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EMPIRICAL ARTICLE

CHILD DEVELOPMENT

Overheard evaluative comments: Implications for beliefs about effort and ability

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Abstract

This research examined the effects of overhearing an adult praise an unseen child for not needing to work hard on an academic task. Five-year-old Han Chinese children (total $N = 270$ across three studies; 135 boys, collected 2020–2021) who heard this low effort praise tended to devalue effort relative to a baseline condition in which the overheard conversation lacked evaluative content. In Study 3, low effort praise increased children's endorsement of essentialist beliefs about ability and their interest in becoming the kind of person who does not need to work hard to succeed. The findings show that overhearing evaluative comments about other people, a pervasive feature of daily life, can have a systematic effect on young children's beliefs about achievement.

Developing academic competence requires sustained effort, and children's reasoning about effort and ability has important implications for their willingness to make such an investment in their future success (Muenks et al., 2018; Oyserman & Dawson, 2021). For example, if children treat low-effort success as a marker of high ability (a perspective linked to essentialist beliefs about ability), they may be less willing to persist when they encounter obstacles (Dweck, 2006). To promote adaptive beliefs about achievement it will be necessary to understand what factors are shaping children's achievement-related beliefs. Here we test the hypothesis that one way ability-related beliefs are transmitted to young children is via overheard comments about others.

Researchers have long recognized that there are distinct patterns of reasoning about the relation between effort and ability that have important implications for achievement motivation (Heyman et al., 2003; Muenks et al., 2018; Rattan et al., 2012). According to what we will refer to as the essentialist view of ability (also known

as the entity, or fixed mindset view), ability is a stable capacity that limits the effectiveness of effort, so effort itself is devalued because it serves as an indicator that one lacks the ability to succeed with ease. In contrast, according to what we will refer to as the non-essentialist view of ability (also known as the incremental, or growth mindset view), ability is a malleable quality, and effort is highly valuable because it allows people to build upon existing skills and acquire new ones. A number of studies have found that the essentialist view of ability is associated with maladaptive motivational responses, such as giving up quickly in the face of obstacles (Blackwell et al., 2007; Robins & Pals, 2002; see Dweck, 2006).

Some prominent achievement motivation researchers have argued that there is no need to be concerned with the negative effects of an essentialist view of ability among young children because children are not intellectually capable of reasoning about ability in this way before about age 10 (see Cimpian, 2017). Much of the evidence for this position comes from research by Nicholls and colleagues (e.g., Nicholls & Miller, 1984), who found that younger children judge individuals who appear to work hard to achieve an outcome to be smarter than individuals who appear to achieve the same outcome without working hard, which is the reverse of the pattern seen among older children. Nicholls and colleagues concluded that young children view effort and outcomes as indistinguishable, or think that effort alone determines outcomes. According to this account, young children are unable to conceive of ability as limiting the effectiveness of effort, and this protects them from negative motivational outcomes associated with an essentialist conception of ability (Nicholls & Miller, 1984).

More recent findings with less cognitively demanding methodologies suggest that rather than being a late-emerging developmental phenomenon, children begin to show essentialist reasoning about ability by age 5 (Heyman & Compton, 2006; Heyman et al., 2003; Muradoglu & Cimpian, 2020; see Cimpian, 2017). For example, by this age children consider someone who completes a task with ease to be smarter than someone who completes the same task with difficulty (Heyman et al., 2003;Heyman & Compton, 2006; Muradoglu & Cimpian, 2020), which indicates they understand that needing to exert greater effort than others to complete a task has negative implications for one's level of ability. Furthermore, many young children endorse the idea that "some children could never be smart at school," which suggests they believe there are individual differences that can limit the effectiveness of effort (Heyman & Compton, 2006; Muradoglu & Cimpian, 2020). The evidence that young children appear to be capable of reasoning about ability in both essentialist and non-essentialist ways raises questions about what factors determine the mode of reasoning they will adopt.

Social learning theory posits that children are influenced by attitudes that adults convey (Bandura, 1971; Ma et al., 2018; Rhodes et al., 2012), and linguistic cues are an important mode of transmission of essentialist beliefs about people (Gelman & Heyman, 1999; Gelman et al., 2010; see Dunlea & Heiphetz, 2021). For example, Gelman and Heyman (1999) found that 5- and 7-year-old children judged novel descriptions of people (such as that someone eats carrots) in a more essentialized way when identified with a noun label (e.g., *she is a carrot-eater*) than with a verbal predicate (e.g., *she eats carrots whenever she can*). The use of generic language also facilitates essentialist reasoning. For example, when Rhodes et al. (2012) gave 3- to 5-year-olds generic statements about novel beings called Zarpies, they were more likely to infer that a property they learned about one Zarpie could be generalized to other Zarpies if they had first heard a generic statement (e.g., *Zarpies are scared of ladybugs*) as compared to a non-generic statement (e.g., *this Zarpie is scared of ladybugs*).

There is evidence of linguistic effects on children's reasoning about ability (Cimpian et al., 2007; Gunderson et al., 2013; Mueller & Dweck, 1998; Pomerantz & Kempner, 2013; Zentall & Morris, 2010). For example, in the Mueller and Dweck (1998) study, an experimenter told fifth graders they had done well on a matrix task regardless of how they had actually performed. Children who were praised with reference to their ability (*you must be smart at these problems*) were more likely to later report viewing intelligence in an essentialist way than were children who were praised with reference to their effort (*you must have worked hard at these problems*). A study by Gunderson et al. (2013) suggests that sensitivity to self-relevant evaluations emerges early. They examined the types of praise parents spontaneously gave to their 14- to 38-month-old children, and found that process praise (e.g., *nice try*) was associated with the same children holding a less essentialist view of ability years later, when they were age 7 or 8.

These studies that investigated linguistic influences on children's achievement-related beliefs all focused on a relatively narrow range of contexts, in that the participant was the subject of the message, and the message was communicated to him or her directly. Such messages are likely to be highly salient to children as they try to make sense of their own experiences. In addition, messages that take this form may implicitly communicate that the speaker considers the information to be meaningful and relevant to the child's life (Sperber & Wilson, 1987). Whether evaluative comments that are not overtly self-relevant can also impact children's achievement-related beliefs remains to be seen. This possibility is important to assess, because many and perhaps most of the evaluative comments that children are exposed to concern others, such as relatives, classmates, or strangers. A primary goal of this study is to determine whether evaluative comments must be self-relevant for them to systematically affect children's achievement-relevant beliefs.

Theoretical accounts of gossip and language socialization (Baumeister et al., 2004; Miller et al., 2012;

Sperry et al., 2019) suggest that evaluative comments can be rich sources of social information even if they are not directly self-relevant. In line with this possibility, recent experimental research suggests that young children's moral behavior and beliefs can be influenced by overhearing evaluative comments about others (Lane et al., 2020; Qin et al., 2020; Sai et al., 2020). For example, Lane et al. (2020) found that 4- to 9-year-old children who overheard an experimenter making negative comments about a novel social group developed more negative attitudes about the group.

The present research examines whether evaluative comments that lack any obvious self-relevance also have implications for children's achievement-related beliefs. We addressed this issue among a population of children in China. This population was chosen to examine the development of these beliefs in non-Western cultures. We were particularly interested in examining children in China in light of prior work on the moral significance of learning in Chinese culture (Li, 2005; Ng et al., 2013).

In each of three studies, we addressed this question among a sample of 5-year-olds by looking at the effects of praising someone for completing a task without needing to work hard. Our primary hypothesis was that hearing this statement would lead children to view the need to exert effort more negatively, which is consistent with holding an essentialist view of ability. We tested this hypothesis by comparing children's responses in a low effort praise condition to the responses of children in a baseline overheard conversation condition that did not contain any effort-related information. In addition, we were interested in exploring the effects of praise for high effort. We thought that high effort praise might lead children to value effort to a greater extent because it might persuade children to view effort as more praiseworthy.

STUDY 1

At the beginning of the experimental session, children overheard a phone conversation in which the experimenter discussed a child who had been tested earlier. The conversation took place as participants were led to believe that they were waiting for the session to begin, and the content of the conversation was manipulated between subjects. For the children who were assigned to the experimental *low effort praise* condition, the conversation described the earlier participant as correctly answering many hard math problems, finding the problems easy, and not having to work hard. Two other conditions were also included. One was a *baseline* condition, which was included for purpose of comparison to allow us to assess our hypothesis that the low effort praise condition would lead to more negative views of effort exertion. In this baseline condition, the conversation was similar in length but there was no mention of effort or achievement. The other was a *high effort praise* condition, which was included for exploratory purposes. In this condition, the conversation was the same as in the *low effort praise* condition except that the earlier participant was described as finding the problems hard and having to work hard to complete them.

After the experimenter completed the phone call, she told the participant that it was time for the study to begin, and she told them about two different children: one who completed a jigsaw puzzle effortlessly, and one who worked hard to complete the same task. She asked the participant to identify which of these children is more deserving of a reward, and which is smarter. See the Online Supplementary Materials: Part 1 for manipulations and measures in both English and Chinese.

Method

Participants

The research plan for all studies in this paper was approved by the Scientific Research Ethics Committee of Hangzhou Normal University. Parents or legal guardians gave informed consent to allow their children to participate, and children gave their oral assent prior to participating in the study.

To determine the sample size we conducted a power analysis in which we focused on the question of key theoretical interest: the contrast between the experimental low effort praise condition and the baseline condition. Our primary dependent measure was the percentage of children who identified the hardworking student as more deserving of a reward, and we estimated it as 75% in the experimental condition and 40% in the baseline condition. These estimates were based on previous findings regarding the effects of overheard conversation on children's generosity (Qin et al., 2020). The analysis yielded a minimum of 30 participants per condition to achieve a condition effect with a power of 0.80, an alpha at 0.05, and an enrollment ratio of 1.

In Study 1, as well as in the other studies, all eligible children in each classroom who were in attendance on testing days were given the opportunity to participate. The only exception was that data collection was stopped as soon as we reached the planned number of participants in each study. The final sample consisted of 90 5-year-old children ($M = 66.68$ months, $SD = 2.73$ months; range = 62.89 to 72.59 months; 45 boys) who attended a preschool in Hangzhou, a city located in eastern China, with 30 children randomly assigned to each of the three conditions. An additional six children were excluded from the study because they failed a manipulation check concerning the contents of the overheard conversation. All participants were Han Chinese and from a school that served children from middle socioeconomic status backgrounds. The sessions were conducted in Modern Standard Mandarin Chinese. Data collection for Study

1 took place from November 3, 2020, to November 24, 2020.

Procedure

Children were tested in individual sessions by an adult female experimenter in a quiet area of their school. After the experimenter introduced herself to the child her phone rang, and she pretended to take the call. In each condition, the experimenter began the call by saying, "Hi! I am playing games with a child… I'm doing well. You mean this piece of paper? I'm holding this paper right now." What she said next varied by condition.

Effort manipulation

In the low effort praise condition, the experimenter finished the call by saying, "You know, I gave a kid so many hard math problems today, and that kid got all of the questions right. That kid thought the questions were so easy and didn't even have to work hard. That kid is so awesome." In the baseline condition she finished the call by saying, "You know, the kid who has just finished these math problems moved here from a faraway place. That kid's family just moved here six months ago." Finally, in the high effort praise condition she finished the call by saying, "You know, I gave a kid so many hard math problems today, and that kid got all the questions right. That kid thought the questions were really difficult and worked so hard to solve them. That kid is so awesome."

Differential effort story

After the experimenter completed the phone call, she explained that it was time to begin the study. She then told the child about two students who successfully completed the same jigsaw puzzle with differing levels of effort. She illustrated the story with two color photos that showed a pair of students whose gender matched the participant's gender (note: all of the descriptions of measures in this paper assume that the participant is female). Both the order of the photos and names of the two children were counterbalanced. For example, girls were told, "These girls both did a puzzle with me. I gave them ten minutes, and they both finished the puzzle. This is Lili [pointing to one of the photos]. Lili worked very hard to complete the puzzle. This is Honghong [pointing to the other photo]. Honghong did not work hard to complete the puzzle. Because both Lili and Honghong completed the puzzle, they both received a sticker as a reward." See Online Supplementary Materials: Figure S1 for an illustration of the stimuli that participants were shown.

Test of story details

The experimenter then asked the child three questions that were designed to confirm that they understood the details of the story: (1) "Which student worked hard to complete the puzzle and which child did not work hard to complete the puzzle? (2) "Did both students complete the puzzle?" (3) "Did they get the same reward?" The majority (94.4%) of participants correctly answered all three questions on their first attempt. When children gave an incorrect response, the experimenter went over the story with them again and repeated the questions. At that point all participants were able to answer the questions correctly.

Dependent measures

Next, the child was presented with two dependent measures: the *effort-reward assessment* and the *effort-intelligence assessment*. Because children often use merit cues when they distribute rewards in ways that benefit some individuals over others (Baumard et al., 2012), we used a reward distribution measure as an index of whether children would consider low-effort achievement or high-effort achievement to be more meritorious. Specifically, the experimenter presented two identical envelopes and placed one next to each photo. She said, "Look, I have an extra sticker here. I want to make this extra sticker a bonus. Will you please help me decide which of the two students to give it to? Because this is an extra sticker, you can give it to either student. It's totally up to you. When you decide which student will get the sticker. Please put the sticker into the envelope next to the photo, and then I will send it to the child you choose." For the effort-intelligence assessment, participants were asked: "Which of these two students do you think is smarter?" Participants responded by pointing to one of the two photos or by saying the student's name.

Effort manipulation check

Participants were asked a series of questions at the end of the session about what they overheard the experimenter say on the phone. Children in the baseline condition were asked, "What did I say on the phone? When I mentioned the kid who did math problems, did I say that kid moved here from a faraway place, or did I say that kid has been studying here?" In the two effort praise conditions they were asked, "What did I say on the phone? When I mentioned the kid who did math problems, did I say that kid worked hard or did not work hard?"

Debriefing

At the conclusion of Study 1, and also Studies 2 and 3, participants were asked, "Why do you think I told you stories and asked you questions?" Most children gave answers such as "to help give out prizes." None made comments that related to the actual purpose of the study. The experimenter then explained the purpose of the study in child-friendly terms (e.g., to find how whether hearing things about other students affects how children think about trying hard). We had also wanted to provide a brief intervention to promote positive beliefs about effort, but

the IRB review committee determined that there was not sufficient evidence that such an intervention would be helpful to children in a Chinese context.

Results and discussion

Preliminary analyses indicated no significant main effects or interactions involving gender in this study, or in either of the subsequent studies (*p*s>.10), so the data were collapsed across this factor. We then conducted a set of binary logistic regression analyses that were both confirmatory (because they tested our hypothesis regarding the baseline and low effort praise conditions) and exploratory (because they allowed us to explore the effect of high effort praise). SPSS 25.0 (IBM Corp.) was used to conduct all of the following data analyses.

Effort-reward assessment

As shown in Figure 1, 76.7% of children in the low effort praise condition gave the extra sticker to the student who did not have to work hard. This rate was greater than the rate for children in the baseline condition (40%), but surprisingly it was similar to the high effort praise condition (63.3%).

To test whether the rates in the two effort praise conditions were significantly different from the rate in the baseline condition, we conducted a binary logistic regression analysis on the effort-reward assessment (0 = the student who worked hard, 1 = the student who did not have to work hard), with condition (specified as a categorical variable and dummy coded automatically in SPSS) entered as the only predictor. The regression model was significant, χ^2 (2, N = 90) = 8.74, p = .013, −2Log likelihood = 112.41, Nagelkerke R^2 = 0.13, as was the condition effect (*Wald* = 8.15, *df* = 2, p = .017). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were significantly more likely than those in the baseline condition to give the extra sticker to the student who did not have to work hard (76.7% vs.40%, β = 1.60, *SE* β = 0.57, *Wald* = 7.82, *df* = 1, p = .005, OR = 4.93, 95% CI = 1.61–15.07). The difference was marginally significant when comparing the high effort praise condition to the baseline condition (63.3% vs. 40%, β = 0.95, *SE* β = 0.53, *Wald* = 3.21, *df* = 1, p = .073, OR = 2.59, 95% CI = 0.91–7.34).

We then specified a post hoc test to compare between the two effort praise conditions. However, it revealed that there was no significant difference between the two effort praise conditions (76.7% vs. 63.3%, β = 0.64, *SE* β = 0.57, *Wald* = 1.25, *df* = 1, p = .263, OR = 1.90, 95% CI = 0.62–5.86).

Effort-intelligence assessment

As shown in Figure 2, results of the effort-intelligence assessment resembled the pattern that was seen in the effort-reward assessment. Specifically, 83.3% of the children in the low effort praise condition rated the student who did not have to work hard as smarter. This rate was greater than the rate for children in the baseline condition (56.7%), but again it was comparable to the rate for children in the high effort praise condition (80%).

A binary logistic regression analysis yielded results that were similar to those seen for the effort-reward assessment. The model was significant, χ^2(2, N = 90) = 6.27, p = .043, −2Log likelihood = 98.11, Nagelkerke R^2 = 0.10, as was the condition effect (*Wald* = 6.15, *df* = 2, p = .046).

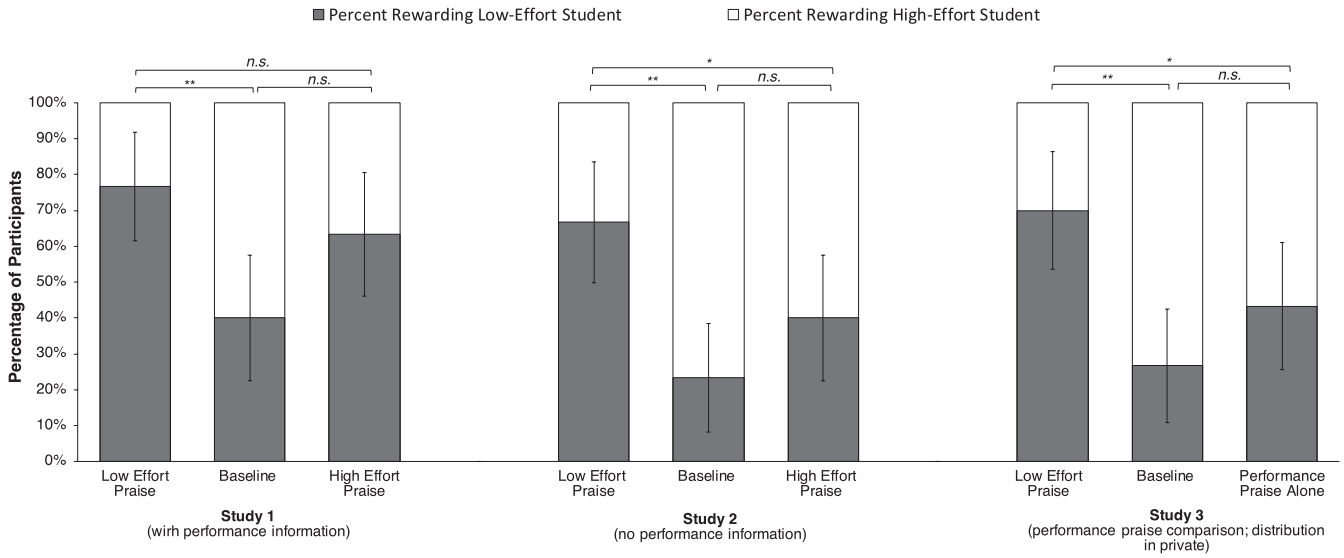

FIGURE 1 Results of the effort-reward assessment in Studies 1, 2, and 3, showing the percentage of children in each condition who gave the sticker to the student who did not have to work hard. Error bars: 95% CI. *Denotes p<.05, **denotes p<.01

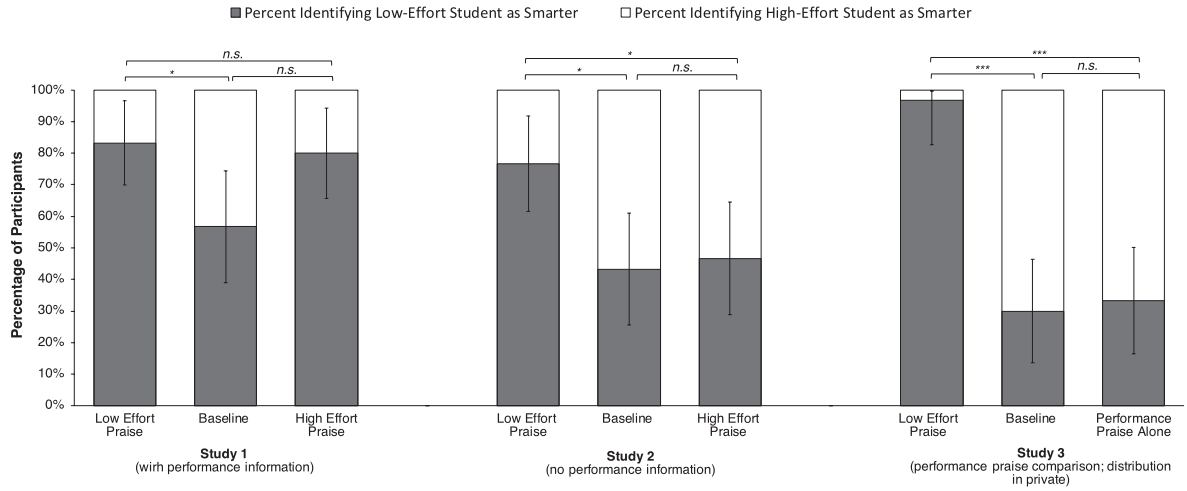

FIGURE 2 Results of the effort-intelligence assessment in Studies 1, 2, and 3, showing the percentage of children in each condition who judged the student who did not have to work hard to be smarter. Error bars: 95% CI. *Denotes $p < .05$, ***denotes $p < .001$

A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely to judge the student who did not have to work hard as smarter (83.3% vs. 56.7%, $\beta = 1.34$, $SE\ \beta = 0.61$, $Wald = 4.79$, $df = 1$, $p = .029$, OR = 3.82, 95% CI = 1.15–12.71). This difference was marginally significant when the high effort condition was compared to the baseline condition (80% vs. 56.7%, $\beta = 1.12$, $SE\ \beta = 0.59$, $Wald = 3.63$, $df = 1$, $p = .057$, OR = 3.06, 95% CI = 0.97–9.66).

Again, a post hoc test was then conducted to compare between the two effort praise conditions, which yielded no significant difference between the two conditions (83.3% vs. 80%, $\beta = 0.22$, $SE\ \beta = 0.67$, $Wald = 0.11$, $df = 1$, $p = .739$, OR = 1.25, 95% CI = 0.34–4.64).

In sum, in line with our hypothesis, participants showed the predicted low effort praise effect, at least when compared with the baseline condition: those in the low effort praise condition, who heard a child being praised for succeeding with ease, demonstrated a more negative view of effort than did children in the baseline condition. This was the case even though the conversation children heard was about a different task (math problems) than the one they were asked to reason about (a jigsaw puzzle). This condition difference was observed on both of the dependent measures, and it is consistent with our predictions. However, the experimenter explicitly mentioned that the student perceived the math problems to be easy, and this information about perceived difficulty might have scaffolded children's ability to reason in essentialist ways (Heyman et al., 2003; Heyman & Compton, 2006; Muradoglu & Cimpian, 2020).

In contrast, the results of our exploratory examination of the effects of high effort praise were not expected: children in this condition showed a devaluation of effort that was comparable to the effects observed in response to low effort praise. One possible explanation is that both effort praise manipulations included comments about the student's successful performance, and it is possible that these comments prompted children to focus on the importance of appearing smart rather than the evaluative comments about effort (see Good & Shaw, 2021).

STUDY 2

Study 2 was designed to assess whether the low effort praise effect in Study 1, in which children in the low effort praise condition showed evidence of more essentialist reasoning than children in the baseline condition, would replicate without any explicit reference to perceived difficulty in the low effort praise condition. A second goal was to determine whether low effort praise and high effort praise would have systematically different effects if the manipulation made no overt reference to the previous child's actual level of performance.

Method

Participants

Following the preregistration for this study (https://aspredicted.org/blind.php?x=2ub883), we tested 90 5-year-old children from the same preschool as in Study 1, ($M = 69.66$ months, $SD = 3.31$ months; range = 63.45 to 75.35 months; 45 boys), with 30 children randomly assigned to each of the three conditions. An additional two children were excluded for failing a manipulation check question concerning the contents of the overheard conversation. Data collection took place from December 28, 2020, to January 20, 2021. We also collected data from an additional sample of 60 4-year-olds, and the results showed a similar but weaker pattern (see Online Supplementary Materials: Part 2 for details).

Procedure

The procedure was the same as in Study 1, except for the wording of the effort manipulation portion of the overheard conversation, in which references to perceived difficulty and the performance outcome were eliminated. The *low effort praise* manipulation was, "Yeah, I played with another kid earlier. I gave that kid some math problems. You know what—that kid never even had to work hard. That kid didn't have to try at all. That kid is awesome." The *baseline* condition was identical to the one used in Study 1 except that it did not specify when the child's family moved from a faraway place. The *high effort praise* manipulation was, "Yeah, I played with another kid earlier. I gave that kid some math problems. You know what—that kid worked so hard. That kid tried and tried. That kid is awesome." The manipulation check was the same as the one used in Study 1. On the test of story details, 93.3% got all three questions right the first time, and all children who did not got them all right the first time passed the check the second time.

Results and discussion

As in Study 1, we conducted a set of binary logistic regression analyses that were both confirmatory (because they tested our hypothesis regarding the baseline and low effort praise conditions) and exploratory (because they allowed us to explore the effect of the new high effort praise condition).

Effort-reward assessment

As shown in Figure 1, 66.7% of the children in the low effort praise condition gave the extra sticker to the student who did not have to work hard, which was higher than in the baseline condition (23.3%) and the high effort praise condition (40.0%).

We conducted a binary logistic regression analysis with condition as the only predictor. The model was significant, χ^2 (2, N = 90) = 11.99, p = .002, −2Log likelihood = 111.17, Nagelkerke R^2 = 0.17, and that the condition effect was also significant (*Wald* = 10.84, *df* = 2, p = .004). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely than those in the baseline condition to give the extra sticker to the student who did not have to work hard (66.7% vs. 23.3%, β = 1.88, *SE* β = 0.58, *Wald* = 10.54, *df* = 1, p = .001, OR = 6.57, 95% CI = 2.11–20.48). In contrast, there was no significant difference between the high effort praise condition and the baseline condition (40% vs. 23.3%, β = 0.78, *SE* β = 0.57, *Wald* = 1.89, *df* = 1, p = .169, OR = 2.19, 95% CI = 0.72–6.70).

We then conducted a post hoc test to compare the two effort praise conditions. Results showed that, in contrast to the results of Study 1, children in the low effort praise condition were significantly more likely than those in the high effort praise condition to give the sticker to the student who did not have to work hard (66.7% vs. 40%, β = 1.10, *SE* β = 0.54, *Wald* = 4.18, *df* = 1, p = .041, OR = 3.00, 95% CI = 1.05–8.60).

Effort-intelligence assessment

As shown in Figure 2, 76.7% of the children in the low effort praise condition judged the student who did not have to work hard to be smarter, which was higher than in the baseline condition (43.3%) and the high effort praise condition (46.7%).

We conducted a parallel binary logistic regression analysis, which yielded similar results to the effort-reward assessment. The model was significant, χ^2 (2, N = 90) = 8.55, p = .014, −2Log likelihood = 115.11, Nagelkerke R^2 = 0.12, as was the condition effect (*Wald* = 7.68, *df* = 2, p = .021). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely than those in the baseline condition to judge the student who did not have to work hard to be smarter (76.7% vs. 43.3%, β = 1.46, *SE* β = 0.57, *Wald* = 6.60, *df* = 1, p = .010, OR = 4.30, 95% CI = 1.41–13.07), but there was no significant difference between the high effort praise condition and the baseline condition (46.7% vs. 43.3%, β = 0.14, *SE* β = 0.52, *Wald* = 0.07, *df* = 1, p = .795, OR = 1.14, 95% CI = 0.41–3.17).

We then conducted a post hoc comparison, which showed that children in the low effort praise condition were also significantly more likely than those in the high effort praise condition to judge the student who did not have to work hard to be smarter (76.7% vs. 46.7%, β = 1.32, *SE* β = 0.57, *Wald* = 5.47, *df* = 1, p = .019, OR = 3.76, 95% CI = 1.24–11.39).

Taken together, these results replicate the low effort praise effect that was seen in Study 1 with a new sample of 5-year-olds even when no information about perceived difficulty was included in the manipulation. This suggests that the low effort praise effect is highly robust.

The results of Study 2 also showed that when there was no reference to the previous child's actual level of performance, the effects of the high effort versus low effort praise manipulation diverged in the predicted manner. However, the high effort manipulation still did not lead children to view effort more positively as compared to children in the baseline condition, even though it contained overt praise for effort. This finding shows that participants were not merely repeating back responses that most closely resembled the ideas they had overheard, which is an issue we will return to in our general discussion.

STUDY 3

The primary goal of Study 3 was to examine whether children might make an even broader set of inferences about ability and effort based on overhearing praise for a student who did not have to work hard. To this end, we included the same dependent variables as in first two studies and added two new ones. In one new measure, we more directly assessed essentialist beliefs about ability by asking participants whether they believe that some students can never achieve at the highest levels no matter how hard they try (Heyman & Compton, 2006). In a second new measure, we asked participants whether they want to be the kind of person who achieves success by working hard, or the kind of person who achieves success without needing to work hard. This allowed us to assess whether children are capable of using comments they hear about someone else to change how they think about themselves (Meltzoff, 2013).

We also explored two additional questions. One examined the effects of performance praise, given our speculation that the lack of a difference between the low effort praise and high effort praise conditions in Study 1 might be due to the explicit reference to the student's performance on math problems in the overheard conversation.

A final goal of Study 3 was to explore the possibility that the low effort praise effect might be driven by children's desire to gain the experimenter's approval (see Heyman et al., 2021). To address this question, we modified the effort-reward assessment to make it appear that the experimenter would not be able to see how children had responded.

We expected that children in the low effort praise condition would still show more negative views of effort on the measures included in the previous studies and also respond in ways associated with more negative views of ability on the new measures (i.e., more likely to report that some students can never achieve at the highest levels no matter how hard they try, and more likely to want to be the kind of person who achieves success without needing to work hard).

Method

Participants

Following the preregistration for Study 3 (https://aspredicted.org/95J_7B4), we tested 90 5-year-olds from the same preschool as in Studies 1 and 2 (M = 67.02 months, SD = 2.65 months; range = 62.04 to 71.77 months; 45 boys), with 30 children randomly assigned to each condition. An additional three children were tested but excluded from the study because they failed a manipulation check concerning the contents of the overheard conversation. Data collection took place from October 25, 2021 to November 12, 2021.

Procedure

The procedure was the same as that of Study 2, except for three changes. First, the high effort praise condition was replaced by a *performance praise alone* condition. Second, the effort-reward assessment measure was revised so that children would believe they were responding anonymously. Third, two new dependent measures were added to assess whether the low effort praise manipulation would have a greater effect on children's essentialist and self-relevant beliefs than the baseline manipulation.

In the performance praise alone condition, the effort manipulation was, "Yeah, I played with another kid earlier. I gave that kid some math problems. You know what—that kid got all the questions right. That kid is awesome."

In the revised effort-reward assessment, the task was the same as in the first two studies, except that participants were led to believe their response would be anonymous. Specifically, just before the participant made the sticker allocation the experimenter said that she needed to leave the room to deal with an emergency. Before she left, she instructed the participant to put the sticker into the envelope corresponding to the student that the participant wanted to give it to, seal it with tape, and put both envelopes in an opaque box. The experimenter then said, "Later today another teacher I don't know will come in and take the box away and give the envelopes to the children. Therefore, neither the teacher nor I will know who you gave the stickers to. Also, neither of the students will know you were the one who sent the envelopes, and the two students don't even know each other, so they won't know what is in each other's envelope."

As a comprehension check, children were asked: (1) "Will I know who you gave the stickers to?" (2) "Will the two children know who gave them the stickers?" (3) "Will anyone know who you give the stickers to?" Almost all of the children (95.6%) answered these questions correctly, and the others got them right after a second attempt. Next, the experimenter left the room for 2 min and immediately after returning she asked a new *essentialist belief assessment*: "Do you think that anyone who works hard could be one of the smartest in the class or that some kids can try and try and never be one of the smartest in the class?" Finally, the experimenter asked the new *self-relevant assessment*: "Would you rather be the kind of kid who works hard to get things right or the kind of kid who gets things right without having to work hard?"

At the end of the session, participants were asked a series of manipulation check questions. In the baseline condition and the low effort praise condition, the questions were identical to those in Studies 1 and 2. In the new performance praise alone condition, they were asked, "What did I say on the phone? When I mentioned the kid who did math problems, did I say that kid got all the questions right or did not get all the questions right?" On the test of story details, 96.7% got all three questions right the first time,

and the children who did not get all of them right the first time got all of them right the second time.

Results and discussion

As in Studies 1 and 2, we conducted a set of binary logistic regression analyses that were both confirmatory (because they tested our hypothesis regarding the baseline and low effort praise conditions) and exploratory (because they allowed us to explore the effect of the new performance praise condition).

Effort-reward assessment

As shown in Figure 1, 70.0% of the children in the low effort praise condition gave the extra sticker to the student who did not have to work hard, as compared to only 26.7% in the baseline condition and 43.3% in the performance praise alone condition.

We conducted a binary logistic regression analysis with condition as the only predictor. The model was significant, χ^2 (2, N = 90) = 11.87, p = .003, −2Log likelihood = 112.50, Nagelkerke R^2 = 0.17, and that the condition effect was also significant (*Wald* = 10.72, *df* = 2, p = .005). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely than those in the baseline condition to give the extra sticker to the student who did not have to work hard (70% vs. 26.7%, β = 1.86, *SE* β = 0.57, *Wald* = 10.50, *df* = 1, p = .001, OR = 6.42, 95% CI = 2.08–19.76). In contrast, there was no significant difference between the performance praise alone condition and the baseline condition (43.3% vs. 26.7%, β = 0.74, *SE* β = 0.55, *Wald* = 1.80, *df* = 1, p = .179, OR = 2.10, 95% CI = 0.71–6.22).

We then conducted a post hoc test, which showed that children in the low effort praise condition were significantly more likely than those in the performance praise alone condition to give the sticker to the student who did not have to work hard (70% vs. 43.3%, β = 1.12, *SE* β = 0.54, *Wald* = 4.23, *df* = 1, p = .040, OR = 3.05, 95% CI = 1.05–8.84).

Effort-intelligence assessment

As shown in Figure 2, 96.7% of the children in the low effort praise condition judged the student who did not have to work hard to be smarter, as compared with only 30% in the baseline condition and 33.3% in the performance praise alone condition.

Following the preregistration for this study, we ran a binary logistic regression analysis. The model was significant, χ^2 (2, N = 90) = 40.76, p < .001, −2Log likelihood = 83.61, Nagelkerke R^2 = 0.49, as was the condition effect (*Wald* = 15.46, *df* = 2, p < .001). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely than those in the baseline condition to judge the student who did not have to work hard to be smarter (96.7% vs. 30%, β = 4.22, *SE* β = 1.09, *Wald* = 14.89, *df* = 1, p < .001, OR = 67.67, 95% CI = 7.95–575.68), but there was no such difference between the performance praise alone condition and the baseline condition (33.3% vs. 30%, β = 0.15, *SE* β = 0.56, *Wald* = 0.08, *df* = 1, p = .781, OR = 1.17, 95% CI = 0.39–3.47).

We then did a post hoc comparison, which showed that children in the low effort praise condition were also significantly more likely than those in the performance praise alone condition to judge the student who did not have to work hard to be smarter (96.7% vs. 33.3%, β = 4.06, *SE* β = 1.09, *Wald* = 13.92, *df* = 1, p < .001, OR = 58, 95% CI = 6.87–489.58).

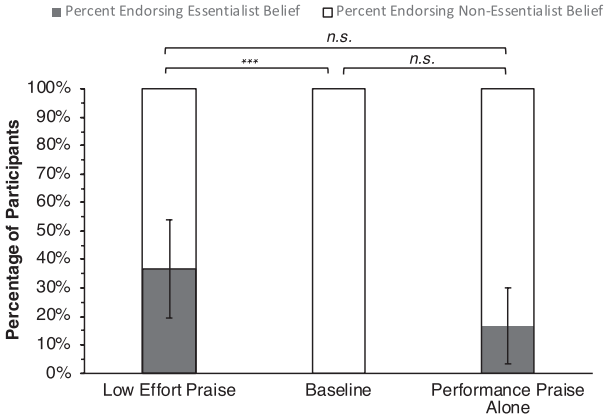

FIGURE 3 Results of the essentialism belief measure, showing the percentage of participants who believed that some children can never be one of the smartest in the class. Error bars: 95% CI. ***Denotes p < .001

Essentialist belief assessment

As shown in Figure 3, 36.7% of the children in the low effort praise condition agreed that some kids can never be one of the smartest in the class no matter how hard they try, as compared to 0% in the baseline condition and 16.7% in the performance praise alone condition.

As specified in our preregistration, because a logistic regression model failed to converge, we ran a chi-squared analysis to test the condition effect, and it revealed that children in the low effort praise condition endorsed an essentialist view of ability more than children in the baseline condition (χ2 [1, N = 60] = 13.47, p < .001). In contrast, responses in the baseline condition did not significantly differ from the performance praise alone condition (χ2 [1, N = 60] = 3.49, p = .062) and there was no significant difference between the performance praise alone condition and the low effort praise condition (χ2 [1, N = 60] = 3.07, p = .080).

Self-relevant assessment

As shown in Figure 4, 73.3% of the children in the low effort praise condition reported that they want to be the kind of kid who gets things right without having to work hard, as compared to 10% in the baseline condition and 20% in the performance praise alone condition.

We conducted a binary logistic regression analysis to examine the condition effect. The model was significant, χ^2 (2, N = 90) = 31.59, p<.001, −2Log likelihood = 84.32, Nagelkerke R^2 = 0.41 as was the condition effect (*Wald* = 24.95, *df* = 2, p<.001). A priori comparisons with the baseline condition as reference showed that children in the low effort praise condition were more likely than those in the baseline condition to report that they would rather succeed without having to work hard (73.3% vs. 10%, β = 3.21, *SE* β = 0.74, *Wald* = 19.04, *df* = 1, p<.001, OR = 24.75, 95% CI = 5.86–104.61), but there was no significant difference between the performance praise alone condition and the baseline condition (20% vs. 10%, β = 0.81, *SE* β = 0.76, *Wald* = 1.14, *df* = 1, p = .286, OR = 2.25, 95% CI = 0.51–9.99).

We then conducted a post hoc comparison, which showed children in the low effort praise condition were also significantly more likely than those in the performance praise alone condition to report that they would rather succeed without having to work hard (73.3% vs. 20%, β = 2.40, *SE* β = 0.62 *Wald* = 15.18, *df* = 1, p<.001, OR = 11, 95% CI = 3.29–36.75).

Taken together, these results replicate the central findings from Studies 1 and 2, that exposure to low effort praise leads children to view peers who exert effort as less worthy of reward and less intelligent. Study 3 also extends these findings by directly showing that exposure to low effort praise can promote essentialist beliefs about ability, and can even affect children's aspirations. Finally, the results of Study 3 suggest that the effects of low effort praise go beyond those of performance praise alone.

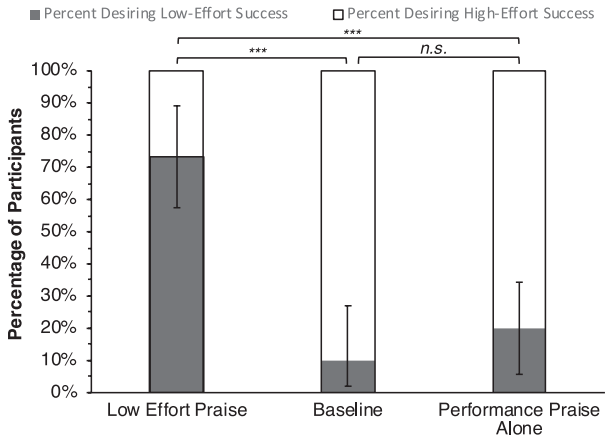

FIGURE 4 Results of the self-relevant assessment, showing the percentage of children who would rather succeed without hard work. Error bars: 95% CI

GENERAL DISCUSSION

To advance our theoretical understanding and provide guidance for intervention it will be important to identify the factors that influence young children's achievement-related beliefs. Previous research has shown that evaluative comments in which children are praised for their own effort or ability constitute one such influence (Cimpian et al., 2007; Gunderson et al., 2013; Mueller & Dweck, 1998; Pomerantz & Kempner, 2013; Zentall & Morris, 2010). In the present research, we investigated how children are influenced by evaluative comments that have no clear self-relevance, in that they are not directed to the child and are not about the child or anyone the child knows. Across three studies, we observed a *low effort praise effect* among 5-year-old children in which children devalue the importance of effort more after overhearing an experimenter express praise for a child for not having to work hard than in a baseline condition with no such evaluative content. This devaluation was observed when children were asked to compare a student who exerted a high level of effort to complete a task to one who exerted a low level of effort to complete the same task: participants in the low effort condition were more likely to reward the student who exerted low effort, and more likely to judge him or her as smarter.

It is noteworthy that in the baseline conditions across all three studies children tended to reward high effort performers more than low effort performers. This suggests that children have a default tendency to view effort favorably or at least recognize it as socially desirable. This finding is in line with Chinese cultural beliefs emphasizing the importance of students cultivating virtues such as diligence and concentration among learners (Li, 2004, 2005). Chinese children are thus likely aware that high effort is socially desirable. Nevertheless, they might secretly admire peers who succeed with little effort, and when they learn that an experimenter feels the same way, they may feel validated in this view or more willing to express it.

Given the Chinese cultural emphasis on cultivating traits related to hard work, it seems surprising that overheard praise for a child who worked hard (i.e., the high effort praise condition) never led children to view effort more favorably, and that in Study 1, children who heard it actually devalued effort more than did children in the baseline condition. One possible explanation we considered was that the high effort praise condition included an overt reference to the successful performance of the child being discussed, which could have elicited concerns about how their performance might be evaluated. In Study 2, we tested this idea by eliminating the overt reference to performance. The result was that children who overheard a child praised for exerting high effort no longer devalued effort more than in a baseline condition, but there was still no evidence that this manipulation led them to value effort

to a greater extent. The fact that in Study 3, children who were only exposed to praise for performance showed similar views of effort as those in the baseline condition further suggests that overt references to performance cannot explain children's response to high effort praise.

It is likely that to account for the effects of both high effort and low effort praise we will need to consider how children draw upon their beliefs and experiences to interpret information that is conveyed by others (Amemiya & Wang, 2018; Qin et al., 2020; see also Harris et al., 2018; Marble & Boseovski, 2020). We propose that overheard conversation is likely to change children's beliefs only in a narrow set of circumstances. For example, it is unlikely to change their beliefs if the information being communicated is already widely assumed to be the predominant belief (e.g., that punching people for no reason is bad) or one that almost everyone would reject (e.g., that punching people for no reason is good). We also propose that overheard conversation can activate certain concepts without stating them directly, just as the statement "girls are as good as boys at math" can activate a preexisting belief that boys are better at math than girls are (Chestnut & Markman, 2018). In the context of the present research, it may well be that because children already know that teachers highly value effort, our manipulation gives them little new information. However, when combined with praise for another child's success, it may activate their preexisting understanding that it is good to be able to perform without having to work hard, by indicating that some adults treat positive outcomes differently when they are achieved with a high versus a low level of effort. These ideas will need to be tested in future research.

The low effort praise effect that we found is consistent with evidence of social learning via overheard conversation that has recently been documented among 4- and 5-year-olds in other domains (Lane et al., 2020; Qin et al., 2020; Sai et al., 2020; Zhao et al., 2020). For example, Qin et al. (2020) found that overhearing an adult praising a peer's generosity led 5-year-old children to show a higher level of generosity, and Lane et al. (2020) found that overhearing an adult make negative comments about a novel social group led 4- to 9-year-old children to develop more negative attitudes about the group. The present findings show that this form of learning can also shape achievement-relevant beliefs in systematic ways.

Our findings also provide evidence that young children can make rich inferences and generalizations in the achievement domain. To demonstrate the observed low effort praise effect, children not only had to attend to information that was not directed at them, but also use the information they had overheard regarding another child's math achievement to inform their judgments of different students on a different task.

Our findings have significant theoretical implications. First, they link social learning theory (Bandura, 1971) to theoretical work positing that evaluative comments about other people dramatically expand the opportunities for social learning beyond what can be experienced or observed directly (Baumeister et al., 2004). Second, they add to our understanding of the types of linguistic cues that promote psychological essentialism (Gelman, 2004). Finally, the results of Study 3 regarding the effect of low effort praise on children's aspirations contribute to theoretical work in social cognitive development on the role of generalizations from others to the self (Meltzoff, 2013).

The present results, along with other evidence regarding drawbacks of exposing children to ability praise (Mueller & Dweck, 1998; Zhao et al., 2017), have practical implications as well. They suggest that praising a child for his or her ability, or for not having to work hard, may lead that child as well as any observers to be more likely to adopt essentialist beliefs, which are linked to maladaptive patterns of motivational response (e.g., Blackwell et al., 2007). It seems reasonable to caution parents and educators that the effects of evaluative comments they make can extend beyond the child they are addressing. These findings also suggest that it is important for researchers who are investigating the effects of evaluative comments to conduct targeted debriefings to address any possible maladaptive beliefs that might be introduced by the experimental manipulations.

Our findings have implications for children's social interactions, achievement motivation, and identity development (Cimpian, 2017; Good & Shaw, 2021). As noted by Oyserman and Dawson (2021), a norm of a succeeding with ease and without effort norm can influence what children find motivating in ways that trigger a chain of events linked to maladaptive motivational patterns. Such a norm may lead students to engage in self-handicapping if they are concerned about how well they will perform (Urdan & Midgley, 2001). Such a norm can also spread among students. For example, it can lead students to downplay their effort in an attempt to appear smarter, which may lead to a peer culture that exacerbates children's performance concerns (see Good & Shaw, 2021). Because the notion of low-effort success is more commonly associated with males than with females, promoting it may make girls especially vulnerable to doubting that they have what it takes to succeed (Bian et al., 2017).

Important questions remain that will need to be addressed in future studies. The present research was conducted in China with children from middle class backgrounds, and it is not clear how the findings will generalize to other populations. It would not be surprising if there are cross-cultural differences in the inferences children make based on the evaluative comments others communicate given that children are likely to use information about cultural norms to inform their inferences about the goals of evaluators (Asaba & Gweon, 2020). There are many specific cultural factors that might have influenced our results. As noted previously, the focus on developing traits like

diligence in Chinese culture may make a difference, but other cultural factors are likely to matter as well. One such factor is the strong emphasis on academic achievement in Chinese culture, with academic achievement having strong implications for social status (Li & Wang, 2004), and learning being viewed as having moral significance (Li, 2005; Ng et al., 2013). Starting in early childhood, Chinese parents tend to convey high expectations for their children's performance, and these expectations have important implications for parent–child interactions (Ng & Wei, 2020). For example, Chinese mothers are more likely than mothers in the United States to adjust the level of warmth they express toward their children based on their academic performance (Ng et al., 2019). Such cultural factors may motivate children to pay close attention to cues about what is valued in this domain (Heyman et al., 2021).

Future research will also be needed to determine the effects of presenting low effort praise in other forms, such as praising participants directly for not having to work hard. Recent studies suggest that this form of praise might have an even stronger effect on children's beliefs than overheard comments (Lane et al., 2020; Li & Koenig, 2020). However, it is possible that the opposite pattern might be seen in some cases, such as when direct communication leads a child to suspect that the speaker has an ulterior motive.

The ability to learn from testimony vastly expands children's opportunities for social learning beyond what is available from direct experience alone (Gelman, 2009; Harris et al., 2018; Skinner et al., 2020). The present research demonstrates the breadth of these learning opportunities by showing that children can make broad and systematic inferences based on overhearing an unfamiliar adult comment on the performance of an unseen child they have never met. These comments influence children's beliefs about exerting effort and what it means to be smart, as well as the kind of person they strive to be, and therefore are likely to shape how they weigh the costs and benefits of exerting the sustained effort that developing academic competence requires.

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DATA AVAILABILITY STATEMENT

The dataset of this study will be published in *Data in Brief*.

ETHICS STATEMENT

This research was approved by the Scientific Research Ethics Committee of Hangzhou Normal University, China (IRB 2019-010).

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REFERENCES

Amemiya, J., & Wang, M. T. (2018). Why effort praise can backfire in adolescence. *Child Development Perspectives*, *12*(3), 199–203. https://doi.org/10.1111/cdep.12284

Asaba, M., & Gweon, H. (2020). Learning about others to learn about the self: Early reasoning about the informativeness of others' praise. In E. Brummelman (Ed.), *Current issues in social psychology: Psychological perspectives on praise* (pp. 67–74). Routledge. https://doi.org/10.4324/9780429327667

Bandura, A. (1971). *Social learning theory*. General Learning Press.

Baumard, N., Mascaro, O., & Chevallier, C. (2012). Preschoolers are able to take merit into account when distributing goods. *Developmental Psychology*, *48*(2), 492–498. https://doi.org/10.1037/a0026598

Baumeister, R. F., Zhang, L., & Vohs, K. D. (2004). Gossip as cultural learning. *Review of General Psychology*, *8*(2), 111–121. https://doi.org/10.1037/1089-2680.8.2.111

Bian, L., Leslie, S. J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, *355*(6323), 389–391. https://doi.org/10.1126/science.aah6524

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246–263. https://doi.org/10.1111/j.1467-8624.2007.00995.x

Chestnut, E. K., & Markman, E. M. (2018). "Girls are as good as boys at math" implies that boys are probably better: A study of expressions of gender equality. *Cognitive Science*, *42*(7), 2229–2249. https://doi.org/10.1111/cogs.12637

Cimpian, A. (2017). Early reasoning about competence is not irrationally optimistic, nor does it stem from inadequate cognitive representations. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (pp. 387–407). Guilford Publications.

Cimpian, A., Arce, H. M. C., Markman, E. M., & Dweck, C. S. (2007). Subtle linguistic cues affect children's motivation. *Psychological Science*, *18*(4), 314–316. https://doi.org/10.1111/j.1467-9280.2007.01896.x

Dunlea, J. P., & Heiphetz, L. (2021). Language shapes children's attitudes: Consequences of internal, behavioral, and societal information in punitive and nonpunitive contexts. *Journal of Experimental Psychology: General*, *151*, 1233–1251. https://doi.org/10.1037/xge0001127

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.
Gelman, S. A. (2004). Psychological essentialism in children. *Trends in Cognitive Sciences*, *8*(9), 404–409. https://doi.org/10.1016/j.tics.2004.07.001
Gelman, S. A. (2009). Learning from others: Children's construction of concepts. *Annual Review of Psychology*, *60*, 115–140. https://doi.org/10.1146/annurev.psych.59.103006.093659
Gelman, S. A., & Heyman, G. D. (1999). Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. *Psychological Science*, *10*(6), 489–493. https://doi.org/10.1111/1467-9280.00194
Gelman, S. A., Ware, E. A., & Kleinberg, F. (2010). Effects of generic language on category content and structure. *Cognitive Psychology*, *61*(3), 273–301. https://doi.org/10.1016/j.cogpsych.2010.06.001
Good, K., & Shaw, A. (2021). Achieving a good impression: Reputation management and performance goals. *Wiley Interdisciplinary Reviews: Cognitive Science*, *12*(4), e1552. https://doi.org/10.1002/wcs.1552
Gunderson, E. A., Gripshover, S. J., Romero, C., Dweck, C. S., Goldin-Meadow, S., & Levine, S. C. (2013). Parent praise to 1- to 3-year-olds predicts children's motivational frameworks 5 years later. *Child Development*, *84*(5), 1526–1541. https://doi.org/10.1111/cdev.12064
Harris, P. L., Koenig, M. A., Corriveau, K. H., & Jaswal, V. K. (2018). Cognitive foundations of learning from testimony. *Annual Review of Psychology*, *69*(1), 251–273. https://doi.org/10.1146/annurev-psych-122216-011710
Heyman, G. D., Compton, A. M., Amemiya, J., Ahn, S., & Shao, S. (2021). Children's reputation management: Learning to identify what is socially valued and acting upon it. *Current Directions in Psychological Science*, *30*(4), 315–320. https://doi.org/10.1177/09637214211009516
Heyman, G. D., & Compton, B. J. (2006). Context sensitivity in children's reasoning about ability across the elementary school years. *Developmental Science*, *9*(6), 616–627. https://doi.org/10.1111/j.1467-7687.2006.00540.x
Heyman, G. D., Gee, C. L., & Giles, J. W. (2003). Preschool children's reasoning about ability. *Child Development*, *74*(2), 516–534. https://doi.org/10.1111/1467-8624.7402013
Lane, J. D., Conder, E. B., & Rottman, J. (2020). The influence of direct and overheard messages on children's attitudes toward novel social groups. *Child Development*, *91*(3), 829–845. https://doi.org/10.1111/cdev.13238
Li, J. (2004). "I learn and I grow big": Chinese preschoolers' purposes for learning. *International Journal of Behavioral Development*, *28*(2), 116–128. https://doi.org/10.1080/01650250344000325
Li, J. (2005). Mind or virtue: Western and Chinese beliefs about learning. *Current Directions in Psychological Science*, *14*(4), 190–194. https://doi.org/10.1111/j.0963-7214.2005.00362.x
Li, J., & Wang, Q. (2004). Perceptions of achievement and achieving peers in US and Chinese kindergartners. *Social Development*, *13*(3), 413–436. https://doi.org/10.1111/j.1467-9507.2004.00275.x
Li, P. H., & Koenig, M. A. (2020). Children's evaluations of informants and their surprising claims in direct and overheard contexts. *Journal of Cognition and Development*, *21*(3), 425–446. https://doi.org/10.1080/15248372.2020.1745208
Ma, F., Heyman, G. D., Jing, C., Fu, Y., Compton, B. J., Xu, F., & Lee, K. (2018). Promoting honesty in young children through observational learning. *Journal of Experimental Child Psychology*, *167*, 234–245. https://doi.org/10.1016/j.jecp.2017.11.003
Marble, K. E., & Boseovski, J. J. (2020). Content counts: A trait and moral reasoning framework for children's selective social learning. *Advances in Child Development and Behavior*, *58*, 95–136. https://doi.org/10.1016/bs.acdb.2020.01.004
Meltzoff, A. N. (2013). Origins of social cognition: Bidirectional self-other mapping and the "like-me" hypothesis. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 139–144). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199890712.003.0025
Miller, P. J., Fung, H., Lin, S., Chen, E. C.-H., & Boldt, B. R. (2012). How socialization happens on the ground: Narrative practices as alternate socializing pathways in Taiwanese and European-American families. *Monographs of the Society for Research in Child Development*, *77*(1), 1–140. https://www.jstor.org/stable/41408750
Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, *75*(1), 33–52. https://doi.org/10.1037/0022-3514.75.1.33
Muenks, K., Wigfield, A., & Eccles, J. S. (2018). I can do this! The development and calibration of children's expectations for success and competence beliefs. *Developmental Review*, *48*, 24–39. https://doi.org/10.1016/j.dr.2018.04.001
Muradoglu, M., & Cimpian, A. (2020). Children's intuitive theories of academic performance. *Child Development*, *91*(4), e902–e918. https://doi.org/10.1111/cdev.13325
Ng, F. F. Y., Pomerantz, E. M., & Lam, S. F. (2013). Mothers' beliefs about children's learning in Hong Kong and the United States: Implications for mothers' child-based worth. *International Journal of Behavioral Development*, *37*(5), 387–394. https://doi.org/10.1177/0165025413483393
Ng, F. F. Y., Pomerantz, E. M., Lam, S. F., & Deng, C. (2019). The role of mothers' child-based worth in their affective responses to children's performance. *Child Development*, *90*(1), e165–e181. https://doi.org/10.1111/cdev.12881
Ng, F. F. Y., & Wei, J. (2020). Delving into the minds of Chinese parents: What beliefs motivate their learning-related practices? *Child Development Perspectives*, *14*(1), 61–67. https://doi.org/10.1111/cdep.12358
Nicholls, J. G., & Miller, A. T. (1984). Reasoning about the ability of self and others: A developmental study. *Child Development*, *55*(6), 1990–1999. https://doi.org/10.2307/1129774
Oyserman, D., & Dawson, A. (2021). Successful learning environments support and harness students' identity-based motivation: A primer. *The Journal of Experimental Education*, *89*(3), 508–522. https://doi.org/10.1080/00220973.2021.1873091
Pomerantz, E. M., & Kempner, S. G. (2013). Mothers' daily person and process praise: Implications for children's theory of intelligence and motivation. *Developmental Psychology*, *49*(11), 2040–2046. https://doi.org/10.1037/a0031840
Qin, W., Zhao, L., Compton, B. J., Zheng, Y., Mao, H., Zheng, J., & Heyman, G. D. (2020). Overheard conversations can influence children's generosity. *Developmental Science*, *24*(5), e13068. https://doi.org/10.1111/desc.13068
Rattan, A., Good, C., & Dweck, C. S. (2012). "It's ok—Not everyone can be good at math": Instructors with an entity theory comfort (and demotivate) students. *Journal of Experimental Social Psychology*, *48*(3), 731–737. https://doi.org/10.1016/j.jesp.2011.12.012
Rhodes, M., Leslie, S. J., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proceedings of the National Academy of Sciences of the United States of America*, *109*(34), 13526–13531. https://doi.org/10.1073/pnas.1208951109
Robins, R. W., & Pals, J. L. (2002). Implicit self-theories in the academic domain: Implications for goal orientation, attributions, affect, and self-esteem change. *Self and Identity*, *1*(4), 313–336. https://doi.org/10.1080/15298860290106805
Sai, L., Liu, X., Li, H., Compton, B. J., & Heyman, G. D. (2020). Promoting honesty through overheard conversations. *Developmental Psychology*, *56*(6), 1073–1079. https://doi.org/10.1037/dev0000933
Skinner, A. L., Olson, K. R., & Meltzoff, A. N. (2020). Acquiring group bias: Observing other people's nonverbal signals can create

social group biases. *Journal of Personality and Social Psychology*, *119*(4), 824–838. https://doi.org/10.1037/pspi0000218

Sperber, D., & Wilson, D. (1987). Précis of relevance: Communication and cognition. *Behavioral and Brain Sciences*, *10*(4), 697–710. https://doi.org/10.1017/S0140525X00055345

Sperry, D. E., Sperry, L. L., & Miller, P. J. (2019). Language does matter: But there is more to language than vocabulary and directed speech. *Child Development*, *90*(3), 993–997. https://doi.org/10.1111/cdev.13125

Urdan, T., & Midgley, C. (2001). Academic self-handicapping: What we know, what more there is to learn. *Educational Psychology Review*, *13*(2), 115–138. https://doi.org/10.1023/A:1009061303214

Zentall, S. R., & Morris, B. J. (2010). "Good job, you're so smart": The effects of inconsistency of praise type on young children's motivation. *Journal of Experimental Child Psychology*, *107*(2), 155–163. https://doi.org/10.1016/j.jecp.2010.04.015

Zhao, L., Chen, L., Sun, W., Compton, B. J., Lee, K., & Heyman, G. D. (2020). Young children are more likely to cheat after overhearing that a classmate is smart. *Developmental Science*, *23*(5), e12930. https://doi.org/10.1111/desc.12930

Zhao, L., Heyman, G. D., Chen, L., & Lee, K. (2017). Praising young children for being smart promotes cheating. *Psychological Science*, *28*(12), 1868–1870. https://doi.org/10.1177/0956797617721529

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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