

Overheard conversations can influence children's generosity

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Abstract

Understanding the factors that promote the development of generosity has both theoretical and practical importance. This study examines one potential influence: overheard conversations that contain evaluative statements about the behavior of others that were described as widely shared opinions. In Study 1 ($N = 120$), younger (mean age 4.1 years old) and older (mean age 5.9 years old) participants overheard two adults discuss a target child's act of generosity, and in a between-subjects manipulation, the conversation included either praise for the target child, or criticism. Participants in the older group were more likely to behave generously on a distribution task if the overheard conversation involved praise rather than criticism, but the participants in the younger group showed no such effect. Study 2 ($N = 150$) and Study 3 ($N = 60$) were preregistered follow-up studies that included older children only (a 5-year-old group). Study 2 showed that children were again more likely to share after overhearing a conversation in which an individual who behaved generously was described in favorable terms, and the same effect was seen when the overheard conversation involved criticism of an individual who did not share. The procedure of Study 3 matched that of Study 1, except the distributions were made in private, and the overheard conversation effect was seen once again. These findings suggest that by age 5, children can use information they hear about individuals who are not present to guide their own behavior, and that overheard evaluative comments can promote generosity.

KEYWORDS

children, evaluative statements, generosity, overheard conversations

1 | INTRODUCTION

The ability to learn from other people allows children to acquire knowledge, skills, and cultural values to an extent that they would never be able to attain on their own (Gelman, 2009). Most of the research on this topic has focused on how children learn information that is conveyed to them directly. However, children are also exposed to a great deal of information that is directed toward other people. Some studies have shown that young children have the capacity to learn from overheard conversations, but there has been

very little work on how it might affect children's sociomoral behavior. In this research, we examine whether overheard comments about a peer can influence children's willingness to act generously, which is a tendency that allows people to live and work together effectively (Blakey et al., 2019; Hamann et al., 2011).

Children have some ability to learn from overheard speech, and much of this evidence comes from studies of language learning (Akhtar, 2005; Akhtar et al., 2001; Arunachalam & Waxman, 2010; Floor & Akhtar, 2006; Gampe et al., 2012; Shneidman et al., 2009; Yuan & Fisher, 2009). For example, Akhtar et al. (2001) found that 2-year-olds were able to learn novel object labels and novel action

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verbs by overhearing others use them. Overheard conversation manipulations have also been shown to affect how young children label a novel hybrid animal (Li & Koenig, 2020), and their willingness to explore novel toys (Bonawitz et al., 2011; Yu et al., 2018).

Overheard conversations also have the potential to influence learning and development in the sociomoral domain. Researchers studying language socialization and storytelling suggest that children overhear relevant information in the form of personal stories on a regular basis (Sperry et al., 2019). In a study of Taiwanese families in Taipei and European American families in Chicago, Miller et al. (2012) examined young children's experiences of hearing stories about themselves. The researchers focused on both interactions in which the child was actively involved, and interactions in which the child was a bystander, which they defined as being within earshot of a statement that was addressed to another individual. Although the Taipei families privileged the bystander role to a greater extent, children in both cultural contexts were frequently involved in both types of interactions, and the narratives provided a wealth of information about the sociomoral domain, such as when adults described transgressions and their consequences.

Experimental research points to a causal connection between overheard conversations and children's sociomoral behavior, at least with reference to honesty (Sai et al., 2020; Zhao et al., 2019). Zhao et al. (2019) examined the effects of children overhearing an experimenter talk about a peer who was no longer present. In the key experimental manipulation, the child was described as smart, and the dependent measure was whether overhearing the conversation would influence the rate at which 3- and 5-year-olds would cheat in a guessing game. The researchers predicted that the conversation would lead to an increase in cheating because it would make children feel pressure to prove their competence, just as telling children directly that they are smart can lead to increased cheating (Mueller & Dweck, 1998; Zhao et al., 2017). The cheating rate of the 3-year-olds was unaffected by the overheard conversation, but the cheating rate of 5-year-olds increased after hearing it. This suggests that an overheard conversation, even about an individual who is not present, can influence children's sociomoral behavior starting at around age 5.

Lane et al. (2020) found that overheard conversations can influence children's evaluations of social groups. They examined how the attitudes of 4- to 9-year-olds toward a novel group were affected by negative information about it. For example, children heard that members of the group are bad people and speak an ugly language. The researchers manipulated whether children were told the information directly or overheard it from one side of a phone conversation. Although the information had a stronger effect when it was communicated directly, even the overheard information led to more negative attitudes about the group.

Experimental research on observational learning also shows that children's generosity can be influenced by social learning outside first-person interactions (Elliott & Vasta, 1970; Grusec, & Skubiski, 1970; Lipscomb et al., 1982; Midlarsky & Bryant, 1972; Rice & Grusec, 1975; Rushton, 1975). For example, Elliott and Vasta (1970) showed 5- to 7-year-olds a short video that depicted a young boy sharing candy

RESEARCH HIGHLIGHTS

- This research examined whether conversations that children overhear can affect their level of generosity.
- Young children overheard a conversation in which adults expressed a positive or a negative attitude about another child's decision to share or not share.
- Older children shared more after hearing favorable judgments about generosity regardless of whether the adults' comments involved praise for sharing, or criticism for not sharing.
- The results show that overheard evaluative information, which is a ubiquitous aspect of children's social environment, can serve as an important force for moral socialization.

with a child from a poor family. Children who watched the video were more likely to donate candy and pennies to a boy who was described as having no candy than were children in a control condition in which no video was shown. Similarly, Rice and Grusec (1975) tested the effects of children hearing an adult talk to himself about how sharing is expected by others, and found that it could promote sharing.

Recent experimental work has provided further evidence about how social learning can impact children's generosity. One finding is that the behavior parents model can influence children's generosity, but this effect may be subject to cross-cultural differences. Blake et al. (2016) compared the responses of 3- to 8-year-olds from the United States and from India, and found that both groups were influenced by a stingy model, but only the children from India showed more generosity after observing a generous model. Other work suggests that social influences extend to information about the generosity of peers (McAuliffe et al., 2017), as well as behaviors depicted by storybook characters (Larsen et al., 2018).

It is not known whether children's generosity can be influenced by overhearing a conversation about an individual who is not present and whose behavior they are never able to observe. In this research, we examined this issue by manipulating the contents of a conversation between two adults. We tested a group of younger children who ranged in age from 3.8 to 4.3 years old, and a group of older children who ranged in age from 5.5 to 6.2 years old. We chose these age groups because prior research suggests it is around age 5 that overheard evaluative comments begin to inform children's decisions about whether to be honest (Sai et al., 2020; Zhao et al., 2019), and we were interested in determining whether there is a similar age-related trend for generosity.

1.1 | STUDY 1

In Study 1, we investigated the effects of overhearing positive and negative comments about another child's act of generosity. The goal



was to determine whether the comments would influence children's generosity toward a different child. In a between-subjects manipulation, we exposed children to a conversation between two adults in which they described a child who had acted generously in a positive way, as nice, or in a negative way, as dumb. Although at first glance it seems simpler to include contrasting traits along a single dimension (e.g., nice vs. mean or smart vs. dumb), we decided against this approach because we thought it would be implausible for someone to claim that giving away an extra sticker is mean. We wanted to use traits that children of this age would be familiar with, and we thought it was plausible that children would consider individuals who outcompete others for resources to be smart. In line with this possibility is evidence that children as young as age three are behaviorally responsive to concerns about how smart they are (Zhao et al., 2017, 2018, 2019). The overheard conversations involved a strong manipulation in which a visitor and an experimenter agreed on the trait description specified by the condition manipulation. In the nice condition, the visitor described liking the child, and in the dumb condition, the visitor described disliking the child. In both conditions, the experimenter claimed that other children must agree with this assessment.

Following the overheard conversation, children chose whether to keep an extra sticker for themselves or share it with another child who they did not know and who was not present, and this distribution choice served as the dependent measure. Based on findings by Zhao et al. (2019) that showed overheard conversations can affect older children's cheating rates, we predicted that only children in the older group would show sensitivity to the contents of the overheard conversation.

1.2 | Method

1.2.1 | Participants

Participants were 120 children from a preschool in eastern China, with 60 in a younger group ($M = 49.1$ months, $SD = 1.8$ months; range = 45.9–51.8 months; 30 boys and 30 girls) and 60 in an older group ($M = 70.6$ months, $SD = 1.8$ months; range = 66.5–74.4 months; 29 boys and 31 girls). Within each age group, 30 children were assigned to the *nice* condition and 30 children were assigned to the *dumb* condition. An additional 14 children in the younger group and 11 children in the older group were excluded from the study because they failed a manipulation check concerning the contents of the overheard conversation. In this and all subsequent studies in this paper, all participants were Han Chinese, and the sessions were conducted in Modern Standard Mandarin Chinese.

1.2.2 | Procedure

Children were tested in individual sessions by an adult female experimenter in a quiet area of their preschool. Each session began

with a puzzle task that children completed as a pretext for distributing prizes. In this task, the experimenter showed children how to arrange a set colored wooden tiles to make a specific design. All participants found the task easy to complete.

The experimenter explained that a gender-matched child at another school had completed the same puzzle task earlier, and had performed just as well as the participant. The experimenter then showed the child two stickers. She said that the stickers were rewards for completing the puzzle task, and that the child should distribute them equally by keeping one sticker and giving one sticker to the other child. Next, the experimenter placed two circular pieces of paper on the table and gave the following instructions.

Look, there are two circular pieces of paper on the table, aren't there? I will now write your name in this circle, which means that this is your circle, and the other circle without a name belongs to another child. You should put the sticker you're giving to yourself in the circle that belongs to you, and the sticker you're giving to the other kid in the other circle.

Next, the experimenter verified that the participant knew where each sticker should go. The experimenter then handed the two stickers to the child, and all children were able to correctly follow the instructions by placing one sticker in their own circle and the other sticker in the other child's circle.

After the first distribution task was completed, the experimenter took another sticker from her pocket, and said the following.

Oh! Why is there an extra sticker here? Let me think about it. I will make this extra sticker a bonus. Because this is an extra sticker, and not a reward like in the previous game, you can give it to yourself or to the child you don't know. It's totally up to you.

Immediately after the experimenter finished giving this explanation, a second adult female, the *visitor*, knocked on the door and while standing outside the room and out of view of the participant, held a brief conversation with the experimenter that the participant was able to overhear. The conversation concerned a *target child* who previously had an opportunity to distribute an extra sticker, and chose to give it away rather than keeping it. The key difference between the conditions was whether the experimenter expressed a positive or a negative reaction to the target child's decision to share. For male participants the conversation was as follows, and for female participants it was the same, except that the target child was described as a girl named Linda.

VISITOR: How's it going?

EXPERIMENTER: [participant] has finished, but I just found an extra sticker.

VISITOR: Oh, really! I remember that the same thing happened once before.

EXPERIMENTER: I remember that time. A boy named Mark gave the extra sticker to the other child. He could have kept that sticker for himself. How [nice/dumb] he is!

VISITOR: That's right, Mark gave the sticker to the other child. How [nice/dumb] he is. I really [like/dislike] him.

EXPERIMENTER: Yes, Mark is so [nice/dumb], and the other kids must [like/dislike] him and [want/not want] to be friends with him. Oh, I have something to do now, bye!

After the conversation, the experimenter apologized to the participant for the interruption and repeated the instructions for distributing the extra sticker. She then handed the extra sticker to the participant and asked him or her to distribute it however he or she saw fit. This second distribution served as the dependent measure.

Following the second distribution, the experimenter asked two questions about the contents of the overheard conversation as a manipulation check. We will describe these questions as they were asked of female participants. The first question was, "Do you remember who Linda gave the extra sticker to? Did she give it to me, or did she give it to someone else?" The correct answer was that Linda gave the extra sticker to another child. Next, the experimenter asked, "How did I describe Linda? Did I say that she is nice or that she is dumb?" The correct answer was either "nice" or "dumb" depending on the condition. Participants who did not correctly answer both of these questions were excluded.

Finally, for participants in the dumb condition, the experimenter explained that the adults had made a mistake in describing the target child as dumb for sharing, and that sharing is good.

1.3 | Results and discussion

As shown in Figure 1, 43.33% of the younger children and 73.33% of the older children in the nice condition shared the extra sticker with the other child, as compared to 46.67% and 33.33%, respectively, in the dumb condition.

All analyses were conducted using the SPSS software package, Version 25. Preliminary analyses yielded no significant main effects or interactions involving gender on children's distribution behavior ($p_s > .10$), so the data for this factor were combined for subsequent analyses.

We first conducted a hierarchical binary logistic regression analysis with distribution behavior (0 = to self, 1 = to others) as the predicted variable. We entered condition (0 = nice, for reference, 1 = dumb, a categorical variable) and age group (0 = younger group, for reference, 1 = older group, a categorical variable) as first-block predictors, and their two-way interaction as the second-block predictor to determine the most parsimonious model for the data. The significance of each block was assessed by a Block χ^2 test (also known as the χ^2 Difference test). In this test, the retention of each predictor in a model must reduce the variability substantially to justify using a more complex model (see Menard, 2001).

The best fit model involved both main effects and the interaction term as significant predictors of distribution behavior. This model was significant, $\chi^2(3, N = 120) = 10.83, p = .013$, $-2\text{Log likelihood} = 155.50$, Nagelkerk $R^2 = .12$. There were two significant effects included in the model. One was a main effect of condition, with A Priori comparisons with the nice condition as reference showing that across age groups, children were more likely to give the extra sticker to others in the nice condition than in the dumb condition (58.33% vs. 40.00%, for the nice condition and the dumb condition, respectively; $\beta = -0.78$, $SE \beta = 0.38$, $Wald = 4.17$, $df = 1$, $p = .041$, odds ratio (OR) = 0.46, 95% confidence interval (CI) = 0.22 to 0.97). The other significant effect was an interaction between condition and age group ($\beta = -1.83$, $SE \beta = 0.77$, $Wald = 5.72$, $df = 1$, $p = .017$, OR = 0.16, 95% CI = 0.04 to 0.72). However, the main effect of age

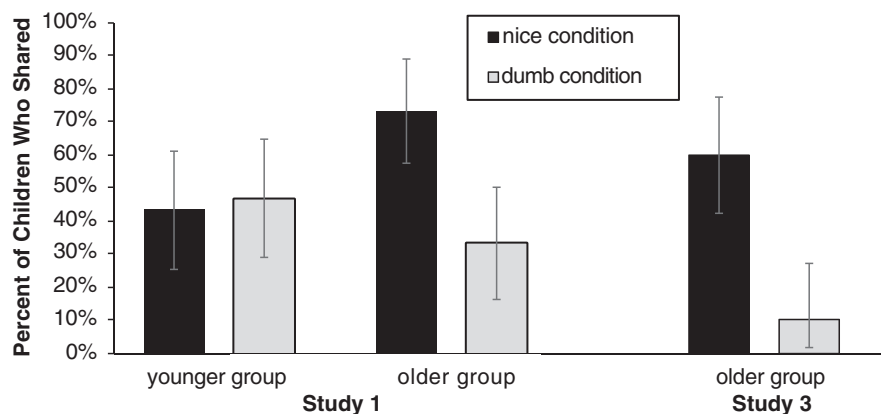


FIGURE 1 The percent of children in the younger and older groups in Study 1 and in the older group in Study 3 who shared the sticker with the other child, by condition. In the nice conditions, participants overheard praise for the target child's decision to share, and in the dumb conditions, participants overheard criticism of the target child's decision to share. Error bars indicate the 95% CI



group was not significant ($\beta = 0.36$, $SE \beta = .38$, $Wald = 0.88$, $df = 1$, $p = .348$, $OR = 1.43$, $95\% CI = 0.68$ to 3.04).

To break down the condition by age group interaction effect, we then conducted a separate hierarchical logistic regression analysis for each age group. For both the younger and older groups, we included age in months (a continuous variable) and condition as first-block predictors and their two-way interaction as the second-block predictor. Results revealed that, for the older group, the best fit model involved the main effects of age and condition only. This model was significant, $\chi^2(2, N = 60) = 10.03$, $p = .007$, $-2\text{Log likelihood} = 72.88$, Nagelkerk $R^2 = 0.21$. With Bonferroni correction for multiple post hoc tests, the only significant effect included in the model was the condition effect (73.33% vs. 33.33%, for the nice condition and the dumb condition, respectively; $\beta = -1.69$, $SE \beta = 0.57$, $Wald = 8.90$, $df = 1$, $p = .003$, $OR = 0.18$, $CI = 0.06$ to 0.56 ; for age in months, $p > .10$). However, for the younger group, the main effects and their interaction were all nonsignificant ($ps > .1$). These results indicate that the condition effect was significant for the older group but not for the younger group.

In sum, the results of Study 1 showed that the overheard conversation manipulation affected the sharing behavior for the older group, but not for the younger group.

2 | STUDY 2

In Study 1, participants overheard adults make evaluative comments about a target child who chose to give an extra sticker to another child. Participants behaved more generously in a subsequent distribution task if the comments characterized the target child as nice rather than as dumb. This finding leaves unanswered how children's distributions in these two conditions might compare to a baseline condition in which the overheard conversation does not contain any evaluative information about the target child. It also does not address whether overhearing a conversation about a target child who chooses not to share would have a similar effect. Because children in the younger group in Study 1 were not responsive to the overheard conversation manipulation, for Study 2 we decided to include an older group of 5-year-olds only.

Study 2 was preregistered, and it included a replication of the *nice* and *dumb* conditions from Study 1 as well as three new conditions. We added a *baseline* condition to assess how children would respond if the overheard conversation did not contain any evaluative information about the target child. We also added two more conditions in which the adults discussed a target child who chose to keep the extra sticker rather than give it away. In one of these conditions the adults described the target child's decision not to share as *smart*, and in the other condition they described it as *mean*.

We also pilot tested a task that was designed to assess whether the overheard conversation manipulation would affect children's judgments about others who behaved generously or selfishly, and the results are summarized in the Appendix.

2.1 | Method

2.1.1 | Participants

Following the preregistration for this study (<https://aspredicted.org/i3gu9.pdf>), the participants were 150 5-year-olds ($M = 65.3$ months, $SD = 2.3$ months; range = 60.5–71.9 months; 75 boys and 75 girls). Children were from the same preschool in eastern China, and none had participated in Study 1. Thirty children were randomly assigned to each of the five conditions. An additional 10 children were excluded from the study because they failed a manipulation check concerning the contents of the overheard conversation.

2.1.2 | Procedure

The procedure was the same as in Study 1 except for the contents of the overheard conversation in the three new conditions. In the *baseline* condition, the experimenter and the visitor discussed finding an extra sticker on a previous occasion without making reference to a target child. In the other two new conditions, the target child was described as keeping the extra sticker rather than giving it away to the other child. In the *mean* condition, the target was described as follows: "A boy named Mark kept the extra sticker for himself. He could have given it to the other child. How mean he is!" In the *smart* condition the child was also described as keeping the extra sticker, but was praised for it: "A boy named Mark kept the extra sticker for himself. He could have given it to the other child. How smart he is!" For female participants, the other child was again described as a girl named Linda. In the *baseline* condition, the conversation between the experimenter and the visitor was as follows:

VISITOR: How's it going?

EXPERIMENTER: [participant] has finished, but I just found an extra sticker.

VISITOR: Oh, really! I remember that the same thing happened once before.

EXPERIMENTER: Oh, I have something to do now, bye!

As in Study 1, after the second distribution task the experimenter conducted a manipulation check. Finally, the experimenter told children in the dumb and smart conditions that the adults had made a mistake in describing the target child as dumb for sharing or as smart for not sharing, and that sharing is good.

2.2 | Results and discussion

Preliminary analyses yielded no significant main effects or interactions involving gender on the distribution behavior ($ps > .10$), so the data for this factor were combined for subsequent analyses.

The percentage of participants who shared the extra sticker is shown in Figure 2. The sharing rates were 43.33%, 73.33%, 26.67%, 80.00%, and 30% for the baseline, nice, dumb, mean, and smart conditions, respectively.

In accordance with the preregistration, we again conducted a hierarchical binary logistic regression analysis of distribution behavior (0 = to self, 1 = to others), with age in months (a continuous variable) and condition (0 = baseline, for reference, 1 = nice, 2 = dumb, 3 = mean, 4 = smart, a categorical variable) entered as first-block predictors, and their two-way interaction as the second-block predictors.

Results showed that the best fit model involved main effects only, without the interaction term as predictors of distribution behavior. The model was significant, $\chi^2(5, N = 150) = 30.60, p < .001$, $-2 \log \text{likelihood} = 177.32$, Nagelkerke $R^2 = 0.25$. The only significant effect included in the model was the condition effect ($Wald = 26.23, df = 4, p < .001$). A Priori comparisons with the baseline condition as reference showed that the percentage of participants who shared was significantly higher in both the nice condition ($\beta = 1.28, SE \beta = 0.55, Wald = 5.35, df = 1, p = .021, OR = 3.60, CI = 1.22 \text{ to } 10.64$) and the mean condition ($\beta = 1.66, SE \beta = 0.59, Wald = 7.96, df = 1, p = .005, OR = 5.23, CI = 1.66 \text{ to } 16.52$) than in the baseline condition. However, the sharing rate did not differ significantly between the dumb condition and the baseline condition ($\beta = -0.74, SE \beta = 0.55, Wald = 1.81, df = 1, p = .179, OR = 0.48, CI = 0.16 \text{ to } 1.41$), and it did not differ significantly between the smart condition and the baseline condition ($\beta = -5.80, SE \beta = 0.54, Wald = 1.14, df = 1, p = .286, OR = 0.56, CI = 0.19 \text{ to } 1.62$). The effect of age in months was not significant ($p > .1$).

Follow-up comparisons showed that the sharing rate was significantly greater in the nice condition than in the dumb condition ($\beta = -2.02, SE \beta = 0.58, Wald = 11.99, df = 1, p = .001, OR = 0.13, CI = 0.04 \text{ to } 0.42$). The sharing rate was also significantly greater

in the mean condition than in the smart condition ($\beta = 2.26, SE \beta = 0.96, Wald = 13.51, df = 1, p < .001, OR = 9.35, CI = 2.84 \text{ to } 30.72$). However, it did not differ significantly between the nice and mean conditions, or the dumb and smart conditions ($ps > .1$).

These results replicated the condition differences that were observed in Study 1 with a new sample of 5-year-olds. We also found that the evaluative comments about the target child being nice for sharing or mean for not sharing had a significant effect on children's distributions relative to the baseline conditions, but the evaluative comments about the target child being smart or dumb did not.

3 | STUDY 3

While the results of Studies 1 and 2 are consistent with the possibility that the overheard conversation produced a more general shift in children's conceptions of generosity, they are also consistent with the possibility that children were trying to establish a positive reputation with the experimenter by acting in accordance with what they inferred about her values from the overheard conversation. This reputational interpretation is plausible in light of evidence that reputational concerns can affect generosity among children 5 years of age and older (Engelmann et al., 2012; Fujii et al., 2015; Shaw & Olson, 2012; see Engelmann & Rapp, 2018). It is also in line with a theoretical model proposed by Botto and Rochat (2019) that suggests children as young as 24 months of age are aware that they may be evaluated by others, so they seek out positive evaluations (Botto & Rochat, 2019; see also Botto & Rochat, 2018). Study 3 was designed to investigate the reputational interpretation using a procedure that was the same as in Study 1, except that children were led to believe their decisions would be anonymous, which should eliminate any incentives to respond in a way that the experimenter would approve of.

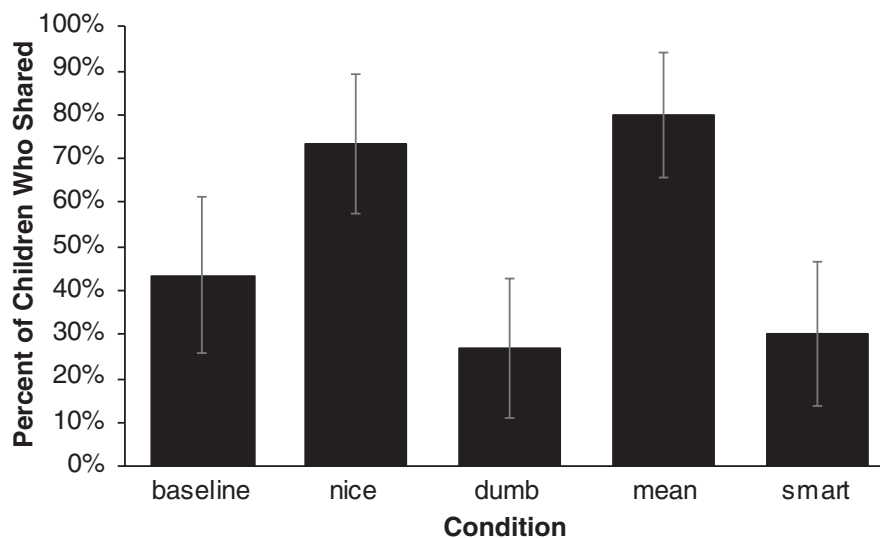


FIGURE 2 The percent of children in Study 2 who shared the sticker with the other child, by condition. In the nice and dumb conditions, participants overheard evaluations of the target child's decision to share, and in the mean and smart conditions participants overheard evaluations of the target child's decision not to share. Error bars indicate the 95% CI



3.1 | Method

3.1.1 | Participants

Following the preregistration for this study (<https://aspredicted.org/zj26v.pdf>), the participants were 60 5-year-old children, with 30 in the *nice* condition ($M = 68.9$ months; $SD = 2.5$ months; range = 64.0–71.9 months; 15 boys and 15 girls), and 30 in the *dumb* condition ($M = 68.2$ months; $SD = 3.1$ months; range = 59.8–72.0 months; 15 boys and 15 girls). Children were from the same preschool in eastern China, and none had participated in Study 1 or Study 2. An additional six children were excluded because they failed a manipulation check concerning the contents of the overheard conversation, as specified in the preregistration.

3.1.2 | Procedure

The procedure was the same as in Study 1, except that instead of placing the stickers on top of two circular pieces of paper, children placed them inside two envelopes, and they made the second distribution in private rather than in the presence of the experimenter. As in Studies 1 and 2, each session began with the puzzle task as a pretext for rewarding the participant with two stickers.

For the first distribution, the child was told to put one sticker in an envelope to keep, and the other sticker in an envelope to be given to the other child. The former envelope was labeled with the child's own name, and the latter was unlabeled.

This second distribution was conducted in private and it served as the dependent measure. For this distribution, the experimenter pretended to accidentally drop an extra sticker, and she asked the child to distribute it as a bonus. The experimenter also showed the child how to seal the two envelopes after completing the second distribution. She explained that the child would get to keep the sealed envelope that had his or her name on it, and should put the other envelope in a locked box so that it could be given to the other child later. The experimenter emphasized that no one would not be able to find out what was inside the envelopes, so the nature of their distributions would remain anonymous. Next, the experimenter did a comprehension check by asking the following series of questions: "What do you do next after you've distributed this extra sticker? Where should you put your envelope? Where should you put the other kid's envelope? When the envelope is sealed, will anyone else know what's inside?" Almost all the children were able to answer these questions correctly, and when children made mistakes the experimenter corrected them.

At this point, the visitor interrupted and held the same conversation with the experimenter that was used in the corresponding condition of Study 1. At the end of the conversation, the experimenter and the visitor excused themselves from the room. Before the experimenter left she emphasized that she would not be able to see out who received the extra sticker, that she did not care who received it, and that the child would not need to disclose the distribution decision to her when she returned. When the experimenter returned she

conducted the same manipulation checks as before, and in the *dumb* condition she also explained that the adults had made a mistake in describing the target child as *dumb* for sharing, and that sharing is good.

3.2 | Results and discussion

Preliminary analyses yielded no significant main effects or interactions involving gender on children's distribution behavior ($ps > .10$), so the data for this factor were combined for subsequent analyses.

As shown in Figure 1, the sharing rate was higher in the *nice* condition (60%) than in the *dumb* condition (10%). To examine our main hypothesis about a condition effect on sharing, we first conducted a hierarchical binary logistic regression analysis with distribution behavior (0 = to self, 1 = to others) as the predicted variable, and age in months (a continuous variable), condition (0 = *nice* condition for reference, 1 = *dumb* condition, a categorical variable), as well as their interaction as the first-block and second-block predictors.

Results showed that the best fit model involved main effects only, without the interaction term as predictors of distribution behavior. The model was significant, $\chi^2(2, N = 60) = 17.85, p < .001$, $-2 \log \text{likelihood} = 59.84$, Nagelkerke $R^2 = 0.35$. The only significant effect included in the model was the condition effect, which showed that the sharing rate in the *nice* condition was significantly higher than in the *dumb* condition ($\beta = -2.63, SE \beta = 0.72, Wald = 13.14, df = 1, p < .001, OR = 0.72, CI = 0.02 \text{ to } 0.30$). However, the main effect of age (in months) was not significant ($p > .1$). One caveat that is needed in interpreting these results is that there was no baseline condition in Study 3 to allow us to determine whether the *nice* and/or *dumb* condition manipulations were driving this difference.

In addition to addressing the main question, we did follow-up comparisons on children's sharing behavior between Studies 1 and 3 by applying Chi-squared analyses. Results showed that the overall sharing rate in Study 3 was significantly lower than the overall rate in Study 1 (35.00% vs. 53.33%; $\chi^2(1, N = 60) = 4.09, p = .043$). We also made comparisons between the *dumb* conditions in Studies 1 and 3 and the *nice* conditions in Studies 1 and 3. Results showed that the sharing rate was significantly lower in the Study 3 *dumb* condition than in the Study 1 *dumb* condition (10.00% vs. 33.33%; $\chi^2(1, N = 60) = 4.81, p = .028$), whereas the sharing rates in the two *nice* conditions were not significantly different (60% vs. 73.33%; $\chi^2(1, N = 60) = 1.2, p = .273$).

The results of Study 3 suggest that the effects of Study 1 were not simply due to children's reputational concerns. Instead, the findings are consistent with the possibility that the overheard conversation influenced children's beliefs in relation to generosity, or that, using the terminology of Jaswal et al. (2009), there was conversion rather than compliance.

4 | GENERAL DISCUSSION

This research shows for the first time that children's generosity is sensitive to evaluative attitudes that adults express about a peer

who is not present. In Study 1 we found that at around 5 years of age, children begin to show more generosity after overhearing adults speaking positively rather than negatively about a target child who had shared a sticker with another child. In Study 2, in which we tested 5-year-olds only, we extended these findings by showing that an overheard conversation that labeled the target child as mean for not sharing produced the same increase in sharing, relative to a non-evaluative baseline condition, as an overheard conversation that labeled the target child as nice for sharing. In Study 3, which again included only 5-year-olds, we replicated the findings of Study 1 using a modified procedure in which the key distribution was made in private to rule out possible reputation effects. Taken together, these results build upon previous findings that point to the importance of overheard conversations for learning and socialization processes (Sperry et al., 2019).

Previous research has shown that overheard conversations can have implications for children's attitudes about social groups (Lane et al., 2020) and their decisions about honesty (Sai et al., 2020; Zhao et al., 2019). The present research extends this work by showing that overheard conversations can promote generosity as well. Given that evaluative comments about unseen others fit the definition of gossip, our findings also build on theoretical work that describes gossip as serving a cultural learning function (Baumeister et al., 2004; Engelmann et al., 2016). As Baumeister and colleagues note, gossip can help people learn about the complexities of the social world to an extent that might not be possible via direct observation alone.

The present findings indicate that when children heard evaluative comments about an unseen individual, they learned something from it that affected their level of generosity. Study 3 was designed to take a closer look at what exactly children had learned. One possibility was that the effects were driven by reputational concerns, which would be consistent with evidence that young children's reputational concerns can be influenced by specific verbal messages relating to how they might be judged (Fu et al., 2016; Zhao et al., 2018). For example, Fu et al. (2016) found that children cheated less after being told they have a reputation for being good. Another possibility was that the overheard comments influenced children's broader attitudes about generosity, and promoted more generous behavior even in the absence of any potential reputational benefits. This possibility is consistent with evidence that both public and private behavior can be influenced by observing models who differ in their generosity (White & Burnam, 1975). The results of Study 3 support the latter possibility, which suggests that the condition differences can be best understood in terms of children internalizing the values about generosity that were conveyed by the overheard conversation.

Although Study 3 showed that the results of Study 1 were not entirely due to children's reputational concerns, these concerns did appear to have an effect on their distribution behavior. Specifically, a comparison of the dumb conditions in Study 1 and Study 3 showed that children made more generous distributions if doing so could affect their reputation with the experimenter. This finding is consistent with evidence of reputational effects

on generosity among children age 5 and older (Engelmann et al., 2012; Fujii et al., 2015; Shaw & Olson, 2012; see Engelmann & Rapp, 2018), and it points to the importance of addressing these factors when designing experiments in which children distribute resources (Blake & Rand, 2010). Future research should further examine the specific role of reputation cues in these decisions, including the extent to which children might tailor their behavior to their audience (Banerjee, 2002).

Our findings raise questions about why the 3- and 4-year-olds in Study 1 showed no sensitivity to the overheard conversation manipulation, given that children begin showing sensitivity to evaluative concerns in their second year of life (Botto & Rochat, 2019; Repacholi & Meltzoff, 2007; Repacholi et al., 2014). The present findings are consistent with evidence from Zhao et al. (2019) and Sai et al. (2020) that although children younger than age 5 are able to remember the contents of an overheard conversation manipulation, it has no effect on their level of honesty. In considering why children younger than age 5 might not show such an effect, it is important to consider the sophistication of the cognitive processes that are needed to produce the effects seen in this research. Specifically, for children to show these effects they needed to comprehend what they overheard and remember it long enough to make use of it in the subsequent distribution task, which itself involves making a chain of inferences that they were never instructed to make. These inferences include determining that what they overheard is relevant to their own experience, relating it to their existing knowledge, and figuring out how to use it to inform their actions in a novel social context.

In Study 2, the distribution decisions of children who were told that a target child who shared was dumb or that a target child who did not share was smart did not significantly differ from those of children in a non-evaluative baseline condition. It is possible they did not care about how smart they are judged to be, but this seems implausible in light of evidence that children as young as 3 years of age will cheat if they believe it is necessary to uphold a reputation for being smart (Zhao et al., 2018), or if they have just heard another child being described as smart (Zhao et al., 2017). A more likely explanation is that children found it puzzling to see adults describe sharing as not smart or not sharing as smart, given that adults typically express positive views about sharing around children.

Questions remain about why the overheard conversations that described the target child as either nice or mean were so effective at increasing children's generosity. There are several possible explanations that are not mutually exclusive. It may be that the conversation served as a reminder of something children already knew: that it is good to be generous. It may also be that the conversation served as a reminder that children are expected to behave generously. A third possibility is that the conversation served as a cue about what kind of behavior is expected for the second distribution, a novel situation for which there did not seem to be any clear norms. In line with the third possibility, we suspect that overheard conversations might have a stronger influence in the absence of clear norms about how to behave, as was the



case when participants were told that the decision to give away the extra sticker was entirely up to them. In fact, our procedure was specifically developed to examine behavior outside of contexts that have clear norms. This raises an interesting question about what would happen if children were also given the option of throwing away the extra sticker, which would allow them to follow an equality norm (Shaw & Olson, 2012).

Our overheard conversation manipulation can be considered a strong one because the experimenter expressed an attitude about both the behavior itself and the child who exhibited the behavior, and she then claimed that this attitude is widely shared. It should be possible to isolate the effects of these different components of the manipulation in future studies. It will also be important to examine whether overheard evaluative language can influence social behaviors that lack a strong moral dimension. One intriguing possibility is that overheard conversations can serve as a potential mechanism for the moralization of behaviors that do not have a clear negative impact on others (see Rottman & Kelemen, 2012).

In summary, the present findings provide experimental evidence that children's generosity can be affected by evaluative comments they overhear about unseen others. More broadly, our work suggests that overhearing evaluative comments can expand children's opportunities for social learning that go beyond what they can observe directly.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Li Zhao (email: zhaoli@hznu.edu.cn) upon request.

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APPENDIX

After children completed the two distributions in Study 2, they were presented with two additional scenarios in a counterbalanced order. Each scenario described a hypothetical child who is given nine identical stickers and is asked to distribute them between himself or herself, and an unnamed gender-matched child. The two scenarios were identical except that in one scenario the character gives away eight of the nine stickers, and in the other the character gives away only one of the nine stickers. Children were asked to rate the following questions on a 7-point scale: (1) How good or bad was the character's behavior? (2) Do you think the character is a nice kid or a mean kid? How nice or mean is he/she? (3) Do you think the character is a smart kid or a dumb kid? How smart or dumb is he/she?

The results showed no main effects of the experimental condition that children had been assigned to for Study 2, and they judged the character who gave eight of nine stickers positively, and the character who gave one of nine stickers negatively. This suggests that the overheard conversation manipulation did not affect children's evaluations, or that it was not strong enough to affect their evaluations in contexts in which the norms for behavior are unambiguous.