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EMPIRICAL ARTICLE

CHILD DEVELOPMENT

Being versus appearing smart: Children's developing intuitions about how reputational motives guide behavior

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Abstract

Children engage in reputation management to appear favorably to others. The present studies explore when children use reputational motives to predict others' behavior. Four- to 9-year-old children (N = 576; 53% female; approximately 60% White) heard stories about two kids: one who cares about *being* competent, and one who cares about *appearing* competent. Across five studies, with age, children predicted the reputationally motivated child would be more likely to lie to cover up failure (OR = 1.97) but less likely to seek help in public (vs. private; OR = 0.53) or downplay success (OR = 0.66). With age, children also liked this character less (OR = 0.56). Implications of these findings for children's reputation management and achievement motivation are discussed.

For human beings, reputation is paramount: We care a lot about how we appear to those around us and sometimes engage in reputation-management strategies to increase the likelihood that others will think we have socially desirable traits, such as generosity or competence (Leary & Kowalski, 1990). At the same time, we recognize that other people may also have reputational concerns (i.e., a desire to influence others' perceptions and evaluations of oneself; Banerjee, 2002b), and we form impressions about others based on whether or not they seem to be motivated by such concerns. Indeed, adults can use information about others' reputational motives to make useful predictions about how that agent is likely to behave across different situations and contexts (e.g., Baumeister & Jones, 1978; Schlenker & Leary, 1982; Steinmetz, 2018)—for example, whether they might brag about their successes and lie about their failures.

Despite the fact that reasoning about others' reputational motives is critical for making predictions about how social agents behave, little research has examined the developmental trajectory of this capacity. The present studies investigate whether 4- to 9-year-old children expect different kinds of behavior from individuals who actually want to have certain traits (herein referred to as "intrinsic" concerns or motives) as compared to those who want to merely *appear* to have certain traits (herein referred to as "reputational" concerns or motives). Given that reputational concerns are ubiquitous in everyday life and likely play a large role in shaping children's behavior in social settings like the classroom (Good & Shaw, 2021), this research provides crucial insight into children's developing ability to *recognize* how these concerns might influence others' behavior. Prior to outlining the details of these studies, we first review relevant literature on children's reputational concerns (and the behaviors that result from such concerns) as well as their third-party expectations regarding others' reputation management.

Caring about one's reputation is common in people's daily lives (Baumeister & Jones, 1978; Schlenker & Leary, 1982; Silver et al., 2021) and some of these concerns with reputation appear early in development. Indeed, children as young as 5 years old modify their behavior in ways that help them form better impressions with others (e.g., Aloise-Young, 1993; for reviews, see Banerjee et al., 2020; Botto & Rochat, 2018; Good & Shaw, 2021; Zhao et al., 2017). For example, 5-year-olds are more generous when they know that others are watching or

Abbreviation: GEE generalized estimating equation

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will be aware of their actions (Engelmann et al., 2013; Leimgruber et al., 2012; Rapp et al., 2019; Yazdi et al., 2020). While such results are certainly consistent with children's being concerned with their reputation, the fact that children modify their behavior in the presence of others (particularly adults) need not be driven by reputational concerns per se—for example, a child might be less selfish when others are watching to avoid being punished or to attain a reward. However, other work suggests children's motives are more sophisticated. Preschoolers cheat less in a guessing game (thus forgoing the rewards they would have gotten had they won) when told they have a reputation for being a "good kid" (Fu et al., 2016). They also manage others' impressions of their competence: Those who win a game in private choose to disclose their outcome to someone who previously saw them lose rather than someone who previously saw them win (Asaba & Gweon, 2019).

These results suggest that even young children may engage in self-presentational behaviors that are aligned with protecting and improving their reputation. This form of reputational cognition has been referred to as "implicit" reputation management (Engelmann & Rapp, 2018) because it involves tracking the impressions that one is creating with others but does not necessarily involve explicit reasoning about reputation or *other people's* self-presentational motives. In addition to being able to manage one's own reputation, another important aspect of reputational cognition is being able to recognize when and how *others* might strategically manage their reputations. Existing literature suggests that this understanding might not fully develop until children are around 8 or 9 years of age, well after children begin managing their own reputations (for review, see Silver & Shaw, 2018) This form of reputational cognition has been referred to as "explicit" reputation management (Engelmann & Rapp, 2018) because strategically managing one's reputation with others, and reasoning about the self-presentational concerns and motives of others, may require more explicit reasoning about reputation. Similar developmental shifts have also been identified in other related areas, such as children's inferences about testimony (e.g., Mills & Keil, 2005) as well as their false belief understanding (e.g., Wiesmann et al., 2017).

In particular, younger children appear to have difficulty thinking about how others might deceptively manage their own reputations. For example, 8- and 9-year-olds infer that someone who chooses to give a gift publicly rather than privately has reputational motives, whereas 6- and 7-year-olds do not make this inference (Heyman et al., 2014). Note these difficulties do not stem from the fact that 6- to 7-year-olds cannot infer others' motives in general—they readily infer prosocial motives (Banerjee & Yuill, 1999a) and even recognize when someone's behavior reflects a desire to deceive others about the self (e.g., saying one is older than they really are to gain admission to a carnival ride; Banerjee, 2002b). However, it is not until age 8 that children seem to spontaneously infer reputational motives for behaviors aimed at shaping others' social evaluations (Banerjee, 2002b; Banerjee & Yuill, 1999a). By this age, children also use cues about an agent's audience to make inferences about whether that agent has reputational motives; for example, they attribute reputational motives to an agent's self-promotional behavior more often when that agent's audience is comprised of peers rather than adults (Watling & Banerjee, 2007a). Moreover, by age 9, but not earlier, children also understand that others can and should strategically modify the information that they convey about themselves depending on the audience they are trying to impress. For instance, they think that other children should emphasize athletic skills when talking to peers and academic skills when talking to adults (Banerjee, 2002a). Taken together, these findings suggest interesting developments in children's ability to infer reputational motives from behavior between the ages of 6 and 9 (Bennett & Yeeles, 1990).

While these previous studies demonstrate that children can identify appropriate self-presentational strategies and infer others' reputational motives based on their behavior, they do not directly test whether children expect different kinds of behaviors from agents with intrinsic versus reputational motives. For adults, identifying and tracking reputational motives affords predictive power: It allows us to form expectations for how others might behave in different situations and across varied contexts. To illustrate, imagine two students: one student is intrinsically motivated and genuinely wants to be smart; the other is reputationally motivated and thus only wants to appear smart to others. You can probably think of ways that these two students might behave differently—the latter might be more likely than the former to brag about academic success and lie about failure, but less likely to seek help when others are watching.

Here, we explore how 4- to 9-year-old children make predictions about two children like the students described above: one who wants to "be" competent (i.e., is intrinsically motivated) and one who wants to "appear" competent (i.e., is reputationally motivated). We specifically examined whether children expect others who want to appear competent to behave strategically in order to manage others' impressions of their competence. We note that the intrinsic and reputational motivations we explore in our studies roughly map on to the constructs of "learning goals" versus "performance goals," respectively, which have been explored with respect to their motivational consequences in the achievement literature (e.g., Dweck & Leggett, 1988). Crucially, however, this work has only addressed how people's achievement goals influence their own behavior; it has not addressed whether children expect others who hold these different achievement goals to behave differently. To our knowledge, our studies are the first to investigate this question, and they join a more recent push to consider achievement

goals through a reputational lens (e.g., Good & Shaw, 2021). We return to this contribution of our work in the General Discussion.

In five studies, children were read vignettes involving two characters: one with reputational motives who "really cares about what others think," and another with intrinsic motives, who "doesn't really care about what others think." Children were also told about these characters' specific reputational or intrinsic concerns. For example, in Studies 1–4, the vignettes took place in a school context, and children were told that the character with reputational motives "wants everyone to think she gets the best grades in the class and that she's really smart" and that the character with intrinsic motives "wants to learn a lot and do her best job on every assignment." After hearing about these two characters, children were asked to predict their behaviors. In Studies 1 and 2, we explored children's expectations for which character would be more likely to lie and say they did "great" after doing poorly on a test (Study 1) or tell a prosocial lie (i.e., "white lie") by downplaying their success after succeeding on a test (Study 2). In Studies 3 and 4, we explored who children thought would seek help publicly (Studies 3 and 4) and privately (Study 4) following poor performance. In Study 5, we explored children's social evaluations of these two characters and whether children might make similar kinds of inferences about their behavior in a non-school context (i.e., the playground).

Note that we opted to maximally contrast the two characters' motivations: the reputationally motivated character was described as having a broad concern for what others think about them (and also a specific concern about being seen as competent), whereas the intrinsically motivated character was described as not being concerned about what others think of them. We intentionally chose this design in order to create a very clear distinction between these two motivations. It is worth noting that the two-part nature of this manipulation did not allow us to examine whether children's inferences were domain specific (since one character was always described as being broadly reputationally motivated). However, given that little prior work has explored children's inferences about those with reputational or intrinsic motives, we chose to present children with a maximal contrast as an initial step toward understanding whether children might make any inferences about how these contrasting motivations might influence others' behavior. Moreover, by distinguishing between the reputationally and intrinsically motivated characters as clearly as possible, we were also able to explore whether even younger children might be able to reason explicitly about others' reputation management behavior.

We specifically explored these inferences about reputationally and intrinsically motivated individuals with children ages 4–9 years old. Recruiting and testing children across this broad age range allowed us to get a sense of the developmental trajectory of children's understanding of reputation and to identify precisely when children begin to use information about others' reputational motives to predict their behavior.

At what age might we expect for children to make such predictions? On one hand, children as young as 3 seem to care about appearing competent to others and modify their behavior accordingly (e.g., Asaba & Gweon, 2019; Zhao et al., 2017, 2018), which suggests they have at least an implicit understanding of how one might try to seem smart. Moreover, as we note above, we made the task of inferring reputational motives very easy in our tasks by explicitly emphasizing that one individual was broadly reputationally motivated (while the other was not). Directly providing this information about the characters' motives should increase the likelihood that even the youngest children in our sample would be able to make adult-like predictions on our tasks. On the other hand, we might expect younger children to struggle given the literature reviewed above, which demonstrates that children start managing their own reputations around age 3–5 but do not seem to reason explicitly about *others*' reputation management until age 8 or 9 (e.g., Banerjee, 2002a; Heyman et al., 2014). Given the latter findings, we might expect only the oldest children in our sample to make consistent inferences, since the inferences we explore require reasoning explicitly about how someone is likely to behave based on whether or not they have reputational motives. Indeed, while such inferences may seem quite simple from an adult perspective, they are actually quite complex, drawing on children's ability to reason about others' motives and goals, their understanding of the reputational implications of different behaviors, as well as their first- and second-order theory of mind capacities. For example, to successfully infer that an agent with intrinsic motives would be more likely than an agent with reputational motives to seek help publicly, one would need to recognize that an agent's audience may form a negative impression of the agent's competence upon seeing the agent seek help. Thus, one must both recognize that the agent's behavior might influence others' mental states (i.e., their perceptions of the agent) and consider the specific implications of the behavior in question (i.e., that help-seeking may signal incompetence). One would also need to consider whether the behavior's implications align with (or contradict) the goals of the reputationally or intrinsically motivated agent. That is, one must recognize that being perceived as incompetent contradicts the goals of the reputationally motivated agent (who "really cares about what others think"), but not of the intrinsically motivated agent (who "does not really care about what others think"). It seems likely that this would involve second-order reasoning about the agents' likely reactions to thinking that their audience's perceptions of them have changed (as a result of seeing them seek help).

We predicted that older children would be more likely than younger children to use others' reputational motives to make predictions about their behavior and that

they would certainly do so by ages 8–9, in line with the above research on children's developing intuitions about others' reputation management (for a review see, Silver & Shaw, 2018). If children recognize that reputational concerns are more likely than intrinsic concerns to motivate impression management behaviors, then they should carry different expectations and evaluations for individuals who merely want to *appear* competent versus those who want to *be* competent.

The present research joins past work in highlighting the theoretical importance of exploring children's developing reputational cognition. Reputational cognition plays a key role in children's own social behaviors in early development and may become even more important as children mature and must make increasingly sophisticated inferences about others' motives, goals, and behaviors (Banerjee & Yuill, 1999b; Engelmann & Rapp, 2018; Hill & Pillow, 2006; Hok et al., 2020; Silver & Shaw, 2018). Moreover, as demonstrated by the rich complexity of the inferences we explore here, reputational cognition draws on a number of other important social cognitive functions, such as theory of mind. Indeed, children's success in inferring reputational motives and in understanding how others should behave to manage impressions have both been linked to their second-order theory of mind capacities (Banerjee, 2002b; Banerjee & Yuill, 1999b). However, it is important to note that explicit reasoning about reputation (such as the inferences explored in the current work) goes beyond mere inferences about others' mental states (theory of mind) or about how others' personality traits might shape their behavior (theory of personality; e.g., Heyman & Gelman, 1999). Explicit reputational cognition requires thinking about how others might try to intentionally influence an audience's mental representations of themselves and thus seems to involve what Bennett and Yeeles (1990) refer to as a "developing theory of *interacting* minds" (p. 460). By examining children's developing reasoning about the relation between others' motives and behavior in social contexts, the present studies shed light on critical aspects of this intuitive theory.

GENERAL METHOD

The majority of children participating in these studies were recruited and tested onsite at a science museum in a major metropolitan city in the Midwest ($N = 397$). The remainder of the sample was recruited at a large public park in the same city ($N = 21$) and via a university participant database ($N = 158$). Those recruited via database were tested either in an on-campus laboratory ($N = 62$) or, for Study 5, online via the video conferencing platform Zoom ($N = 96$). For each study, children were recruited across these sites until a target n of 32 participants per age group was reached. All experimental procedures received approval from the museum, the park district, as well as the Institutional Review Board at the university where this research was conducted. Parents' written informed consent and children's verbal consent were obtained prior to participation. Due to the fast-paced nature of data collection in the museum and park settings, we did not collect any demographic information besides participant age and gender at these sites, which allowed us to examine age differences and gender-match our experimental stimuli. However, our museum partner generously provided us with a summary of their own survey data of museum visitors between March 2018 and 2019: 68% of museum visitors self-identified as White; 12% as Hispanic, Latino, or Spanish origin; 12% as Asian; 8% as Black or African American; 4% as some other race or origins (6% of visitors surveyed selected more than one category). Approximately 65% of adults reported having completed a Bachelor's degree or higher. We expect that our sample is, at least approximately, representative of this broader museum sample. (Demographics for our online sample are described in Study 5.)

Participants at all study sites were compensated in accordance with site-specific policies. As a thank-you for participating, children at the museum and park received stickers, children who visited the laboratory in person received a small toy, and families who participated online received a gift card. All study materials and analytic code are available on the Open Science Framework (https://osf.io/328ab/).

STUDY 1

Study 1 examined whether children think that those who have reputational motives (i.e., those who want to "appear" smart) will be more likely than those who have intrinsic motives (i.e., those who want to "be" smart) to engage in behaviors that promote their desired reputation. Specifically, might children expect someone who is concerned with appearing smart to be more likely than someone who is concerned with being smart to lie in order to cover up failure? When faced with failure, being truthful about one's performance may lead others to negatively evaluate one's competence. Thus, one's motivations might dramatically shape one's desire to lie. The individual who cares about appearing smart should be more motivated to avoid the reputational cost entailed by honesty than the individual who simply cares about being smart. Indeed, from research on testimony, we know that children are more suspicious of statements when they are aligned with self-interest than when they are not (Heyman & Legare, 2005; Liberman & Shaw, 2020; Mills & Keil, 2005). If children understand that reputational concerns for appearing smart could motivate behaviors intended to manage others' impressions of their competence, then they should expect that the reputationally motivated individual would be more likely to lie than the intrinsically motivated individual.

In line with previous work on reputation (e.g., Silver & Shaw, 2018), we predicted that older children would be more likely than younger children to hold expectations about these motives and thus make these inferences, and that children would certainly show clear expectations by the age of 8–9.

Methods

Participants

Our sample included 96 children: thirty-two 4- to 5-year-olds (M_{age} = 4.92 ± 0.56 years, 23 female), thirty-two 6- to 7-year-olds (M_{age} = 6.80 ± 0.50 years, 18 female), and thirty-two 8- to 9-year-olds (M_{age} = 8.79 ± 0.56 years, 18 female).

Procedure

After providing assent, children were introduced to two gender-matched characters (a reputationally motivated character and an intrinsically motivated character), who they were told are students in the same class. The characters were represented by dolls at the museum and in the laboratory and by identical pictures on an iPad at the parks. The reputationally motivated character was described as someone who "really cares about what other people think of her" and "wants everyone to think she gets the best grades in the class and that she's really smart." The intrinsically motivated character was described as someone who "doesn't really care about what other people think of her" and "wants to learn a lot and do her best job on every assignment." The order in which these two characters were introduced and described was counterbalanced across participants, such that one character was always mentioned and described first throughout the story (which is also true of all of our subsequent studies).

After hearing the descriptions of each character, children were told that these two characters each did "badly" on a test at school. Children were then told that one of these characters lied and said they did "great" on the test when later asked by a classmate about their performance. Children were then asked a forced-choice question about which character they thought lied about doing badly on the test. If children did not initially choose one character (e.g., if they responded "both" or "I don't know"), they were asked, "If you had to choose one, who do you think lied?" Responses of either "both" or "I don't know" were not recorded in any of our studies, as very few children gave these responses and all children who were given the additional forced-choice prompt made a choice.

It is worth noting the possibility that younger children in our sample might not have been familiar with the concept of a "test"; however, familiarity with this concept was not essential for children to hold an expectation about which character would lie about doing "great" when they actually did "badly." Rather, holding such an expectation merely required understanding the latter concepts (i.e., that doing "great" is not the same as, and is in fact better than, doing "badly"); we expect that these concepts should have been accessible for even the youngest children in our sample, as we know that even 4-year-old children care about doing well rather than badly (e.g., Asaba & Gweon, 2019). To further address this concern, in Study 5, we explore similar inferences in a non-school context, that is, the playground, which should be familiar to 4- to 5-year-olds.

Results and discussion

Prior to conducting analyses examining the effect of age on children's choice of the reputationally or intrinsically motivated character, we first examined whether children's responses differed by gender or by whether the reputationally or intrinsically motivated character was mentioned first. These initial analyses allowed us to explore whether these non-focal factors had a significant effect on children's responses (or interacted with age, our key predictor of interest). No significant effects were found for either factor (nor did either factor interact with age), so they were not included in subsequent analyses. (For this study as well as subsequent studies, full analyses regarding effects of gender, order, etc., are reported in Supporting Information.)

Our primary analysis was a binary logistic regression examining the effect of age, entered as a continuous variable, on children's responses to the target question. This model was significant, $\chi^2(1, N = 96) = 19.67$, $p < .001$, −2 Log likelihood = 97.95, Nagelkerke $R^2 = .262$. Age positively predicted children's likelihood of choosing the reputationally motivated character as the one who would lie to a peer about poor academic performance, $b = .68$, $SE = .17$, Wald = 15.20, $df = 1$, $p < .001$, $OR = 1.97$, 95% CI OR = [1.40, 2.77] (see Figure 1). This finding supports our hypothesis that older children would be more likely than younger children to think that the character with reputational motives would be the one who lied about doing poorly.

As an exploratory analysis inspired by Muradoglu and Cimpian (2020), the aforementioned logistic regression model was used to estimate predicted probabilities at 0.1-year increments. This analysis allowed us to approximate the age at which children's responses were significantly above chance. Starting at age 6.0 years, the predicted probability of children choosing the reputationally motivated character as the one who would lie about having performed poorly was significantly above chance (predicted probability = .62, 95% CIs [0.51, 0.74]).

These results suggest that, as early as age 6, children expect those who are reputationally motivated to *appear*

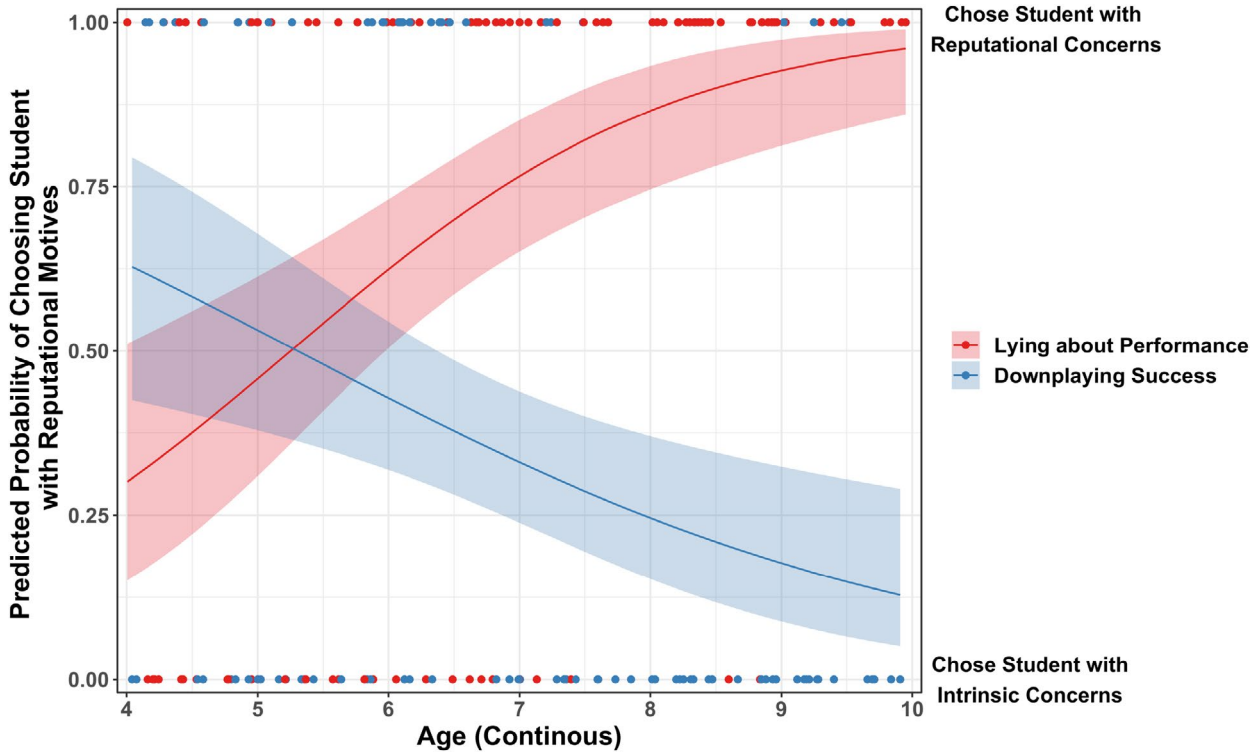

FIGURE 1 Predicted probability of choosing the reputationally motivated student as the one who either lied about poor performance (Study 1, in red) or downplayed success (Study 2, in blue) by age (continuous). Points reflect the individual data for each study; dots at $y = 1$ indicate choosing the student with reputational concerns, and dots at $y = 0$ indicate choosing the student with intrinsic concerns. Shaded regions indicate 95% confidence intervals

smart to be more likely to lie about poor academic performance than those who are intrinsically motivated to *be* smart. Furthermore, we found that age positively predicted children's likelihood of making this prediction: Older children were much more likely than younger children to predict that the reputationally motivated character would lie. However, it is possible that our findings in this study were due not to children's reputation-based reasoning, but rather a general expectation that someone with reputational motives is more likely to engage in "bad" actions (e.g., lying about their performance). Therefore, our next study examined a case where one might predict that someone with reputational motives would be *less* likely to lie—that is, when they have succeeded and could lie to spare someone else's feelings.

STUDY 2

In Study 2, we again asked children who they expect will lie, but this time the lie in question is a prosocial lie or "white lie" (for a review, see Heyman et al., 2009; Talwar & Crossman, 2011) that could potentially damage one's reputation—namely, lying about success to avoid making someone else feel bad. Specifically, in Study 2, children were presented with the same two characters described to children in Study 1. However, rather than being told that both characters did badly on a test, children in this study were told that both characters did "great" on a test. Children were then asked to predict which character would downplay their success via a prosocial lie when asked about their performance by a classmate who did "badly" on the test. This question allowed us to explore the sophistication of children's inferences about others' behavior. If they believe that the character with reputational concerns is more likely to lie in general, then they should expect that this character was the one who lied, and with age, they should be more likely to predict that the student with reputational motives will tell a lie (as in Study 1). However, if children are using someone's reputational motives (or lack thereof) specifically, then children should show the opposite pattern; with age, they should be less likely to predict that the student with reputational concerns would lie, as downplaying success would be counterproductive to this individual's desire to be viewed as smart.

Methods

Participants

Our sample included 96 children: thirty-two 4- to 5-year-olds (M_{age} = 5.02 ± 0.61 years, 11 female), thirty-two 6- to 7-year-olds (M_{age} = 6.80 ± 0.59 years, 13 female), and thirty-two 8- to 9-year-olds (M_{age} = 8.94 ± 0.57 years, 15 female).

Procedure

Children were introduced to the same two gender-matched characters (a reputationally motivated student and an intrinsically motivated student) described in Study 1. After hearing the descriptions of each character, children were told that these two characters each did "great" on a test at school. They were then told that, later, a classmate approaches them and says, "I did really badly on the test. How did you guys do?" Finally, children were told that one of the characters said, "I did great!" and the other said, "I did just okay." Children were then asked a forced-choice question about which character they thought said she did "just okay." If children did not initially choose one character (e.g., if they responded "both" or "I don't know"), they were asked, "If you had to choose one, who do you think said she did 'just okay'?".

Results and discussion

As in Study 1, there were no significant effects of gender or whether the reputationally or intrinsically motivated character was mentioned first; thus, these factors were not included in subsequent analyses. Our primary analysis was a binary logistic regression examining the effect of age, entered as a continuous variable, on children's responses to the target question. The model was significant, $\chi^2(1, N = 96) = 9.77$, $p = .002$, −2 Log likelihood = 115.03, Nagelkerke $R^2 = .133$. Age negatively predicted children's likelihood of choosing the reputationally motivated character as the one who would lie to a peer about a successful academic performance (i.e., doing "great" on a test), $b = -.42$, $SE = .14$, Wald = 8.71, $df = 1$, $p = .003$, $OR = 0.66$, 95% CI $OR = [0.50, 0.87]$ (see Figure 1). This finding supported our initial hypothesis: Older children were less likely than younger children to choose the reputationally motivated character as the one who would downplay their success via a prosocial lie.

As in Study 1, we also conducted an exploratory analysis in which predicted probabilities were estimated from the logistic regression model described above. Starting at 6.4 years, the predicted probability of children choosing the reputationally motivated character as the one who would downplay their academic success was significantly below chance (predicted probability = .39, 95% CIs [0.29, 0.49]).

We found that, by around age 6 or 7, children expect those who are reputationally motivated to *appear* smart to be less likely to lie to downplay their own successful performance than those who are intrinsically motivated to *be* smart. This suggests that, by this age, children can make fairly nuanced predictions about others' actions based on their motives, understanding that reputational motives can promote lying in some circumstances (i.e., when doing so will benefit the agent's reputation), but not in others (i.e., when doing so will harm the agent's reputation).

Here, children younger than 6 years of age did not expect a reputationally motivated person to be more or less likely to lie about their own success than a person with intrinsic concerns for being smart. Younger children's struggle could have been due, at least in part, to difficulty understanding why someone might downplay their success to others. However, there is evidence that children as young as 5 recognize that someone might downplay the fact that they are better at a particular skill (e.g., academics) to make others feel good (Lockhart et al., 2018). Thus, while there are age-related developments in children's understanding of modesty (e.g., Banerjee, 2000; Watling & Banerjee, 2007b), it is unlikely that such developments can fully account for children's inferences in the present study (although they may have played a role for the youngest children in our sample, i.e., the 4-year-olds).

STUDY 3

Studies 1 and 2 suggest that, by around age 6 or 7, children think that those who have reputational motives for appearing smart will actively manage their own reputations (by lying about their poor performance) and will refrain from engaging in behaviors that might harm their reputations (by opting *not* to lie prosocially about their success). In Study 3, we examined another case in which children might expect the reputationally motivated individual to avoid a behavior that could be threatening to her reputation for appearing smart: seeking help in public.

In achievement-related contexts, seeking help when needed is often crucial to children's learning. Despite such benefits, children tend to avoid help-seeking when they are concerned with seeming high-achieving in the eyes of peers (Dweck & Leggett, 1988). Consistent with this, 4- to 6-year-old children also infer that kids who receive help are less smart than those who do not (Sierksma & Shutts, 2020). To explore whether children think that others with reputational concerns might be less likely to engage in help seeking, we examined children's predictions about who is more likely to publicly seek help after performing poorly: Someone who has reputational motives to *appear* smart or someone who has intrinsic motives to *be* smart?

For both characters, seeking help has clear benefits (i.e., improving understanding). However, seeking help publicly could be costly to their reputation because it might signal a lack of competence to others (Dweck & Leggett, 1988; Sierksma & Shutts, 2020). The character who cares about *appearing* smart should be much more motivated to avoid the reputational cost posed by such negative evaluations. Indeed, for the character who cares about actually *being* smart, the benefit of receiving useful

information likely outweighs any potential reputational cost associated with others perceiving her as less competent. Therefore, if children understand that reputational concerns may prevent people from engaging in behaviors that could lead others to negatively evaluate their competence, then they should choose the character with intrinsic motives as the one who would seek help publicly. In line with previous work and our previous two studies, we predicted that older children would be less likely than younger children to expect that the reputationally motivated character would be the one to seek help publicly.

Methods

Participants

Our sample included 96 children: thirty-two 4- to 5-year-olds (M_{age} = 4.95 ± 0.66 years, 21 female), thirty-two 6- to 7-year-olds (M_{age} = 6.82 ± 0.61 years, 18 female), and thirty-two 8- to 9-year-olds (M_{age} = 8.96 ± 0.57 years, 15 female).

Procedure

The methods and presentation of stimuli were similar to those used in Studies 1 and 2. After providing assent, children were introduced to the same two gender-matched characters described in Studies 1 and 2. After hearing the descriptions of each character, children were told that, later, the students' teacher stood up and told their entire class, "Raise your hand if you didn't do well on the test and want extra help after school." At this point, children were asked a forced-choice question about which character they thought raised his or her hand. If children did not initially choose one character (e.g., if they responded "both" or "I don't know"), they were asked, "If you had to choose one, who do you think raised her hand?".

Results and discussion

As in Studies 1 and 2, there was no significant effect of gender nor of whether the reputationally or intrinsically motivated character was mentioned first; thus, these factors were not included in subsequent analyses. Our primary analysis was a binary logistic regression examining the effect of age, entered as a continuous variable, on children's responses to the target question. The model was significant, $\chi^2(1, N = 96) = 5.33$, $p = .021$, −2 Log likelihood = 112.29, Nagelkerke $R^2 = .076$. Age negatively predicted children's likelihood of choosing the character with reputational concerns as the one who would seek help in public, $b = -.30$, $SE = .14$, Wald = 4.98, $df = 1$, $p = .026$, $OR = 0.74$, 95% CI OR = [0.56, 0.96] (see Figure S1). This finding supported our initial hypothesis that older children would be less likely than younger children to think that the reputationally motivated character would seek help publicly.

As in Studies 1 and 2, we estimated predicted probabilities from the logistic regression model described above. This exploratory analysis suggested that, starting at 5.7 years, the predicted probability of children of choosing the reputationally motivated character as the one who would seek help publicly was significantly below chance (predicted probability = .37, 95% CIs [0.25, 0.49]).

These results suggest that, starting around the age of 6, children recognize that someone who has reputational motives for appearing smart will be less likely to seek help (a behavior that could damage their desired reputation by making them appear less smart) than someone who has intrinsic motives (i.e., who actually wants to be smart). Considered alongside findings from Studies 1 and 2, these three studies suggest that children recognize that someone who wants to appear smart will not only engage in behaviors that make them look smart (e.g., lying to say that they did well), but will also avoid behaviors that might make them look less smart (e.g., prosocially downplaying success or publicly seeking help). Furthermore, the similar age patterns found in Studies 1–3 point toward a clear developmental shift, with children starting to make these inferences around the age of 6.

Although this convergence across studies seems to suggest that we are tapping into children's developing reasoning about reputation, it is again possible that our findings in this study could have been driven by something other than children's reputational reasoning. Namely, children might have thought that the intrinsically motivated character is just more likely to care about her performance than the reputationally motivated character. If this is the case, then children should predict that the intrinsically motivated character would be more likely than the reputationally motivated student to seek help not only in public, but also in private. On the other hand, if children's expectations are being driven by their reasoning about reputation specifically, then they should be much less likely to make this prediction for *private* help-seeking, since reputational concerns should be dampened in a private context. To shed light on which of these possibilities is more likely, our fourth study assessed whether children predict different kinds of behavior from reputationally and intrinsically motivated individuals in public versus private.

STUDY 4

As in Study 3, we again examined children's predictions about help-seeking, but we varied (using a between-subjects design) whether this help-seeking would be done in public or in private. One clear prediction that one should

make when claiming that a behavior is motivated by reputational concerns (prompted by previous literature in this area) is that the behavior should be more prevalent in public than in private (e.g., Buhrmester et al., 1992; Eskritt & Lee, 2009; Heyman et al., 2014; Shaw et al., 2014). In the present study, children were thus presented with the same scenario from Study 3, but we manipulated whether the help seeking was in public or private. Children were told that the intrinsically and reputationally motivated characters both performed poorly on a test and had an opportunity to seek help. What differed between conditions is whether this help could be sought in public or private. In the public help-seeking condition, which served as a replication of Study 3, children were asked to predict which character would be more likely to seek help publicly. As in Study 3, we expected children should predict that the reputationally motivated character would be less likely to seek help publicly, since this could signal her poor performance to peers and lead to negative competence evaluations.

In the private help-seeking condition, children were asked to predict which character would be more likely to seek help privately. If children's predictions in Study 3 were merely due to an inference that the intrinsically motivated character is more likely to seek help in general (e.g., perhaps because they are more devoted), then children should show a similar preference even when help-seeking occurs in private. On the other hand, if children's predictions are based on understanding the agents' motives and the reputational implications of their behavior, then they should not choose the intrinsically motivated character more often in this case. Rather, they should respond at chance (i.e., not choosing one character significantly more often), or even choose the reputationally motivated character more often, since they might be particularly likely to take advantage of the lack of potential reputational costs afforded by private help-seeking.

Methods

Participants

Our sample included 192 children: 96 in the private condition (thirty-two 4- to 5-year-olds [M_{age} = 4.98 ± 0.62 years, 18 female], thirty-two 6- to 7-year-olds [M_{age} = 6.97 ± 0.60 years, 23 female], and thirty-two 8- to 9-year-olds [M_{age} = 8.96 ± 0.56 years, 17 female]) and 96 in the public condition (thirty-two 4- to 5-year-olds [M_{age} = 4.80 ± 0.54 years, 15 female], thirty-two 6- to 7-year-olds [M_{age} = 6.74 ± 0.57, 16 female], and thirty-two 8- to 9-year-olds [M_{age} = 8.97 ± 0.63, 15 female]).

Procedure

As in Studies 1–3, after providing assent, children were introduced to the same two gender-matched characters described in Studies 1–3. After hearing the descriptions of each character, children were told that these two characters each did "badly" on a test at school. They were then told that, later, the teacher stood up and told the entire class, "Sometimes school is hard for students, and they need extra help. One way you can get extra help and do really well on the next test is to sign up for help on the computer. You can raise your hand right now if you want to sign up for help on the computer." In the public help-seeking condition, they were told that, "One of these kids raised her hand *right then*, in front of the *entire class*, to sign up for help on the computer." In the private help-seeking condition, they were instead told that, "One of these kids waited until *no one* was around in the classroom to sign up for help on the computer." At this point, children in both conditions were asked a forced-choice question in which they were asked which character they thought sought out help. If children did not initially choose one character (e.g., if they responded "both" or "I don't know"), they were asked, "If you had to choose one, who do you think raised her hand?".

Results and discussion

As in Studies 1–3, we first checked for effects of gender or of whether the reputationally or intrinsically motivated character was mentioned first. There was a main effect of gender in the private condition (and a marginal effect in the public condition—see Supporting Information). Critically, however, neither gender nor character order significantly interacted with age in either condition; thus, these variables were not included in subsequent analyses.

For our primary analyses, we first conducted a binary logistic regression that examined whether older children's responses differed from those of younger children across the public and private help-seeking conditions. The model was significant, $\chi^2(3, N = 192) = 15.27$, $p = .002$, −2 Log likelihood = 250.57, Nagelkerke $R^2 = .102$. In line with this idea, we found a significant interaction between age and condition, $b = -.63$, $SE = .18$, Wald = 12.88, $df = 1$, $p < .001$, $OR = 0.53$, 95% CI OR = [0.38, 0.75]. This interaction revealed that older children were less likely than younger children to predict that the reputationally motivated character would seek help in the public condition (vs. the private condition; see Figure 2).

We then conducted separate binary logistic regressions within the public and private help-seeking conditions in order to determine whether age, entered continuously, predicted children's responses to the target question. Within the public help-seeking condition, our main finding from Study 3 was replicated ($\chi^2(1, N = 96) = 10.28$, $p = .001$, −2 Log likelihood = 122.77, Nagelkerke $R^2 = .135$); that is, there was a significant relation between age and children's responses to the target question, $b = -.38$, $SE = .13$, Wald = 9.30, $df = 1$, $p = .002$, $OR = 0.68$, 95% CI OR = [0.53, 0.87]. Older children were

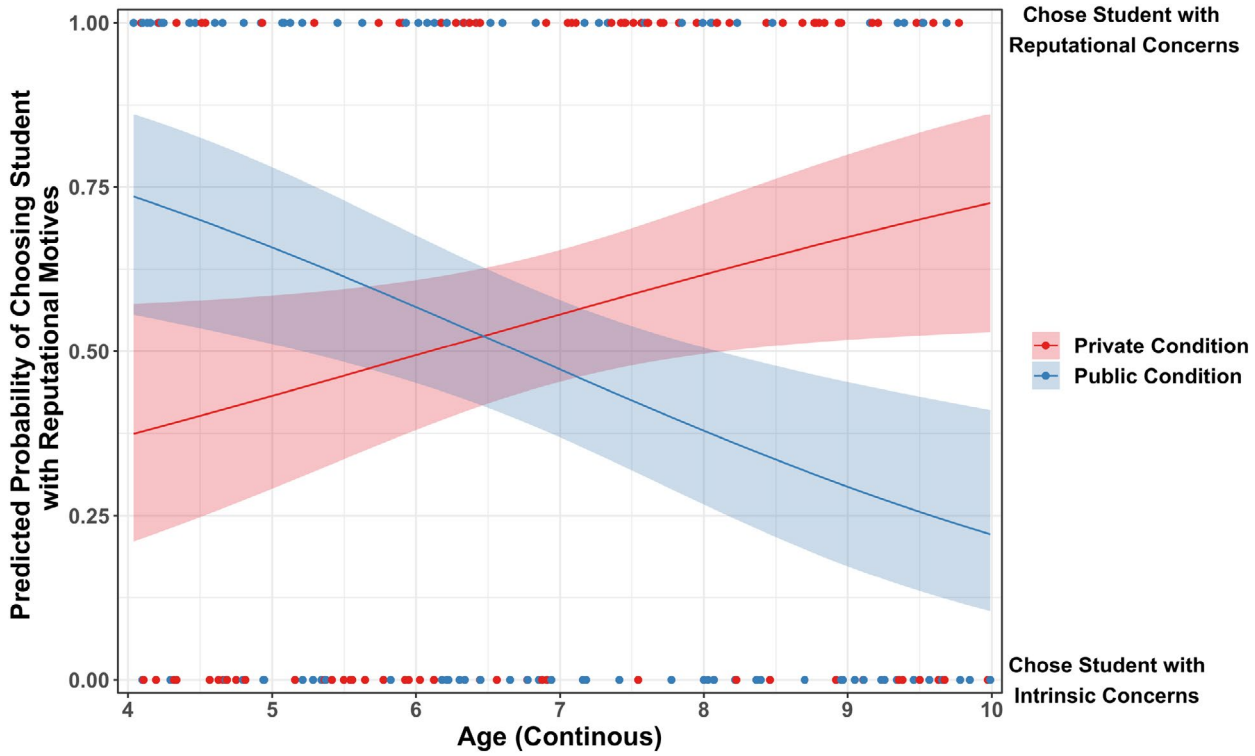

FIGURE 2 Predicted probability of choosing the reputationally motivated student as the one who either sought help in private (in red) or public (in blue) by age (continuous). Points reflect the individual data for each condition; dots at $y = 1$ indicate choosing the student with reputational concerns, and dots at $y = 0$ indicate choosing the student with intrinsic concerns. Shaded regions indicate 95% confidence intervals

less likely than younger children to choose the character with reputational concerns as the individual who would seek help publicly. As an exploratory analysis, predicted probabilities were estimated from the aforementioned logistic regression model. This analysis revealed that the predicted probability of children choosing the reputationally motivated character as the one who would seek help publicly was significantly below chance starting at 8.1 years (predicted probability = .37, 95% CIs [0.25, 0.49]). Note that, in contrast to Study 3, only the oldest children in the current study (8- to 9-year-olds) made this inference. This result may have arisen due to a difference in the wording of the scenarios in these two studies. In Study 3, children were told that the students' classroom teacher said, "Raise your hand *if you didn't do well* [emphasis added] on the test and want extra help after school," whereas in Study 4, the teacher simply told students that they could raise their hand if they wanted to sign up for extra help. The absence of information about not doing well specifically might have made the task more difficult here. (We return to this issue in the General Discussion.)

Within the private help-seeking condition, age significantly predicted children's responses to the target question ($\chi^2(1, N = 96) = 4.24$, $p = .039$, −2 Log likelihood = 127.80, Nagelkerke $R^2 = .058$), but in the opposite direction of their response in the public condition (as one would expect), $b = .25$, $SE = .12$, Wald = 4.07, $df = 1$, $p = .044$, $OR = 1.28$, 95% CI OR = [1.01, 1.64]. Specifically, with age, children became more likely to choose the reputationally motivated character as the one who would seek help privately. As an exploratory analysis, predicted probabilities were estimated from the aforementioned logistic regression model. This analysis revealed that the predicted probability of children choosing the reputationally motivated character as the one who would seek help privately was significantly above chance starting at 8.0 years (predicted probability = .62, 95% CIs [0.50, 0.73]). It is important to note that, in this case, the model predictions do not entirely reflect patterns that arose in the actual data, since the data were slightly U-shaped. Breaking down children's responses by age reveals that 7-year-olds actually showed the strongest tendency to pick the reputationally motivated character (94% of 7-year-olds made this choice; see Supporting Information). However, since we did not have strong predictions about children's expectations for who would seek help privately, we do not discuss this particular result further. Critically, these results still supported our initial prediction that children would not have the same expectations about the behavior of the two characters when help is sought privately.

Overall, these results demonstrate that, with age, children made different predictions about who would seek help depending on whether help was being sought in public or private. Older children were more likely

than younger children to predict that the character with reputational concerns would be less likely to seek help in public, but not necessarily in private. That is, we replicated our finding from Study 3: When help-seeking was public, older children, but not younger children, thought that the reputationally motivated character would be less likely to seek help. We saw a different developmental pattern for private help-seeking: There was a trend toward children thinking, with age, that the reputationally motivated character would be more likely to seek help privately. Although we made no strong predictions about the private condition, it is reasonable that children suspected that the reputationally motivated character would be more likely to engage in help-seeking in this context, given that this condition explicitly highlighted that one student deliberately waited until no one was around to seek help (which could be construed as avoiding the risk of appearing incompetent). This sensitivity to public versus private contexts suggests that, between ages 4 and 9, children are developing an increasing appreciation for a key component of reputation; namely, that concerns related to one's reputation will be especially influential for one's public behavior.

STUDY 5

Studies 1–4 revealed a largely consistent pattern: Around age 6, children were in some cases able to infer that someone with reputational motives will be more likely than someone with intrinsic motives to engage in behaviors that make them look smart (e.g., lying to a classmate about having performed poorly), and by age 8, children made a broader range of inferences (e.g., consistently inferring that someone with reputational motives will be less likely to seek help publicly). Children younger than 6, on the other hand, did not make any consistent inferences about behavior based on whether or not someone had reputational motives.

Despite findings consistent with this developmental trajectory, it is possible that our studies thus far have underestimated younger children's capacity to make such inferences. In Studies 1–4, children were always presented with scenarios involving a school context (and school-related concepts, such as tests). This context may have been less familiar to the youngest children in our samples, some of whom may not have started formal schooling. As we argued earlier, this should not have prevented the 4- to 5-year-olds from succeeding, because children in this age group should still have been able to understand the concept of "doing badly" on something. However, our goal in Study 5 was to address this concern more directly. Specifically, Study 5 (preregistered: https://aspredicted.org/yu3k7.pdf) explored whether children use others' reputational concerns to predict their behavior in a non-school context (i.e., the playground) that should be familiar to even the youngest children in our sample.

Children were again told about two kids, but this time, the kids were in a playground setting. One kid had reputational motives (who "really cares about what others think" and "wants everyone to think she's the best at all the games and that she wins all the time"), while the other had intrinsic motives (who "doesn't really care about what others think" and "wants to play games a lot and enjoys playing them all the time"). Children were asked to predict which character they think lied about doing poorly at a game. This measure served as a replication of Study 1 in a new context. We expected that, even in this non-school context, younger children would struggle to make a prediction, whereas older children would infer that the reputationally motivated character would be more likely to lie about having done poorly.

We also added a social evaluation measure that explored who children liked better (i.e., whether children had a preference between the two characters). We predicted that as children developed an appreciation for how reputational concerns shape others' behavior, they would begin to show a social preference for those who are intrinsically motivated. In addition to providing insight into younger and older children's social evaluations, we also thought this question might be simpler for the youngest children compared to an inference about behavior. Although the youngest children (4- to 5-year-olds) in our previous studies did not make consistent inferences about behavior, it seemed possible that they might differently evaluate people with these different motives. Still, we expected that older children would be more likely than younger children to report liking the character with intrinsic concerns more.

Finally, we added a new measure where children were asked which character would lie about helping clean up the toys at the playground. As we noted in our Introduction, our manipulation of motivations was fairly broad. In addition to mentioning their competence-specific motivations, we deliberately opted to describe one character as being broadly reputationally focused. Because of this two-part manipulation, we predicted that children's responses to the lying about helping measure would look much like their responses to the lying about performance: Older children should be more likely than younger children to predict that the reputationally motivated character would lie about helping because doing so is consistent with their broader reputational motive of "really car[ing] about what other people think of her."

Our three measures (liking, lying about performance, and lying about helping) thus provided a battery for assessing children's inferences about intrinsically and reputationally motivated individuals. Our primary analysis for this study (described in more detail in the Results section) involved examining the effect of age on all three of these measures in a single model, which provides a more

complete picture of children's developing inferences about reputationally motivated agents.

Methods

Participants

Our sample included 96 children: thirty-two 4- to 5-year-olds (M_{age} = 4.85 ± 0.54 years, 14 female), thirty-two 6- to 7-year-olds (M_{age} = 6.88 ± 0.56 years, 16 female), and thirty-two 8- to 9-year-olds (M_{age} = 8.95 ± 0.54 years, 20 female). Based on demographic information provided by parents, 52% of participating children were White or Caucasian, 20% were multiracial, 14% were Asian or Asian-American, 8% were Black or African-American, 5% were Hispanic or Latino, and 1% were Pacific Islander. 94% of children had at least one parent with a Bachelor's degree or higher.

Procedure

For this study, all participants participated via Zoom with an experimenter. Children were introduced to two gender-matched characters (a reputationally motivated kid and an intrinsically motivated kid), who they were told like to play games at the playground with other kids. Both characters were represented as images on a PowerPoint slide. The reputationally and intrinsically motivated characters were then described (using the language noted above).

Children were then asked some measures in a fixed order. Children were first asked who they like better (liking measure). (Note that the liking measure was presented before any of our other measures because we wanted to know children's social evaluations before they were told that one of the two characters did poorly or lied.) After this, children were told that these two characters each played a game on the playground and that each did badly. They were then told that, later, another kid who just arrived at the playground approached them and asked how they did at the game. Children were told that one of the kids lied and said she did great at the game and were asked who they thought did this (lying about performance measure).

Afterward, children were asked two comprehension check questions to ensure that they remembered which character was which. Specifically, children were reminded of the character descriptions they heard at the beginning of the study (i.e., "Earlier, I told you that one of these girls [really cares about/doesn't really care about] what others think of her…") and were asked to recall which character was described in this way. If correct, children were told, ("You're right! [This girl really cares/doesn't really care] about what others think…"); if incorrect, children were told, "Actually, [This girl really cares/doesn't really care] about what others think…" Note that we conducted these comprehension checks after children had already answered two other questions, and so this measure was slightly conservative and likely underestimated children's initial ability to track which character was which. A total of 13 children (including nine 4- to 5-year-olds, two 6- to 7-year-olds, and two 8- to 9-year-olds) failed at least one comprehension check question (9 children only failed one, while 2 children failed both). It is worth noting that, because children had to answer two questions in order to pass the comprehension check, we would only expect 25% of children to pass by chance. All age groups were above this chance level in their responding to the comprehension checks (see Supporting Information). Per our preregistered analyses, we conducted our analyses reported below with and without those who failed at least one of the two comprehension check questions; importantly, our findings were the same in either case. Thus, the full (N = 96) sample was included in the final analyses.

Following the comprehension check questions, children were told that the two characters were at the playground again, and that while everyone was at recess, someone helped clean up the toys. Children were then told that, even though neither of them helped clean up the toys, one of the characters lied and told someone that she was the one who helped clean up the toys; children again were asked who they thought engaged in this behavior (lying about helping measure). All three questions asked in a forced-choice manner, and if children did not initially choose one character (e.g., if they responded "both" or "I don't know"), they were prompted to choose just one character (such initial refusals to choose one character were rare).

Results and discussion

We expected that, with age, children would increasingly make the inferences explored in our three primary measures. To test this prediction, we assigned a score to children's responses on these separate measures, such that children received a score of 1 if they responded in the predicted fashion (i.e., selecting the intrinsically motivated character for the liking measure and the reputationally motivated character for the two lying measures) and a score of 0 if they did not. Initially, we had planned to examine children's responses on these measures together by summing their scores to produce a composite score (and then test whether age significantly predicted children's composite scores). However, based on an anonymous reviewer's suggestion, we deviated from this pre-registered analysis and instead submitted children's scores on the individual measures to a logistic generalized estimating equation (GEE) model, as this model allowed us to explicitly account for dependence in the data (resulting from each child being presented with three

measures). We note that both analyses produced comparable results.

We first conducted a logistic GEE with participant ID entered as the subject variable and age (continuous), measure (liking, lying about performance, and lying about helping), and their interaction entered as predictors. The model revealed a significant effect of age (Wald = 26.44, $df = 1$, $p < .001$); no other predictors were significant, so only age was retained in the final model. We also checked for effects of gender, study order (i.e., whether or not children participated in an unrelated study prior to the current study during the Zoom session), and whether the reputationally or intrinsically motivated character was mentioned first before investigating the effect of age on children's responses. No significant main effects of these variables, nor any interactions between these variables and age, were found (see Supporting Information); thus, we did not include these variables in the final model. The final logistic GEE model, with participant ID entered as the subject variable and age (continuous) entered as a predictor, revealed that, collapsing across measures, older children were more likely than younger children to respond in the predicted fashion ($b = .67$, $SE = .12$, Wald = 31.75, $df = 1$, $p < .001$, $OR = 1.96$, 95% CI $OR = [1.55, 2.48]$). (Note the pre-registered ordinal logistic regression analysis also revealed a significant main effect of age; see Supporting Information.)

The lack of interaction between measure and age suggested a similar effect of age on the three measures, which we sought to confirm by conducting separate binary logistic regression models (per our pre-registered analyses). We first checked for effects of gender, study order, and character order. There were significant effects of gender and study order (and a marginal effect of character order) for the liking measure, but these effects again did not interact with age and were thus not included in the analyses that follow (see Supporting Information). The final binary logistic regression models (conducted for each individual measure) revealed that age (entered as a continuous variable) significantly predicted children's choice of who they like better ($\chi^2(1, N = 96) = 14.94$, $p < .001$, −2 Log likelihood = 93.03, Nagelkerke $R^2 = .213$), who they think lied about performing poorly ($\chi^2(1, N = 96) = 11.00$, $p < .001$, −2 Log likelihood = 92.35, Nagelkerke $R^2 = .164$), and who they think lied about helping ($\chi^2(1, N = 96) = 24.43$, $p < .001$, −2 Log likelihood = 73.83, Nagelkerke $R^2 = .351$; see Figure 3). Older children were less likely than younger children to report liking the reputationally motivated character ($b = -.58$, $SE = .17$, Wald = 11.99, $df = 1$, $p < .001$, $OR = 0.56$, 95% CI $OR = [0.40, 0.78]$) and were more likely to choose this character as the one who would lie about having performed poorly ($b = .50$, $SE = .17$, Wald = 9.26, $df = 1$, $p = .002$, $OR = 1.65$, 95% CI $OR = [1.20, 2.28]$) and about helping ($b = .90$, $SE = .23$, Wald = 15.44, $df = 1$,

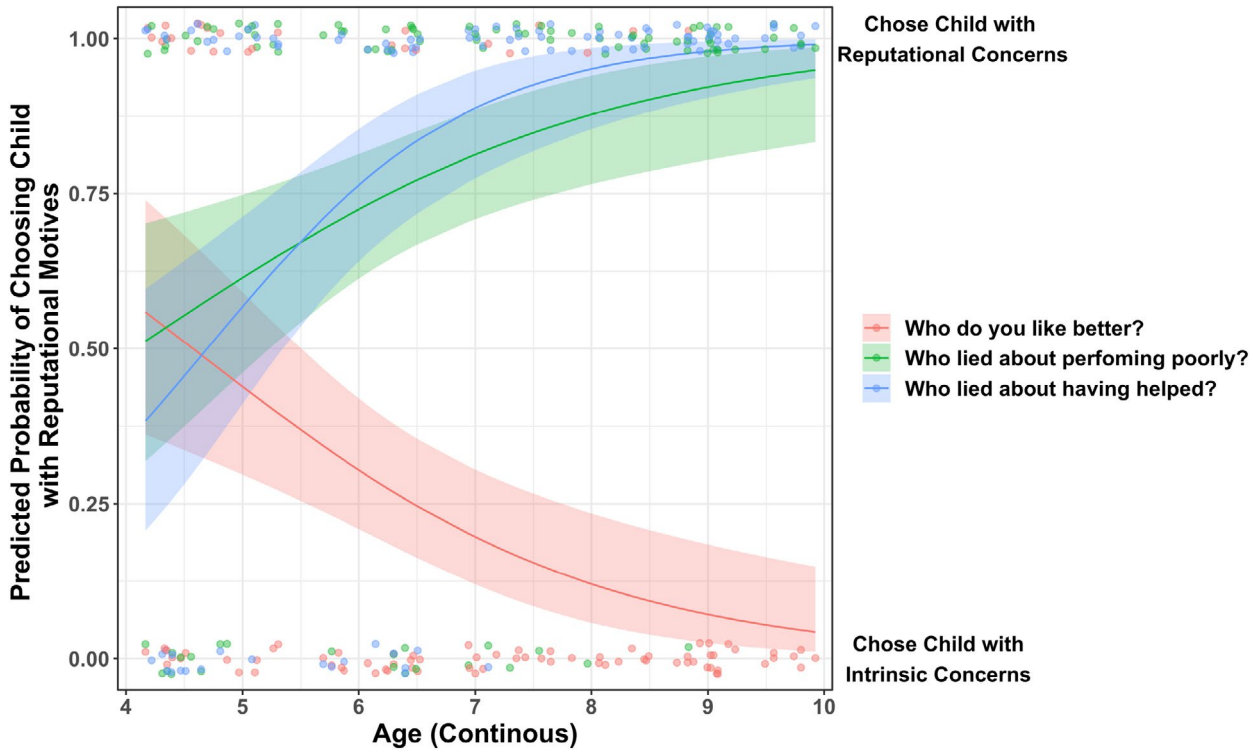

FIGURE 3 Predicted probability of children choosing the reputationally motivated character as the one who they liked better (red), who would lie about poor performance (green), or who would lie about helping (blue) by age (continuous). Points reflect the individual data for each measure; dots at $y = 1$ indicate choosing the character with reputational concerns, and dots at $y = 0$ indicate choosing the character with intrinsic concerns. Shaded regions indicate 95% confidence intervals

$p < .001$, $OR = 2.46$, 95% CI $OR = [1.57, 3.85]$). Thus, in line with our hypotheses, age positively predicted the number of adult-like inferences children made.

As in Studies 1–4, we conducted an exploratory analysis in which predicted probabilities were estimated from the logistic regression models described above. On the liking measure, the predicted probability of children choosing the reputationally motivated character as the one they like better was significantly below chance starting at 5.5 years (predicted probability = .37, 95% CIs [0.24, 0.49]). On the lying about performance measure, the predicted probability of children choosing the reputationally motivated character as the one who would lie about performing poorly was significantly above chance starting at 5.2 years (predicted probability = .64, 95% CIs [0.50, 0.77]). Finally, on the lying about helping measure, the predicted probability of children choosing the reputationally motivated character as the one who would lie about having helped was significantly above chance starting at 5.4 years (predicted probability = .65, 95% Cis [0.52, 0.78]).

We again found that children made different predictions about reputationally and intrinsically motivated characters as they got older. We also found that the youngest children we tested failed to make any strong differentiation between these characters. Importantly, these results suggest that younger children struggle to make such inferences even outside of the school context. When presented with context that should be quite familiar (i.e., the playground), 4-year-olds (and many 5-year-olds) were still at chance on all three of our measures, including a simple liking measure that did not require children to make an inference about behavior. Indeed, children older than 5.5 years reported disliking the reputationally motivated character, while younger children did not. Thus, despite the simplified context and measure, the 4-year-olds still responded differently than older children. Overall, these findings suggest that the age effects we have found in our previous studies were not solely driven simply by young children's lack of familiarity with school contexts in particular.

These results also extend our previous findings by demonstrating that children older than 5 showed a clear preference for the intrinsically motivated character, suggesting that, with age, children make different social evaluations about those who are intrinsically motivated as compared to those who are reputationally motivated. This preference for the intrinsically motivated character (or against the reputationally motivated character) could be reflective of broader expectations about what the presence of reputational motives might suggest about other motives, such as the person's likelihood of being competitive, prosocial, and dishonest.

We also found that older children infer that the reputationally motivated character will engage in a particular behavior (i.e., helping) even when a related reputational concern (i.e., to look helpful) was not specifically mentioned. This suggests that older children believed that the reputationally motivated character had reputational concerns that were more general than simply wanting to appear to be "the best at all the games." Indeed, as we noted in our Introduction, we opted to make our reputationally motivated character broadly reputationally motivated as a first pass at understanding how children generate predictions and evaluations of those who are reputationally motivated. We are aware that children want to pursue many reputations: to be seen as kind, loyal, fair, honest, tough, and cool (Silver & Shaw, 2018), and adults recognize that there are often tradeoffs between pursuing one reputation or another (Chaudhry & Loewenstein, 2019; Shaw et al., 2018; Steinmetz, 2018). Future work could explore the nuanced predictions that children make about those with specific reputational concerns that conflict or trade-off with one another (e.g., wanting to appear cool and wanting to appear smart may conflict in some circumstances).

GENERAL DISCUSSION

The current studies suggest that, as early as age 6, children demonstrate clear expectations that reputationally motivated agents will behave differently than intrinsically motivated agents across both academic and nonacademic contexts. Specifically, we found that, by ages 6–7, children believed that a reputationally motivated character would be more likely to lie in order to cover up their failures (Study 1) or losses (Study 5), less likely to tell a prosocial lie about their success in order to spare someone else's feelings (Study 2), and less likely to admit failure by publicly seeking help (Study 3). They also reported liking the reputationally motivated character less than the intrinsically motivated character (Study 5). By age 8, children showed even more advanced forms of reasoning about others' behaviors based on their motivations: they recognize that the impact of reputational motives on behavior depends on context; they predicted that a reputationally motivated student will be less likely to seek help in public, but not in private (Study 4). Four-year-olds (and 5-year-olds in every study except Study 5) did not make any of the aforementioned inferences or social evaluations. These results paint a fairly consistent picture of children's developing understanding of how reputational motives shape behaviors, with children struggling to make such inferences early in development, to being able to make them in some contexts and with the right scaffolding (by around age 6–7), to finally making very consistent inferences across a wider range of contexts (by ages 8–9).

Below, we discuss how these findings inform our understanding of children's reputational cognition and consider the developmental trajectory of the reputational inferences involved in our tasks. We also discuss how our findings relate to and inform the literature on

children's achievement motivation as well as how these findings might spur novel investigations and theorizing about links between children's understanding of reputation and achievement.

What these results tell us about children's understanding of reputational motives

To our knowledge, our studies are the first to explore children's developmental capacity to use information about whether someone has intrinsic or reputational motives to make inferences about their behavior. While the present studies made the task of identifying which agent was reputationally motivated quite easy (since motive information was clearly provided), the task of using this information to make inferences about the agents' behavior is quite sophisticated and draws on several social capacities. Even when one is given explicit information about agents' motives, there are a number of inferential processes involved in reasoning about how these agents are likely to behave (as noted in the Introduction). It is worth noting that children could not have succeeded on our tasks simply by expecting the reputationally motivated agent to generally pursue rewards or avoid punishment. Indeed, with age, children predicted that the reputationally motivated character would be *less* likely to engage in certain behaviors that could lead to personal benefits, such as seeking help after doing poorly on a test, suggesting that the inferences we explore here require reasoning about reputation specifically.

Across several of our studies, we find that, even 6-year-old children are able to make adult-like inferences when asked to predict someone's behavior based on whether or not they have reputational motives. Prior literature investigating children's reasoning about others' reputation management has found that children do not make the opposite inference (e.g., inferring whether or not someone has reputational motives based on their behavior) until later in development (Heyman et al., 2014; Watling & Banerjee, 2007a). The fact that 6-year-olds made sophisticated inferences about third-party reputation management in many of our tasks across studies, despite not doing so in prior work, might suggest that it is easier for children to infer people's behavior based on their motives than to make the reverse inference. After all, behavior is observable, while motivations are not. It may be more difficult to presume a candidate (unobservable) motive that prompted a particular (observable) behavior than it is to predict how someone is likely to behave given their particular mental state (i.e., their motive). Our results reveal that some of these skills are in place by age 6, but that there are important developments in the sophistication of these skills between the ages of 6 and 9.

Our results also raise interesting questions about what other reputationally relevant inferences children might be able to make between the ages of 6 and 9. Given that people often do not clearly state their underlying motives, one important question is what cues children use to infer that someone is reputationally motivated. One obvious cue that children can use is an inconsistency between an agent's public and private behavior (e.g., Heyman et al., 2014); for example, if a child only studies when others are watching, this might be a cue that she is more interested in appearing, than actually being, smart. Relatedly, observing attempts at reputation management also could serve as a potential cue: someone who avoids publicly seeking help, engages in bragging about good grades (or winning a game), or inquires about others' performance (or even engages in explicit social comparison via "trash talking") is likely more concerned with appearing rather than simply being smart. Of course, in real-life situations, people often have a mixture of motives for success, and children must use these kinds of cues to decide if someone is more strongly driven by reputational or intrinsic motives. Future work exploring which cues older children might use to make these inferences will give us a better sense of their capacities for reputation-based reasoning.

When and why do younger children struggle to make such inferences?

Although our tasks revealed that children show some competencies with making reputational inferences at younger ages than those found in previous work, we still found notable developmental differences. Eight- to 9-year-olds showed clear behavioral expectations for the reputationally and intrinsically motivated individuals in all of our studies, but the 6- to 7-year-olds did not always make these sophisticated inferences, and 4-year-olds (and most 5-year-olds) failed to make these inferences at all. We will now briefly discuss why younger children may have had difficulty in making these inferences.

Six- to 7-year-olds shared the intuitions of older children when making inferences about behaviors that were explicitly linked to failure in academic and nonacademic contexts: when the behavior involved lying about doing badly (Study 1 and Study 5) or when help-seeking was proceeded by a teacher stating that one should seek help if one "didn't do well" (Study 3). Yet, they sometimes struggled to make similar inferences in cases where the link to failure was less clear, for example, when the teacher just asked who needed help and did not connect this to the personal failure (Study 4). In this case, the link to the reputational consequences may have been less obvious; moreover, children would have needed to make this link and then use it in their behavioral prediction. These results highlight that, in some cases, providing additional scaffolding can help children demonstrate social competencies that they appear to lack. Moreover, in Study 5, we found that many

5-year-olds could make such predictions in a (perhaps more familiar) playground context. Five-year-olds' success at making some of these inferences about behaviors in a non-academic setting (i.e., the playground) suggests that considering a more familiar context may also help to support children's reputational reasoning.

It is worth noting that this age pattern is generally consistent with prior theorizing on the development of children's reputational cognition. As noted in the Introduction, this work has distinguished between the more implicit forms of reputation management present in younger children (i.e., by 3–5 years of age) and the explicit reasoning about reputation present in older children (i.e., by 8 years of age; Engelmann & Rapp, 2018). This previous work finds that preschool-aged children modify their own behavior in order to shape others' impressions of them (e.g., Asaba & Gweon, 2019; Zhao et al., 2017, 2018) and it is only much later in development that children understand that others modify their behavior in order to create similar impressions (Banerjee, 2002b; Heyman et al., 2014; Silver & Shaw, 2018). Our studies fit into the latter category by demanding that children explicitly reason about reputation on our tasks; thus, younger children's struggle may reflect difficulty with some of the skills noted previously as being seemingly important for success at this kind of reasoning.

Indeed, the youngest children in our sample (4-year-olds) did not make systematic predictions in any of our studies. While these children may have less familiarity than older children with school contexts like those featured in the vignettes used in Studies 1–4, their lack of clear expectations for the reputationally and intrinsically motivated characters does not appear to simply be due to their not understanding reputation in contexts involving school-related concepts, such as tests. Four-year-olds also struggled to make these inferences even when being asked to reason about other children playing games on the playground, a context that should have been familiar to them. Further, these results likely do not reflect children's inability to link competence and impressions they form with others. In a first-party context, by age 4, children already have concerns for appearing competent to others and engage in actions intended to favorably revise others' beliefs about their competence (e.g., Asaba & Gweon, 2019). Additionally, younger children seem to understand the possible negative implications of receiving help; by age 4, they infer that groups of people who receive help are less smart than those who do not (Sierksma & Shutts, 2020). These results suggest that young children do not lack any ability to think about competence, reputation, and the effects of help-seeking on one's reputation. Thus, we believe that the 4-year-olds' difficulty here is reflective of a broader difficulty with reasoning about deceptive reputation management in third-party contexts.

Although we do not believe that younger children failed to make these inferences simply because they lacked familiarity with the school setting, this does not mean that we deny the fact that the social experience of attending school and participating in a classroom context may have contributed to the developmental pattern observed across many of our studies. The school environment provides countless opportunities to practice reputation management and to observe others' social strategies. It is likely that, as children adopt their own achievement goals (both in and outside of the classroom) and figure out whether certain behaviors, such as seeking help publicly, are likely to aid their goals, they might also start to pick up on the fact that their peers are doing this as well. For instance, children might encounter other children who readily brag about their successes but remain silent otherwise. Such experiences might support their developing understanding of how others might modify their behavior in order to fulfill different motives, especially those that would be salient in the classroom such as wanting to "appear" or "be" smart. It will be important for future research explore how children's own concerns for appearing smart, as well as their experiences in environments where such concerns may be especially salient (e.g., competitive classrooms), facilitate their reasoning about reputation.

The age range during which this social experience is likely to be acquired also coincides with developmental shifts in theory of mind—or the ability to represent others' mental states. Indeed, previous work on children's reputation management has linked second-order theory of mind skills to children's performance on tasks that require reasoning about how someone should manage their reputation (Banerjee & Yuill, 1999b). Such second-order theory of mind capacities would certainly be helpful for making inferences in our tasks. In making inferences about how the reputationally and intrinsically motivated characters were likely to behave, children had to engage in second-order reasoning about the characters' respective intentions to influence the audience's beliefs as well as how a given behavior (e.g., seeking help) is likely to shape these beliefs. Given that children can successfully make these inferences as early as age 5 or 6 (e.g., Sullivan et al., 1994), these capacities may play an important role in supporting children's reasoning about how reputational concerns shape behavior. Future studies should track children's reputational inferences longitudinally (both before and after entering school) in order to examine how the development of children's reputation-based reasoning is supported by their experiences in the classroom as well as corresponding developments in their theory of mind.

Reputation and achievement goals

Our studies highlight the role of reputation in children's achievement motivation and the benefits of connecting these two literatures. A large body of work

demonstrates that children modify their behavior to achieve "learning goals," which emphasize personal mastery and improvement, or "performance goals," which emphasize seeming smart (e.g., Dweck & Leggett, 1988; Robins & Pals, 2002; Van Yperen et al., 2011). While performance goals are not explicitly labeled as "reputational" in this literature, these goals certainly entail reputational consequences: Actions are evaluated in terms of how they might influence others' judgments of oneself as "smart" and are only taken if they will contribute positively to such judgments (Dweck & Leggett, 1988). This is evident in the different kinds of behavior these goals motivate: those with performance goals often avoid challenges and seek short-cuts (e.g., cheating in order to appear to have gotten difficult problems correct), while those with learning goals seek out challenges and persist in the face of difficulty (even if this might make them appear less smart in the short-term; Dweck & Leggett, 1988). Our studies build on these first-party findings to suggest that children expect third parties to behave differently depending on whether their achievement goals entail a reputational concern for appearing competent.

Additionally, we hope that these studies open up many new, exciting areas of research connecting reputation management and achievement goals (see Good & Shaw, 2021, for further discussion). For instance, do children make specific inferences about who is motivated by learning goals versus performance goals? If so, what cues might they use to make such inferences, and how might they then use these inferences to guide their own achievement-related decisions (e.g., deciding who to ask for help)? Relatedly, how might children reason about situations where achievement-related reputational concerns come into conflict (e.g., wanting to appear hard-working vs. wanting to appear smart)? By age 4, children recognize that those who have to put in a lot of effort to achieve a successful outcome are probably less skilled than those who achieve the same outcome but work less hard (Muradoglu & Cimpian, 2020). Thus, even young children may recognize that certain behaviors may involve important trade-offs. For instance, putting in effort in the presence of peers could help one appear hard-working but could also threaten one's appearance of being competent (and instead imply greater warmth; for adult work on these topics, see Chaudhry & Loewenstein, 2019; Steinmetz, 2018). Additionally, children's inferences about competence-related reputational motives may be shaped by features of the achievement context. For example, children may expect different reputational management behaviors depending on whether an achievement setting is competitive or cooperative (Reyes-Jaquez & Echols, 2015) or whether peer norms are supportive of challenge-seeking (Yeager et al., 2019). Exploring these questions could allow us to better understand children's experience in achievement contexts and could even inform classroom interventions.

In addition to providing information about children's intuitions about how reputational motives might influence others' behavior, the present findings also open up many new avenues for future research on children's own reputation management— for instance, will children sometimes be reluctant to seek help because they fear they will appear less smart? Given evidence reviewed earlier that children often begin engaging in strategic reputation management themselves before they predict the same from others, it would be informative to explore when children begin to engage in the behaviors we explored in the current studies. Not only would this inform our understanding of the developmental course of managing others' impressions of our competence, but it could also provide useful information for educators and caregivers. For instance, knowing when (and in what contexts) children might avoid seeking help could inform strategies for helping students whose concerns for appearing smart might hinder their learning.

Limitations

Of course, these studies are not without their limitations. The present findings were limited in that they relied exclusively on forced-choice measures where children had to choose either the character with reputational or intrinsic motives; no other options, such as "both" or "neither," were given. Forced-choice measures are useful for exploring how children might use certain cues or information to make predictions; however, these measures do not shed light on the extent to which this information provides a *strong* cue. That is, we do not know if children think the likelihood of both characters engaging in a particular behavior (e.g., public help-seeking) is similar or different. Relatedly, the present studies examined children's reasoning only within the context of hypothetical situations involving fictional characters. Future research is needed to determine whether children actually think that individuals who are reputationally or intrinsically motivated would engage in the behaviors we explore here in real-life scenarios.

Furthermore, it is important to note that all of the present studies were conducted in a single cultural context (a large city in the midwestern United States). Given that previous work has found differences in reputation-based reasoning across different cultural contexts (e.g., between U.S. and Chinese children; Heyman, Fu, & Lee, 2008, 2013), future research should examine how cultural context influences children's expectations for those with reputational concerns. For instance, might children living in the United States and China differ in their attributions of reputational or intrinsic motives in cases where someone discloses their success to a poorly-performing peer? Future work should also examine how cultural messages about what gives rise to good academic performance (i.e., whether it arises from effort or innate ability)

influence children's reputational strategies for appearing smart (as well as their judgments of others' attempts to do so).

CONCLUSION

The present research provides an important first examination into how children use information about others' reputational motives to form expectations about others' behavior. Our work provides evidence suggesting that, between the ages of 4 and 9 years, children's reputation-based reasoning undergoes important developments. These findings contribute to our understanding of how children's developing understanding of reputation unfolds across middle childhood and open many interesting avenues for future investigation, including what might precede (or arise from) these capacities for reputation-based reasoning as well as how their development is shaped by domain, social experiences, and cultural context. We hope that our work here will motivate future research along these lines and provide useful insights for those working to intervene on children's motivation, mindsets, and achievement in school.

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