Teachers' Nonverbal Behaviors Influence Children's Stereotypic Beliefs

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This paper has been accepted for publication at the *Journal of Experimental Psychology*.

Acknowledgements: This work was supported by the National Science Foundation under Grant No. (1606808) and the Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health under Award Number F32HD089539. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Science Foundation or the National Institutes of Health. We thank Marina Matsui for assistance with data collection and coding and thank the families and children who participated.

Declarations of interest: None.

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Abstract

The current research tested whether differences in teachers' nonverbal behaviors influence children's intergroup attitudes and stereotypic beliefs. In this study, 5- to 8-year-old participants ($N = 96$) were assigned to novel groups (marked by T-shirt color) and then viewed interactions between teachers and pairs of students who were also members of the novel groups. Across four interactions, the teacher directed positive nonverbal behaviors toward students from one group and directed negative nonverbal behaviors toward students from another group. After viewing the interactions, participants were presented with pairs of new students from the two novel groups and were asked three types of test questions. When participants were asked who was smarter, they selected new students from the group that had received positive nonverbal behaviors regardless of their own group membership. However, when asked who they would like to befriend, only participants who were assigned to the group that received positive behaviors selected ingroup members. On trials where participants were asked to select a partner on an academic task, participants' selections did not differ from chance. This study shows that teachers' nonverbal behaviors may be one source of children's academic stereotypes, including negative stereotypes about groups to which they belong. Moreover, these findings highlight the importance of subtle social cues in guiding children's beliefs about social groups.

Keywords: Child development, social cognition, intergroup dynamics, stereotypes, educational psychology

Highlights

- Children are sensitive to patterns in teachers' nonverbal behaviors.
- Nonverbal teacher behaviors influence children's group stereotypes.
- Children associate positive nonverbal behaviors with group-level smartness.
- Nonverbal teacher behaviors do not influence children's group preferences.
- Children prefer to befriend ingroup members regardless of teacher behaviors.

Teachers' Nonverbal Behaviors Influence Children's Stereotypic Beliefs

Despite being raised in communities that value egalitarian attitudes, children begin to use group markers such as race, class, and gender to guide their preferences for and expectations about others around the age of school entry (Aboud, 2003; Pauker, Ambady, & Apfelbaum, 2010; Raabe & Beelman, 2011; Shutts, 2015). Adults are unlikely to provide children with explicit instruction about prejudice and stereotyping; however, adults who strive to be egalitarian may still demonstrate biases toward individuals from various social groups through their nonverbal behaviors (Dovidio, Kawakami, & Gaertner, 2002). Schools provide a context where children have the opportunity to observe interactions between teachers and peers from various social groups, and teachers often differ in their treatment of children from different social groups (Ferguson, 2003; Skiba et al., 2011; Tenenbaum & Ruck, 2007). Yet the role of differential teacher treatment as a source of young children's intergroup bias or stereotyping has gone largely untested. Therefore, the goals of the present research are to: 1) determine whether children acquire group-level biases and stereotypes after observing differential teacher treatment toward students from different novel groups, and 2) test how children's own group membership in a novel social group interacts with differential teacher treatment to influence the emergence of children's intergroup preferences and stereotypic beliefs.

Classroom Settings and Peer Relationships

When children enter school, a key task involves evaluating one's peers and determining which of one's classmates is likely to be a friend, a bully, a leader, or smart. Previous studies using sociometric rankings suggest that, beginning in preschool, children tend to converge on which peers are most and least liked (La Freniere & Charlesworth, 1983). Children who receive high rankings (indicating that they are liked by many peers) also tend to be labelled by their

peers as cooperative, supportive, and physically attractive, whereas children who are less popular tend to be labelled by peers as aggressive and disruptive (Coie, Dodge, & Coppotelli, 1982). In addition to these traits, one of the strongest and most consistent predictors of peer rankings is teacher rankings (Chang et al., 2007; Hendrickx, Mainhard, Oudman, Boor-Klip, & Brekelmans, 2017; Kiuru et al., 2015; Landau, Milich, & Whitten, 1984; Mercer & DeRosier, 2008; Taylor, 1989). In one study, teachers' preferences for their students in kindergarten predicted peer acceptance not only in kindergarten but also 2 years later (Taylor, 1989). These studies suggest that children's evaluations of individual peers align with, and may be influenced by, teachers' preferences.

Less is known about whether teachers influence children's attitudes toward and stereotypes about individuals from different social groups. Sociometric studies find that Black children tend to receive lower rankings (meaning fewer students report liking them) than White children, particularly when they are the minority group in the classroom (Bartel, Bartel, & Grill, 1973; Jackson, Barth, Powell, & Lochman, 2006). Moreover, elementary school teachers' implicit racial prejudice predicts their students' implicit racial prejudice (Vezzali, Giovannini, & Capozza, 2012), suggesting that teachers' group-level attitudes may be communicated to children. However, the specific ways in which teachers transmit such attitudes to their students is unknown.

Communicating Bias through Nonverbal Behavior

Although teachers might not explicitly endorse biased or stereotypic beliefs, numerous studies show that teachers tend to have higher expectations for and prefer students from stereotypically high-achieving groups (McKown & Weinstein, 2008; Tenenbaum & Ruck, 2007). Teachers' expectations are evident in their nonverbal behaviors: they (often unwittingly)

tend to direct positive nonverbal behaviors such as smiling and nodding toward students from positively stereotyped groups, and negative nonverbal behaviors, such as frowns and headshakes toward students from negatively stereotyped groups (Babad, 1993; Babad, Bernieri, & Rosenthal, 1991; Chaikin, Sigler, & Derlega, 1974; Harris & Rosenthal, 1985). Such differences in teachers' nonverbal behaviors may highlight for their students which groups are preferred and associated with positive (or negative) academic stereotypes. Thus, if children are attuned to the nonverbal behaviors demonstrated by their teacher, they may acquire group-level biases and stereotypes.

In fact, controlled laboratory studies show that preschool-age children readily detect and adopt biases expressed through adults' nonverbal behaviors directed toward other adults. Children prefer adults who receive positive nonverbal behaviors from an experimenter over adults who receive negative nonverbal behaviors (Castelli, De Dea, & Nesdale, 2008; Skinner, Meltzoff, & Olson, 2017). Children also generalize such attitudes to other individuals who belong to the same social group: in one study, 4- to 6-year-olds viewed interactions where a White experimenter expressed either friendliness or uneasiness through his nonverbal behaviors when interacting with a Black actor. Children endorsed more negative attitudes toward a new Black adult after viewing the uneasy interaction compared with the friendly interaction, even when verbal content of both interactions was positive (Castelli et al., 2008). Outside of the lab, children's attitudes are also shaped by their exposure to biased nonverbal behaviors. For example, 4- to 8-year-olds display more implicit pro-White bias after exposure to patterns of nonverbal racial bias on television (Pauker, Weisbuch, Lagerwaard, McCaslin, & Ambady, 2013).

Taken together, previous studies show that adults' nonverbal behaviors not only influence children's evaluations of individuals but also increase children's biases toward members of low-status groups. However, these studies leave open three important questions about how differences in teachers' nonverbal behaviors toward students from different groups might influence children who observe these interactions. First, existing research does not demonstrate whether differences in nonverbal behaviors can cause children to form preferences for members of groups for which they do not already have associations. Most research has examined how nonverbal behavior exacerbates or mitigates biases about existing social groups (i.e., race; Castelli et al., 2008). One study found that exposure to biased nonverbal signals influenced children's preferences for individuals and their close friends who also shared their novel group membership; however, in this case it is unclear whether children generalized their attitudes to a new individual on the basis of shared friendship or shared group membership (Skinner et al., 2017).

Second, previous studies have not identified whether adults' nonverbal behaviors might influence children's group-level stereotypes in addition to group biases. Given that teachers tend to direct more positive behaviors toward students from stereotypically high achieving groups, children may learn to associate positive academic stereotypes with social groups that receive positive nonverbal behaviors from a teacher. In fact, one study showed that children believe that individual students who receive more positive nonverbal behaviors from a teacher are smarter than those who do not (Brey & Shutts, 2018), suggesting that teacher behaviors influence children's inferences about the students who directly receive a positive nonverbal response from a teacher. However, the role of teacher behaviors in guiding children's judgments about individuals on the basis of shared group membership (i.e., group-level stereotyping) remains

untested. In other words, do children make inferences about other children who did not directly receive any teacher behaviors but merely belong to the same group as the child who did?

Finally, much of the work on children's sensitivity to nonverbal behaviors in intergroup contexts has been conducted with primarily White samples (i.e., Pauker et al., 2013). Thus, evidence that children use adults' nonverbal behavior to guide their preferences toward members of social groups has come from children in the high-status, preferred, and positively stereotyped group. Studies on the development of children's intergroup biases suggest that children's own group membership plays a key role in guiding their preferences for and stereotypes about individuals from different groups (e.g., Aboud & Skerry, 1984; Baron & Banaji, 2009; Dunham, Baron, & Banaji, 2008; Martin, 1989; Shutts, Kinzler, Katz, Tredoux, & Spelke, 2011; Shutts, Pemberton, & Spelke, 2013); thus, it is important to consider the impact of children's own group membership on how bias and stereotypes may be transmitted. In the current work, we used a novel groups design where children were assigned to groups marked by T-shirt color and subsequently viewed interactions between teachers and members of those groups to assess how children's own group membership influenced the acquisition of biases and stereotypes.

Variation in the Development of Children's Intergroup Attitudes and Stereotypes

Beginning in infancy, children are able to categorize individuals on the basis of social groups marked by race and gender (Anzures, Quinn, Pascalis, Slater, & Lee, 2010; Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002), and even show some awareness of markers of class (e.g., access to resources; Enright, Gweon, & Sommerville, 2017). However, around the age of school entry, children begin to use such social groupings to guide trait inferences (i.e., stereotypes) and their own social preferences (i.e., biases; Bian, Leslie, & Cimpian, 2017; Cvencek, Meltzoff, & Greenwald, 2011; Pauker et al., 2010; Shutts, Brey, Dornbusch, Slywotzky, & Olson, 2016).

Much of the existing literature documents majority children's preferences and stereotypes favoring individuals who are also members of the majority group which may result either from developing an awareness of the cultural biases and stereotypes associated with their group, or from children's tendency to prefer members of their own group. Studies with children from stigmatized groups (which disassociate ingroup preferences from cultural norms) suggest that children's stereotypes may result from cultural biases, while group preferences may be guided by a combination of cultural biases and ingroup preferences.

In early elementary school, children from both positively- and negatively-stereotyped groups are aware of stereotypes about their group. Not only are those in positively-stereotyped groups aware of stereotypes that favor their own groups, but girls, Black children, and children from low SES backgrounds all report stereotypes that disfavor their own groups (Bian et al., 2017; Bigler, Averhart, & Liben, 2003; Cvencek et al., 2011; Shutts et al., 2016; Sigelman, 2012). Additionally, in the case of gender, children's belief that 'boys are smarter than girls' conflicts with their own experiences in the classroom as girls tend to receive better grades than boys in all school subjects (Pomerantz, Altermatt, & Saxon, 2002). Thus, regardless of their own observations or group membership, children know prevalent social stereotypes about a number of social groups shortly after they enter school.

Although children from stigmatized groups report stereotypes that reflect cultural norms (and disfavor their own group), children's social preferences show a more variable pattern in early elementary school. In the domain of social class, children from a variety of socio-economic backgrounds prefer rich over poor children (Shutts et al., 2016), in the domain of race, studies with Black children typically find small or no ingroup preferences (Aboud & Skerry, 1984; Baron & Banaji, 2009; Dunham et al., 2006; Shutts et al., 2011), and in the domain of gender,

children of both genders tend to prefer ingroup members (Martin, 1989; Shutts et al., 2013).

Finally, studies with novel groups show that children assigned to high-status groups typically prefer members of their ingroup whereas children assigned to low-status groups do not (Bigler, Spears Brown, & Markell, 2001; Brown & Bigler, 2002; Horwitz, Shutts, & Olson, 2014; Patterson & Bigler, 2017; Schug, Shusterman, Barth, & Patalano, 2013).

These studies suggest that children's preferences are guided by multiple inputs: both children's own group membership and cultural biases about social groups exert an influence. Classroom settings, and teacher behaviors in particular, may provide children with information about prevalent cultural stereotypes and biases associated with different social groups; yet the role of teacher behaviors in guiding children's stereotypes and group-level attitudes (and whether the acquisition of these stereotypes and attitudes vary based on the child's group membership) remains untested.

Overview

The goal of the current work was to determine whether children could track patterns in teachers' nonverbal behaviors directed toward members of different novel groups, and test whether these patterns of behavior would influence both children's preferences for and their stereotypes about new group members (who were not present in the interactions with a teacher). Moreover, given that children's own group membership influences their preferences for and stereotypes about existing social groups, we also examined whether children's membership in a particular group (i.e., whether they were assigned to a novel group whose members subsequently received positive or negative nonverbal behaviors from a teacher) would influence the acquisition of group preferences and stereotypes. Although previous research demonstrates that children are aware of negative stereotypes about their own groups beginning in early elementary

school (e.g., Bian et al., 2017), very little research has examined how children acquire negative beliefs about their own group.

In the current work, we assigned participants to novel groups (marked by T-shirt color), and presented them with videos featuring interactions between a teacher and students from two of the novel groups. In each video, a teacher directed positive nonverbal behaviors toward a student from one group and directed negative nonverbal behaviors toward a student from another group. After viewing the videos, we tested whether children had acquired group-level biases and stereotypes by presenting them with pairs of new students (who did not interact with the teacher but belonged to the same two groups as the children who did) and asking a series of questions. We assessed participants' biases by asking them to indicate which of the new students they would like to befriend and we assessed participants' stereotypes about the groups by asking them to indicate which of the new students was smarter. We also asked children who they would like to select as a partner on an academic task. This method allowed us to examine (a) whether exposure to biases in a teacher's nonverbal behavior could produce both group biases and stereotypes in young children, (b) whether children would generalize their preferences and stereotypes to new group members (who did not directly receive positive or negative nonverbal behaviors from a teacher), and (c) whether children's own group membership would affect the acquisition of nonverbally transmitted group biases and stereotypes.

Method

Participants. Participants were 96 5- to 8-year-old children (32 per condition, $M_{\text{age}} = 6;6$, range = 4;8–8;4, 48 males, 51% Multiracial, 22% White, 22% Asian, 5% did not report race) living in Hawai'i. We were able to obtain information about current school level for 91 participants; of these participants, 26% were in preschool or pre-K, 69% were in kindergarten,

and 4% were in first grade. One additional child participated but was excluded for not finishing the session. Participants were recruited from a database of families who said they were interested in participating in research. The sample size was pre-determined to be 32 participants per condition based on previous studies examining children's understanding of nonverbal behaviors (Brey & Shutts, 2015; Castelli et al., 2008; Skinner et al., 2016). The previous studies testing children's attention to nonverbal behaviors typically found medium effect sizes, and a power analysis carried out using G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007) showed that 32 participants would be needed to detect a medium effect ($d = .52$) for comparisons to chance, and 34 participants per group would be needed to detect a medium effect ($n_p^2 = .09$) in a one-way ANOVA with power of .80 and alpha of .05. Parents provided written informed consent for their children to participate and completed demographic questionnaires; children provided verbal assent. All children were tested in a quiet laboratory space and spoke English.

Materials. At the beginning of the session, participants were presented with a picture of three groups of 12 children. The children depicted were gender matched to each participant and represented a variety of racial groups common in Hawai'i. The novel groups were marked by the children wearing a specific color of T-shirt (orange, green, or blue). Participants were assigned to one of the three groups and were given a corresponding shirt to wear or hold. Then, participants viewed four 17-s videos featuring an interaction between a female teacher and two students who matched the gender of the participant. In each video, one student wore a green shirt, one student wore an orange shirt, and the teacher wore black. The teacher and the students were unfamiliar to participants. Throughout each video, the teacher faced the students and the participant; the participant could only see the backs of the students' heads.

At the beginning of each video, the teacher first faced forward, then turned toward the student on the left while that student read a brief (7 s) passage. Then, she turned and faced the student on the right while that student read the same passage. The audio clips of the students reading were actually recordings of the same student with minor adjustments made to tone and pitch so that the voices sounded different. The teacher then faced forward at the end of the clip. Across the videos, the teacher directed positive nonverbal behaviors (i.e., smiles and nods) toward students wearing one color shirt while they read, and negative nonverbal behaviors (i.e., frowns and head shakes) toward students wearing the other color shirt while they read.

Test trials featured photographs of new children who matched the gender of the participant and across the trials, the photographs varied by race to match the racial diversity of classrooms in Hawai'i. On each trial, participants viewed a pair of new children who were matched according to race, age, and attractiveness (based on adult ratings). In each pair of children, one wore an orange shirt and the other wore a green shirt.

Procedure. Participants were tested individually in the lab. The study was presented on a monitor and an experimenter sat facing the child during the familiarization phase at such an angle that she was unaware of which shirt group (orange or green) received positive or negative nonverbal behaviors from the teacher in the videos.

Familiarization phase. At the start of the session, participants were told that they would be learning about a school with three groups of children: oranges, greens and blues. They were going to pretend that they went to the school and would be in one of the groups. They then received either an orange, green, or blue shirt to wear or hold during the study. We used a novel groups design (featuring groups defined by shirt color) in order to avoid teaching children about existing groups or measuring their intergroup attitudes about groups to which they may already

belong. Based on random assignment to condition, some children were assigned to the group that subsequently received positive behaviors from the teacher ('positive group'), some children were assigned to the group that subsequently received negative behaviors from the teacher ('negative group'), and a third group of children participated in a control condition where they were also assigned to a group and received a shirt, but did not see any interactions between their ingroup members and the teacher ('control group').

After receiving the shirt, participants were told that they were going to watch some of the kids in the orange and green groups read for their teacher. Participants then viewed a series of four interactions where two students from the orange and green groups each read a passage for the teacher and the teacher's nonverbal behavior was correlated with group membership: students from one group always received positive teacher behaviors ('positive group') and students from the other group received negative teacher behaviors ('negative group'). Students in the 'control group' were not included in the interactions (i.e., those in the 'control group' always saw interactions featuring students from other groups).

Test phase. We then assessed children's group-level preferences for and stereotypes about *new* students from the 'positive' and 'negative' groups in three blocks of test trials. Each block included four trials. After viewing the familiarization videos, participants were told that the experimenter was going to ask them some questions about new kids in the orange and green groups. They then viewed displays with pictures of two new students (who matched the gender of the participant) from the 'positive' and 'negative' groups. On 'smart' test trials, participants were asked to select the student they thought was smarter; we provided a definition of smart as "someone who is really good at learning stuff." On 'friend' test trials, participants were asked whom they would want to befriend. We also included a third set of test trials ('partner' test trials)

to assess children's group preferences in an academic context. On 'partner' test trials, participants were asked to pick one of the students as a partner to help them read a hard book. Participants indicated their answers by pointing and never received feedback. In between each block of test trials, participants viewed one of the familiarization videos for a second time (see Figure 1 for an overview of the study procedure). After the three blocks of test trials, participants completed some additional measures that addressed different questions; these measures are not reported here.

Figure 1. An overview of the study procedure. A. Familiarization phase: Participants are introduced to three groups and assigned to one, participants then view four interactions where a teacher directs positive behaviors toward students from one group (in this case, green) and negative behaviors toward students from another group (in this case, orange). B. Test phase: Participants are asked three blocks of test questions about new students from the green and orange groups. We do not have permission to publish the pictures of children used in the familiarization and test trials so the faces are blurred out. Participants in the study saw the original images without blurring.

Design. Participants were randomly assigned to the ‘positive group,’ ‘negative group,’ or ‘control group,’ balanced across age and gender. In the ‘positive group’ ($M_{\text{age}} = 6;5$, 16 males, 59% Multiracial, 18% White, 13% Asian), participants were assigned to wear a shirt that was the same color as the shirt worn by students who received positive nonverbal behaviors from the teacher in the familiarization videos. In the ‘negative group’ ($M_{\text{age}} = 6;8$, 16 males, 56% Multiracial, 22% White, 16% Asian), participants were assigned to wear a shirt that was the same color as the shirt worn by the students who received negative nonverbal behaviors from the teacher in the familiarization videos. In the ‘control group’ ($M_{\text{age}} = 6;5$, 16 males, 38% Multiracial, 25% White, 31% Asian), participants were assigned to wear a shirt that was not worn by any students in the familiarization videos or test trials. The shirt color of the ‘positive’ and ‘negative’ groups, the order of familiarization videos, the order of test trial blocks, the students in each test trial block, the side of the students in the ‘positive’ and ‘negative’ groups in the familiarization and test trials, and the students in the ‘positive’ and ‘negative’ groups varied across participants.

Scoring. On each test trial, selecting the student from the ‘positive group’ was scored as 1 and selecting the student from the ‘negative group’ was scored as 0. For each participant, we created an average ‘positive group score’ for each trial type by summing across each block of test trials and dividing by the total number of completed trials in the block (4 in most cases, except for one participant who did not give a response on 2 trials, and two participants who did not give a response on 1 trial; one participant in the ‘control’ condition failed to give any responses on friend test trials so they were excluded from analyses of that variable). Preliminary ANCOVAs with participant age, participant gender, participant race and test trial order as between-subjects factors and participants’ responses on smart, friend, and partner trials as the

DVs revealed no main effects or interactions with these variables so they were not included in remaining analyses. More information about the preliminary analyses can be found in the supplemental materials.

Results

To determine whether participants' group membership influenced their responses for each test question, we conducted a series of one-way ANOVAs for each trial type with condition (positive, negative, control) as a between-subjects factor. For smart trials, there was no effect of condition ($F(2, 93) = 1.48, p = .233, \eta^2_p = .03$), due to children consistently picking children from the 'positive group' as smarter, regardless of their own group membership (see Figure 2). For friend trials there was an effect of condition ($F(2, 92) = 5.82, p = .004, \eta^2_p = .11$). Tukey's honestly significant difference (HSD) post-hoc tests revealed that participants in the 'negative group' had significantly lower scores than participants in the 'positive' group ($p = .003$) and marginally lower scores than participants in the 'control' group ($p = .069$). This meant that participants in both the 'positive group' and 'control group' were more likely to prefer children from the 'positive group' (which was coded as 1) compared to participants in the 'negative group' who marginally tended to select peers in their own group (the 'negative group', which was coded as 0). There was no effect of condition on partner trials ($F(2, 93) = .19, p = .830, \eta^2_p < .01$).

To determine whether participants in the three conditions were influenced by the teacher's non-verbal behaviors, we also conducted a series of one-sample t tests comparing participants' positive group selections to chance (chance = 0.5, or 2 positive group selections out of 4 trials in each block). On smart trials, participants in the 'positive' and 'negative' groups both selected new students from the 'positive group' at levels that exceeded chance, and participants

in the 'control group' selected new students from the 'positive group' at levels that marginally exceeded chance (smart trials: $M_{positive} = 0.72$, $SD = 0.24$, $t(31) = 5.07$, $p < .001$, $d = 0.90$, $M_{negative} = 0.66$, $SD = 0.33$, $t(31) = 2.83$, $p = .008$, $d = 0.50$; $M_{control} = 0.59$, $SD = 0.30$, $t(31) = 1.79$, $p = .083$, $d = 0.32$). On friend trials, participants in the 'positive' group selected new students from the positive group at levels that exceeded chance, however, participants in the 'negative group' showed a marginal preference for new students from the 'negative group,' and 'control group' participants' selections did not differ from chance (friend trials: $M_{positive} = 0.63$, $SD = 0.25$, $t(31) = 3.06$, $p = .005$, $d = 0.54$, $M_{negative} = 0.43$, $SD = 0.23$, $t(31) = 1.69$, $p = .100$, $d = 0.50$; $M_{control} = 0.57$, $SD = 0.25$, $t(30) = 1.51$, $p = .143$, $d = 0.27$). On partner trials, participants in the 'positive group' selected new students from the 'positive group' at levels that marginally exceeded chance; participants in the 'negative' and 'control' groups' scores did not differ from chance (partner trials: $M_{positive} = 0.60$, $SD = 0.30$, $t(31) = 1.96$, $p = .059$, $d = 0.35$; $M_{negative} = 0.56$, $SD = 0.31$, $t(31) = 1.14$, $p = .264$, $d = 0.20$; $M_{control} = 0.57$, $SD = 0.26$, $t(31) = 1.56$, $p = .130$, $d = 0.28$; see Figure 2).

Figure 2. Proportion of positive group selections for participants from the 'positive,' 'negative,' and 'control' groups. Asterisks indicate scores that are significantly different from chance

(chance = 0.5; $p < .05$), plus signs indicate scores that are marginally different from chance ($p < .1$). Error bars represent 95% confidence intervals.

Discussion

The current study showed that teacher behaviors and children's own group membership differentially influenced the acquisition of intergroup preferences and stereotypes. When considering whom they would like to befriend, children tended to select members of their own group regardless of whether they were assigned to a group that received positive or negative behaviors from a teacher. Ingroup preferences were strongest for those assigned to the positive group, consistent with the extant literature that often finds stronger ingroup preferences for those in high-status groups (Aboud & Skerry, 1984; Baron & Banaji, 2009; Bigler, et al., 2001; Brown & Bigler, 2002; Horwitz et al., 2014; Patterson & Bigler, 2017; Schug et al., 2013; Shutts et al., 2011). However, children's group stereotypes were influenced by the teacher's behavior: children in the three conditions did not differ in their tendency to pick children from the group that received positive behaviors from the teacher when asked to select the 'smarter' student. Importantly, participants had not seen these children interact with the teacher. Instead, participants formed a belief about the relative intelligence of the two groups based on their observations of the teacher's behavior, and generalized that belief to *new* students from the groups. These results suggest that brief exposure to patterns of differential teacher behaviors toward students from different groups may guide children's stereotypes about new group members, but not their group biases.

In addition to questions about smartness and friendship, children were also asked to select a partner on a reading task. However, responses to this question did not differ from chance for children in the 'positive,' 'negative,' or 'control' groups. While it is possible that children simply

did not understand the question, there are a few other possible explanations for children's chance performance. Children in the 'positive group' may have been weighing whether to select members of their own group (whom they believed were smarter and preferred as friends) or to help members of the 'negative group.' Children in the 'negative group' may have been deciding between selecting children from their own group (whom they preferred) versus selecting members of the group that they believed was smarter. Because children were not asked to explain their responses, it is difficult to determine what motivated children's selections on the partner trials. To better understand how nonverbal behaviors influence children's inclusion behaviors in academic settings, future studies could differentiate between children's prosocial motivations (i.e., helping students from negatively stereotyped groups) and self-serving motivations (i.e., selecting preferred or positively stereotyped students). Such studies would also illuminate how teachers could foster inclusive behaviors and promote positive peer interactions.

The present study also featured a condition where children were assigned to a group that was not featured in the familiarization (the 'control group'). In this condition, children's selections did not show strong evidence of either stereotyping or bias. This finding was unexpected as this condition was intended to serve as a control (for membership in a group, wearing a shirt etc.). However, children in this group did not tend to select members of the 'positive' or 'negative' group on any test questions, suggesting that perhaps the teacher's nonverbal behavior was not meaningful to them. They may not have tracked the teacher's behavior toward groups to which they did not belong, they may not have remembered the pattern of teacher's behaviors since they were irrelevant to their group, or, they may have performed at chance on test questions because there was no option to select students from their ingroup. It is difficult to distinguish between these options because, with one exception (Dunham, Baron &

Carey, 2011), previous studies featuring minimal groups have not typically included a control group where children were assigned to a group that was not featured in the remainder of the study. Additional research could examine the importance of representation for children when learning about their own and other groups.

This study is one of the first to show that children generalize information from nonverbal behaviors in individual interactions to social groups. Previous research has shown that nonverbal behaviors can amplify children's biases toward existing social groups (e.g., racial groups: Castelli et al., 2008; Pauker et al., 2013). However, studies featuring novel groups have typically focused on children's ability to learn information about individuals (i.e., Bigler et al., 2001). In one study featuring differential nonverbal behaviors directed toward members of novel groups, children only generalized their positive or negative evaluations to new individuals who were friends of the individual who received either positive or negative nonverbal behaviors (Skinner et al., 2017). Given that generalization requires children to track both patterns of teachers' nonverbal behaviors directed toward individual students, and the group membership of those individual students across multiple interactions, it is understandable that children would have difficulty generalizing biases or stereotypes to new group members. Perhaps assigning children to the groups made the group-level information particularly salient in the current study, and children who did not have access to information about their own group (i.e., the children in the 'control group') did not demonstrate group biases or stereotypes for this reason.

The present study is also one of the first to explore *both* stereotyping and biases for children assigned to a stigmatized group. The inclusion of both stereotyping and bias measures is revealing, as children's performance differed on the two types of measures: on preference questions, children in the 'negative group' showed a tendency to prefer ingroup members,

whereas when asked who was smarter, these children selected members of the 'positive group' (the outgroup). This finding aligns with existing studies featuring minimal group designs with children assigned to low-status groups. Across a variety of status manipulations, children in high-status groups typically show robust ingroup biases, whereas children in low-status groups show mixed results, often reporting similar preferences for ingroup and outgroup members (Bigler et al., 2001; Brown & Bigler, 2002; Horwitz et al., 2014; Patterson & Bigler, 2018; Schug et al., 2013). Moreover, the divergence of preferences and stereotypes for children in the 'negative' (novel) group in the present work mirrors the preferences and stereotypes of children in stigmatized (real) groups. For example, by the age of 6, girls report that boys are more likely to be "really really smart," yet they prefer to be friends with girls (Bian, et al., 2017; Martin, Fabes, Evans, & Wyman, 1999). The findings from the present work indicate that different motivations may underlie stigmatized group members' preferences and stereotypes, and suggest that subtle cues about one's group (i.e., a teacher's negative nonverbal behaviors from a teacher) may be particularly impactful in guiding children's negative stereotypes about their group. Indeed, this study is one of the first to show that nonverbal behaviors guide group-level stereotypes (in addition to biases). Future research could assess the role of context (i.e., the school setting) or the identity of the individual demonstrating nonverbal behaviors (i.e., the teacher) and whether they differentially influence children's acquisition of biases and stereotypes about groups.

Although the present research illustrated how teacher behaviors guide children's stereotypes about groups, it is unknown how such behaviors might influence children's academic performance in classroom settings. Future research could examine whether children's sensitivity to negative teacher behaviors directed to ingroup members also influences outcomes like

motivation, identification with school, and academic achievement. Existing work suggests that when students receive negative nonverbal behaviors from a teacher, their performance suffers (e.g., Harris & Rosenthal, 1985; Witt, Wheelless, & Allen, 2004), however, less is known about how a child would perform when he or she belongs to a social group that tends to receive more negative behaviors (even when that child does not directly receive such behaviors).

Future studies could also test children's attention to teachers' nonverbal behaviors in real classrooms. In the present work, we tested children's reactions to students after viewing interactions featuring a specific set of nonverbal cues demonstrated by a teacher in a lab setting; however, in real classrooms children have access to a variety of cues about their peers including their own observations of student performance. Previous studies suggest that children might weigh information from a teacher over their own direct observations of peer performance (Brey & Shutts, 2018), however, it would be important to understand whether children use group-level stereotypes when they have access to individual information.

In this study, children were provided with a specific definition of smartness (i.e., 'someone who is really good at learning stuff'). This definition was chosen because it was unrelated to receiving feedback or doing well on a task (which could have prompted children to look to the teacher's behavior to guide their selections). However, providing children with different definitions of 'smartness,' particularly those that emphasize ability, might yield different results. Moreover, it would be important for future work to assess whether children use teachers' behaviors to guide group-level generalizations or stereotypes in non-academic domains. Previous work suggests that children use teacher feedback to make globally positive or negative inferences about other children (i.e., inferring that a child who receives positive feedback from a teacher is both nicer and stronger than a child who does not; Brey & Shutts,

2018). However, in the present work, children only used the teacher's behavior toward members of a particular group to draw inferences about the intelligence of other students in that group; they did not prefer to befriend or partner with children who shared a group identity with children who received positive nonverbal behaviors from the teacher (unless they were also members of that group).

Overall, this research suggests that biases in teachers' behaviors may be one source of children's group stereotypes in early elementary school. The results found here align with previous studies showing that children typically prefer ingroup members even when they themselves are members of negatively stereotyped groups. However, because members of the negatively treated group did acquire negative stereotypes about their own group, this work highlights the importance of understanding how classroom contexts could be used to promote academic success and emotional well-being for students from all social groups.

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Supplemental Materials

In our preliminary analyses we conducted three-way analyses of covariance (ANCOVAs) with participant gender (male or female), participant race (White, Asian or Multiracial), and participant condition (positive group, negative group, or control group) as between-subjects factors and age (in days) as a covariate on participants' scores for each block of test trials (smart trials, friend trials, and partner trials). In order to include participant race in these analyses we excluded participants who did not report race information ($N = 5$), or whose race was Pacific Islander ($N = 2$) leaving us with a sample size of $N = 89$. On smart trials, none of the main effects or interactions were significant (see table S1 for descriptive statistics and Table S2 for results of the ANCOVA). On friend trials, there was a main effect of participant condition (replicating the analyses reported in the main document) but no other main effects or interactions were significant (see tables S3 and S4). On partner trials, there was a significant three-way interaction between participant condition, gender, and race ($p = .035$), however, given the small cell sizes this interaction is difficult to interpret. None of the remaining main effects or interactions were significant (see tables S5 and S6). We also conducted these preliminary analyses with test trial order included as a between-subjects factor. In these analyses, none of the main effects or interactions with test trial order were significant, and none of the results reported below changed except that the three-way interaction between participant condition, gender, and race on partner trials was no longer significant.

Table S1

Means, standard deviations, and cell sizes for smart trials separated by participant condition, race, and gender

Gender	Race	Mean score	Standard Deviation	N
Positive Group				
Female	Not reported	0.75	.	1
	Asian	0.75	0.35	2
	Caucasian	0.56	0.24	4
	Multiracial	0.86	0.22	9
Male	Not reported	0.50	.	1
	Asian	0.63	0.18	2
	Caucasian	0.75	0.35	2
	Multiracial	0.68	0.26	10
	Pacific Islander	0.75	.	1
Negative Group				
Female	Not reported	1.00	.	1
	Asian	0.58	0.38	3
	Caucasian	0.88	0.18	2
	Multiracial	0.58	0.35	9
	Pacific Islander	0.25	.	1
Male	Asian	0.25	0.35	2
	Caucasian	0.80	0.27	5
	Multiracial	0.75	0.28	9
Control Group				
Female	Not reported	0.25	0.35	2
	Asian	0.67	0.20	6
	Caucasian	0.58	0.29	3
	Multiracial	0.50	0.40	5
Male	Asian	0.75	0.35	4
	Caucasian	0.60	0.34	5
	Multiracial	0.61	0.24	7

Table S2

Preliminary ANCOVA results for smart trials

Sources	SS	df	MS	F	p	η_p^2
Age (in days)	0.02	1.00	0.02	0.21	.645	0.00
Condition	0.09	2.00	0.05	0.52	.597	0.02
Gender	0.01	1.00	0.01	0.06	.811	0.00
Race	0.08	2.00	0.04	0.45	.639	0.01
Condition X Gender	0.08	2.00	0.04	0.46	.636	0.01
Condition X Race	0.61	4.00	0.15	1.78	.143	0.09
Race X Gender	0.08	2.00	0.04	0.44	.647	0.01
Condition X Gender X Race	0.37	4.00	0.09	1.09	.370	0.06
Error	6.01	70.00	0.09			

Table S3

Means, standard deviations, and cell sizes for friend trials separated by participant condition, race, and gender

Gender	Race	Mean score	Standard Deviation	N
Positive Group				
Female	Not reported	0.75	.	1
	Asian	0.63	0.18	2
	Caucasian	0.38	0.25	4
	Multiracial	0.58	0.22	9
Male	Not reported	0.75	.	1
	Asian	0.75	0.35	2
	Caucasian	0.88	0.18	2
	Multiracial	0.68	0.26	10
	Pacific Islander	0.75	.	1
Negative Group				
Female	Not reported	0.25	.	1
	Asian	0.42	0.14	3
	Caucasian	0.38	0.18	2
	Multiracial	0.48	0.19	9
	Pacific Islander	0.75	.	1
Male	Asian	0.25	0.35	2
	Caucasian	0.58	0.28	5
	Multiracial	0.33	0.25	9
Control Group				
Female	Not reported	0.50	0.00	2
	Asian	0.50	0.22	6
	Caucasian	0.58	0.14	3
	Multiracial	0.68	0.32	5
Male	Asian	0.83	0.29	3
	Caucasian	0.45	0.27	5
	Multiracial	0.52	0.21	7

Table S4

Preliminary ANCOVA results for friend trials

Sources	SS	df	MS	F	p	n_p^2
Age (in days)	0.01	1.00	0.01	0.10	.749	0.00
Condition*	0.66	2.00	0.33	5.51	.006	0.14
Gender	0.08	1.00	0.08	1.39	.242	0.02
Race	0.00	2.00	0.00	0.03	.968	0.00
Condition X Gender	0.21	2.00	0.11	1.78	.177	0.05
Condition X Race	0.14	4.00	0.03	0.57	.687	0.03
Race X Gender	0.26	2.00	0.13	2.14	.125	0.06
Condition X Gender X Race	0.37	4.00	0.09	1.56	.194	0.08
Error	4.11	69.00	0.06			

Note. * indicates $p < .05$

Table S5

Means, standard deviations, and cell sizes for partner trials separated by participant condition, race, and gender

Gender	Race	Mean score	Standard Deviation	N
Positive Group				
Female	Not reported	0.5	.	1
	Asian	0.5	0.35	2
	Caucasian	0.75	0	4
	Multiracial	0.61	0.25	9
Male	Not reported	0.5	.	1
	Asian	0.13	0.18	2
	Caucasian	0.63	0.53	2
	Multiracial	0.71	0.34	10
	Pacific Islander	0.25	.	1
Negative Group				
Female	Not reported	1	.	1
	Asian	0.75	0.43	3
	Caucasian	0.25	0	2
	Multiracial	0.64	0.18	9
	Pacific Islander	0.5	.	1
Male	Asian	0.13	0.18	2
	Caucasian	0.60	0.29	5
	Multiracial	0.53	0.36	9
Control Group				
Female	Not reported	0.50	0.00	2
	Asian	0.50	0.16	6
	Caucasian	0.58	0.14	3
	Multiracial	0.50	0.40	5
Male	Asian	0.81	0.38	4
	Caucasian	0.60	0.29	5
	Multiracial	0.54	0.17	7

Table S6

Preliminary ANCOVA results for partner trials

Sources	SS	df	MS	F	p	n_p^2
Age (in days)	0.03	1.00	0.03	0.39	.533	0.01
Condition	0.13	2.00	0.06	0.78	.461	0.02
Gender	0.04	1.00	0.04	0.44	.509	0.01
Race	0.17	2.00	0.09	1.05	.355	0.03
Condition X Gender	0.25	2.00	0.13	1.53	.223	0.04
Condition X Race	0.61	4.00	0.15	1.87	.126	0.10
Race X Gender	0.24	2.00	0.12	1.47	.237	0.04
Condition X Gender X Race*	0.90	4.00	0.23	2.75	.035	0.14
Error	5.72	70.00	0.08			

Note. * indicates $p < .05$