023), means will be built for each scale ($MSC_{Helping}$, $MSC_{Sharing}$ and $MSC_{Comforting}$) and the scale means will be z-standardized. The mean of these z-standardized scale scores will give the global MSC score.

Furthermore, to test hypothesis 2, we will compute Pearson Correlations for the MSC_{Global} as well as separately for $MSC_{Helping}$, $MSC_{Sharing}$ and $MSC_{Comforting}$ across all three measurement points to check for stability over time. To statistically test whether the stability is stronger for MSC_{Global} than for the subdimension, we will use Fisher's Z transformation and conduct paired t-tests on the transformed correlation coefficients.

Stability of prosocial behaviours

To test hypothesis 3, we will examine the stability of prosocial behaviours over time using simple Pearson correlation coefficients comparing the scores of each measurement point with each other separately for helping, sharing and comforting.

TABLE 1 Study hypotheses, related statistical models and hypothesized results.



Hypothesis	Statistical model	Hypothesized results
1. The MSC is three-dimensional structured in $MSC_{helping}$, $MSC_{Sharing}$ and $MSC_{Comforting}$	a. Three separate confirmatory factor analysis (CFAs) for T1, T2 and T3 with a three-dimensional structure b. Three separate confirmatory factor analysis (CFA) for T1, T2 and T3 with a one-dimensional structure c. Comparison of the three-dimensional and the one-dimensional models	Model fit of the three-dimensional model is better than the model fit for a one-dimensional model for T1, T2 and T3
2. The MSC is stable over time, on a global level as well as on the level of the subdimensions. Stability is higher for the global MSC than for the subdimensions	a. MSC_{global} T1 ~ MSC_{global} T2 ~ MSC_{global} T3 b. $MSC_{helping}$ T1 ~ $MSC_{helping}$ T2 ~ $MSC_{helping}$ T3 c. $MSC_{Sharing,}$ T1 ~ $MSC_{Sharing}$ T2 ~ $MSC_{Sharing}$ T3 d. $MSC_{Comforting}$ T1 ~ $MSC_{Comforting}$ T2 ~ $MSC_{Comforting}$ T3 e. Correlation comparison for stability of MSC_{global} and the subdimensions	Positive significant correlations within the global MSC as well as the three MSC dimensions between T1, T2 and T3. Correlation coefficients are higher on the global level
3. All three prosocial behaviours (helping, sharing, comforting) are stable over the three measurement points from 4 to 6.5 years	a. Helping T1 ~ Helping T2 ~ Helping T3 b. Sharing T1 ~ Sharing T2 ~ Sharing T3 c. Comforting T1 ~ Comforting T2 ~ Comforting T3	Positive significant correlations within the three prosocial behaviours between all measurement points (T1, T2, T3)
4. The three MSC dimensions helping, sharing and comforting are related with respective behaviours cross-sectionally and longitudinally	Cross-lagged panel models separate for helping, sharing and comforting	Prosocial behaviours correlate longitudinally as well as cross-sectionally with respective dimensions of the MSC

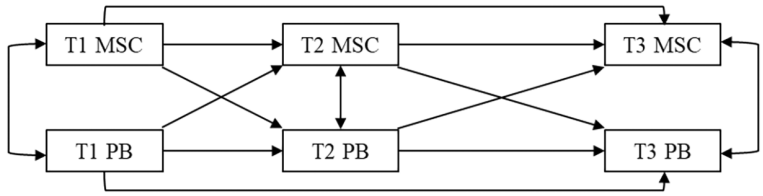


FIGURE 1 Cross-lagged panel design to identify relations between moral self-concept and prosocial behaviour across three measurement times.

Cross-lagged panel model of MSC and PB

As the main analysis, to test hypothesis 4 and to identify relations between moral self-concept dimensions and corresponding prosocial behaviours over time, we will compute cross-lagged panel analyses by using structural equation modelling. The cross-lagged panel model (CLPM) is advantageous for the current study due to its ability to capture temporal relationships between variables over time. It provides insights into the directionality, causal pathways, and lagged effects, allowing for a comprehensive understanding of the dynamic nature of the relationship between the MSC and prosocial behaviours. Figure 1 shows potential cross-lagged relations between MSC and PB from T1 to T3. All relations will be implemented in a model per measurement point and per helping, sharing and comforting separately. We will implement children's age as a control variable.

Missing data

To avoid bias and decreased reduced statistical power due to missing data, we will use the mice package in R to impute missing data via predictive mean matching (Enders et al., 2016; van Buuren & Groothuis-Oudshoorn, 2010). The predictive mean matching (PMM) procedure, implemented in the mice package in R, is a tool for imputing missing data in research studies. PMM works by utilizing a regression model to predict the missing values based on observed data and other variables in the dataset. It is particularly useful when dealing with incomplete datasets, as it helps preserve the distributional properties of the original data. By incorporating the PMM procedure in the analysis, we will obtain more accurate and reliable results by accounting for missing values appropriately. The mice package simplifies the implementation of PMM in R.

To make sure that missing data are at random, we will analyse the imputed datasets and compare the results with the complete case analysis. If the results are consistent across imputed datasets, it suggests that the missingness is likely at random. If we encounter missing data that are not at random (MNAR), we will still utilize the 'mice' package in R. By employing multiple imputation with chained equations, we will impute missing values, generate multiple imputed datasets and perform subsequent analyses to ensure valid statistical inferences in our research study.

AUTHOR CONTRIBUTIONS

Lena Söldner: Conceptualization; investigation; writing – original draft; writing – review and editing; methodology; validation; data curation; visualization; formal analysis. **Markus Paulus:** Conceptualization; writing – review and editing; project administration; supervision; funding acquisition.

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CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Since this is a Registered Report, data is not yet available. We will make the data available via OSF as soon as coding and preparation is completed.

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REFERENCES

Abrams, D., Van de Vyver, J., Pelletier, J., & Cameron, L. (2015). Children's prosocial behavioural intentions towards outgroup members. *British Journal of Developmental Psychology*, *33*(3), 277–294. https://doi.org/10.1111/bjdp.12085

Anderson, C., & Kilduff, G. J. (2009). The pursuit of status in social groups. *Current Directions in Psychological Science*, *18*(5), 295–298. https://doi.org/10.1111/j.1467-8721.2009.01655.x

Aquino, K. (2002). The self-importance of moral identity. *Journal of Personality and Social Psychology*, *83*(6), 1423–1440. https://doi.org/10.1037/0022-3514.83.6.1423

Baker, E. R., & Woodward, A. M. (2023). The preschooler's moral self and executive functions: An experimental approach with exclusion. *Cognitive Development*, *66*, 101310. https://doi.org/10.1016/j.cogdev.2023.101310

Bem, D. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. *6*, pp. 1–62). Academic Press. https://doi.org/10.1016/S0065-2601(08)60024-6

Blasi, A. (1980). Bridging moral cognition and moral action: A critical review of the literature. *Psychological Bulletin*, *88*(1), 1–45. https://doi.org/10.1037/0033-2909.88.1.1

Brunner, M., Keller, U., Dierendonck, C., Reichert, M., Ugen, S., Fischbach, A., & Martin, R. (2010). The structure of academic self-concepts revisited: The nested Marsh/Shavelson model. *Journal of Educational Psychology*, *102*, 964–981. https://doi.org/10.1037/a0019644

Caputi, M., Lecce, S., Pagnin, A., & Banerjee, R. (2012). Longitudinal effects of theory of mind on later peer relations: The role of prosocial behavior. *Developmental Psychology*, *48*(1), 257–270. https://doi.org/10.1037/a0025402

Carpendale, J. (2013). An explication of Piaget's constructivism: Implications for social cognitive development. In *The development of social cognition* (pp. 35–64). Psychology Press.

Carpendale, J. I., Hammond, S. I., & Atwood, S. (2013). A relational developmental systems approach to moral development. *Advances in Child Development and Behavior*, *45*, 125–153. https://doi.org/10.1016/B978-0-12-397946-9.00006-3

Carpendale, J. I. M., & Wallbridge, B. (2023). From action to ethics: A process-relational approach to prosocial development. *Frontiers in Psychology*, *14*, 1059646. https://doi.org/10.3389/fpsyg.2023.1059646

Christner, N., Pletti, C., & Paulus, M. (2020). Emotion understanding and the moral self-concept as motivators of prosocial behavior in middle childhood. *Cognitive Development*, *55*, 100893. https://doi.org/10.1016/j.cogdev.2020.100893

Cohen, J. (1988). *Statistical power for the behavioral sciences* (2nd ed.). Erlbaum.

Damon, W., & Hart, D. (1982). The development of self-understanding from infancy through adolescence. *Child Development*, *53*, 841–864. https://doi.org/10.2307/1129122

Dunfield, K. A. (2014). A construct divided: Prosocial behavior as helping, sharing, and comforting subtypes. *Frontiers in Psychology*, *5*, 958. https://doi.org/10.3389/fpsyg.2014.00958

Dunfield, K. A., & Kuhlmeier, V. A. (2013). Classifying prosocial behavior: Children's responses to instrumental need, emotional distress, and material desire. *Child Development*, *84*(5), 1766–1776. https://doi.org/10.1111/cdev.12075

Eder, R. A. (1990). Uncovering young children's psychological selves: Individual and developmental differences. *Child Development*, *61*(3), 849–863. https://doi.org/10.2307/1130969

Enders, C. K., Mistler, S. A., & Keller, B. T. (2016). Multilevel multiple imputation: A review and evaluation of joint modeling and chained equations imputation. *Psychological Methods*, *21*, 222–240. https://doi.org/10.1037/met0000063

Gniewosz, G., Sticker, R. M., & Paulus, M. (2022). A longitudinal assessment of the stability of the three-dimensional moral self-concept during early childhood. *European Journal of Developmental Psychology*, *20*(2), 327–346. https://doi.org/10.1080/17405629.2022.2090333

Guay, F., Marsh, H. W., & Boivin, M. (2003). Academic self-concept and academic achievement: Developmental perspectives on their causal ordering. *Journal of Educational Psychology*, *95*, 124–136. https://doi.org/10.1037/0022-0663.95.1.124

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. (2014). Children's early helping in action: Piagetian developmental theory and early prosocial behavior. *Frontiers in Psychology*, *5*, 759. https://doi.org/10.3389/fpsyg.2014.00759

Hardy, S. A., Bean, D. S., & Olsen, J. A. (2015). Moral identity and adolescent prosocial and antisocial behaviors: Interactions with moral disengagement and self-regulation. *Journal of Youth and Adolescence*, *44*(8), 1542–1554. https://doi.org/10.1007/s10964-014-0172-1

Hardy, S. A., & Carlo, G. (2011). Moral identity: What is it, how does it develop, and is it linked to moral action? *Child Development Perspectives*, *5*, 212–218. https://doi.org/10.1111/j.1750-8606.2011.00189.x

Hart, D. (2005). The development of moral identity. In G. Carlo, & C. P. Edwards (Eds.), *Nebraska symposium on motivation: Moral development through the lifespan: Theory, research, and application* (Vol. *51*, p. 165). University of Nebraska Press.

Harter, S. (2015). Self-development in childhood and adolescence.

Hay, D. F., & Cook, K. V. (2007). The transformation of prosocial behavior from infancy to childhood. In *Socioemotional development in the toddler years: Transitions and transformations* (pp. 100–131). The Guilford Press.

Hertz, S. G., & Krettenauer, T. (2016). Does moral identity effectively predict moral behavior?: A meta-analysis. *Review of General Psychology*, *20*(2), 129–140. https://doi.org/10.1037/gpr0000062

Jackson, D. L. (2003). Revisiting sample size and number of parameter estimates: Some support for the N:Q hypothesis. *Structural Equation Modeling*, *10*, 128–141. https://doi.org/10.1207/S15328007SEM1001_6

Kagan, J. (1981). *The second year: The emergence of self-awareness*. Harvard University Press. https://doi.org/10.4159/harvard.9780674181410

Kärtner, J., Schuhmacher, N., & Collard, J. (2014). Socio-cognitive influences on the domain-specificity of prosocial behavior in the second year. *Infant Behavior & Development*, *37*(4), 665–675. https://doi.org/10.1016/j.infbeh.2014.08.004

Kenward, B., Hellmer, K., Winter, L. S., & Eriksson, M. (2015). Four-year-olds' strategic allocation of resources: Attempts to elicit reciprocation correlate negatively with spontaneous helping. *Cognition*, *136*, 1–8. https://doi.org/10.1016/j.cognition.2014.11.035

Kim, Y., Dykema, J., Stevenson, J., Black, P., & Moberg, D. P. (2019). Straightlining: Overview of measurement, comparison of indicators, and effects in mail–web mixed-mode surveys. *Social Science Computer Review*, *37*(2), 214–233. https://doi.org/10.1177/0894439317752406

Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford Publications.

Kochanska, G. (2002). Committed compliance, moral self, and internalization: A mediational model. *Developmental Psychology*, *38*(3), 339–351. https://doi.org/10.1037//0012-1649.38.3.339

Kochanska, G., Koenig, J. L., Barry, R. A., Kim, S., & Yoon, J. E. (2010). Children's conscience during toddler and preschool years, moral self, and a competent, adaptive developmental trajectory. *Developmental Psychology*, *46*(5), 1320–1332. https://doi.org/10.1037/a0020381

Kohlberg, L. (1971). *From is to ought: How to commit the naturalistic fallacy and get away with it in the study of moral development*. Elsevier Inc.

Krettenauer, T. (2013a). Revisiting the moral self construct: Developmental perspectives on moral selfhood. In B. Sokol, F. Grouzet, & U. Müller (Eds.), *Self-regulation and autonomy: Social and developmental dimensions of human conduct* (pp. 115–140). Cambridge University Press.

Krettenauer, T. (2013b). Moral motivation, responsibility and the development of the moral self. In *Handbook of moral motivation* (pp. 215–228). Brill.

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. SAGE Publications.

Lemmon, K., & Moore, C. (2001). Binding the self in time. In *The self in time* (pp. 171–188). Psychology Press.

Malti, T., Gummerum, M., Keller, M., & Buchmann, M. (2009). Children's moral motivation, sympathy, and prosocial behavior. *Child Development*, *80*(2), 442–460. https://doi.org/10.1111/j.1467-8624.2009.01271.x

Marsh, H. W., Craven, R., & Debus, R. (1998). Structure, stability, and development of young children's self-concepts: A multicohort–multioccasion study. *Child Development*, *69*(4), 1030–1053. https://doi.org/10.1111/j.1467-8624.1998.tb06159.x

Marsh, H. W., & Craven, R. G. (2006). Reciprocal effects of self-concept and performance from a multidimensional perspective: Beyond seductive pleasure and unidimensional perspectives. *Perspectives on Psychological Science*, *1*(2), 133–163. https://doi.org/10.1111/j.1745-6916.2006.00010.x

Marsh, H. W., Ellis, L., & Craven, R. (2002). How do preschool children feel about themselves? Unraveling measurement and multidimensional self-concept structure. *Developmental Psychology*, *38*, 376–393. https://doi.org/10.1037/0012-1649.38.3.376

Marsh, H. W., Pekrun, R., Murayama, K., Arens, A. K., Parker, P. D., Guo, J., & Dicke, T. (2018). An integrated model of academic self-concept development: Academic self-concept, grades, test scores, and tracking over 6 years. *Developmental Psychology*, *54*(2), 263–280. https://doi.org/10.1037/dev0000393

Marsh, H. W., & Shavelson, R. (2010). Self-concept: Its multifaceted, hierarchical structure. *Educational Psychologist*, *20*, 107–123. https://doi.org/10.1207/s15326985ep2003_1

Marsh, H. W., & Yeung, A. S. (1997). Coursework selection: Relations to academic self-concept and achievement. *American Educational Research Journal*, *34*(4), 691–720. https://doi.org/10.3102/00028312034004

Niepel, C., Stadler, M., & Greiff, S. (2019). Seeing is believing: Gender diversity in STEM is related to mathematics self-concept. *Journal of Educational Psychology*, *111*(6), 1119–1130. https://doi.org/10.1037/edu0000340

Olson, K. R., & Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition*, *108*(1), 222–231. https://doi.org/10.1016/j.cognition.2007.12.003

Paulus, M. (2018). The multidimensional nature of early prosocial behavior: A motivational perspective. *Current Opinion in Psychology*, *20*, 111–116. https://doi.org/10.1016/j.copsyc.2017.09.003

Paulus, M., Kühn-Popp, N., Licata, M., Sodian, B., & Meinhardt, J. (2013). Neural correlates of prosocial behavior in infancy: Different neurophysiological mechanisms support the emergence of helping and comforting. *NeuroImage*, *66*, 522–530. https://doi.org/10.1016/j.neuroimage.2012.10.041

Perez, T., Cromley, J. G., & Kaplan, A. (2014). The role of identity development, values, and costs in college STEM retention. *Journal of Educational Psychology*, *106*(1), 315–329. https://doi.org/10.1037/a0034027

Piaget, J. (1969). *Le jugement moral chez l'enfant*. Presses Universitaires de France.

Putnick, D. L., Hahn, C.-S., Hendricks, C., & Bornstein, M. H. (2020). Developmental stability of scholastic, social, athletic, and physical appearance self-concepts from preschool to early adulthood. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *61*(1), 95–103. https://doi.org/10.1111/jcpp.13107

Radke-Yarrow, M., & Zahn-Waxler, C. (1984). Roots, motives, and patterns in Children's prosocial behavior. In E. Staub, D. Bar-Tal, J. Karylowski, & J. Reykowski (Eds.), *Development and maintenance of prosocial behavior: International perspectives on positive morality* (pp. 81–99). Springer US. https://doi.org/10.1007/978-1-4613-2645-8_6

Reese, E., Bird, A., & Tripp, G. (2007). Children's self-esteem and moral self: Links to parent–child conversations regarding emotion. *Social Development*, *16*(3), 460–478. https://doi.org/10.1111/j.1467-9507.2007.00393.x

Robinson, J. L., Zahn-Waxler, C., & Emde, R. N. (1994). Patterns of development in early empathic behavior: Environmental and child constitutional influences. *Social Development*, *3*, 125–145. https://doi.org/10.1111/j.1467-9507.1994.tb00032.x

RStudio Team. (2019). RStudio: Integrated Development for R. RStudio, PBC, Boston, MA. http://www.rstudio.com/.

Sallquist, J., DiDonato, M. D., Hanish, L. D., Martin, C. L., & Fabes, R. A. (2012). The importance of mutual positive expressivity in social adjustment: Understanding the role of peers and gender. *Emotion (Washington, D.C.)*, *12*(2), 304–313. https://doi.org/10.1037/a0025238

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*. Psychology Press.

Sengsavang, S., & Krettenauer, T. (2015). Children's moral self-concept: The role of aggression and parent–child relationships. *Merrill-Palmer Quarterly*, *61*, 213–235. https://doi.org/10.13110/merrpalmquar1982.61.2.0213

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, *46*(3), 407–441. https://doi.org/10.3102/00346543046003407

Sierksma, J., Thijs, J., & Verkuyten, M. (2015). In-group bias in children's intention to help can be overpowered by inducing empathy. *British Journal of Developmental Psychology*, *33*(1), 45–56. https://doi.org/10.1111/bjdp.12065

Smith, C. E., Blake, P. R., & Harris, P. L. (2013). I should but I won't: Why young children endorse norms of fair sharing but do not follow them. *PLoS One*, *8*(3), e59510. https://doi.org/10.1371/journal.pone.0059510

Sticker, R. M., Christner, N., Gniewosz, G., Pletti, C., & Paulus, M. (2023). Longitudinal stability and cross-relations of prosocial behavior and the moral self-concept in early childhood. *Cognitive Development*, *66*, 101341. https://doi.org/10.1016/j.cogdev.2023.101341

Sticker, R. M., Christner, N., Pletti, C., & Paulus, M. (2021). The moral self-concept in preschool children: Its dimensions and relation to prosocial behaviors. *Cognitive Development*, *58*(101), 033. https://doi.org/10.1016/j.cogdev.2021.101033

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

Tomasello, M. (2009). *Why we cooperate*. MIT Press.

Trautwein, U., Lüdtke, O., Köller, O., & Baumert, J. (2006). Self-esteem, academic self-concept, and achievement: How the learning environment moderates the dynamics of self-concept. *Journal of Personality and Social Psychology*, *90*(2), 334–349. https://doi.org/10.1037/0022-3514.90.2.334

van Buuren, S., & Groothuis-Oudshoorn, K. (2010). MICE: Multivariate Imputation by Chained Equations in R. *Journal of Statistical Software*, 1–68.

Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy*, *11*(3), 271–294. https://doi.org/10.1111/j.1532-7078.2007.tb00227.x

Young, S. K., Fox, N. A., & Zahn-Waxler, C. (1999). The relations between temperament and empathy in 2-year-olds. *Developmental Psychology*, *35*, 1189–1197. https://doi.org/10.1037/0012-1649.35.5.1189

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology*, *28*(1), 126–136. https://doi.org/10.1037/0012-1649.28.1.126

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APPENDIX A

TABLE A1 Items of the puppet-interview.

Scale	Item	
HSC	1	I like to help to fold the laundry
	2	I like to help to set the table at home
	3	I like to help with the dishes
SSC	1	I like to share my crayons
	2	I make sure everyone gets the same amount
	3	I like letting other children play with my toys
CSC	1	I like to comfort a child who has been mean to me before
	2	I stop playing my favourite game to comfort a crying child
	3	I comfort a child who started the fight himself or herself
VSC	1	I like looking at books
	2	I like it when someone reads me a story
	3	I like listening to stories
PSC	1	I like to play with the ball
	2	I would like to be strong
	3	I can jump really far
	4	I can run really fast

Note: Table only displays items from the positive end of the scale.

Abbreviations: CSC, Comforting self-concept; HSC, Helping self-concept; PSC, Physical self-concept; SSC, Sharing self-concept; VSC, Verbal self-concept.

APPENDIX B

Coding scheme: helping task

From when is encoding started: From the time when the pencils/marbles/pictures fall down (0 s) until the time after experimenter has put all marbles back into the cup.

Helping: behavioural scales

- Was experimenter informed by the child about the pencils/marbles/pictures?
  - 0: The experimenter is not informed.
  - 1: Child points to pencils/marbles/pictures when experimenter turns back to the table/child.
  - 2: Child verbally informs experimenter about the pencils/marbles/pictures when she turns back to the table/child.
  - 3: Child points to pencils/marbles/pictures and verbally informs experimenter when she turns back to the table/child.
  - 4: Child informs experimenter about the pencils/marbles/pictures while she searches the shelf for other documents (within the first 30 s).

Helping: global scale

Code	Category	Behaviour
99	Not evaluable	• Cannot be evaluated because the child is crying, for example, or the helping task is aborted
0	No reaction	• Child does not pay attention to the pencils/marbles/pictures on the floor • Child does not comment on the marbles • Child looks around the room • Child playing with something else
1	Low help	• When the experimenter turns back to the table/child, the child informs her that the marbles have fallen and/or points to the pencils/marbles/pictures on the floor and looks at experimenter • Child informs experimenter while she is still at the shelf, but does not help pick it up • The child goes to the pencils/marbles/pictures, sits down next to them, but does not pick them up. • Child picks up marbles after experimenter has turned around again after 30 s/helps experimenter to pick up or • Child does not pick up the marbles himself, but helps by pointing to missing pencils/marbles/pictures and thus helps to find the pencils/marbles/pictures
2	Moderate help	• 11 s to about 30 s after the pencils/marbles/pictures fall down, the child runs to the pencils/marbles/pictures and collects them (This score is given regardless of whether the child has finished picking up all the pencils/marbles/pictures when experimenter turns back.) • Child informs experimenter while she is still at the shelf and then helps to pick it up
3	Strong help	• Immediately (0 s) or 10 s after the pencils/marbles/pictures fall down, the child runs to the marbles and picks them up (This score is given regardless of whether the child has finished picking up all the pencils/marbles/pictures when experimenter turns back.)

APPENDIX C

Coding scheme: comforting task

Global comforting rating

Combined information about the expression of concern and caring; general involvement of the child should be assessed; qualitative assessment about the general quality and strength of the empathic response (overall impression).

7-point scale:

1 = no involvement (e.g. child laughs).

3 = mild concern (e.g. no prosocial behaviour).

5 = moderate concern (e.g. some prosocial behaviour).

7 = strong expression of concern and helping/caring behaviour.