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EMPIRICAL REPORT

Messaging about descriptive and injunctive norms can promote honesty in young children

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Abstract

This research examined the effectiveness of using norms to promote honesty. Participants were Han Chinese children ($N = 568$, 50.4% male, 3.24 to 6.00 years, collected 2020–2022). Relative to children in a control condition, children in Study 1 were more likely to confess to having cheated in a game after being presented with a descriptive norm indicating that confessions are typical, or an injunctive norm indicating that most other children approve of confessing. Study 2 showed that this finding was not due to a methodological artifact, and Study 3 replicated the effect in a context in which the norm information was conveyed by someone other than the experimenter. The findings suggest that messages about social norms can influence children's honesty.

Dishonest behavior can undermine the interpersonal and institutional trust that is critical for healthy relationships and well-functioning societies. In the present research, we test a new approach to promote honesty in young children that is grounded in theoretical and empirical work on social norms (Cialdini & Trost, 1998; McAuliffe et al., 2017). In doing so we examine the effects of both descriptive norms, which convey information about what people typically do, and injunctive norms, which convey information about what people should do.

Most of the research examining the effects of norms has been done with adults, and it shows that descriptive norm interventions can affect a wide range of behaviors (Bicchieri & Xiao, 2009; Goldstein et al., 2008; Morrongiello et al., 2013; Reno et al., 1993; Terrier &

Marfaing, 2015). For example, it is possible to promote generosity in a dictator game context by communicating that most people engage in generous behavior (Bicchieri & Xiao, 2009). In addition, messages that suggest most people engage in proenvironmental behavior can promote behaviors such as the reuse of towels at hotels (Goldstein et al., 2008; Terrier & Marfaing, 2015). Research on injunctive norms suggests that these norms also have the potential to influence behavior (Bicchieri et al., 2021), but the observed effects have been variable, ranging from no effect (Bicchieri & Xiao, 2009) to being more influential than descriptive norms (Raihani & McAuliffe, 2014).

A small number of studies have found that social norms also can impact behavior in children. One area

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in which this influence has been documented is reference to prosocial behavior. McAuliffe et al. (2017) found that both injunctive and descriptive norms influenced the generosity of 4- to 9-year-old children in a dictator game, and that the effects of the two types of norms were similar in magnitude. In addition, House and Tomasello (2018) found an age-related increase in the extent to which 6- to 11-year-old children's generosity was influenced by statements an adult made about what is normative, and that injunctive norms were more influential than descriptive norms. Social norm information can also affect children's dietary behavior: Sharps and Robinson (2016) tested 6- to 11-year-olds and found that descriptive norm messages indicating that other children eat a lot of fruits and vegetables led to increased fruit and vegetable consumption, as compared to a baseline condition.

The present research builds on prior work on the effects of descriptive and injunctive norms by examining their influence on young children's truth-telling. We tested 3- and 5-year-olds because it is around this age that these effects are likely to first emerge. We thought there was some possibility that sensitivity to norms might begin by age 3, in light of evidence that children of this age understand certain norms that structure social interactions (Schmidt & Tomasello, 2012; Schmidt et al., 2016). For example, Rakoczy et al. (2008) found that 3-year-olds often respond to violations of the rules of a game by proclaiming what should be done instead. We were also interested in whether there would be any age-related change. Although some manipulations have been found to influence the honesty of 5-year-olds but not 3-year-olds (Fu et al., 2016; Zhao et al., 2019), other manipulations have been effective with 3-year-olds (e.g., Ding et al., 2015).

We used a variation of the temptation resistance paradigm to investigate children's honesty (e.g., Lewis et al., 1989; Polak & Harris, 1999; Talwar & Lee, 2002). This paradigm involves a guessing game in which children are tempted to violate the rules of a game by peeking at a target object while the experimenter is away. In our version, the experimenter placed a toy behind the child on each trial and instructed him or her to guess the object's identity based on its sound alone, without peeking at it. For example, on one trial in which the target object was a toy dog, children heard barking. On the final trial, the sound of the target object was not informative, so the child could correctly respond only by peeking, an option the experimenter facilitated by stepping out of the room to take a phone call. After the experimenter returned, she asked the child whether he or she had peeked at the toy, and this response served as the dependent variable. While the experimenter was away, children's actual behavior was recorded by a hidden camera.

The experimenter presented the norm-related messaging manipulation after the child had already decided whether to peek, but before the experimenter asked the

child whether he or she had peeked. Specifically, participants in the *descriptive norm* condition were told that most children confess to peeking, and participants in the *injunctive norm* condition were told that most children think children who peek should confess. There was also a *control* condition in which participants were told that most children think the game is fun.

STUDY 1

Method

Participants

A total of 164 three-year-olds and 175 five-year-olds in the Han nationality were recruited from preschools in an eastern city of China. Participants were randomly assigned to the descriptive norm condition (56 three-year-olds; $M_{\text{age}} = 3.66$ years, $SD = .22$, range = 3.24 to 3.99, 28 boys; 59 five-year-olds; $M_{\text{age}} = 5.59$ years, $SD = .27$, range = 5.01 to 6.00, 30 boys), the injunctive norm condition (57 three-year-olds; $M_{\text{age}} = 3.64$ years, $SD = .21$, range = 3.26 to 4.00, 32 boys; 58 five-year-olds; $M_{\text{age}} = 5.51$ years, $SD = .30$, range = 5.00 to 5.97, 29 boys) or the control condition (51 three-year-olds; $M_{\text{age}} = 3.65$ years, $SD = .22$, range = 3.26 to 4.00, 29 boys; 58 five-year-olds; $M_{\text{age}} = 5.65$ years, $SD = .23$, range = 5.01 to 5.94, 25 boys). The sample size was determined by a prior power analysis using G*Power 3.1 with Power ($1 - \beta$) set at .8 and $\alpha = .05$, which showed that to detect a significant condition effect in a binary logistic regression, 300 children who peeked would be required (50 children in each combination age by condition). Because the study design was based on responses of children who peeked, within each condition in each study we stopped recruiting participants as soon as there were exactly 50 children who peeked. Data collection took place between July 2020 and December 2020. Informed consent was obtained from parents or legal guardians, and children also provided verbal assent before participating. All the studies were approved by the university ethics review board.

Procedure

Children were tested individually in a quiet room at their school by a female experimenter. The experimenter began the session by explaining to the child that he or she will play a game that involves guessing the identity of toys based on their sound alone. The children were told that they will get a prize if they make three correct guesses. The child sat in a chair, and on each trial, the experimenter placed a toy behind the child and then triggered a sound. Children were able to successfully guess the first two toys because the sound strongly hinted at the toy's identity. However, the toy

used in the third trial produced music, so children were not able to guess the toy's identity based on the sound alone. Before the third trial began, the experimenter said that she needed to leave the room for 1 min and would continue the game after she came back. She told the child not to turn around to look at the toy while she was gone.

After 1 min the experimenter returned to the room and made the statement that served as the basis of experimental manipulation. Note that the manipulation took place after children had already decided whether to peek, which means that it could not have affected the actual peeking rates across the conditions. In the descriptive norm condition, the experimenter said, "I played this game with other children earlier. Some of the children peeked when I left, and most of the children who peeked confessed to me." In the injunctive norm condition she said, "I played this game with other children earlier, and some of the children peeked when I left. Most of the children think that children who peek should confess to me." In the control condition she said, "I played this game with other children earlier. Most of them think this game is fun."

The experimenter then asked the question that served as the primary dependent measure: "Did you turn around to look at the toy while I was gone?" After the child responded, the experimenter asked, "What do you think the toy is?" and "Why do you think that?" The number of children in each condition who peeked and then confessed to peeking served as the dependent measure.

Results

Preliminary analyses showed that there was no significant effect of gender, and no gender by condition interaction, so all reported analyses were collapsed across gender. Peeking rates were 87.0% in the descriptive norm condition, 87.0% in the injunctive norm

condition, and 91.7% in the control condition. Because the experimental manipulation took place after children had decided whether to peek, we did not expect condition differences, and that is what we found: an exploratory logistic regression showed that peeking rates did not differ significantly across conditions, $\chi^2(1) = 1.24$, Nagelkerke $R^2 = .00$, $p = .265$. Separate analyses by age verified that there were no significant condition differences in peeking rates for either age group: for 3-year-olds, $\chi^2(1) = 3.73$, Nagelkerke $R^2 = .05$, $p = .053$, and for 5-year-olds, $\chi^2(1) = 0.00$, Nagelkerke $R^2 = .00$, $p = 1$. Of the children who did not peek, none falsely confessed.

Of primary theoretical interest was whether confession rate, defined as the percent of peekers who confessed, would differ across conditions. We thus excluded all non-peekers from these analyses. This resulted in analyses based on 50 three-year-olds and 50 five-year-olds in the descriptive norm condition (the excluded non-peekers were six 3-year-olds and nine 5-year-olds), 50 three-year-olds and 50 five-year-olds in the injunctive norm condition (the excluded non-peekers were seven 3-year-olds and eight 5-year-olds), and 50 three-year-olds and 50 five-year-olds peekers in the control condition (the excluded non-peekers were one 3-year-old and eight 5-year-olds). Figure 1 shows the confession rates for each age group by condition.

A confirmatory logistic regression analysis was conducted with confession behavior as the predicted variable (0 = lie-teller, 1 = truth-teller), condition (0 = control condition, 1 = descriptive norm condition, 2 = injunctive norm condition), and age (3-year-old, 5-year-old) as the predictors, and the control condition as the reference group. The model was significant, $\chi^2(3) = 14.34$, Nagelkerke $R^2 = .07$, $p = .002$, with more children confessing to peeking in the descriptive norm condition than in the control condition, $B = 0.98$, $SE = .35$, Wald (1) = 7.74, $p = .008$, odds ratio = 2.67, 95% CI [1.34, 5.33] and more children confessing to peeking in the injunctive norm condition than in the control

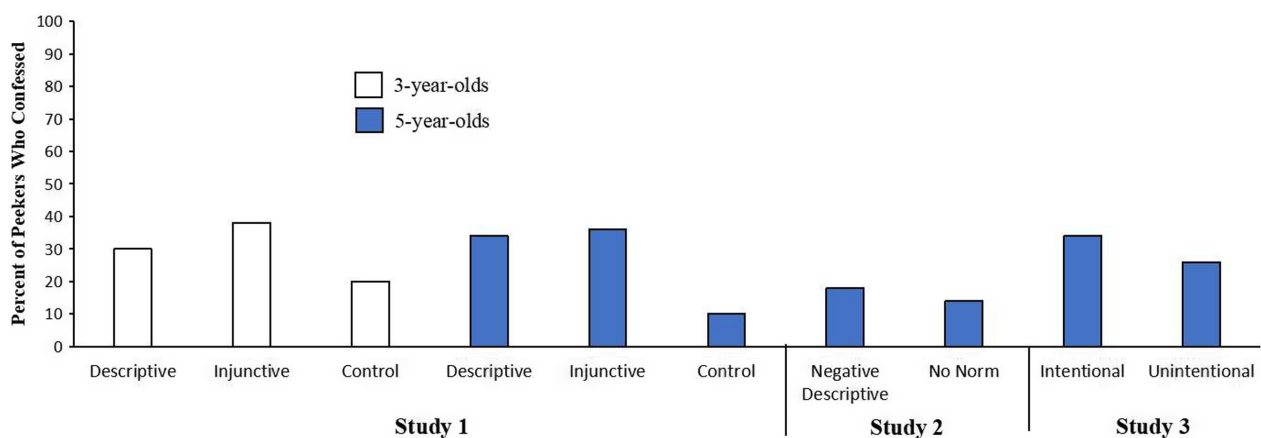


FIGURE 1 Confession rates for peekers in all studies, by age and condition



condition, $B = 1.20$, $SE = .35$, Wald (1) = 11.93, $p = .001$, odds ratio = 3.33, 95% CI [1.68, 6.60]. There was no significant difference in the confession rate between the descriptive norm condition and the injunctive norm condition, $B = -0.14$, $SE = .26$, Wald (1) = 0.28, $p = .599$, odds ratio = 0.80, 95% CI [0.45, 1.44]. Age was not a significant predictor, $B = -0.14$, $SE = .26$, Wald (1) = 0.28, $p = .599$, odds ratio = 0.87, 95% CI [0.52, 1.46]. The interaction between condition and age was also not significant, Wald (2) = 1.88, $p = .390$. False discovery rate adjustments were used to correct p values for multiple comparisons in all of the studies that are reported in this paper.

Discussion

The results indicate that providing information about either descriptive norms or injunctive norms can influence children's honesty. Specifically, among the children who peeked, those who heard the message that confessing is common or something that most people think should be done showed elevated confession rates. The effects were comparable for the different types of norms, and were similar for 3-year-olds and 5-year-olds. It should also be noted that, like Talwar and Lee (2008) and Polak and Harris (1999), we did not observe the increase in lying after age 3 that some researchers have found (e.g., Sodian, 1991; Talwar & Lee, 2002).

STUDY 2

We interpret the effects of the norm information manipulation in Study 1 as indicating that both types of norms can affect children's decisions about whether to tell the truth. However, there is another difference between the norm conditions and the control condition that could have affected the results. Specifically, children were told, "I played this game with other children earlier, and some of them peeked when I left," and it is possible that this statement made some of them wonder whether the act of turning around to peek at the toy could somehow be detected. If so, they might have been more likely to confess to peeking because they wanted to avoid compounding their transgression by getting caught lying about it. In Study 2, we evaluated this alternative explanation by introducing a new control condition in which peeking was mentioned, but without providing any norm information. In addition, we sought to examine whether any reference to a descriptive norm might have the same effect, so we also included a condition in which a norm was mentioned, but confessing to peeking was described as uncommon. We expected that this manipulation would not lead to the elevated confession rates that were observed in the descriptive norm condition in Study 1.

Method

Participants

A total of 119 five-year-olds in the Han nationality were recruited from a preschool in an eastern city of China ($M_{\text{age}} = 5.49$ years, $SD = .30$, range = 5.01 to 5.99 years, 55 boys). Participants were randomly assigned to either a *no norm* control condition (52 five-year-olds, $M_{\text{age}} = 5.43$ years, $SD = .30$, range = 5.02 to 5.99 years, 27 boys) or a *negative descriptive norm* condition (67 five-year-olds, $M_{\text{age}} = 5.54$ years, $SD = .30$, range = 5.01 to 5.99 years, 28 boys). The sample size was based on a power analysis of the data from Study 1, and from peeking rates that have been reported in previous research (Sai et al., 2020). Data collection took place between April 2021 and September 2021.

Procedure

The procedure was the same as in Study 1 except for the statement the experimenter made when she returned to the room. For children in the no norm control condition she said, "I played this game with other children earlier, and some of the children peeked when I left" and for children in the negative descriptive norm condition she said, "I played this game with other children earlier, some of the children peeked when I left, but few of the children who peeked confessed to me."

Results

Preliminary analyses showed that there was no significant effect of gender and no gender by condition interaction, so gender was not included as a variable in the subsequent analyses. Peeking rates were 74.6% in the negative descriptive norm condition and 96.2% in the no norm condition. Exploratory logistic regression analyses of these peeking rates and those in Study 1 showed no significant difference across conditions, $\chi^2(1) = 0.16$, Nagelkerke $R^2 = .00$, $p = .689$. There were no false confessions.

As in Study 1, confession rates were defined as the percent of peekers who confessed, with non-peekers excluded from these analyses. This resulted in analyses based on 50 peekers in the negative descriptive norm condition (with 17 non-peekers excluded), 50 peekers in the no norm condition (with two non-peekers excluded). The confession rate for 5-year-old children who peeked was 18.0% in the negative descriptive norm condition and 14.0% in the no norm condition, which are similar to the confession rate of 10.0% that was seen in the control condition of Study 1, but different from the confession rate of 34.0% in the descriptive norm condition and 36.0% in the injunctive norm condition of Study 1 (see Figure 1).

To compare these confession rates, we conducted a confirmatory logistic regression analysis with children's confession behavior as the predicted variable (0 = lie-teller, 1 = truth-teller) and condition (0 = control condition in Study 1, 1 = descriptive norm condition in Study 1, 2 = injunctive norm condition in Study 1, 3 = negative descriptive norm condition, 4 = no norm control condition) as the predictors. The model was significant, $\chi^2(4) = 16.37$, Nagelkerke $R^2 = .10$, $p = .003$. Specifically, the negative descriptive norm condition and the no norm condition were statistically indistinguishable from the Study 1 control condition, $B = 0.68$, $SE = .60$, Wald (1) = 1.30, $p = .255$, odds ratio = 1.98, 95% CI [0.61, 6.38]; $B = 0.38$, $SE = .62$, Wald (1) = 0.38, $p = .540$, odds ratio = 1.47, 95% CI [0.43, 4.97].

In addition to our planned analyses, we also did an exploratory logistic regression analysis to examine whether confession rate in the two conditions of Study 2 differed from the norm conditions of Study 1. Confession rates in the no norm condition were significantly lower than in descriptive norm condition of Study 1, $B = 1.15$, $SE = .51$, Wald (1) = 5.20, $p = .031$, odds ratio = 3.17, 95% CI [1.18, 8.52], and confession rates in both conditions in Study 2 were lower than in injunctive norm condition of Study 1, $B = 0.94$, $SE = .47$, Wald (1) = 3.98, $p = .046$, odds ratio = 0.05, 95% CI [1.02, 6.46]; $B = 1.24$, $SE = .50$, Wald (1) = 6.08, $p = .014$, odds ratio = 3.46, 95% CI [1.29, 9.26].

Discussion

In Study 2, we found that the confession rate did not increase when the messaging manipulation made no reference to confessing and involved simply telling participants that some children had peeked. This finding helps to rule out the possibility that the messaging effects that were observed in Study 1 were caused by children in the norm conditions becoming suspicious that the experimenter had the ability to detect acts of peeking. We also found that telling participants it is rare for children to confess to peeking did not produce a significant increase in the confession rate, which suggests that children do not treat all descriptive norm information as equivalent.

STUDY 3

Study 3 was designed to further investigate the nature of the descriptive norm messaging effect. The primary question addressed was whether it is necessary for the same individual to provide the norm-related message and administer the test. This may be the case if children only use the norm information to make inferences about the desires of the specific individual conveying the information (see Heyman et al., 2021). We were also interested

in examining the possibility that the descriptive norm messaging would be effective only if it seemed to be an act of intentional communication (Schwarz, *in press*).

To address these questions, rather than the experimenter providing the norm-related message directly, it was conveyed by an unfamiliar female research assistant in a pre-recorded video. In one condition, the experimenter appeared to intentionally share the norm-related message, and in another condition, she portrayed herself as uninterested in the video and unaware of its content.

Method

Participants

Following the preregistration for this study (https://aspredicted.org/DC9_B7B), a total of 110 five-year-olds in the Han nationality were recruited from a preschool in an eastern city of China ($M_{\text{age}} = 5.65$ years, $SD = .25$, range = 5.20 to 5.99 years, 62 boys). Participants were randomly assigned to either an *intentional* condition (54 five-year-olds, $M_{\text{age}} = 5.70$ years, $SD = .21$, range = 5.24 to 5.99 years, 28 boys) or an *unintentional* condition (56 five-year-olds, $M_{\text{age}} = 5.61$ years, $SD = .28$, range = 5.20 to 5.98 years, 34 boys). The sample size was based on a power analysis of the data from Study 1, and from peeking rates that have been reported in previous research (Sai et al., 2020). Data collection took place between March 10, 2022 and March 20, 2022.

Procedure

The procedure was the same as the descriptive norm condition in Study 1 except that the descriptive norm messaging was presented by video. For children in both conditions, the experimenter explained that they were going to watch a video. In the intentional condition, the child watched the video along with the experimenter. In contrast, in the unintentional condition, the child watched the video alone after the experimenter stated that she did not know what was on the video. In this condition, as the video played the experimenter sat away from the child, did not look at him or her, and pretended to be absorbed in her work.

Results

Because preliminary analyses showed that there were no significant effects of gender and no gender by condition interaction, all subsequent analyses were collapsed across gender. The peeking rate was 92.6% in the intentional condition and 89.3% in the unintentional condition. An exploratory logistic regression showed no significant difference between conditions



in the peeking rate, $\chi^2(1) = 1.90$, Nagelkerke $R^2 = .028$, $p = .168$. As in the other two studies, no children falsely confessed.

There were 50 peekers in the intentional condition (after four non-peekers were excluded), and 50 peekers in the unintentional condition (after six non-peekers were excluded). The confession rate among the peekers was 34.0% in intentional condition and 26.0% in unintentional condition, which is greater the confession rate of 14.0% that was seen in the no norm condition of Study 2. To compare these confession rates, we conducted a confirmatory logistic regression analysis with children's confession behavior as the predicted variable (0 = lie-teller, 1 = truth-teller), condition (0 = no norm condition in study 2, 1 = intentional, 2 = unintentional) as the predictor, and the no norm condition of Study 2 as the reference group (as was specified in our preregistration). The model was marginally significant, $\chi^2(2) = 5.69$, Nagelkerke $R^2 = .055$, $p = .058$. Specifically, the confession rate in the intentional condition was significantly higher than in the no norm condition of Study 2. $B = 1.15$, $SE = .51$, Wald (1) = 5.20, $p = .023$, odds ratio = 3.17, 95% CI [1.18, 8.52], and the confession rate in the unintentional condition was similar to that of the no norm condition of Study 2. $B = 0.77$, $SE = .52$, Wald (1) = 2.19, $p = .139$, odds ratio = 2.16, 95% CI [0.78, 5.98]. The intentional condition and unintentional condition were not significantly different from each other, $B = 0.38$, $SE = .44$, Wald (1) = 0.76, $p = .384$, odds ratio = 1.47, 95% CI [0.62, 3.47].

Discussion

The results from the intentional condition in Study 3 suggest that children can go beyond person-specific inferences as they interpret messaging about norms. The findings also suggest that the intentionality of the message matters, given that the manipulation effect was only significant in the intention condition. However, further investigation will be needed to confirm this finding, given that there was no significant difference between the intentional and unintentional conditions.

GENERAL DISCUSSION

The current research examined the role of descriptive and injunctive norms in promoting honesty in preschool-age children. Study 1 showed that children as young as 3 years of age show greater honesty after being told that most other children are honest in the dilemma they faced, or that most children think people should be honest in this context. Study 2 confirmed that these results are best explained by the specific type of social norm information that was conveyed, and Study 3 showed that the influence of the norm messaging went beyond interactions with the individual who conveyed it.

Our findings regarding descriptive norms build upon prior work showing that children frequently adjust their own social behavior after observing their peers' behavior (Bandura, 1977; Blake et al., 2016; Corriveau & Harris, 2010; Haun & Tomasello, 2011; Walker & Andrade, 1996), and that this type of observational learning can have an impact on honesty in particular (Engarhos et al., 2019; Ma et al., 2017). The present work extends these findings by showing that messages about how most children behave can also increase children's honesty.

Our findings regarding the effectiveness of injunctive norms build upon prior work showing that children frequently adjust their social behavior based on moral evaluations made by others (Qin et al., 2021; Sai et al., 2020). For example, Sai et al. (2020) found that 5-year-olds were more likely to make an honest confession after hearing an experimenter describe another child who confessed as a "good and honest kid." The present work suggests that children are responsive to being told that most children think confessing is what should be done in these circumstances.

We found that descriptive norms and injunctive norms had a similar degree of effectiveness in promoting honesty, which is consistent with the results McAuliffe et al. (2017), who found that descriptive and injunctive norms were about equally effective in promoting generosity among 4- to 9-year-olds. Taken together, these findings suggest that the two types of norms have similar effects regardless of whether the injunctive norm takes the form of an experimenter telling the child what should be done (as in the McAuliffe et al. study) or hearing what their peers think should be done (as in the present research). It is possible that descriptive and injunctive norms have similar effects because children have difficulty distinguishing between them (McAuliffe et al., 2017). This possibility is in line with theoretical work and empirical findings suggesting that young children often show descriptive-to-prescriptive tendencies in which they treat what people tend to do as equivalent to what people should do (Roberts et al., 2017, 2019; Tworek & Cimpian, 2016). However, further research will be needed on this topic, in light of evidence from House and Tomasello (2018) that injunctive norms can be more influential than descriptive norms.

It is possible that children's sensitivity to messaging about descriptive and injunctive norms can help to explain other manipulations that have been shown to impact honesty, such as eliciting promises (Evans & Lee, 2010; Heyman et al., 2015; Kanngiesser et al., 2021; Lyon & Dorado, 2008; Lyon et al., 2008; Talwar et al., 2002, 2004) and telling children moral stories (Lee et al., 2014; Talwar et al., 2016, 2017). For example, perhaps the promise manipulation is effective because a promise carries an obligation to keep one's word, which can be understood in terms of its implications for what should be done (Kanngiesser et al., 2017).

Questions remain about the reason for the normative messaging effects that we observed. Study 3 helped to narrow down some of the possibilities by showing that descriptive normative messaging can be effective even when it is conveyed by someone the participant has never interacted with before. The findings of Study 3 also suggest that norm messaging may be more effective when it appears to be conveyed intentionally. However, we want to note that the unintentional and intentional conditions also differed in terms of whether participants were likely to believe they and the experimenter had a shared understanding of the norm, and this could have affected the results. In addition, all of the norm effects that we observed involved situations in which an authority figure was aware of the norm, and this raises questions about how the findings will generalize to other contexts, such as when only a peer is aware of the norm.

Another open question concerns the role of emotions such as guilt and fear of disapproval in relation to messaging about norms (Kochanska et al., 2002; Zaleski & Aloise-Young, 2013). In addition, it remains unclear whether the messaging effects that were seen in the present research stem from children's attempts to bring what they think and do into alignment with their peers. In its simplest form, this possibility would lead to the prediction that finding out peekers only rarely confess would lead to a decrease in the confession rate, but we saw no evidence of this. One possible reason is that the baseline confession rate was too low to provide a good test of this possibility. However, it is also possible that the effects of norm-related messaging about a behavior being rare does not impact behavior given that the effects of such messaging are likely to depend on the prior beliefs and attitudes of recipients.

It is possible that the norm messaging influenced children's values. For example, being told that most peekers confess might lead children to conclude that confessing is probably the right thing to do. Alternatively, the norm messaging might have shifted their beliefs about the likelihood of being punished or being negatively judged by others (Alempaki et al., 2021; Williams et al., 2013). The results of Study 2 help to rule a simple version of the latter possibility by showing that the effects of honesty depend on the content of the norm information that is being conveyed. Thus, at the very minimum, if young children were using the messaging to inform their ideas about the likely consequences of their behavior, they needed to engage in a sophisticated set of nonobvious inferences about what the messages imply about the likely consequences.

Future research will be needed to examine how long the effects of messaging about norms will persist. In addition, it will be important to examine whether these effects show any cultural differences, such as those relating to beliefs about conformity (Wen et al., 2019).

Future research will be needed to examine how our findings extend to other contexts, especially given

evidence that children's judgments and behavior often show context sensitivity in this domain (Fu et al., 2008; Heyman et al., 2020; Sierksma et al., 2019; Warneken & Orlins, 2015; Williams et al., 2013). For example, Williams et al. (2013) found that 6- to 9-year-olds were more likely to lie to hide their peeking behavior in the temptation resistance paradigm when interacting with unfamiliar adults than when interacting with their parents. In the present research, children were always interacting with an unfamiliar adult whom they likely viewed as an authority figure, and perhaps the messaging would not be treated as seriously if it came from a peer. It may also matter that children are likely to be uncertain about how unfamiliar adults will respond to them if they confess (Williams et al., 2013).

More research will be needed on the effects of different ways of conveying norms. For example, perhaps our findings would have turned out differently if the experimenter had directly told children that they should be honest because they may interpret such messaging as an attempt to control them. Additional research is also needed to better understand the role of self-regulation (Blake et al., 2015), and why children often fail to act upon moral norms, even ones that they fully understand (Smith et al., 2013), such as when they prioritize self-interest over compliance (Blake et al., 2014).

In summary, we found that presenting information about descriptive and injunctive norms can have a systematic effect on the behavior of children as young as 3 years of age. Our findings further suggest that this type of norm messaging can be used to promote honesty.

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