Reputation Management and Psychological Mechanisms in Children' s Prosocial Behavior

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Abstract

Reputation management is a strategic behavior aimed at controlling others' evaluations of oneself to obtain a desired personal reputation. In the evolution of children' s prosocial motivation, their concern for their own reputation gradually emerges, and they exhibit a tendency to manage their reputation through prosocial behavior. Based on this, the present article systematically reviews the manifestations and developmental trends of children' s reputation management from the perspective of prosocial behavior in reputation contexts, analyzes the psychological mechanisms of reputation management from three angles: individual cognition, social motivation, and neurophysiology, and proposes a comprehensive model of reputation management based on cognition, motivation, and brain mechanisms. Future research should further expand investigations into the occurrence, development, and influencing factors of children' s reputation management within prosocial behavior, focus on the neural mechanisms underlying reputation management in children' s prosocial behavior, and strengthen applied practical research on children' s reputation management.

Full Text

Children' s Reputation Management in Prosocial Behavior and Its Psychological Mechanisms

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Abstract: Reputation management is a strategic behavior aimed at controlling others' evaluations of oneself to obtain a desired personal reputation. In the evolving process of children' s prosocial motivation, concern for their own reputation gradually emerges and manifests through prosocial behavior. Based

on this, this article systematically reviews children' s reputation management performance and developmental trends in reputational contexts, analyzes the psychological mechanisms of reputation management from three perspectives —individual cognition, social motivation, and neurophysiology—and proposes a comprehensive reputation management model based on cognitive, motivational, and brain mechanisms. Future research should further investigate the emergence, development, and influencing factors of reputation management in children' s prosocial behavior, explore the neural mechanisms underlying reputation management, and strengthen applied and practical research on children' s reputation management.

Keywords: prosocial behavior, children, reputation management, cognitive-motivational-neural mechanisms

1 Introduction

Individual reputation refers to the public evaluation of an individual formed by a group based on information about that individual' s personality, abilities, or behavior (Engelmann & Rapp, 2018; Hill & Pillow, 2006; Milinski, 2016). Unlike personal perception or impression (an individual' s evaluation of another individual, Hou Yubo, 2018), reputation is created, maintained, or changed through the public discourse of a group (a collection of two or more individuals who interact or are interdependent) (Engelmann & Rapp, 2018). Reputation holds significant value: a good reputation can bring more cooperation and long-term potential benefits, while a bad reputation may lead to condemnation or even group exclusion (Engelmann & Rapp, 2018; Milinski, 2016).

In the prosocial domain, an individual' s reputation refers to others' comprehensive evaluation of that individual' s prosocial motives and behaviors. In real life, reputation does not exist in isolation. Out of concern for social evaluation, people consider mainstream social values and guide their behavior accordingly to obtain a good reputation. This strategic behavior arising from concern for one' s own reputation is called reputation management (Heyman et al., 2021). Reputation management exists in all aspects of society and is particularly common in people' s prosocial behavior. When facing situations where their words and actions may be monitored or disseminated by others, individuals exhibit more prosocial behavior to manage their reputation, such as being more generous, cooperative, helpful, and socially conscientious, thereby obtaining a good reputation (Kelsey, Vaish, & Grossmann, 2018; Milinski, 2016; SimanTov-Nachlieli & Moran, 2022).

Recent studies have confirmed that reputation management also manifests in children' s prosocial behavior. Prosocial behavior refers to positive social behavior directed toward other individuals or groups, with multiple forms including donation, cooperation, helping, and sympathy (Wispé, 1972). Research on the motives behind children' s prosocial behavior has found that initially, children' s prosocial motives are mostly non-self-directed intrinsic motivations, including

empathy and compliance with social and moral norms (Eisenberg et al., 2016; Wang Xin, Zhang Zhen, 2019). For example, after collaborating with others to complete a task, 3-year-old children typically share prizes equally with their peers even when not asked to do so (Warneken et al., 2011), and external rewards can weaken their prosocial behavior (Ulber et al., 2016). Overall, children' s initial prosocial behavior is not motivated by self-interest considerations. However, as their social cognitive abilities develop, children' s prosocial behavior becomes more selective and strategic (Shinohara et al., 2019). They begin to exhibit good behavior more often due to self-directed strategic motives, such as wanting to obtain or maintain a positive prosocial reputation (Hepach et al., 2023; Leimgruber et al., 2012). Consequently, in different contexts, they employ various reputation management strategies to appear more prosocial (e.g., being more generous when observers are present), thereby achieving reputation management (Engelmann et al., 2012, 2013; Qin et al., 2021; Zhao et al., 2019).

From the evolution of children' s prosocial motives, it is evident that strategic prosocial behavior for reputation management is not innate. How, then, does reputation management in children' s prosocial behavior manifest and develop as their social cognition advances? What are the psychological mechanisms underlying this strategic behavior? As core prosocial behaviors, sharing, helping, and cooperation are typical behaviors that emerge and develop rapidly in early childhood (Zhao Zhangliu, Kou Yu, 2006), playing important roles in children' s social development and receiving widespread attention across research fields. Moreover, researchers have primarily explored reputation management based on sharing, helping, and cooperation behaviors (Engelmann & Rapp, 2018; Silver & Shaw, 2018; Köster & Kärtner, 2019). Previous review studies have often treated prosocial behavior as a whole, discussing and summarizing the manifestations of reputation management in children' s prosocial behavior (Engelmann & Rapp, 2018; Heyman et al., 2021). Although empirical studies on reputation management in sharing, helping, and cooperation show generally consistent developmental trends, the role of reputation is not uniform across different behavioral contexts, and children' s performance varies. Exploring how children manage their reputation in sharing, helping, and cooperation contexts can reveal both commonalities and unique characteristics of reputation management across different types of prosocial behavior, leading to a deeper understanding of its essence. Therefore, this study examines children' s different prosocial behavioral manifestations and developmental trends driven by reputation management motives across various contexts, and analyzes the psychological and neural mechanisms underlying this strategic behavior. We hope that reviewing and summarizing existing research will help us better understand the emergence and development of children' s complex prosocial behaviors and their psychological mechanisms.

2 Children's Reputation Management in Prosocial Behavior

Reputation plays an important role as children implement strategic prosocial behavior. Based on the social reward properties of a good reputation and its potential benefits, children aim for reputation and engage in sharing or helping behaviors to obtain a good reputation. In cooperative contexts, to achieve cooperation with resource holders, children also use reputation as a strategy, employing prosocial behavior to build a positive reputation that increases the likelihood of reciprocal cooperation.

2.1.1 Sharing Behavior

Sharing behavior emerges in infancy. Seven-and-a-half-month-old infants can share after systematic training (Xu et al., 2016), 12-month-old infants begin to spontaneously share objects with others (Hay, 1979), and around 18 months, infants develop relatively stable sharing behavior (Dunfield et al., 2011). Due to its early emergence and typical nature, most research on children' s reputation management has been conducted based on sharing behavior. These studies typically use the classic dictator game paradigm, controlling reputation conditions to examine children' s reputation management performance. For example, before sharing tasks, children are informed about their own or their peers' existing reputations (e.g., "good child," "generous child") (Qin et al., 2021; Zhang et al., 2023; Zhang Zhen et al., 2025), whether their behavior will be publicly disseminated or evaluated (Cage et al., 2016; Rapp et al., 2019; Zhang et al., 2023), whether observers are present during sharing tasks (directly or indirectly) (Cage et al., 2016; Engelmann et al., 2012; Kelsey, Grossmann, & Vaish, 2018; Leimgruber et al., 2012; Okumura et al., 2023; Zhang et al., 2023; Li Hui et al., 2025), and the identity, needs, attitudes, traits, or behaviors of observers or recipients (e.g., whether observers or recipients are children' s peers, whether recipients have antisocial or prosocial reputations) (Blakey, 2025; Engelmann et al., 2013, 2018; Fast et al., 2022; Olivier et al., 2022; Shinohara et al., 2021). In these studies, a good reputation is the main incentive for children to share more. The diversification of reputation conditions allows research to approximate complex real-world environments while comprehensively revealing the development of children' s reputation management in sharing behavior.

Research has found that children as young as 3 years old can demonstrate reputation management tendencies in sharing behavior (Blakey, 2025; Kelsey, Grossmann, & Vaish, 2018; Zhang et al., 2023). In Zhang et al.' s (2023) study, when informed that they were "generous good children" and that their performance in sharing tasks would be communicated to others, 3-year-old children showed stronger sharing willingness, but only 4-year-olds shared more stickers. Once the cognitive load and additional demands of sharing tasks in reputation contexts were reduced, 3-year-old children exhibited reputation management behavior (Kelsey, Grossmann, & Vaish, 2018). In Li et al.' s (2025) study, even when observers were socially interactive robots, their presence prompted 3-year-old children to show more generous sharing behavior.

Most studies support that children begin to exhibit reputation-based strategic sharing behavior from at least age 5 (Engelmann & Rapp, 2018; Silver & Shaw, 2018). When reputation is at stake, 5-year-old children use simple strategies (e.g., being more generous) to achieve reputation management. For example, the presence of observers makes 5-year-old children more generous in sharing (Engelmann et al., 2012). Socially interactive robots also promote their sharing behavior (Okumura et al., 2023). Even without observers, when hearing positive evaluations of other children's sharing behavior, 5-year-old children behave more generously in sharing tasks (Qin et al., 2021). As they age, children's reputation management strategies become more flexible; they integrate others' beliefs and show more flexible sharing behavior in reputation contexts. For instance, in Shinohara et al.'s (2019) study, when observers were unaware of recipients' moral qualities, 6- to 8-year-old children showed no significant difference in sharing between recipients with prosocial versus antisocial moral qualities. However, when observers knew recipients' moral qualities, 6- to 8-year-old children shared fewer resources with antisocial recipients than with prosocial ones.

2.1.2 Helping Behavior

Helping behavior also emerges in early childhood. Twelve-month-old infants can provide information to others searching for objects by pointing (Liszkowski et al., 2008). Researchers generally agree that children begin to help others spontaneously at age two (Köster & Kärtner, 2019; Martin et al., 2020). Early in infancy, when helping others, children do not consider their own reputation. For example, 18-month-old infants provide the same level of help regardless of whether recipients are present (Hepach et al., 2017). Moreover, in studies examining emotional and physiological arousal in helping, 2-year-old children show similar positive emotions and sympathetic arousal when they help others themselves versus when they see others being helped by a third party (Hepach et al., 2023, 2012). For children around age 2, the intrinsic motivation behind their helping behavior is not to obtain a good reputation or rewards but simply the desire for others to receive help (Hepach et al., 2013).

However, as children' s socialization develops, their helping motives become less "pure." They begin to pay attention to their own reputation when helping others and want to achieve reputation management through helping behavior. For example, Katz et al. (2024) found that 4-year-old children use prosocial helping and subsequent communicative behavior to enhance their reputation and consider cost. In high-cost conditions, children more quickly inform the helped partner of their helping behavior and are more likely to protest incorrect praise (praising another person). Hepach et al. (2023) monitored emotions to study children' s prosocial motives and found that, when the outcome is the same—the recipient receives help—5-year-old children experience more positive emotions when they help personally than when they watch a third party help. Moreover, when bystanders are present, 5-year-old children show higher levels of positive emotion after helping others, whereas 2-year-old children show the

same emotional arousal regardless of who provides help. This demonstrates that 5-year-old children already implicitly consider their own reputation when helping others; when they see someone in need, they prefer to help personally to avoid missing opportunities to gain a good reputation. Behavioral experimental studies have also found that children help others strategically to maintain their reputation. In Siposova et al.' s (2021) study, 6-year-old children and experimenters either privately knew or commonly knew that an injured person needed help. Children could choose to take stickers or give up stickers to help the injured person. Results showed that under common knowledge conditions, children chose to forgo personal benefits (collecting stickers) to help others (helping the injured person sit down) faster and more frequently than under private knowledge conditions. They understood that in common knowledge situations, they could not shirk responsibility and had to provide help to maintain a prosocial image. These findings demonstrate that from age 4, children' s helping behavior has become strategic and has begun to serve as a tool for reputation management. In addition to concern for their own reputation, 8-year-old children also show concern for others' reputations when judging others' helping behavior; they more strongly support helpers providing help when the helper' s friends are present, demonstrating that 8-year-old children consider reputation when evaluating helping situations (Sierksma et al., 2014).

2.2.1 Cooperative Behavior

Cooperative behavior refers to individuals using reputation to make cooperative choices in social interactions and engaging in prosocial behavior to shape a positive reputation conducive to cooperation in cooperative contexts. Research shows that cooperators' interactions with others are selective, and this selection is largely based on their judgment of others' reputations (Tennie et al., 2010). In cooperative contexts, individuals make reputation judgments about others, confirm the potential value of cooperation partners, and choose those with good reputations. Correspondingly, individuals also realize that others judge their reputations and adjust their behavior accordingly to shape a more positive social image for future interactions (Tomasello et al., 2012). As an important psychological mechanism for human social cooperation, reputation management is a crucial means of maintaining cooperation and a strategic tool that children gradually acquire and use through interactive practice.

From age 5, children generally show concern for reputation, a key psychological mechanism for high-level human cooperation (Manrique et al., 2021). To be selected as future cooperation (reciprocity) partners, children need to adjust their behavior to influence others' reputation judgments. In Warneken et al.' s (2019) study, resource recipients possessed attractive toys, and 3- to 7-year-old children could choose to share more valuable or less valuable resources with them. When recipients would select a play partner from among the child and a competitor, 5- and 7-year-old children shared more of the more valuable resources. This suggests that to achieve future direct reciprocal cooperation, 5-year-old

children can construct a better reputation through behavioral adjustment to make others more likely to choose them as cooperation partners. In addition to direct reciprocal cooperation, to achieve indirect reciprocal cooperation, children also engage in more prosocial behavior for reputation management. In Engelmann et al.' s (2013) study, when children knew that a third-party observer would share resources after observing the sharing process, 5-year-old children shared more resources with recipients. Herrmann et al. (2019) also found that compared to being observed by a third party only, when children' s behavior would be observed and the observer might choose them as future cooperation partners, 8-year-old children shared more, indicating that children not only care about whether observers are present but also shape a good reputation through strategic generosity to achieve future cooperation. In summary, children can strategically adjust prosocial behavior based on reputation from at least age 5, thereby increasing the likelihood of being selected as cooperation partners.

From the overall developmental process of children' s reputation management in prosocial behavior, children begin to show concern for their own reputation from age 3 (Kelsey, Grossmann, & Vaish, 2018; Li Hui et al., 2025). As they age, children' s reputation management motivation in prosocial behavior gradually shifts from unconscious to conscious functioning (Engelmann & Rapp, 2018). From age 5, children generally realize the importance of reputation to themselves, show concern for their own reputation, and exhibit more prosocial behavior in helping or sharing tasks due to reputation management motives (Silver & Shaw, 2018). Although children' s reputation management in prosocial behavior shows universal common developmental features, its manifestations and mechanisms also differ according to the characteristics of different types of prosocial behavior. From the perspective of the emergence process of prosocial behavior, sharing and helping are more altruistic supportive behaviors, while cooperation is more interpersonal reciprocity (Zhao Huali et al., 2018). Sharing and helping behaviors are unidirectional social interactions in which the two parties are usually not resource-equivalent—one person possesses resources that another needs but lacks. In this process, children' s strategic prosocial behavior aims to construct a good reputation as the ultimate goal. The feedback based on a good reputation is often delayed, and sharing and helping behaviors do not necessarily bring good reputations. If reputation management strategies are used inappropriately, even more altruistic behavior may risk reputation damage. In contrast, cooperation is a bidirectional social interaction in which both cooperation partners are equal and have choice power. As one party, children are not only the initiators in choosing cooperation partners but also face the possibility of being chosen. In this context, children' s motivation for reputation management is not only to construct a good reputation but also to increase their likelihood of becoming cooperation partners through a good reputation. In cooperative contexts, reputation-based feedback is also more immediate—a good reputation (e.g., being generous) helps facilitate successful cooperation with ideal partners. In summary, manifestations of reputation management in prosocial behavior can be divided into two categories: strategic sharing and helping are prosocial

behaviors aimed at reputation as the goal, whereas in cooperative contexts, reputation transforms from a "terminal station" to a "midpoint station," becoming a means to achieve ideal cooperation.

3 Psychological Mechanisms of Reputation Management in Prosocial Behavior

Reputation management is an advanced social cognitive ability that requires individuals to first pay attention to and understand others' evaluations of themselves, then weigh the social value of behaviors, and finally decide whether to take action to manage their image. Children's reputation management in prosocial contexts is driven by a combination of individual cognition, social motivation, and neurophysiological foundations.

3.1 Individual Cognitive Perspective

Heyman et al. (2021) argue that children face two major cognitive challenges in reputation management: first, integrating different information to infer socially valuable words and actions, and second, acting according to social value based on these inferences to ultimately obtain positive social evaluation. In this process, children need to identify and integrate relevant information, infer others' mental states and social value orientations, and also coordinate reputation with other interests to choose and control their own behavior. This poses challenges to children's cognitive abilities. First, inferring others' mental states based on social information requires children to reach a certain level of theory of mind. Second, norm understanding is an important cognitive ability needed for children to infer social value orientations and make reputation judgments—only by understanding social norms can they adjust their behavior according to standards to obtain a good reputation. Third, when facing conflicts between immediate benefits and long-term returns from a good reputation, children need delayed gratification ability to obtain the latter's long-term benefits. Additionally, in the process of integrating and coordinating multiple pieces of information and putting them into action, working memory provides basic cognitive support for these psychological processes, improving the efficiency of the reputation management cognitive system (Manrique et al., 2021).

3.1.1 Theory of Mind Theory of mind refers to the ability to infer one's own or others' mental states and to explain and predict behavior based on these inferences (Flavell, 2004). According to the multiple motives theory hypothesis, theory of mind can help children weigh pros and cons among different motivations in various contexts, balancing self-interest and others' needs (Yu, Zhu, & Leslie, 2016; Chen Tong, Wu Zhen, 2017). Reputation management consists of two interrelated processes: first, identifying social value by inferring others' mental states to generalize social value orientations (Heyman et al., 2021), and second, adjusting behavior after becoming aware of social value and

others' reputation judgments, even sacrificing self-interest to obtain more positive evaluations (Zhang et al., 2023). In this process, children need to perceive, interpret, and predict others' beliefs (Hill & Pillow, 2006) and weigh different motivations. Therefore, theory of mind level affects their reputation management performance in prosocial behavior. Zhang et al. (2023) analyzed 4- to 5-year-old children' s theory of mind levels and the number of stickers they shared in different reputation contexts, finding that children' s theory of mind scores were not significantly correlated with the number of stickers shared in non-reputation contexts but were significantly correlated with sharing in reputation contexts. Moreover, in partner-choice reputation contexts, 4- to 5-year-old children showed more pronounced reputation management behavior. This indicates that theory of mind positively predicts children' s reputation management; children with more mature theory of mind can better understand reputation' s impact on themselves, more accurately infer others' beliefs, and thus better engage in behaviors that shape and maintain their good reputation. Additionally, the role of theory of mind in reputation management has been more extensively validated in comparative studies between children with autism and typically developing children (Cage et al., 2013, 2016; Gong Liyao, Wang Tao, 2022). Cage et al. (2016) found that under implicit reputation conditions of "observer presence," children with autism shared fewer coins when observed, whereas under explicit reputation conditions of "being told rankings would be seen by others," some low-ranking children with autism, like typical children, chose not to retain their ranking position. This indicates that deficits in implicit theory of mind lead to deficits in implicit reputation management in children with autism, who only show some reputation management ability when explicit information cues are provided (Cage et al., 2013). These findings verify the important role of theory of mind in the reputation management process.

3.1.2 Norm Understanding From birth, children live in social environments filled with norms. Social norms are behavioral rule standards collectively agreed upon and followed by social groups, conveying collective expectations for individual behavior (Schmidt et al., 2016). Driven by social norms, different behaviors have corresponding reputation consequences (Jordan, 2023). In previous research, children' s early-developed sensitivity to norms has often been regarded as a key factor in the development of reputation concern (Botto & Rochat, 2019). As cognitive abilities develop, children increasingly understand the obligations and rights that norms bring to individuals (Manrique et al., 2021). Social norms prompt people to allocate resources toward individuals with good reputations, and children' s reputation management also develops on the cognitive foundation of norm understanding (Jordan, 2023). In the reputation management process, norm understanding plays a connecting role. First, norm understanding provides more precise references for children to infer social value orientations. Often, people do not accurately convey their beliefs, and their external expressions may completely contradict their internal beliefs (Yoon et al., 2020). In such cases, individuals need to make more detailed reputation

inferences based on norm understanding. For example, although people usually bestow good reputations on altruists, the reputation benefits of altruistic behavior are constrained by social norms. Excessive altruistic behavior that deviates from norms can damage the actor' s reputation even if it brings more benefits to others (Kawamura & Kusumi, 2020). Additionally, studies have found that children can flexibly adjust resource allocation based on observers' knowledge beliefs about whether resource recipients are antisocial, indicating that they not only understand the core requirement of social norms to encourage prosocial behavior and inhibit antisocial behavior but can also effectively apply this norm in different social contexts (Jordan, 2023; Shinohara et al., 2019). Second, norm understanding provides directional guidance for children' s reputation management. Many studies have shown that children can spontaneously infer social norms from others' behaviors and consequences and use these as standards for reputation management behavior (Liu et al., 2022; Qin et al., 2021; Sai et al., 2020). In Liu et al.' s (2022) study, when children understood norms, they were more likely to confess cheating to maintain an honest reputation. Additionally, Engelmann et al. (2012) found that when observed, 5-year-old children' s stealing behavior decreased significantly, while helping behavior only showed a trend toward difference. Compared to helping behavior, which involves assessing social norms related to needs, the simple social norm of not stealing is easier for children to understand. This result validates the influence of norm understanding on children' s reputation management. In summary, children' s reputation management cannot be separated from norm understanding ability; individuals need to understand social norms and appropriately adjust their behavior within standard ranges to better achieve reputation management.

3.1.3 Delayed Gratification After confirming social value orientations, individuals need to obtain positive reputations through appropriate behavioral choices and effective execution. When facing conflicts between immediate benefits and long-term returns from a good reputation, maintaining reputation and its long-term benefits requires children to inhibit impulses to choose immediate benefits (which may negatively impact personal reputation) to achieve more important goals. Due to the social reward nature of a good reputation and its potential benefits, the reputation management process requires the involvement of delayed gratification, a component closely related to "hot" executive function. Research on children' s sharing behavior in reciprocal contexts has found that compared to non-reciprocators, 5-year-old children increase sharing with potential reciprocators, and their delayed gratification ability positively correlates with sharing tendency, indicating that delayed gratification ability may be a prerequisite for children to achieve reputation-based cooperation through generous sharing (Sebastian-Enesco & Warneken, 2015). Additionally, in delayed gratification tasks, 4-year-old children' s choices among different delayed rewards also reflect their consideration of size differences between immediate and delayed rewards (Lemmon & Moore, 2007), which shares similar internal logic with choosing long-term benefits over immediate ones in the reputation

investment process. Direct research on children' s delayed gratification and reputation management shows that when reputation conditions exist, 3- to 4-year-old children wait much longer to manage their reputation than in general delayed gratification tasks (Ma et al., 2020). Fu et al.' s (2016) study also confirms this: when 3- to 5-year-old children are asked not to cheat in reputation contexts, although 3- to 4-year-old children do not show consistent reputation management results (i.e., reduced cheating rates) like 5-year-old children, they still show longer delay in resisting temptation. This aligns with the development of delayed gratification ability in 3- to 5-year-old children. Research shows that children' s delayed gratification ability undergoes important changes between ages 3 and 5, shifting from smaller immediate rewards to larger delayed rewards in delayed reward choices, with significant improvements in delay duration and strategies (Lemmon & Moore, 2007; Yang Lizhu et al., 2005). Thus, delayed gratification plays an important role in implementing reputation management behavior.

3.1.4 Working Memory Working memory is crucial for individuals to perform complex tasks such as reasoning, understanding, and planning. It can activate long-term memory information and integrate new input information according to individual needs, serving as a workstation for temporarily storing and processing information (Baddeley, 2010; Diamond, 2013). When managing their reputation, individuals need to monitor their image in others' eyes from multiple perspectives and imagine future developments of events, a process in which working memory plays an important role (Manrique et al., 2021). First, in social cognitive development models, children internalize social environmental rules early on and acquire understanding of social norms (Paulus, 2014). Social norms exist in children' s long-term memory; when children engage in reputation management, social norms are activated by working memory, providing effective references for individuals' reputation inferences and behavioral choices (Manrique et al., 2021). Second, working memory is also closely related to individuals' delayed gratification ability. Lower working memory capacity is associated with higher delayed discounting (decreasing reward value due to delayed acquisition), causing people to perform poorly in delayed gratification tasks due to excessively devaluing rewards (Hinson et al., 2003). Yu and Kam et al. (2016) compared executive function characteristics of children who succeeded versus failed in delayed gratification tasks and found that children who successfully completed delayed gratification tasks had stronger working memory ability, proving the important role of working memory in delayed gratification. However, general cognitive working memory research has focused more on individuals' performance in basic cognitive information tasks (letters, numbers, and object locations) rather than social cognitive information (traits, beliefs, interpersonal relationships) (Meyer et al., 2012). Moreover, processing social and non-social cognitive information relies on different neural network systems (Meyer & Lieberman, 2012). Therefore, whether general working memory contributes to individuals' social cognitive performance remains controversial

(Thornton & Conway, 2013).

To better explore working memory for social cognitive information, researchers have proposed social working memory (SWM), defined as the ability to preserve and process information about people' s beliefs, traits, and mental states (Meyer et al., 2012). Studies have found that preschool children's theory of mind is positively predicted by social working memory rather than general working memory; children with stronger social working memory ability can understand social interactions more effectively and efficiently, making it easier for them to participate in social interactions, which may further promote their theory of mind development (He et al., 2019). Another study on adult populations further confirmed that social working memory training can significantly improve perspective-taking accuracy, whereas general working memory training has no such effect (Meyer & Lieberman, 2016). These studies demonstrate the unique role of social working memory in understanding and participating in social interactions, which is crucial for reputation management as an advanced social cognitive ability. It not only helps individuals understand social evaluation situations more efficiently but may also promote rapid identification of behaviors that can gain positive reputations in groups, leading to more proactive reputation management.

In summary, from the individual cognitive perspective, theory of mind, norm understanding, and delayed gratification respectively act on the two processes constituting reputation management: inferring value orientations and taking effective action (Heyman et al., 2021) (see Figure 1 [Figure 1: see original paper]). Inferring value orientations involves reasoning and predicting others' mental states and social value concepts, which requires individual theory of mind and norm understanding abilities. Taking effective action involves making reputation judgments based on value orientations and selecting and implementing effective behaviors to maintain or optimize one' s reputation, which requires not only norm understanding to guide behavioral choices but also delayed gratification ability to control one' s behavior. Working memory is the foundation of the above cognitive processes, providing a platform and support for them. In the cognitive mechanism of reputation management based on the individual perspective, theory of mind provides social reasoning support, norm understanding establishes social value benchmarks, delayed gratification enables behavioral regulation, and working memory provides the basic cognitive platform for these operations. These four core elements together constitute a complete process from cognition to behavior.

3.2 Social Motivation Perspective

Figure 1 Psychological Mechanism of Reputation Management from Individual Cognitive Perspective

Although cognitive development is the foundation of reputation management, without social motivation driving them, children would not actively pay atten-

tion to their own reputation (Chevallier et al., 2012; Engelmann & Rapp, 2018). The emergence and development of reputation management begin with children' s cognitive understanding of reputation value, leading to reputation concern, and finally externalizing into reputation management behavior. In this process, at least three social motivations function as internal driving factors: indirect reciprocity, social interaction, and social reward.

3.2.1 Indirect Reciprocity Reciprocity is future-oriented behavioral investment that depends on the other party' s behavior, divided into direct reciprocity (i.e., "A helps B, B helps A") and indirect reciprocity (i.e., "A helps B, C helps A") (Cage et al., 2016; Tennie et al., 2010). Understanding the reciprocity principle and expecting others to reciprocate is the foundation for the emergence and development of reputation management (Cage et al., 2016; Gong Liyao, Wang Tao, 2022). Direct reciprocity is limited to resource exchange between two parties and has relatively limited effect in promoting individuals' broad reputation understanding. In contrast, indirect reciprocity plays a more critical role in forming reputation understanding. Although investing in reputation initially brings losses to individuals, having a good reputation enables them to obtain more long-term benefits from others in indirect reciprocity (Milinski et al., 2002; Manrique et al., 2021). Because people are more likely to help those with positive reputations and more willing to cooperate with those who have good reputations (Balliet et al., 2020). Especially for "strong reciprocators," they implement rewards or punishments based on third parties' reputations (i.e., whether they actively cooperate) (Fehr & Fischbacher, 2003). As shown in children' s performance in sharing and cooperation tasks, when third-party observers (C) are present as indirect reciprocators, children (A) share more resources with recipients (B) (Engelmann et al., 2013). Similarly, as indirect reciprocity implementers, children (C) are also more willing to allocate more resources to individuals with good reputations (A) and more inclined to choose individuals with positive reputations for cooperation (Warneken, 2018). This mechanism transcends one-on-one interactions, prompting individuals to pay attention to the reputation impact of their behavior in broader social networks (Milinski, 2016). In summary, compared to direct reciprocity where individuals only need to infer interaction partners' reactions, indirect reciprocity requires individuals to infer third-party social evaluations and learn to use reputation to seek long-term benefits in large-scale social environments, promoting children' s reputation understanding and their concern for and maintenance of their own reputation.

3.2.2 Social Interaction The focus of children's interaction motivation shifts across age stages, and these shifts show some synergy with the emergence and development of their reputation management. In Romano et al.' s (2021) reputation system operation framework, changes in socio-ecological conditions affect reputation system operation, including social environments. The stronger the fluidity of the social environment individuals are in, the more they depend on

reputation. In infancy, children interact most with relatives, the social environment has low fluidity, they lack peer interaction experience, and the core of social motivation is meeting basic physiological and safety needs. Although infants already show a preference for interacting with cooperation partners with good reputations, they have not yet realized that they are similarly judged by others (Engelmann et al., 2012). Combined with limited cognitive abilities in infancy, they neither understand reputation nor have social reputation needs.

As children' s social cognitive abilities develop and social environment fluidity increases, the meaning and importance of reputation in their lives become apparent. From age two, children' s peer interactions begin to transition from focusing on activities to focusing on social relationships themselves (Parker et al., 2006). In the preschool period, children focus more and more attention on peers, and social motivation begins to shift toward establishing peer relationships (Parker et al., 2006). They start showing interest in social interactions and enter choice-based social relationships, gradually developing the social motivation to be selected by peers. In this process, reputation is an important factor helping individuals make partner choices (Giardini et al., 2021; Milinski, 2016; Számadó et al., 2021). According to cooperation theory, individuals tend to choose partners with good reputations (Fu et al., 2008). Group selection theory also shows that groups with more prosocial individuals have competitive advantages (Xiao Fengqiu et al., 2014). Therefore, to be selected as cooperation partners, individuals must pay attention to their own reputation. This makes partner choice a key driving factor for the emergence of children' s reputation concern (Engelmann & Rapp, 2018). However, for young children with limited cognitive abilities, although they show concern for their own reputation when facing partner choices, they may not necessarily be able to complete actual reputation management behavior (Zhang et al., 2023). In summary, partner choice is significant as the prerequisite for the emergence of reputation concern in young children.

From middle to late childhood, children's social motivation shifts to seeking peer approval and group acceptance, building friendship networks, stabilizing group identity, and seeking equality and belonging (Over, 2016; Parker et al., 2006). In Parker and Gottman's friendship formation model, the core goal of friendship relationships for 3- to 7-year-old children is interacting with peers, whereas for 8- to 12-year-old children, it shifts to seeking peer approval (cited in Banerjee, 2000). This shift in peer interaction patterns fosters children' s sensitivity to their own social evaluation. Just as understanding of gossip changes, compared to younger children who care about the accuracy of gossip content, older children are more concerned about how to use gossip to manipulate their own and others' reputations, thereby influencing their own or others' group social status (Parker et al., 2006). Similarly, in Cage et al.' s (2016) study, children with higher friendship motivation scores are also more sensitive to reputation and more likely to protect their reputation. This shows that peer acceptance prompts children to pay more active attention to and strategically manage their own reputation. As children's social abilities develop and social relationships become

more complex, when their social motivation shifts from partner choice to social approval, their motivation to gain approval directly drives children' s reputation management behavior, not merely staying at the level of reputation concern. At this point, reputation management becomes an external manifestation of the dual development of children' s motivation and cognition.

In children' s social interactions, besides equal friendship relationships with peer groups, there are also authority relationships with adults (An Qiuling, Chen Guopeng, 2003). Children' s social interactions with authority figures (e.g., parents, teachers) are also important factors prompting them to engage in reputation management. When making cost-benefit estimates, children are sensitive to information related to social identity (Ma et al., 2020). For children, authority figures have more power in defining and explaining social norms and possess more social resources. To gain their approval and support, children often engage in behaviors that meet authority figures' expectations. For example, in Ma et al.' s (2020) study, children waited longer in delay of gratification tasks under teacher-informed conditions than under peer-informed conditions. Additionally, children' s self-presentation choices are also affected by audience identity. Compared to statements about their athletic skills in front of peers, children are more inclined to make statements about their learning skills in front of adults (Banerjee, 2002). These research results reflect children' s different reputation considerations in authority relationships compared to peer relationships. Although group characteristics cause changes in children' s reputation management methods, overall, compared to partner choice motivation, when children begin to seek more social approval, their motivation to gain approval directly drives reputation management behavior, not merely staying at the level of reputation concern. At this point, reputation management is an external manifestation of the dual development of children' s motivation and cognition.

3.2.3 Social Reward The development of reward preference begins at birth, maturing with the development of the brain' s reward system and having an important impact on individual behavioral development (Wang et al., 2017). For individuals, when they understand the social meaning behind reputation, a positive reputation acquires social reward properties (Hill & Pillow, 2006; Izuma, 2012; Phan et al., 2010). In classic tasks studying individual reward processing, reward processing includes two stages: reward anticipation and reward consumption (Rademacher et al., 2010), corresponding to two psychological components of reward processing: wanting and liking (Wang et al., 2022). Wanting is a motivational form triggered by reward cues or imagination about rewards, while liking is the actual pleasure experience brought by reward consumption, which triggers individuals' desire for rewards (Grimm et al., 2021). In social environments, reputation is a reward cue—a good reputation brings individuals social acceptance, respect, recognition, more cooperation, and reciprocity (Milinski, 2016; Tennie et al., 2010), while a positive reputation itself can also serve as a social reward. The pleasure individuals experience when consuming a positive reputation stimulates their desire to further obtain a positive reputation. In Qin

et al.' s (2021) study, after hearing adults' positive evaluations of other children' s sharing behavior, 5-year-old children shared more. This proves that under the drive of social rewards such as positive reputation, children pay attention to the reputation benefits of behavior and adjust their behavior accordingly. For children who have developed reputation understanding but have not yet developed reputation management behavior, social rewards mainly cause reputation concern (Zhang et al., 2023). When social reward processing is defective, individuals have insufficient motivation regarding social reward anticipation, find it difficult to experience pleasure from reward consumption, and thus lack motivation to manage their own reputation (Wang et al., 2022; Gong Liyao, Wang Tao, 2022). In summary, reputation management can also be described as a process in which individuals generate social reward anticipation regarding positive reputation and take strategic action for this purpose.

In summary, social motivation provides internal drive for children' s reputation understanding and reputation management in prosocial behavior (see Figure 2 [Figure 2: see original paper]). In the emergence and development of reputation management, indirect reciprocity promotes children' s reputation understanding, partner choice triggers children' s concern for their own reputation, and social approval and social reward provide internal driving force for children' s reputation management behavior, prompting them to actively maintain their own reputation.

Figure 2 Mechanism of Reputation Management Emergence and Development from Social Motivation Perspective

3.3 Neurophysiological Perspective

The core processes of reputation management can be summarized as follows: first, forming meta-representations of reputation—thinking about reputation—which requires individuals to reflect on others' views of themselves or their own behavior; second, conducting cost-benefit analysis—choosing behaviors—which requires individuals to conduct expected reward and punishment analysis of reputation and choose the most valuable behavior (Izuma, 2012; Gong Liyao, Wang Tao, 2022). fMRI studies on reputation management have found that the medial prefrontal cortex (mPFC) and striatum are the main brain regions involved in reputation management; when individuals need to manage their reputation, activation in the mPFC and striatum increases (Izuma et al., 2010). According to previous research, the mPFC plays a key role in forming abstract or metacognitive representations, supporting individuals in reflecting on others' views of themselves (Amodio & Frith, 2006). As a brain region related to reward and punishment processing, the striatum shows increased activity for both concrete material rewards and abstract social rewards (e.g., good reputation) (Izuma et al., 2008), and negative reputation more strongly activates the caudate nucleus (Wardle et al., 2013). Based on the mPFC' s metacognitive representation function and the striatum's value evaluation function, reputation-related information is first represented in the mPFC and then transmitted to the

striatum for further value evaluation, thereby supporting individuals in making appropriate behaviors in specific social contexts (Izuma et al., 2010). In addition to these brain regions, when individuals conduct reputation analysis, they may also recruit brain regions related to metacognitive representations required for theory of mind, such as the temporo-parietal junction (TPJ) and superior temporal sulcus (STS) (Saxe & Kanwisher, 2003). Similarly, social reward and punishment or value evaluation related to reputation also recruits brain regions beyond the striatum, such as the anterior cingulate cortex (ACC), orbitofrontal cortex (OFC), and amygdala, which are also jointly sensitive to gains and losses, participate in weighing costs and returns, rewards and punishments, and are important brain regions in reward processing (Lin et al., 2012; Lü Fangyan et al., 2021).

Based on the above perspectives, we propose a psychological mechanism model of reputation management in prosocial behavior (see Figure 3 [Figure 3: see original paper]). In this model, social motivation serves as the driving layer (i.e., "why to do it")—children become aware of reputation value through indirect reciprocity and develop concern for and management of their own reputation through social interaction and social reward. Individual cognition serves as the ability layer (i.e., "what can be done")—the development of abilities such as theory of mind, norm understanding, and delayed gratification enables children to infer others' value orientations, assess social value, and regulate their own behavior. In the reputation management process, close collaboration between brain regions such as the medial prefrontal cortex and striatum provides physiological support. After taking action, feedback from social interactions further affects motivation and cognition, adjusting cognitive reasoning and strategy selection and regulating social motivation, forming a continuously developing interactive mechanism. In this cycle, children gradually develop mature and stable reputation management patterns.

Figure 3 Psychological Mechanism Model of Reputation Management in Prosocial Behavior

4.1 Expand Research on the Emergence and Development of Reputation Management in Prosocial Behavior

First, future research can explore the early emergence and development of reputation management. Initial interview studies on reputation management showed that 8-year-old children began to express concerns about reputation, whereas 5-year-old children did not (Aloise-Young, 1993), leading researchers to believe this was due to insufficient reputation management motivation in younger children (Banerjee, 2002). With improved experimental designs, studies found that 5-year-old children possess reputation management motivation, but previous experimental tasks had high demands for self-awareness and language skills, preventing them from effectively engaging in reputation management (Kelsey, Grossmann, & Vaish, 2018). Kelsey and Grossmann et al. (2018) further reduced experimental tasks' cognitive load and extraneous ability requirements

and found that reputation management behavior already emerges in 3-year-old children. Recent studies have provided more evidence of reputation management in 3-year-old children (Ma et al., 2023; Li Hui et al., 2025). However, most studies still hold contrary arguments that children around age 3 possess reputation management ability (Engelmann & Rapp, 2018; Warneken et al., 2019). In Ma et al.' s (2020) study, 3-year-old children did not make efforts for their reputation risks; Zhang et al. (2023) also found that children did not show reputation management behavior until age 4. Based on the controversies in the above research and the "younger age" trend in recent reputation management studies, future research can develop more suitable reputation management tasks for younger children to more deeply explore the early emergence and development of reputation management.

Second, future research can expand developmental models of children' s reputation management in different prosocial behaviors to construct more explanatory mechanism frameworks. Currently, research on the emergence and development of reputation management in the prosocial domain mostly focuses on sharing, cooperation, and helping behaviors. However, prosocial behavior is a multidimensional structure that includes broader interpersonal behaviors (Yu, Zhu, & Leslie, 2016). Different forms of prosocial behavior may have their own developmental patterns and unique motivational and social-cognitive predictors (Brownell, 2013). This study approaches from three behaviors—sharing, helping, and cooperation—and divides children' s reputation management in prosocial behavior into two categories: reputation as goal and reputation as strategy, using reputation' s role as a reference. Future research can also explore reputation management manifestations in other children' s prosocial behaviors (e.g., prosocial lying, prosocial risk-taking) (Armstrong-Carter & Telzer, 2024; Ahn et al., 2020), integrate behavioral emergence mechanisms, and categorize them based on more essential dimensions. While enriching research on children' s prosocial behavior and reputation management, this can construct more explanatory frameworks from more fundamental perspectives. Additionally, reputation includes positive and negative dimensions. Reputation management includes both creating and maintaining positive reputation and improving negative reputation. A study of Scottish adults found that when told that Scottish people were seen as "stingy" by non-Scottish people, they were more generous toward outgroup members to maintain group reputation (Hopkins et al., 2007). However, current research on children' s reputation management mostly focuses on exploring the impact of positive reputation on children' s prosocial or rule-breaking behavior. Perhaps due to ethical reasons, research exploring the impact of negative reputation on children' s behavior is very rare, but negative reputation remains an indispensable part of the social environment. Therefore, future research can explore the manifestations and mechanisms of reputation management based on negative reputation in children' s prosocial behavior under the premise of balancing ethics.

Third, future research can investigate children' s reputation management in prosocial behavior in group contexts and multicultural backgrounds. First, at-

tention can be paid to reputation management in children' s prosocial behavior in group contexts. Previous research mostly treats children as independent individuals, exploring the emergence, development, and influencing factors of reputation management in children' s prosocial behavior. However, with social development, children' s prosocial behavior is also closely related to group factors (e.g., group identity, status, norms) (Jiang Danying et al., 2022). Reputation is a public evaluation of individuals based on groups, so it is necessary to conduct research on children' s reputation management in prosocial behavior in group contexts. Second, attention needs to be paid to the impact of different cultural differences on children' s reputation management in prosocial behavior. Reputation is a product of social collective construction, and different socio-cultural environments' emphasis on and valuation of collectives also affect children' s reputation management behavior. Additionally, children from different cultural backgrounds differ in sensitivity to reputation cues. For example, Chinese people value interpersonal relationships, advocate cultures of face, and focus on others' evaluations of themselves (Leung & Cohen, 2011; Jin Shenghua et al., 2009), and Chinese traditional education often holds value concepts such as "strict fathers produce filial sons" and "strict teachers produce outstanding students." In contrast, American society focuses more on individual value, pursues cultures of dignity, and believes that self-worth is not affected by others (Gunsoy et al., 2020; Leung & Cohen, 2011). Compared to the United States, Chinese families and schools provide relatively less positive praise to children and tend to give more negative feedback on failures (Wang et al., 2019; Ng et al., 2007). These cultural differences may shape children' s different cognitive responses to reputation contexts. Empirical research shows that compared to American children, Chinese and Japanese children have higher sensitivity than their American peers when facing reputation-related contexts (Fu et al., 2011; Heyman et al., 2010).

Fourth, future research can further explore direct or indirect influencing factors of children' s reputation management behavior. Although existing theories have constructed logical chains with working memory as the cognitive foundation of reputation management, this field still lacks direct evidence revealing the causal relationship between the two. Existing research has proven that working memory (especially social working memory) is a key cognitive resource for children' s advanced social abilities (e.g., theory of mind, complex social interactions) (He et al., 2019; McQuade et al., 2013; Meyer & Lieberman, 2012; Shimizu, 2023). Therefore, future research can systematically examine the dynamic influence mechanisms of working memory and other related cognitive factors on children' s reputation management. In addition to external factors and cognitive abilities, individual psychological traits (e.g., self-efficacy, self-esteem levels, and personality tendencies) may also affect reputation management by regulating the expression process of "cognition-behavior" (Erkmen & Esen, 2019; Hertz et al., 2020; Collodi et al., 2018). In Collodi et al.' s (2108) study, individuals with different personality traits showed different sensitivity to reputation; individuals high in conscientiousness, high in social dominance orientation, low in

openness, and low in anxiety were more easily influenced by reputation. Hertz et al. (2020) found that when more confident in their own abilities, people are more likely to pay to enhance social influence. Additionally, research has found that compared to autism spectrum traits, social anxiety has a more significant impact on individuals' reputation management decisions (Dubey et al., 2024). These evidences indicate that individual self-efficacy, social anxiety, personality traits, etc., may be key psychological traits affecting reputation management. Therefore, future research should not only focus on cognitive factors but also further explore how differences in children' s psychological traits regulate their reputation management behavior, revealing the important role of non-cognitive factors in the mechanism of reputation management.

4.2 Focus on Exploring the Neural Mechanisms of Reputation Management in Children' s Prosocial Behavior

First, the neural mechanisms of reputation management remain a direction for future in-depth exploration. In addition to medial prefrontal cortex and striatum functions, perceiving and managing reputation also requires recruiting brain regions related to social perception and self-control. Among them, perceiving reputation-related social information requires recruiting brain regions such as the amygdala, temporal visual cortex, and anterior insula (AI). Research shows that the amygdala plays an important role in processing others' eyes and gaze, judging facial trustworthiness, and processing emotional and socially relevant information (Kennedy & Adolphs, 2010; Santos et al., 2016). The temporal visual cortex, especially the fusiform face area (FFA), participates in facial and identity recognition (Vuilleumier, 2007). The anterior insula also participates in individuals' conscious awareness of meaningful sensory information in social interactions by regulating dynamic transitions between brain networks (Huang et al., 2021). Because reputation management requires controlling immediate benefit acquisition behaviors that are detrimental to reputation, brain regions related to executive control also need to be recruited, such as the dorsolateral prefrontal cortex (dlPFC) and dorsal anterior cingulate cortices (dACC) more related to cool executive functions, and the medial-orbital prefrontal cortex (mOFC), ventral anterior cingulate cortex (vACC), and posterior cingulate cortex (PCC) closely related to hot executive functions (Salehinejad et al., 2021). Additionally, throughout childhood and adolescence, enhanced connections between the prefrontal cortex (PFC) and parietal lobes (PL) are also the neural basis for developmental shifts in executive functions (Best & Miller, 2010). Reputation management involves complex psychological processes such as cognition, emotion, and motivation, with multifaceted brain region activation, and specific brain activities also vary due to individual differences and task types. Although the above brain regions are all associated with cognitive processing processes that achieve reputation management, whether these brain regions truly play a role in the reputation management process remains to be determined.

Second, the scope of research on the neurophysiological mechanisms of reputa-

tion management can be expanded to younger child populations to explore neural mechanisms in early cognitive development. Currently, physiological mechanism research in this field mostly focuses on adults. Although researchers have used sensor imaging to examine posture changes in children during reputation-based helping (Hepach et al., 2023), no research has directly revealed the neural mechanisms of children' s reputation management. Brain development in childhood is closely related to social cognitive development. For example, in peer observation situations, both children' s and adults' mentalizing, attention, and reward-related brain regions show task-irrelevant changes activated by being observed, but compared to adults, children lack activation in the right temporoparietal junction (rTPJ), possibly because the rTPJ is not yet mature in late childhood (Tricoche et al., 2022). In summary, future research can use neuroimaging techniques such as fMRI and EEG to explore the neural mechanisms of children' s reputation management, revealing developmental trajectories of relevant brain regions and neural pathways by comparing brain activation patterns across different age groups. Considering ethical and technical issues limiting brain research in children, future research can also use physiological research techniques such as functional near-infrared spectroscopy and eye-tracking to expand research on the neurophysiological mechanisms of reputation management in children' s prosocial behavior.

4.3 Strengthen Applied Practice Research on Children' s Reputation Management

Reputation plays an important role in children' s social development, helping them construct values about society and others and behave accordingly (Heyman et al., 2021). In this process, evaluations from teachers, parents, and peers profoundly influence the formation and change of children's reputation and drive children to produce corresponding reputation management behavior. Research shows that having a good reputation promotes children' s reputation maintenance, making them more inclined to engage in prosocial behavior (Zhang et al., 2023). However, a good reputation is also a "double-edged sword." For example, a "smart" reputation actually increases children' s cheating behavior (Zhao et al., 2017, 2018). Specific praise from authority figures about ability or effort also affects the shaping of children' s achievement concepts (Zhao et al., 2022). Additionally, school-age children' s reputation concern is closely related to their establishment and achievement process of achievement goals (Good & Shaw, 2021). Therefore, future research can incorporate children' s reputation management into the practical systems of school education, family education, and social education, fully leveraging the lever effect of reputation to stimulate children' s learning motivation, thereby improving the "school-family-society" collaborative education.

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