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If she watches, I will share: The impact of private and public self-focus on children's sharing behavior and the moral self-concept

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ABSTRACT

States with a focus on oneself, such as observing oneself (private self-focus) and being observed by others (public self-focus), are proposed to increase the saliency of own motives and evaluations by others and thereby to influence behavior. These processes become particularly relevant toward the end of early childhood, around the same age when children's moral self-concept (their view of themselves as prosocial agents) consolidates. This study advances the understanding of the role of self-focus on children's prosocial behavior by considering their moral self-concept. We investigated how private self-focus and two facets of public self-focus affect sharing behavior, the moral self-concept, and their interrelation. In a preregistered study, we assessed 5- to 8-year-olds' (N = 161, 84 female) sharing behavior and moral self-concept across four conditions. Children shared while observing themselves (private self-focus), while being observed by another child (reputation), while being observed by another child who could reciprocate later (reciprocity), or while not being observed (control). Generally, children shared more when observed by another person compared to when they were not in the focus of anybody, whereas observing themselves did not increase sharing. Children's moral self-concept was positively correlated with sharing, particularly when being in public self-focus, while mean values did not differ between conditions. The study provides novel evidence for the specific role of the awareness of others' evaluation in children's prosocial behavior. It suggests a social grounding of the moral self-concept by revealing its particular role for sharing behavior when being in the focus of social attention.

The emerging self-awareness in young children serves as a cornerstone in the development of their self-understanding and social behavior. In the second year of life, children become aware of themselves as agents, evidenced by their self-recognition in a mirror (Amsterdam, 1972). This represents a first step into children's understanding of their own person. With increasing age, children understand that others might create a view of themselves and evaluate them (Botto & Rochat, 2019). This increasing awareness of others' evaluation leads to reputational management strategies, that is, strategic behavior that aims to manipulate others' impression of oneself (Engelmann & Rapp, 2018). Young children start to invest in their reputation, for example, by being more generous when being watched by others or when others are informed about details of their decision (e.g., Froming et al., 1985; Leimgruber et al., 2012;

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Rapp et al., 2019). Yet, the underlying mechanisms for such behaviors are still unclear. What makes children act differently under observation? Is children's prosocial behavior in these situations based on strategic considerations such as reputation management and reciprocity expectations (Engelmann et al., 2013; Tomasello, 2019) or does the presence of others heighten the salience of children's own motives and views of the self? In this study, we directly target the role of different facets of self-focus and the self-concept for observer effects on young children's prosocial behavior.

Being observed by others but also focusing privately on the self are proposed to influence social behavior by increasing the awareness of others' views on oneself and one's own view of oneself (Govern & Marsch, 2001; Silvia & Duval, 2001). For example, viewing themselves in a mirror lead to less cheating and more generous donations in 3- to 4-year-olds (Bender et al., 2018; Ross et al., 2011), highlighting the role of self-focus for prosocial behavior. Importantly, parallel in development, children form a view of their own behavioral preferences and tendencies, i.e., a moral self-concept (Sengsavang & Krettenauer, 2015; Sticker et al., 2021). The moral self-concept thus reflects children's motives, which are proposed to be particularly salient when being in states with a high focus on oneself. Consequently, investigating the interactive effect of the moral self-concept helps to understand the role of self-focus for prosocial behavior. Whereas several studies have reported effects of being observed by others on social behavior (Bradley et al., 2018; Engelmann et al., 2016; Haun & Tomasello, 2011), evidence on the role of observing oneself is less consistent, and no research so far has looked at the role that children's moral self-concept might play in situations of increased self-focus. In the current study we therefore aimed to, first, disentangle the different motives that might affect children's prosocial behavior when being observed vs. when observing themselves (compared to when being alone without focusing on oneself). Second, we examined how the moral self-concept is affected by these situations of varying self-focus and how it affects sharing differently in these situations. Results of this study will help us to get a better understanding of the social basis of prosocial development and likewise advance theories on the nature of the moral self-concept in childhood. The study will reveal to what degree sharing behavior and the moral self-concept depend on others' presence, on the one hand, and on a focus on oneself without others' presence, on the other hand.

Private and public self-focus

The current study investigates two situational contexts of different self-focus: public self-focus (i.e., being observed by another person) and private self-focus (i.e., observing oneself). According to objective self-awareness theory (Duval & Wicklund, 1972; Silvia & Duval, 2001), focusing on oneself (e.g., seeing oneself or reflecting on one's view of oneself) results in comparing oneself against standards. This comparison may lead to a perceived discrepancy and thus comes with social implications about how to behave and how to attribute one's own behavior. While this theory made an important first step in distinguishing between an attentional focus on the self versus non-self objects, other theories on self-awareness typically distinguish between two facets of self-awareness: Self-directed attention may result from a private reflection on the self or from an awareness of oneself as a social object, resulting in the distinction between private self-awareness and public self-awareness (Fenigstein et al., 1975; Govern & Marsch, 2001). These two facets of self-awareness may be underpinned by different mechanisms and come with different implications for behavior (Froming et al., 1982). While the authors of this line of social psychological research label these facets private and public self-awareness, we prefer the notion of private and public self-focus (Rutland et al., 2005) to highlight the different situational conditions that have implications for the awareness of others' views or one's own view of oneself. The differentiation of private and public self-focus is likewise interesting for developmental psychology. Investigating how the relevance of both states differs in early development helps to advance our understanding of the social groundings of prosocial behavior and self-concept, given that these two states differ in whether the focus on oneself is induced by a social context or privately.

Being in states of private self-focus, for example, when observing one's face in a mirror (Fejfar & Hoyle, 2000) or when being asked to reflect on oneself (Froming et al., 1998), entails a heightened salience of one's values and emotions and is proposed to influence behavioral decisions (Froming et al., 1982; Govern & Marsch, 2001). Some studies showed that situations of private self-focus have behavioral consequences in children and adults, resulting in more honesty and prosocial behavior (Beaman et al., 1979; Bender et al., 2018; Diener & Wallbom, 1976). For example, Bender et al. (2018) showed that 3- to 4-year-olds were more honest about peeking in a temptation scenario when they faced their own mirror image as compared to when facing the nonreflective side of a mirror. Other studies reported no influence of facing a mirror on children's donation behavior (Froming et al., 1985), but found differences in children's rule transgressions when children in the no-mirror condition were additionally deindividualized by wearing a costume (Ross et al., 2011), and effects of a mirror on adults' prosocial behavior only if the saliency of the behavioral standards was first increased (Batson et al., 1999). That is, while substantial theoretical work has proposed a role of private self-focus for prosocial behavior, the evidence is inconclusive. The positive effects of private self-focus on prosocial behavior have mostly been explained with private self-focus increasing the sensitivity to social standards (Bender et al., 2018; Ross et al., 2011). Yet, given the theoretical distinction between the processes induced through private versus public self-focus, it is interesting to consider children's views of their own behavioral preferences to better understand effects of private self-focus. From a developmental perspective, children reflect on their behavior and form a differentiated self-concept about their behavioral tendencies and preferences from around preschool years (Harter, 2007; Marsh et al., 2002). Thus, focusing on oneself should become effective in influencing self-concept consistent behavior particularly during early childhood. It remains an important question whether mirror effects are replicable in early development, when children's view of themselves consolidates, and how taking into account children's self-concept regarding prosocial behavior can help to understand the effects of private self-focus on prosocial behavior.

Being in situations of public self-focus, such as when being faced with an audience, emphasizes the apprehension of being seen and evaluated by others (Froming et al., 1982; Govern & Marsch, 2001). The conceptualization of public self-focus is thus related to theoretical ideas that an awareness and understanding of the self stems from an awareness of how others view oneself (Cooley, 1902;

Mead, 1934). Developmental psychological theories similarly highlight a social grounding of prosocial behavior. Prosocial behavior is proposed to develop from pleasurable, social interactions (Carpendale et al., 2013) and to be used as a means to foster social relationships and a positive reputation (Grueneisen & Warneken, 2022; Laursen & Hartup, 2002). Consequently, investigating the social impact on prosocial behavior is interesting early in development. Both social psychological and developmental theories claim that in a state of high public self-focus, people tend to align their behavior with prevalent social standards, with the aim of being perceived as someone who engages in highly valued actions (Engelmann & Rapp, 2018; Govern & Marsch, 2001). Previous studies showed such audience effects on children's behavior. For example, children shared more when being observed than when being alone (e.g., Engelmann et al., 2012; Froming et al., 1985; Herrmann et al., 2019) and their explicit intergroup bias differed depending on whether they were videotaped or not (Rutland et al., 2005). Explicit reflection on self-presentational motives follows these behavioral strategies from around eight years on, such as reasoning about how others think of them (Banerjee et al., 2012; Banerjee & Yuill, 1999). Moreover, socially desirable behavior increased even when adults just thought about God (Gervais & Norenzayan, 2012), and when children believed to be observed by an invisible person (Piazza et al., 2011). Yet, simply seeing cues of being watched, such as eye spots (Kelsey et al., 2018; Vaish et al., 2017), does not robustly affect prosociality (Northover et al., 2017; Vogt et al., 2015), leading to a debate on the boundary conditions for observability effects on prosocial behavior (Bradley et al., 2018).

Effects of public self-focus are often explained with reference to reputation management, which describes strategic behavior that aims to impact how others evaluate oneself (for review, see Engelmann & Rapp, 2018). The purpose of reputation management is linked to the idea of indirect reciprocity, comprising the assumption that others will respond to us as we behave toward others. Indirect reciprocity means that interpersonal behavior of one actor is rewarded or punished by an uninvolved person, who is not directly affected by the actor's behavior (Engelmann & Fischbacher, 2009). Building a positive reputation accordingly serves to gain future benefits from others. Similarly, Tomasello (2019) proposes that children manage their impression on others to be recognized as cooperative. While he claims that "children's strategic impression management is clearly not moral" (p. 281), a sense of being part of a moral community is highlighted in his approach. An alternative purpose of reputation management might be to demonstrate one's good moral character. This is not mutually exclusive with other explanations of reputation management but focuses particularly on the rightness of the action. All these mechanisms might explain why children engage in more prosocial behavior when being observed, i.e., in states of public self-focus. In order to gauge their relative importance for children's behavior, we examine them simultaneously in the current study.

Taken together, developmental theories highlight the impact of social presence, particularly reputation management strategies, on children's prosocial behavior (Engelmann & Rapp, 2018; Grueneisen & Warneken, 2022). Additionally, children develop a view of their own behavior and preferences, including a moral self-concept, which is proposed to have a social basis (Harter, 2007; Kochanska et al., 2010). We are interested in how being observed by others shapes prosocial behavior and which role the increased focus on oneself plays in driving this effect. Being aware of others' views on oneself (induced through public self-focus) is theoretically differentiated from being aware of one's own view on oneself (induced through private self-focus). While both situations of self-focus direct attention to oneself, they are proposed to elicit different considerations and ultimately different behaviors (Govern & Marsch, 2001). Previous studies showed relatively consistent effects of public self-focus on children's prosocial behavior, as they engaged in more generous behavior when their behavior was observed by others. For the impact of private self-focus on prosocial behavior, previous evidence appears to be less consistent, calling for further investigations on the effect of private self-focus on prosocial behavior. Furthermore, studies mostly examined either the effect of private or public self-focus but rarely directly compared the two (Froming et al., 1985), although both are proposed to heighten self-evaluation while differing in the social context. The current study aims to disentangle different processes that may underlie the role of social presence in prosocial behavior. We compare children's sharing behavior between different situations when being observed by others (public self-focus with considerations of reputation management and indirect reciprocity), when observing oneself (private self-focus with heightened awareness of self standards), and when being alone without focusing on oneself. Beyond that, this study takes a first step in linking research on self-focus in the context of prosocial behavior with research on the moral self-concept, that is, children's awareness and representation of their own prosocial behavioral preferences, as outlined in the following.

The moral self-concept

Even young children are aware of their own preferences regarding prosocial behavior and develop a so-called "moral self-concept". They view themselves as someone who more or less likes to engage in prosocial behavior, such as helping, sharing, or comforting, which constitutes their moral self-concept (Sengsavang & Krettenauer, 2015; Sticker et al., 2021). A growing body of research supports the notion that children form a coherent view of their prosocial behavioral preferences in preschool years, which relates to their actual prosocial behavior (Kochanska et al., 2010; Schiele et al., 2024; Söldner et al., 2024; Sticker et al., 2023). The formation of the self is proposed to be closely intertwined with social interactional experiences (Harter, 2007; Mead, 1934; Thompson, 2012), with the self-concept being shaped based on the experience of one's own behavior and others' reactions. Indeed, experiences within caregiver-child interaction influence the moral self-concept across development (Kochanska et al., 2010; Söldner & Paulus, 2025). Yet, it remains an open question what social conditions influence the strength of the moral self-concept and its relation with behavior within a particular situation. Investigating the moral self-concept in the context of private and public self-focus and prosocial behavior is particularly informative for two reasons, which we will outline in the following.

First, it allows to test whether the moral self-concept is impacted by a social situation, that is, whether heightened attention to the self by increasing self-focus leads to a stronger momentary moral self-concept. Based on the assumption that the self is socially grounded (Harter, 2007; Mead, 1934; Thompson, 2012), social conditions might impact also the momentary strength of the self-

concept. Particularly from early childhood on, when children strive to be evaluated positively by others (Engelmann & Rapp, 2018), they may report a stronger moral self-concept when a public self-focus is prevalent compared to when they focus privately on themselves or when no self-focus is induced. One study with adults showed that priming moral identity did not influence the strength of moral identity per se (Leavitt et al., 2016), suggesting a situationally stable moral identity in adulthood. We will examine how social conditions influence the moral self-concept in childhood, a phase when the self is constructed from social experiences (Harter, 2007) and when the moral self-concept may be still more under construction (Söldner et al., 2024) and thus malleable.

Second, examining the moral self-concept in the context of private and public self-focus allows to examine how the moral self-concept and self-focus interact when predicting sharing behavior. That means, we can investigate whether the relation between the moral self-concept and behavior depends on self-focus. Private self-focus is characterized by an inward focus on one's own values and motives. We thus hypothesize that increasing private self-awareness increases the saliency of the moral self-concept, thereby leading to a stronger relation between the moral self-concept and prosocial behavior. This assumption relates to a social-cognitive account of moral identity (Lapsley & Narvaez, 2004), which is considered to be a continuation of children's moral self-concept into adolescence and beyond. The social-cognitive model of moral identity proposes that moral identity is characterized by the centrality of moral schemas and knowledge structures to oneself. The more readily accessible moral schemas are, the greater their potential influence on behavior. Empirical evidence supporting this assumption in adults comes from studies showing that priming moral self-schemas facilitates the accessibility of moral identity and increases prosocial behavior (Aquino et al., 2009, Aquino et al., 2011). While this line of research activates particularly moral schemas, thereby increasing the saliency of moral identity, we aim to increase self-focus in general. This may lead to an activation of different self-schemata, including the moral self-concept, besides others.

Viewing the hypothesized interaction between self-focus and moral self-concept on prosocial behavior from an alternative angle, it is informative for theories on the nature of the moral self-concept and its underlying motivation, by investigating under which circumstances the moral self-concept relates most strongly to prosocial behavior. Drawing on self-determination theory (Ryan & Deci, 2000), Krettenauer (2020) describes moral identity as a goal, which progresses across development from being more externally to more internally motivated. The moral self-concept in childhood can accordingly be conceived as resulting from children's focus on external relations with others to a desire to be socially engaged and related to others. This fits well to the so called introjected motivation, which stems from a focus on being approved by others to maintain self-worth (Ryan & Deci, 2000). Relatedly, Kochanska (2002) proposes that the moral self in childhood stems from children's compliance with parental rules (yet, the idea here is that children internalize these rules into their sense of self and attribute them to themselves rather than externally). These assumptions speak for a relation between the moral self-concept and prosocial behavior particularly when being observed by another person, that is, in situations of increased public self-awareness.

The distinction between different motivations is also reflected in the widely used conceptualization of moral identity in adolescents and adults, which separates between internalization and symbolization of moral identity (Aquino & Reed, 2002). Internalization refers to the degree to which moral characteristics are central to one's self, while symbolization refers to the degree to which one demonstrates these characteristics in behavior. Drawing on this conceptualization, it is an interesting question to ask to what extent the moral self-concept, as a developmental precursor of moral identity, reflects the urge to demonstrate moral characteristics in public. Towards this end, we examine the relation between moral self-concept and prosocial behavior in situations of private and public self-focus.

The current study

This study examined whether and how being observed by others and observing oneself influences sharing behavior, the moral self-concept, and their interrelation in a sample of 5- to 8-year-olds. We decided for this age range because, from around five years on, children's prosocial behavior is proposed to become more strategic (Grueneisen & Warneken, 2022), they adapt their behavior based on reputational concerns (Engelmann & Rapp, 2018) and they form a coherent representation of their own prosocial behavioral preferences (Söldner et al., 2024). Addressing theoretical claims on the nature of audience effects in children's prosocial behavior (Engelmann & Rapp, 2018; Grueneisen & Warneken, 2022), this study advances our understanding of early prosocial behavior by targeting different aspects of being observed. Based on the theoretical claims about the social foundation of the self (Harter, 2007; Thompson, 2012), examining the influence of social presence and private self-focus on the moral self-concept and its relation with prosocial behavior helps to understand the ontogeny of the moral self-concept.

To answer our research questions, we assessed children's sharing behavior with a recipient in one of four conditions (between-subject design), in which we manipulated children's self-focus. In the *private self-focus condition*, children observed themselves in a selfie camera. In the *public self-focus / reputation condition*, children were observed by another child through a video connection. In the *public self-focus / reciprocity condition*, children were observed by another child who was present and who had the possibility to share items later with the participant, thus increasing potential reciprocity considerations. In the *control condition*, children shared privately without any self-focus manipulation. Children's moral self-concept was assessed with a puppet-interview afterwards. Additionally, we asked children to explicitly report private and public self-focus during sharing.

First, investigating the effect of self-focus on sharing behavior, we hypothesized that private self-focus and public self-focus increases sharing behavior (Hypothesis 1, H1). Specifically, we expected children to engage more in reputation-enhancing sharing behavior, in conditions of raised awareness of their own and others' view of themselves compared to the control condition. For the second aim of the study, investigating whether private and public self-focus in the different conditions influence sharing behavior through the activation of children's moral self-concept, we expected independent moderation and mediation effects. On the one hand, we hypothesized the condition to moderate the relation between moral self-concept and sharing behavior (Hypothesis 2, H2). We assumed that either private self-focus increases the saliency of the moral self-concept, thus leading to a stronger relation between moral

self-concept and sharing behavior when observing oneself, or that the moral self-concept particularly relates to sharing in social contexts, when being observed by others. On the other hand, we hypothesized that children's self-focus increases the current strength of the moral self-concept, which in turn increases children's sharing in these conditions. In particular, we hypothesized children to express a stronger moral self-concept in the conditions of increased self-focus (Hypothesis 3, H3), with the moral self-concept in turn relating positively to children's sharing behavior (Hypothesis 4, H4). Additionally, we hypothesize that the moral self-concept mediates the effect of heightened self-focus conditions on sharing behavior (Hypothesis 5, H5). Note that Hypotheses 1 to 5 were preregistered (point 2 and 5 in the preregistration; conditions that are supposed to increase self-awareness refer to the conditions of private and public self-focus). Nevertheless, the analyses will expand beyond preregistered analyses and explore patterns of relationships between self-focus, moral self-concept and sharing behavior, that are not directly covered by these hypotheses.

Methods

Participants

The final sample comprised 156 children, aged 5 to 8 years ($M = 6.5$ years, $SD = 1.1$; 79 female). Four additionally tested children were excluded because of technical or procedural errors, 2 additionally tested children were excluded because they were out of the age range, and 22 additionally tested children were excluded because they did not answer the final manipulation check question correctly. We determined sample size with an a priori power analysis (see preregistration: https://aspredicted.org/y5vv-2tnw.pdf). Assuming a power of .80 and alpha of .05, with an estimated effect size of $f = .29$ (based on results of similar paradigms conducting ANOVAs; e.g., Froming et al., 1985; Ross et al., 2011), including 4 groups and 3 numerator degrees of freedom results in a minimum of 134 participants. Parents provided informed written consent and the study was approved by the local faculty's ethics committee (Faculty of Psychology and Educational Sciences, University of Munich, Germany). Participants were recruited in a large European city and mostly came from a Western cultural background. Information on socioeconomic status and ethnicity were not assessed to follow the principle of data economy.

Procedure

Testings took place in a public museum and laboratory rooms of the university. Children participated individually in a between-subject design with four conditions. Each child was tested individually without the parent being present. All data was live coded and we additionally videotaped the experimental session, provided parents had given their consent. As a warm up, children played a visual search game. Second, children had the possibility to share balloons with another child, with instructions differing between conditions. After that, children's moral self-concept and explicit self-focus were measured with a puppet-interview. Lastly, children answered check questions to ensure their understanding of the task. In the end, children received a note with information on the study and the balloons they kept for themselves in the sharing task.

Measures

Sharing. Situational characteristics differed between the sharing task for the four conditions (see below), but the general procedure for assessing sharing was identical across conditions. Children had the opportunity to share six balloons with another, absent child. They received six balloons of their favorite color and were informed that these balloons are theirs and they can take them home later. They were also informed that they can give balloons to another child, who couldn't be there today. Children were asked to put the items they want to keep for themselves in an envelope and the items for the other child into a box. Children's understanding of where to put the items was ensured by a check question. The box had a small hole on top and was decorated as a present with a hand drawn picture of the recipient to ensure that children understood that they cannot choose the recipient themselves. All children made their sharing decision behind a (70x30cm) privacy screen to ensure that the children did not feel pressured to share due to the experimenter's presence. Additionally, the experimenter turned away during the sharing task, mentioning that she had to do something. The child was instructed to call the experimenter once they were done. At the end of the experimental session, the experimenter counted

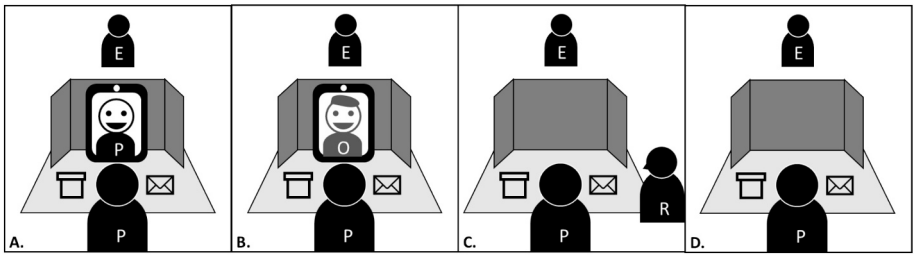

Fig. 1. Illustration of the four experimental conditions with the participant (P), experimenter (E, always behind the privacy screen), observer (O, via video connection), observer with possibility to reciprocate (R). A: private self-focus/self-observation condition. B: public self-focus/reputation condition. C: public self-focus/reciprocity condition. D: control condition.

the number of shared items in the box, which serves as a measure of sharing.

We created four different conditions for the sharing task (between-subject design), which manipulated whether and how children were observed (see Fig. 1). These manipulations of self-focus were adapted from Cañigueral and Hamilton (2019). In the *private self-focus/self-observation condition*, we let children share while they could see themselves through a tablet (13.3́) with activated selfie camera. The tablet was positioned in front of the child before the sharing task and children were animated to wink in order to notice themselves in the mirror. In the *public self-focus/reputation condition*, we let children share while they believed another child watched them through a video connection on a tablet (13.3́"). The tablet was positioned in front of the participant and they were made to believe that the other child, connected via video, will watch how they decide. The simulated video call was implemented in such a way that only the video but not the audio connection worked in order to prevent the participant's attempt to talk to the other child. In the *public self-focus/reciprocity condition*, children shared while being observed by another present child. Both children were informed that the observing child will have the opportunity to share items with the participant later on. In the *control condition*, children shared privately without being observed by anyone.

In order to ensure that children understood the condition-specific characteristics, we asked them in the end whether anybody saw what they did with the balloons, and if so, who. Children who did not pass this manipulation check were excluded from the final sample.

Moral Self-Concept. We assessed the moral self-concept about sharing with three items in a puppet-interview based on previous research (Christner et al., 2020; Sticker et al., 2021). We presented the items on a tablet with the software Qualtrics (Provo, Utah, USA). For each item, two identical puppets (a different pair for each item) stated opposing sentences (read out by the experimenter), such as: "I like to share my…", "I dońt like to share my…" (Item 1: "I like / don't like to share my pencils."; Item 2: "I (don't) take care that everyone gets the same amount."; Item 3: "I (don't) like to let other children play with my toys."). The experimenter then asked the child, which puppet they are more alike ("Are you more like this puppet or like that puppet?"), followed by "Are you a lot or a bit like this puppet?". The task started with a familiarization item ("I would like to be strong") to introduce children to this mode of questioning. After that, three items focused on the moral self-concept. Answers were coded from 1 to 5. One means being a lot like the negating puppet, 2 being a bit like the negating puppet, 3 being like both sometimes, 4 being a bit like the affirming puppet, 5 being a lot like the affirming puppet. A mean score across items serves as a moral self-concept measure. Internal consistency of this measure was Cronbach's $\alpha = .57$ and McDonald's $\omega = .61$. This is relatively low, but, given that Cronbach's alpha depends on the number of items (Cortina, 1993), acceptable for a three-item scale. Internal consistency is also comparable to previous research on the moral self-concept on sharing (Gniewosz et al., 2023, reporting Cronbach's $\alpha = .50$-$.71$).

Explicit Self-Focus. In order to check whether the experimental manipulations are explicitly reflected in children's reports, we assessed their awareness of the public and private self-focus within the same puppet-interview. Before the three items for the moral self-concept, children answered two items on their awareness of self-focus. One item targeted public self-focus ("When I was deciding what to do with the balloons, I thought about what others think of me.", "… I didn't think about what others think of me."), one item private self-focus ("When I was deciding what to do with the balloons, I thought a lot about myself', "… I didn't think a lot about myself."). Answers for each item were coded from 1 to 5 (see above), with higher scores indicating higher explicit self-focus. We used the single items as well as the mean across the two items (global self-focus measure) for the analyses.

Data analysis

To address H1, we test the effect of condition on children's sharing by running an analysis of variance (ANOVA). To examine whether conditions of heightened self-focus generally increase sharing, we compute a second ANOVA with conditions aggregated: all conditions raising self-focus (private, reputation, reciprocity) vs. control condition. To address H2, we conduct a moderation analysis in order to examine whether experimental condition moderated the relation between moral self-concept and sharing behavior. To test H3, the effect of condition on moral self-concept, we compute one-way ANOVAs as for H1. To address H4, we compute a correlation between the moral self-concept and sharing behavior across all conditions. Finally, to address H5, we conduct a mediation analysis with moral self-concept as mediator between condition (self-focus vs. control) and sharing behavior, if sharing and moral self-concept differ between the respective conditions. Because some key variables correlated with age and differed by gender (see Results), we consider age and gender as control variables in the main analyses and thus compute analyses of covariance (ANCOVAs) for examining effects of condition on sharing and moral self-concept. Missing data on single variables is handled by listwise deletion for the ANOVAs and ANCOVAs.

In order to explore whether the manipulations influenced children's explicit self-focus, we compute one-way ANOVAs examining whether explicit public self-focus and explicit private self-focus differ between conditions. Extending the pre-registered analyses, we additionally aggregate the conditions in which the child shared while being watched (reputation and reciprocity) for exploratory analyses on the effects of public self-focus and we explored potential interactions with age.

Transparency and openness

We report our sample size planning, all data exclusion criteria, all conditions, and all measures of the study. The study design and analyses were preregistered on aspredicted.org (https://aspredicted.org/y5vv-2tnw.pdf). All data and analysis code are openly available at https://osf.io/pm5zk. Data were analyzed using R, version 4.5.0 (R Core Team, 2020), and JASP, version 0.18.3.

Results

Descriptive statistics and preliminary analyses

Descriptive statistics and correlations of all key variables across conditions are presented in Table 1. Final sample sizes for the four conditions were 38 in the private self-focus, 42 in the reputation, 32 in the reciprocity and 44 in the control condition, with no differences between conditions regarding mean age ($F(3, 152) = 0.92$, $p = .431$, $\eta^2 = .02$) and gender distribution ($\chi^2(3) = 3.30$, $p = .347$). Age correlated positively with sharing behavior across conditions; thus, the older participants were, the more they shared. Exploratory analyses of gender revealed a higher explicit private self-focus of girls ($M = 3.58$, $SD = 1.36$) than boys ($M = 3.13$, $SD = 1.38$), $t(152) = 2.02$, $p = .046$, $d = .32$, across conditions. Moral self-concept, $t(154) = 1.85$, $p = 0.066$, $d = .30$, sharing, $t(154) = -0.83$, $p = 0.405$, $d = .13$, and explicit public self-focus, $t(151) = 0.37$, $p = 0.711$, $d = .06$, did not differ between girls and boys.

One-way ANOVAs revealed that neither explicit public self-focus ($F(3, 149) = 0.75$, $p = .525$, $\eta^2 = .01$) nor private self-focus ($F(3, 150) = 0.51$, $p = .677$, $\eta^2 = .01$) differed significantly between conditions (see Fig. 2), suggesting that children's explicit reports of self-focus did not reflect the experimental manipulations.

Preregistered analyses

Fig. 2 depicts the distribution and means of children's sharing behavior and moral self-concept depending on condition. One-way ANCOVAs for testing H1, the effect of condition on sharing behavior while controlling for age and gender, revealed no significant main effect of condition – neither when considering all conditions individually ($F(3, 150) = 2.53$, $p = .060$, $\eta^2_p = .03$), nor aggregated across conditions of self-focus ($F(1, 152) = 2.63$, $p = .107$, $\eta^2_p = .01$). The only significant effect revealed in the ANCOVAs was the positive effect of age on sharing behavior ($Fs > 24.56$, $p < .001$, $\eta^2_p = .14$).

In order to test H2, whether condition moderated the relation between moral self-concept and sharing, we computed an ANCOVA with the interaction between moral self-concept and condition while controlling for age and gender. The ANCOVA revealed no significant interaction ($F(3, 146) = 1.57$, $p = .199$, $\eta^2_p = .03$). For descriptive purposes, we nevertheless report the correlation between moral self-concept and sharing separately for each condition in the Supplemental Material S1. The positive correlations are particularly strong in the public self-focus conditions.

One-way ANCOVAs for testing H3, the effect of condition on the moral self-concept while controlling for age and gender, revealed no significant main effect of condition – neither considering the individual conditions ($F(3, 150) = 1.26$, $p = .289$, $\eta^2_p = .02$), nor aggregating across self-focus conditions ($F(1, 152) = 0.36$, $p = .550$, $\eta^2_p = .003$).

Testing H4, a one-sided Pearson correlation between the moral self-concept and sharing across all conditions revealed a positive correlation ($r = .32$, $p < .001$). Given that we did not find the increased moral self-concept in conditions of self-focus, we did not further test the mediation hypothesis (H5).

Exploratory analyses: Differences between conditions

Given the tendency of a condition effect on sharing behavior, we exploratively computed pairwise comparisons using one-sided *t*-tests. These revealed that children shared significantly more in the reputation condition ($M = 2.45$, $SD = 1.06$) compared to the private self-focus condition ($M = 1.97$, $SD = 1.33$; $t(78) = -1.79$, $p = .039$, $d = .40$) and control condition ($M = 1.98$, $SD = 1.27$; $t(84) = -1.88$, $p = .032$, $d = .41$). Additionally, children shared more in the reciprocity ($M = 2.47$, $SD = 0.98$) compared to the private self-focus condition ($t(67) = -1.79$, $p = .039$, $d = .42$) and control condition ($t(74) = -1.83$, $p = .036$, $d = .43$). In order to complement the analyses and to be able to also quantify evidence for the null hypothesis (i.e., no difference between conditions), we additionally computed Bayesian independent samples *t*-tests. For the comparison of sharing between the private self-focus and control condition, the Bayes Factor $BF_{01} = 4.339$ indicates that the data is 4.3 times more likely under the null hypothesis than under the alternative hypothesis. According to common guidelines on the interpretation of Bayes Factors (Jarosz & Wiley, 2014), this indicates positive/substantial evidence for no difference between conditions. For the comparison of sharing between the reciprocity and reputation condition, the Bayes Factor indicates substantial evidence for no difference as well, with $BF_{01} = 4.122$. For the other comparisons for sharing, the Bayes Factors provide no substantial evidence in favor of the null hypothesis (reputation vs. private: $BF_{01} = 1.084$; reputation vs. control: $BF_{01} = 0.960$; reciprocity vs. private: $BF_{01} = 1.114$; reciprocity vs. control: $BF_{01} = 0.999$).

Table 1
Descriptive statistics and Pearson correlations of all key variables.

	n	*M*	*SD*	MSC	Explicit public SF	Explicit private SF	Explicit global SF	Sharing
Age	156	6.54	1.06	.12	−.11	−.10	−.13^{+}	.38***
MSC	156	4.21	0.81	–	.14^{+}	.12	.17*	.32***
Explicit public SF	153	2.86	1.40	.16^{+}	–	.16*	.77***	−.02
Explicit private SF	154	3.36	1.38	.14^{+}	.15^{+}	–	.76***	−.17*
Explicit global SF	154	3.10	1.06	.19*	.76***	.76***	–	−.12
Sharing	156	2.21	1.19	.29***	.02	−.14^{+}	−.08	–

Note. MSC = moral self-concept. SF = self-focus. Explicit global SF = aggregate score across explicit public SF and explicit private SF. Upper triangle: zero-order correlation. Lower triangle: correlations with age partialed out. $^{+}$ $p < .1$, *, $p < .05$, *** $p < .001$ (two-sided).

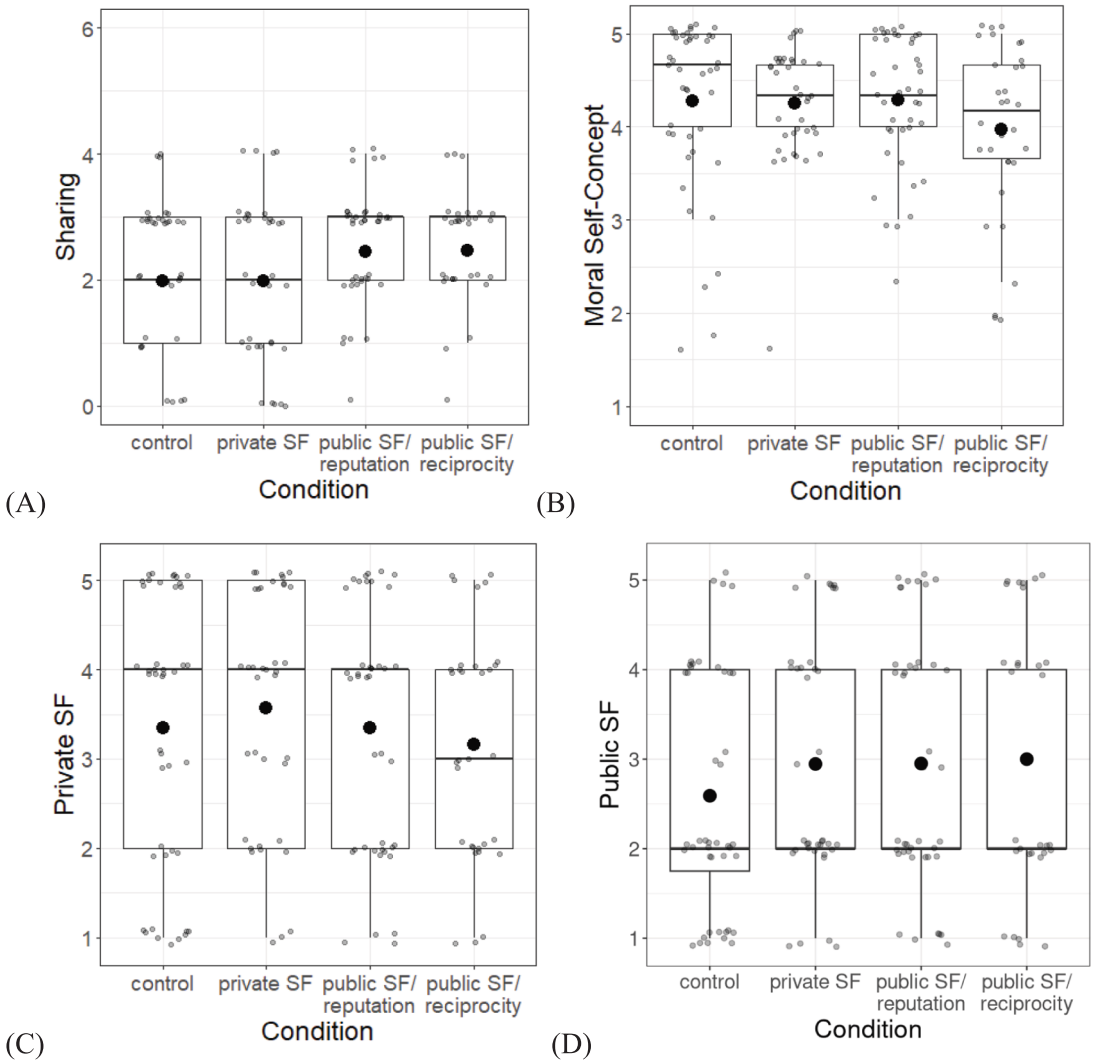

Fig. 2. Boxplot of sharing behavior (A), and moral self-concept (B), explicit private self-focus (C), explicit public self-focus (D) split by condition (SF = self-focus). Individual datapoints are slightly jittered for visibility.

Exploratory analyses: Aggregating conditions

Children's sharing behavior did not differ significantly between the two public self-focus conditions. We therefore additionally collapsed conditions that clearly targeted public self-focus by having another person watching the child's behavior (*public* conditions: reputation and reciprocity condition). We examined the general role of public self-focus (*public*) versus no self-focus (*control*) in the subsample of children completing any of the three conditions. An ANCOVA revealed a positive effect of aggregated condition ($F(1, 114) = 5.71$, $p = .019$, $\eta_p^2 = .04$) and age ($F(1, 114) = 14.54$, $p < .001$, $\eta_p^2 = .11$) on sharing behavior. Children shared on average more when they were observed ($M = 2.46$, $SD = 1.02$) compared to when there was no self-focus induced ($M = 1.98$, $SD = 1.27$). For the moral self-concept, the aggregated condition showed no effect ($F(1, 114) = 0.53$, $p = .467$, $\eta_p^2 = .01$). In order to examine the moderation with the aggregated conditions, we computed an ANCOVA with the interaction between moral self-concept and condition while controlling for age and gender. The ANCOVA revealed a significant interaction between moral self-concept and condition ($F(1, 112) = 4.21$, $p = .042$, $\eta_p^2 = .04$). Separate follow-up ANCOVAs for the public self-focus conditions and the control condition revealed a positive relation between the moral self-concept and sharing behavior when children were observed by others ($F(1, 70) = 28.51$, $p < 001$, $\eta_p^2 = .30$) but not when they shared without any focus on themselves ($F(1, 40) = 2.13$, $p = .152$, $\eta_p^2 = .03$) (see Fig. 3).

Exploratory analyses: Interactions with age

Detailed analyses on interactions between age, condition, and moral self-concept on sharing behavior are reported in the

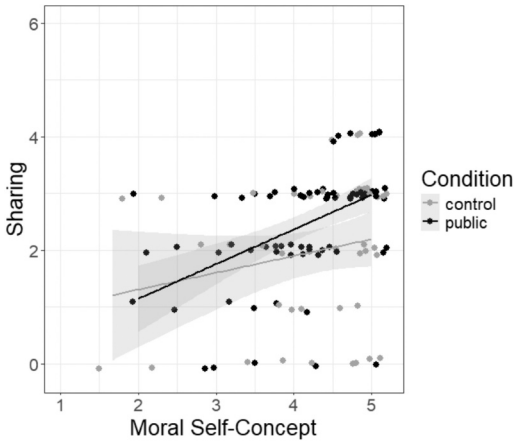

Fig. 3. Linear relations between moral self-concept and sharing, depending on condition (public: reputation & reciprocity condition; control condition), with shaded 95% confidence interval. Individual datapoints are slightly jittered for visibility.

Supplemental Material S2. In summary, the analyses revealed significant three-way interactions between age, condition, and moral self-concept on sharing behavior while controlling for gender, when considering conditions aggregated across self-focus and when considering conditions aggregated across manipulations targeting specifically public self-focus. Yet, in both cases, follow-up two-way interactions between condition and moral self-concept were not significant for any age. Examining main effects only revealed that 6- and 7-year-olds shared more across conditions inducing self-focus and across conditions inducing particularly public self-focus compared to the control condition. Beyond that, the moral self-concept was positively related to sharing behavior from 6 years on.

Discussion

States of public self-focus, i.e., being aware of others' evaluation of oneself, and private self-focus, i.e., being aware of own values and motives, are debatable influences on children's prosocial behavior. Relatedly, young children are aware of their own prosocial behavioral preferences, as reflected in their moral self-concept. The current study examined how private self-focus, induced by looking into the mirror, and two aspects of public self-focus, being observed by another person and additional considerations of indirect reciprocity, influence sharing behavior, the moral self-concept, and the relation between moral self-concept and sharing in early childhood. The results revealed that being watched by another person increased children's sharing behavior, while seeing themselves in the mirror (selfie-camera) had no effect. Children's moral self-concept was positively correlated with sharing behavior, particularly when children were in situations of public self-focus. The results provide evidence for children caring about their reputation by engaging in prosocial behavior and support developmental theories on the social nature of the moral self-concept in childhood.

The study provides differentiated evidence on the role of self-focus for prosocial behavior. Specifically, public self-focus, not private self-focus, increased prosocial behavior compared to a control condition. As hypothesized, children shared more when they were observed by another person compared to when they were not in the focus of anybody. This supports theoretical views that highlight the social grounding of prosocial behavior (Carpendale et al., 2013; Laursen & Hartup, 2002), particularly children's use of reputation management strategies (Kelsey et al., 2018; Tomasello, 2019). Taking a more fine-grained look at the results, the study allows to draw conclusions about the relative importance of different motives that subserve increased sharing under observation early in development (Engelmann & Rapp, 2018; Grueneisen & Warneken, 2022). Considerations of reputation management and, more specifically, indirect reciprocity seem to be equally important for prosocial behavior, given the evidence for no difference in sharing behavior between the two public self-focus conditions. This suggests that sharing under observation is not something simply strategic: aiming for direct benefit from reciprocity seems to be equally relevant as other considerations elicited through observation. Overall, from a broader social psychological perspective, the results generally align with objective self-awareness theory (Duval & Wicklund, 1972; Silvia & Duval, 2001), showing that in some situations of raised self-focus, children move their behavior more towards perceived standards. In the current study, this was particularly the case for 6- and 7-year-olds, supporting an increase of reputation management during childhood (Engelmann & Rapp, 2018). At the same time, the study supports the distinction between private and public self-focus, induced by self-observation and observation by others (Fenigstein et al., 1975; Govern & Marsch, 2001), by highlighting different implications for prosocial behavior.

For observing oneself, the current preregistered study adds to previous inconsistent research by providing statistical evidence for no effect on sharing behavior. This speaks against the idea that viewing oneself in a mirror raises self-awareness in such a way that it fosters adherence to norms (Bender et al., 2018). Instead, mirror effects might have been overestimated in previous studies; they might be bound to certain conditions, such as additional deindividuation (Ross et al., 2011) or an already otherwise raised saliency of behavioral standards (Batson et al., 1999). Additionally, against our hypothesis, the effect of private self-focus on sharing behavior did not depend on children's moral self-concept. This speaks against the proposal that private self-focus, in contrast to public self-focus, highlights own values and standards (Fenigstein et al., 1975; Govern & Marsch, 2001), which should be particularly related to

behavior in these situations. One explanation could be that prosocial values, as reflected in the moral self-concept, reflect only one self-relevant aspect that is highlighted through private self-focus. Observing oneself could additionally increase the attention to other motives and self-relevant schemata that are currently present, which might override any effects of the moral self-concept.

Interestingly, exploratory analyses aggregating across public self-focus conditions demonstrated that the positive relation between the moral self-concept and sharing was particularly pronounced when children were observed by others compared to when no self-focus was induced. This extends increasing research on children's considerations and behavioral relevance of a moral self (Christner et al., 2020; Heiphetz, 2020; Kochanska et al., 2010; Sticker et al., 2023) by revealing situational conditions that moderate this relation. Related to social-cognitive accounts on moral identity (Lapsley & Narvaez, 2004; Aquino et al., 2009), this suggests that the moral self-concept becomes more salient when being observed and thus guides behavior more strongly. Interestingly, situations of increased public self-focus, not private self-focus, increased the association between moral self-concept and behavior. Acting in alignment with one's moral self-concept may thus serve as one way to gain social approval. This supports Krettenauer's (2020, 2022) perspective that the moral self-concept in childhood reflects some externally motivated goal. It further resonates with broader theoretical accounts that emphasize the relational origins of the self (Harter, 2007; Thompson, 2012) and prosocial behavior (Carpendale et al., 2013; Dahl & Brownell, 2019; for review see Paulus et al., in press). Within this context, the motivation to engage in prosocial behavior is proposed to emerge within social interaction. This relates well to the moral self-concept being particularly activated and thus gaining relevance in social settings. Finally, coming back to children's reputation management strategies as discussed above, the current result suggests that presenting one's good moral character serves as one prominent motive for behavior when being observed by others. The correlations between the moral self-concept and sharing behavior in the public conditions were particularly strong (reputation $r = .57$ and reciprocity $r = .45$, see Supplemental Material), also relative to comparable previous research (Christner & Paulus, 2022; Sticker et al., 2023; with r ranging between.18 and .36). Notably, these previous studies had slightly younger samples and did not explicitly manipulate a public or private setting. When children had the possibility to share in these studies, the experimenter was present, but not explicitly observing the child. One possibility is that explicitly highlighting others' observation and interest in the child's decision, rather than the mere presence of another person, contributes to such pronounced relations between the moral self-concept and sharing.

Against our hypothesis, the moral self-concept itself did not differ across conditions, supporting it to be a relatively stable characteristic (Harter, 2007). Neither private nor public self-focus impacted the reported strength of the moral self-concept. This extends previous work showing stability of children's moral self-concept across several months (Schiele et al., 2024; Sticker et al., 2023; Söldner et al., 2024) to situational stability. Additionally, the results align with first evidence from adults, showing no malleability of the strength of moral identity through priming (Leavitt et al., 2016). Given this lack of evidence for a stronger moral self-concept in conditions with self-focus (H3), we did not follow up on the mediation hypothesis (H5). Taken together, the results provide novel evidence for the role of public self-focus, that is, being in the focus of social attention, in translating the moral self-concept into prosocial behavior. They show that not the strength of the moral self-concept per se, but its role for prosocial behavior depends on states of self-focus, likely through increasing the saliency of moral behavioral standards and preferences.

Overall, the study advances our understanding of children's prosocial behavior and its interplay with the moral self-concept. The results speak for prosocial behaviour being to some degree driven by external factors, namely the observation of others (Engelmann & Rapp, 2018). Considering prosocial motivation on a continuum from egoistic to other-oriented motives, as suggested by Eisenberg et al. (2016), this result highlights the relevance of social approval. Beyond that, the current study suggests that having a strong moral self-concept and acting accordingly is partly driven by social motives, for example, to be approved and valued by others. Additionally, developing a strong moral self-concept might require focusing on oneself to some degree, as suggested by the positive correlation between moral self-concept and explicit self-focus. Integrating the current results with previous literature on the moral self-concept and prosocial development suggests that, within early social interaction, children start to engage in prosocial behavior to engage in joyful interactions and to feel related to others (Carpendale et al., 2013; Eisenberg et al., 2016; Paulus, 2022). The need for social relatedness might turn into a more direct motive, driving strategic prosocial behavior, such as increased prosociality when being observed by others (Grueneisen & Warneken, 2022). The moral self-concept might likewise emerge from children's engagement within social interaction and wish for social approval (Krettenauer, 2020; Sengsavang et al., 2015), reflecting children's prosocial behavioral tendencies and driving these behaviors particularly when observed by others. Interestingly, the moral self-concept related positively to sharing behavior from 6 years on – around the same age when children started to share more when they were observed. This further hints to similar developmental processes underlying the increased relevance of moral self-concept and being in the focus of social attention for prosocial behavior.

We aimed at implementing a manipulation check of the experimental conditions by asking children to report on their experienced self-focus during sharing. Notably, explicit self-focus ratings did not differ significantly between conditions, suggesting that the effects of self-focus on prosocial behavior are more implicit than explicit. Previous studies on self-focus and prosocial behavior largely did not include direct assessments of children's self-focus (Engelmann et al., 2012; Piazza et al., 2011; Ross et al., 2011). The current evidence thus suggests that the effects of public self-focus – as reported in prior studies and replicated here – operate quite implicitly. This pattern aligns with further research on self-presentation, which indicates that children's reasoning about reputation management strategies becomes more explicit only around the age of eight years (Banerjee et al., 2012; Banerjee & Yuill, 1999). It is important to note, however, that we assessed each dimension of self-focus with a single item only, leaving the possibility that the measure was not reliable and adequate to assess these constructs. For example, the negative correlation between explicit private self-focus and sharing behavior suggests that children's report on their focus inwards („I thought a lot about myself.“) may reflect their attention to their own desires and needs rather than their values and motives. Future research should thus try to assess children's awareness of self-focus with more nuanced measures.

Limitations and further research

While the experimental design of the current study allows for conclusions about the influence of conditions on behavior, the observed association between moral self-concept and prosocial behavior was cross-sectional and correlational. We interpreted the correlations in the way that children's moral self-concept drives their behavior differently, depending on whether they were observed or not. This interpretation draws on theories on the behavioral relevance and relative stability of the moral self-concept and identity (Hardy & Carlo, 2005; Harter, 2007) and fits to longitudinal effects from moral self-concept to later behavior (Sticker et al., 2023). Yet, future research, such as longitudinal studies or studies assessing the moral self-concept repeatedly, before and after sharing, are needed to draw causal inferences. Second, theories on self-awareness differentiate between states of self-awareness and trait-like dispositions of paying attention to oneself, mostly labelled self-consciousness (Buss & Scheier, 1976; Trapnell & Campbell, 1999). It remains an open question for future research how individual differences in this general disposition of self-awareness might influence prosocial behavior and the relation between moral self-concept and prosocial behavior. Individuals with higher trait self-consciousness might consistently show stronger links between moral self-concept and sharing behaviors due to a more habitual focus on their view of themselves. Third, we examined the role of self-focus for sharing behavior as one prominent dimension of prosocial behavior. It remains open whether the differential effects of self-focus and the moral self-concept are similar for other forms of prosociality, such as helping and comforting (Dunfield, 2014; Paulus, 2018). Lastly, internal consistency of the moral self-concept was relatively low, but comparable to previous research on the moral self-concept for sharing (Gniewosz et al., 2023). Despite the demonstration of the validity of this moral self-concept scale in previous studies (Sticker et al., 2021; Söldner et al., 2024), future studies could consider including more items to assess the construct more reliably.

Conclusion

Overall, the current study highlights the relevance of others' presence for enhancing sharing behavior and the relation between the moral self-concept and sharing in children. This suggests that being observed not only elicits more socially desirable actions but also reinforces children's behavioral alignment with their moral self-concept. The study thus supports a social basis of the moral self-concept and highlights the interplay between external social influences and internal mechanisms of self-concept in children's prosocial behavior.

CRediT authorship contribution statement

Natalie Christner: Writing – original draft, Project administration, Formal analysis, Data curation. **Regina M. Sticker:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Antonia Misch:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Tobias Krettenauer:** Writing – review & editing, Supervision. **Markus Paulus:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jecp.2025.106399.

Data availability

The data is openly available at https://osf.io/pm5zk.

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