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The Icing on the Cake. Or Is it Frosting? The Influence of Group Membership on Children's Lexical Choices

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Abstract

Adults are skilled at using language to construct/negotiate identity and to signal affiliation with others, but little is known about how these abilities develop in children. Clearly, children mirror statistical patterns in their local environment (e.g., Canadian children using *zed* instead of *zee*), but do they flexibly adapt their linguistic choices on the fly in response to the choices of different peers? To address this question, we examined the effect of group membership on 7- to 9-year-olds' labeling of objects in a trivia game, exploring whether they were more likely to use a particular label (e.g., *sofa* vs. *couch*) if members of their "team" also used that label. In a preregistered study, children ($N = 72$) were assigned to a team (red or green) and were asked during experimental trials to answer questions—which had multiple possible answers (e.g., *blackboard* or *chalkboard*)—after hearing two teammates and two opponents respond to the same question. Results showed that children were significantly more likely to produce labels less commonly used by the community (i.e., dispreferred labels) when their teammates had produced those labels. Crucially, this effect was tied to group membership, and could not be explained by children simply repeating the most recently used label. These findings demonstrate how social processes (i.e., group membership) can guide linguistic variation in children.

Keywords: Developmental sociolinguistics; Lexical alignment; Intergroup cognition; Minimal groups; Language identity

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1. Introduction

The words we use and the way we speak can say a lot about who we are. For example, in the United States, although the terms *undocumented immigrant* and *illegal alien* can refer to the same person, the use of one over the other says a lot about the groups or ideologies a speaker identifies with, and how they are positioned with respect to others. Decades of work in psycholinguistics, social psychology, and sociocultural linguistics have documented ways in which individuals use language to situate themselves in the world and construct or negotiate their identities (see, e.g., Coupland, 2007; Duranti et al., 2011; Eckert, 2012; Haugh et al., 2021; Hay & Drager, 2007; Holtgraves, 2014; Kinzler, 2021; Llamas & Watt, 2010), with entire theories developed to account for the social functions of language use (e.g., Gasiorek, 2016). Although we have learned much about how adults (and adolescents) use language to signal aspects of their identity, less work has looked at children's use of language to convey social information. Here, we asked whether 7- to 9-year-olds spontaneously adapt their word choices in online interactions in response to the word choices of their peers.

To actively use language to convey social meaning, children first need to understand that language has the potential to carry social information. From a young age, children make inferences about people and how they relate to one another based on how they speak. Like adults, they expect individuals who speak alike (e.g., sharing the same language or accent) to have more in common (e.g., shared cultural practices) than individuals who do not (Weatherhead, White, & Friedman, 2016). Additionally, they assume individuals who speak alike are more likely to affiliate with one another compared to individuals who do not (e.g., those who speak different languages; Liberman, Woodward, & Kinzler, 2017). In this way, children understand how language can provide cues for different aspects of a speaker's identity, including whom that person associates with.

The kinds of language-based inferences that children make depend not only on how linguistically similar (or different) third-party speakers are from another, but also how linguistically similar (or different) speakers are from the children *themselves* (or their community). Indeed, many of the social inferences that children draw from language hinge on whether speakers are perceived as fellow speakers of the same variety as them or not (i.e., whether they are perceived as in-group or out-group speakers). Young children, for example, are more likely to assume that non-native speakers are "not from around here" (Kinzler & DeJesus, 2013), live in unfamiliar-looking dwellings, and wear unfamiliar-looking clothes (Hirschfield & Gelman, 1997; Wagner, Clopper, & Pate, 2014). This is not because children have specific cultural knowledge about speakers of language variety X, but because they perceive speakers as sounding different from speakers in their own community, and therefore, as unlikely to live in the same region and follow the same customs. Because children tend to favor members of their own social groups over members of other groups (e.g., Dunham, 2018), they are more likely to orient toward speakers of their own variety over speakers of other languages or language varieties, preferring to imitate (Kinzler, Corriveau, & Harris, 2011; Wagner, Dunfield, & Rohrbeck, 2014), trust (Kinzler et al., 2011; Shutts, Kinzler, McKee, & Spelke, 2009), be friends with (Kinzler, Dupoux, & Spelke, 2007; St. Pierre & Johnson, 2020), learn from (Corriveau, Kinzler, & Harris, 2013; Pető, Elekes, Oláh, & Király, 2018), and play with

(Myers-Burg & Behrend, 2021) the former compared to the latter. Thus, children have some understanding that an individual's language serves as a cue to which social group(s) they belong to, and importantly, whether that individual belongs to the same group(s) as them or not.

The studies summarized above make it clear that children see language as a marker of group membership, and can make spontaneous inferences about others based on how they speak, but very little research has examined children's abilities—in their own productions—to convey social meaning with language, including signaling how they relate to others in social space. The traditional sociolinguistic view, in fact, was that younger children were largely monostylistic, and did not vary their language based on context (Labov, 1964). While some work has examined children's acquisition of community/group patterns of sociolinguistic variation (see Kaiser, 2022 and Nardy, Chevrot, & Barbu, 2013 for recent reviews), most sociolinguistic research on how young people use language in real-time to index and negotiate identity has focused on adolescents (e.g., Bucholtz, 1999; Eckert, 1989; but see Lake, 2022; Mooney, 2020). In the current study, we examined whether children can spontaneously adapt their language on the fly in response to the language used by children in their social groups. Specifically, we examined how peer group membership might influence children's word choices, testing whether 7- to 9-year-old children—who have been in school for several years and have begun orienting toward peer groups—are more likely to produce the same words as in-group members compared to out-group members. Although children tend to repeat recently heard labels (lexical alignment; Branigan, Tosi, & Gillespie-Smith, 2016; Garrod & Clark, 1993; Hopkins, Yuill, & Branigan, 2017), and are more likely to do so when feeling ostracized (Hopkins & Branigan, 2020; see also Li & Koenig, 2022), no study, to our knowledge, has examined whether children's lexical alignment can be strategic, with children aligning with some individuals (as opposed to others) based on group membership.

To explore this question, children in the present experiment were assigned to either a red or green team (cf., Rabbie & Horwitz, 1969; Tajfel, Billig, Bundy, & Flament, 1971), and participated in a virtual trivia game they believed involved two teammates and three children from an opposing team (in fact, all other children were represented by prerecorded audio files controlled by the experimenter). Importantly, during critical trials—where questions had multiple possible answers (e.g., *blackboard* vs. *chalkboard*)—children heard their two teammates respond with one label, and two opposing team members respond with another. We manipulated (1) whether in-group members always produced the term preferred (*chalkboard*) or dispreferred (*blackboard*) by the broader speech community (as established by prior norming), and (2) whether children were asked to answer immediately after hearing the others (teams present, or TP, trials), or after the game, where they were asked to recall the answers to previous questions when only the experimenter remained (teams absent, or TA, trials). We predicted children would be more likely to produce dispreferred labels when their teammates also produced dispreferred labels, but may be less likely to do so when other children were not present (i.e., during TA trials). Crucially, we predicted that children would not invariably produce the preferred term, or the term they most recently heard, but that children's word choices would be socially conditioned (i.e., dependent on who produced which labels).

2. Method

The experiments reported in the manuscript—including sample size, experimental design, and statistical analyses—were preregistered (<https://doi.org/10.17605/OSF.IO/AYVFM> and <https://doi.org/10.17605/OSF.IO/NQTH4>) on the Open Science Framework, and the data and R Code can be found at <https://doi.org/10.17605/OSF.IO/EQBT6>. The study was conducted in accordance with our ethics protocol, which was approved by the University of Toronto Research Ethics Board.

2.1. Participants

Our final sample included 72 children ($M_{\text{AGE}} = 8.39$ years, range = 7;0–10;0; 24 girls) from the Greater Toronto Area with no reported hearing/vision difficulties, who were exposed to English at least 80% of the time ($M = 95.16\%$, $SD = 6.52$), and who had at least one parent who grew up in an English-speaking region in Canada. Of the 60 families who provided information about parental education, 73% reported that both parents had received post-secondary degrees, 25% reported one parent completing a post-secondary degree, and the remaining 2% reported that no parents had obtained a post-secondary degree. Thirty-five families also provided information on family income: 40% reported family incomes over \$140,000 CAD a year, 34% reported a family income between \$90,000 and \$140,000, 17% reported a family income between \$45,000 and \$90,000, and 9% reported a family income of less than \$45,000. Finally, while we did not collect information about children's race/ethnicity, our sample—like that of the surrounding community—was racially/ethnically diverse.

The experimenters included a White, undergraduate male from the Greater Toronto Area who tested eight children, and a female graduate student from Syria who tested 64 (St. Pierre, White, & Johnson, 2024).

2.2. Materials

In a separate norming study ($N = 41$), we established children's knowledge of synonym pairs (e.g., *blackboard/chalkboard*), drawing on the same population as the main experiment (see Supplementary Materials for more information). We identified 16 pairs of words (see Appendix A) that could refer to the same referents, and for which 7- to 9-year-old children—though familiar with both terms—would favor one label over the other, based on the conventions of their community (Clark, 2007).

Next, we created 32 questions for the trivia game in the main experiment, with 16 questions designed to elicit labels for our normed items, and another 16 serving as filler trials (see Appendix B for the list of questions). We then recruited and recorded Canadian English-speaking children producing the answers to these questions and inserted them into the trivia game (see Supplementary Materials for more information).

2.3. Procedure

The experiment was conducted online on Adobe Connect and consisted of three phases (see Appendix C for the experimenter script). In the first phase (team assignment), children were told they were going to play in a trivia game on either the red team or the green team, but that first, the experimenter needed to figure out which team to assign them to. To do this, the experimenter presented children with seven pairs of images (bike/scooter, butterfly/spider, cat/dog, pizza/French fries, shark/dolphin, chocolate milk/orange juice, and ice cream/chips) and asked them which item they preferred in each pair, under the pretense that children would be placed on a team with other children who shared the same tastes as them (see Watson-Jones, Whitehouse, & Legare, 2016). This was done to strengthen the degree of affiliation that children felt for their team. At this point, the experimenter pretended to look busy figuring out which team the child should be placed on (based on their preferences); in actuality, children were assigned to the team color their parents secretly told us during the screening that their child preferred (between green and red).

In the second phase (trivia game), children entered a virtual room (with their webcam disabled) to play a trivia game with whom they thought were five other online child participants. To make it more believable that the other children were live (rather than prerecorded), and to highlight that players were grouped based on shared preferences (supposedly), the experimenter asked each child to introduce themselves by stating their initials, whether they were joining on a computer or a tablet, and whether they were an ice cream person or a chip person. We varied the types of sentence structures used by the other children (e.g., *I'm on a computer*, *I'm using a tablet today*, etc.) to make the answers sound natural. Depending on what children answered in the team assignment phase (whether they preferred chips or ice cream), the experimenter ensured that children's in-group members responded with the same preference (chip person or ice cream person), and that the out-group members responded with the alternative preference.

Then, the experimenter proceeded to facilitate a trivia game containing eight rounds of three questions (24 questions/trials total). Each round contained two questions where one member from each team answered (filler trials, $N = 16$ total), and one question where multiple members from each team answered (critical trials, $N = 8$ total) (see Fig. 1). The filler trials—consisting of age-appropriate trivia questions—were included both to distract from the critical trials and to reinforce the impression that the other children were indeed live players through the use of naturalistic response frames (e.g., *I think ostrich*, *I'm gonna say ostrich*, etc.). Additionally, in three filler trials, the responding players from both teams answered incorrectly, again to make the game appear authentic. In the remaining 13 filler trials, each responding child answered correctly using the same term. Importantly, both teams got an equal number of questions correct throughout the game, ensuring that participants would not prefer one team over another based on performance. Altogether, each child in the game (including the participant) provided between 11 and 13 responses.

Critical trials came in two types: teams present (TP) trials ($n = 4$) and teams absent (TA) trials ($n = 4$), and each participant encountered both types. In TP trials, all players provided an answer to the same question (e.g., *What is the name of the big board found in classrooms*

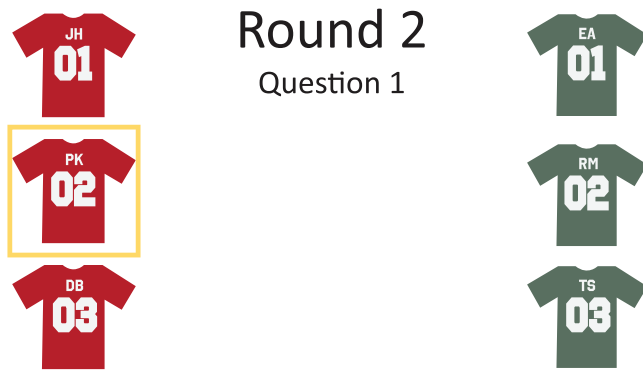


Fig. 1. A representation of an example display for a trial. The participant's team was always on the left side of the screen, and the participant was always player number 3, positioned in the lower lefthand corner. To show which child was speaking at a given time, and to prevent children from speaking out of turn, the experimenter announced that children could only be heard by the other children when they were called on, which was signaled by a yellow box appearing around an individual jersey. In this example, the participant is on the red team (number 03), with their initials represented on their jersey. Player 02 on the red team (an experimenter-controlled recording) is currently speaking, as indicated by the yellow box around their jersey.

that the teacher writes on?) starting with the first in-group member, and then moving on to the first out-group member, the second in-group member, the second out-group member, the participant, and finally the third out-group member. This meant that children heard two tokens from their teammates and two from out-group members before producing their response. For half of the child participants, their teammates always used preferred terms (e.g., *chalkboard*), while the other (out-group) team used dispreferred terms (e.g., *blackboard*); for the other half, this was reversed. Unlike in filler trials, the prerecorded answers only included the critical token with no response frames.

TA trials were identical to TP trials, except that neither the participant nor the third out-group member answered. Instead, after the trivia game, in the third phase of the experiment, participants were brought into a new virtual room that just contained them and the experimenter. Here, the experimenter asked the child to answer the critical trials they did not previously answer during the trivia game (in random order). Of interest was whether children would be less likely, in the absence of copresent peers, to use the same labels their teammates used during the trivia game. The assignment of word pairs (e.g., *chalkboard/blackboard*) to TP versus TA trials was counterbalanced across participants.

3. Results

Altogether, children produced 576 critical responses (8 critical trials \times 72 children). After removing trials in which children answered with both labels (e.g., child says, *gift or present*; $N = 13$), provided a label not mentioned by either team (e.g., *sleigh* instead of *sled* or *toboggan*; $N = 9$), or forgot/didn't know the label ($N = 3$), we were left with 551 trials.

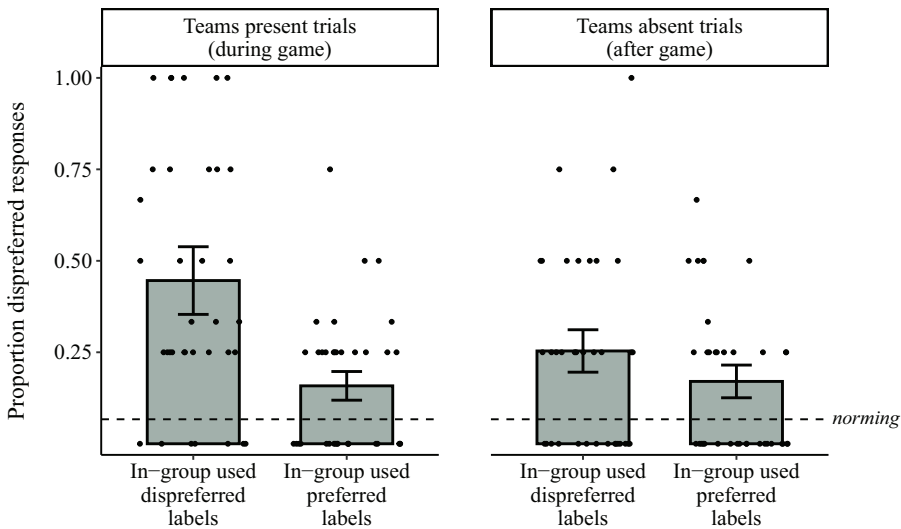


Fig. 2. Proportion of trials in which children produced dispreferred labels. During TP trials (in which children believed their teammates and opponents were copresent), children were more likely to produce dispreferred labels when their teammates did as well, demonstrating that children's productions were influenced by those of their teammates (and/or opponents). However, in TA trials (when children were alone with the experimenter), they mostly produced preferred labels, regardless of what their teammates previously produced. The dashed line (0.07) represents the average proportion of times that dispreferred terms were produced as children's first response during norming. Error bars represent \pm one standard error.

The data were analyzed using mixed-effects logistic regression, predicting the log odds of choosing the dispreferred label from trial type (TP, coded -0.5 , and TA, 0.5), in-group label (In-group Preferred, -0.5 , In-group Dispreferred, 0.5), and their interaction using the *glmer* function in the *lme4* package (Bates, Mächler, Bolker, & Walker, 2015) in R (R Core Team, 2023), with the maximum possible random effects structure that would converge (Barr, Levy, Scheepers, & Tily, 2013).¹ This revealed a significant interaction between trial type and in-group label ($\beta = -1.47$, $SE = 0.55$, $z = -2.68$, $p < .01$) (see Fig. 2); to understand this interaction, we conducted two follow-up analyses—one with TP trials as the reference level (coded 0), and another with TA trials as the reference level—in order to measure the simple effect of in-group label for each trial type. Results showed that during TP trials, children were significantly more likely to produce dispreferred labels when their teammates did as well ($\beta = 2.00$, $SE = 0.49$, $z = 4.08$, $p < .001$, $OR = 7.39$; $M_{\text{In-group Dispreferred}} = 0.45$ and $M_{\text{In-group Preferred}} = 0.16$), providing clear evidence that children's lexical choices were influenced by those of copresent groups.² Interestingly, although TA trials exhibited a similar pattern ($M_{\text{In-group Dispreferred}} = 0.25$ and $M_{\text{In-group Preferred}} = 0.17$), with children tending to produce dispreferred terms more when their teammates previously did, this difference was not significant ($\beta = 0.54$, $SE = 0.37$, $z = 1.43$, $p = .15$, $OR = 1.72$; see, however, Supplementary Materials for an exploratory analysis showing a possible effect of gender in TA trials).

4. General discussion

Research in language acquisition has overwhelmingly focused on how children acquire the abilities to convey semantic meaning, with much less work investigating how children use language to navigate their social world. An integral part of being a competent language user, however, is knowing how to use language to construct and negotiate identity, and position oneself in relation to others in social space (Bucholtz & Hall, 2010; Goodwin & Kyratzis, 2011; Kyratzis & Goodwin, 2017). In the current study, we are the first to provide experimental evidence that children's word choices are influenced by the lexical choices of peer groups. In target present trials, when all players were "copresent," children were more likely to produce labels dispreferred by the community when their teammates did as well, demonstrating that children are sensitive to the fact that words can convey social information about which group(s) an individual belongs to, even in novel social situations—as in the current experiment—where there were no previously established associations between the words (e.g., *blackboard/chalkboard*) and the groups (red/green).

These results directly show how social processes can guide linguistic variation in children, and how linguistic variation can develop impromptu social meaning. Impressively, children's linguistic behavior was *not* guided by prior knowledge of how particular labels are used, but arose from children's *online* sociolinguistic inferences about who used which labels (and which labels they themselves should use). The type of paradigm used in the current study—which capitalizes on the recent proliferation of video-conferencing—provides a highly structured yet naturalistic environment for exploring the relationship between children's developing sociocognitive knowledge and linguistic knowledge. By manipulating the groups (e.g., red/green, girl/boy, etc.), social configurations (e.g., cooperative vs. competitive), and linguistic features (e.g., lexical, phonetic, and syntactic), among other variables, such an experimental approach can ask a host of novel questions in the young field of developmental sociolinguistics about children's social and linguistic knowledge across development, contributing to a new and growing interest in the intersections between sociolinguistics, psycholinguistics, and cognitive science in language acquisition (e.g., Chevrot & Foulkes, 2013; De Vogelaer & Katerbow, 2017; Ghimenton et al., 2021).

Although this study clearly demonstrates that children's word choices were influenced by their teammates' word choices, what is less clear is *why* children opted to use the same labels as their teammates. Previous studies in selective trust word learning (see Sobel & Finiasz, 2020 for a recent review) have shown that children are more likely to endorse *novel* labels from in-group members compared to out-group members due to epistemic trust (i.e., trusting that labels from in-group members are more likely to be "correct" than labels from out-group members). In the current study, however, children were already familiar with the labels used in the experiment, and likely knew that both the preferred and dispreferred labels could accurately refer to the object in question; thus, children's decision to produce dispreferred terms when their teammates did were likely due to social rather than epistemic goals. Given that children believed they were placed on a team with others who shared their interests, they may have repeated the labels of their teammates out of a desire to affiliate with their team (e.g., Altinok, Over, & Carpenter, 2023; Over, 2020), or to avoid the term used by the out-group

(e.g., Oostenbroek & Over, 2015). On the other hand, children may have felt social pressure to copy their teammates (e.g., Costanzo & Shaw, 1966; Haun & Tomasello, 2011; Henrich & Boyd, 1998; Nielsen & Blank, 2011), in which case, children may have repeated dispreferred labels because they felt obligated to, and not because they identified strongly with their group(mates). Crucially, both explanations highlight the fact that children's linguistic behavior was socially guided, being influenced by complex considerations of the linguistic behavior of others *and* their relationship to them.

Given that the trivia game was highly structured, where children were required to think of a response to a question and provide their answer when called upon, we suspect that children's word choices during the experiment were explicit and intentional (and based on the choices of other children). However, it remains an open question in sociolinguistics of how consciously aware interlocutors are in their perception and production of linguistic variation (see, e.g., Babel, 2016), with awareness likely varying along a continuum based on the particular features and contexts under consideration. In the current study, for example, children's tendency to reuse in-group labels may have been aided by low-level mechanisms, whereby children attended more to the responses of in-group members (and more deeply processed them) compared to those of out-group members, making these labels more readily accessible, and therefore, more likely to be produced during the game (see, e.g., Sumner, 2015). Given children's early propensity in development to attend more to in-group speakers compared to out-group speakers (e.g., Kinzler et al., 2007), such low-level processes may in fact play an important role in the acquisition of linguistic patterns of particular social groups and sociolinguistic competence more generally.

Interestingly, the effect of group membership on children's lexical choices was only present during TP trials, where children were asked to produce a label in the presence of other children during the trivia game. After the trivia game, when children were alone with the experimenter (TA trials), and were asked to provide answers to previously heard questions, children tended to produce labels that were preferred in the speech community, even when their teammates had previously produced dispreferred labels (though see exploratory analysis in Supplementary Materials showing that girls may have continued using dispreferred terms if their teammates did). The absence of an overall effect of group membership in TA trials may suggest that group membership influenced children's lexical choices only in the copresence of in-group and/or out-group members, when the social manipulation was particularly salient. Outside of this socially salient context, children may have simply used the preferred term because it was the most accessible (see Branigan, Pickering, Pearson, McLean, & Brown, 2011, who found that participants repeated dispreferred terms less after a delay of several turns compared to when they named an object immediately after their interlocutor). Another possibility, however, is that children may have forgotten some of the labels used by particular teams during the trivia game, leading to a much smaller effect in the TA condition for which the current study could not reliably detect (see DiYanni, Corriveau, Kurkul, Nasrini, & Nini, 2015, who found that children who did not imitate a model's actions were also less likely to remember them). Finally, the less competitive nature of the TA trials may have additionally weakened the effect of group membership on children's word choices (Zhang & Sylva, 2021). Nevertheless, these results serve as a first step in

understanding the extent to which children's socially conditioned word choices generalize to different contexts.

Language is a powerful tool for positioning oneself in social space, involving a complex array of linguistic strategies, including stance-taking (e.g., Du Bois, 2007; Jaffe, 2009), politeness (e.g., Brown & Levinson, 1987; Gilman & Brown, 1958), accommodating different listeners (e.g., Giles, 2016), and mastering linguistic variation (e.g., Eckert, 2008). How children develop the linguistic tools to accomplish this complex task is still poorly understood. In the present study, we show that children do not simply parrot the words they hear most often or most recently, but selectively produce words that align with those used by the groups they belong to; in other words, children's word choices can be guided by social goals and/or processes. The methodological paradigm and the findings of the present study lay the groundwork for future experimental work exploring how children use language to navigate their social world (Johnson & White, 2020).

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Notes

- 1 $\text{DispreferredTermProduced} \sim \text{TrialType} * \text{InGroupLabel} + (1 + \text{TrialType} | \text{Item}) + (1 + \text{TrialType} | \text{Subject})$. Note that a fully maximum model produced similar results, albeit with a singular fit warning.
- 2 One possible concern is that children's lexical choices were not actually influenced by social factors (i.e., what their teammates/opponents produced), but by lower level, visuo-temporal patterns in the structure of the critical trials. Visually, in all critical trials, the children represented by the jerseys on the left side of the screen all responded with one label, while the children on the right side of the screen responded with another label, and temporally, labels were presented in an alternating fashion (label 1, label 2, label 1, label 2, participant response). Thus, the results we obtained in TP trials, rather than being influenced by group membership, might instead have been due to children

completing a pattern (responding to spatial or temporal cues). However, results from a separate, preregistered control study with 24 children ($M_{\text{Age}} = 8.03$ years, range = 7;0–9;9; 12 girls) using a subset of six items, in which the order of responses were varied and with only the responding child's jersey displayed on the screen (in the center), showed that children were still influenced by the labels of their in-group members ($\beta = 2.94$, $SE = 1.01$, $z = 2.91$, $p < .01$, $OR = 18.92$). That is, children were more likely to produce dispreferred labels when their teammates did as well ($M_{\text{In-group Dispreferred}} = 0.49$ and $M_{\text{In-group Preferred}} = 0.10$), confirming that children's lexical choices were based on social considerations rather than visuo-temporal cues (see Supplementary Materials for more information about the control study).

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Supporting Information

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

Supplementary Materials

Appendix A: Critical items used in the experiment

Critical items used in the experiment

Preferred term	Dispreferred term
chalkboard	blackboard
couch	sofa
life jacket	life vest
sled	toboggan
dinner	supper
grade 1	1 st grade
lollipop	sucker
fishing rod	fishing pole
rainboots	rubber boots
hot chocolate	hot cocoa
jam	jelly
bunny	rabbit
present	gift
icing	frosting
dirt	soil
jacket	coat

Note. Items came from a previously normed list of word pairs. Preferred labels are those which first came to mind in more than 70% of children in the norming study (19–22 responses per pair); dispreferred labels needed to be recognized by at least 80% of children.

Appendix B: List of trivia questions

Filler questions	Critical questions
What is closer to the earth: the moon or the sun?	What is the name of the big board found in classrooms that the teacher writes on?

(Continued)

Filler questions	Critical questions
Things fall when you drop them because of what?	After junior kindergarten, you go to senior kindergarten? After senior kindergarten, where do you go?
What dinosaur was big and had little arms?	If you jump in a puddle, be sure to put on this type of boots so that your socks don't get wet!
What color is a polar bear's skin?	What do kids often get on their birthday wrapped in paper with a bow on top?
What do you call a really long car driven by a chauffeur?	What do we wear to help us float if we fall out of a boat?
What do you call a doctor for animals?	What long, skinny thing do you take to the lake to catch fish with?
What is the largest bird?	This long-eared animal's favorite food is carrots, and they eat them with their two big front teeth.
What is the name of the country below Canada?	What do you dig up from the ground and put seeds in?
What do caterpillars turn into?	What is the long piece of furniture often found in living rooms where many people can sit down next to each other?
What is the largest organ in the human body?	Finish the name of this drink—which often comes with marshmallows—that kids like to have in the winter. Hot what?
What kind of doctor looks after your teeth?	When it snows, what do children sit on to ride down a hill?
What is the world's fastest land animal?	Strawberries and other fruit can be turned into this yummy, sweet spread that people put on toast.
Which country do French fries come from?	Breakfast is what we eat in the morning. Lunch is what we eat in the afternoon. What do we eat in the evening?
What is the tallest animal in the world?	What is the sweet stuff you put on top of cakes and cupcakes?
How do you say "hello" in French?	What kind of hard candy comes on a stick?
In which country are the ancient pyramids located?	What green piece of clothing is this person wearing to stay warm?

Appendix C: Experimenter script

Phase	Script
Team assignment	<p><i>In a little bit we're gonna play a trivia game. We're gonna put you on a team—either the red team or the green team—and you're gonna have to answer some trivia questions along with your teammates. Does that sound like fun?</i></p> <p><i>We first need to figure out whether to put you on the red team or the green team. I'm gonna ask you some questions about things that you like, and we'll put you on a team with kids who like the same things as you. Does that sound good?</i></p>

(Continued)

Phase	Script
	[Go through slides. Pretend to write down answers.]
	[Slide 1] <i>What do you like better, bikes or scooters?</i>
	[Slide 2] <i>Which insect you like better, butterflies or spiders?</i>
	[Slide 3] <i>What do you like better, cats or dogs?</i>
	[Slide 4] <i>What do you prefer to eat, pizza or French fries?</i>
	[Slide 5] <i>Which animal do you like better, sharks or dolphins?</i>
	[Slide 6] <i>Which drink do you like more, milk or orange juice?</i>
	[Slide 7] <i>What do you prefer to eat, ice cream or chips?</i>
	[Slide 8, which says, “Please wait while we figure out which team you’re on.”]
	<i>OK, I just need a minute to figure out which team to put you on. Just give me a second.</i> [Look busy. Take notes. Look at different parts of the computer screen.]
	<i>All right, it looks like you are going to be on the RED/GREEN team today. Now let me get you set up with a team jersey. Can you tell me what your initials are?</i> [Explain it if they don’t know, e.g., <i>The first letter of your first name and the first letter of your last name.</i> Look busy again.]
	[Slide 9, which shows everyone’s jerseys, with an arrow pointing to the participant’s jersey] <i>OK, so here is your jersey. You’re gonna be number 3 on the RED/GREEN team today. Once we get to the room with the other kids, you’ll be located on the bottom left of the screen, right where that black arrow is pointing, OK?</i>
	<i>All right, I’m gonna check and see if we are ready to begin, OK?</i> [Look busy for a little bit.]
	<i>OK, they’re ready for us. I’m gonna transfer you to another room so you can play the trivia game, OK?</i> [Go to ice cream or chips room depending on what the child answered for slide 7.]

(Continued)

Phase	Script
Trivia game	<p><i>All right, everyone, welcome to our trivia game. My name is _____ and I will be the one asking you the trivia questions today. The first thing I need to say is that other people in the game won't be able to hear you unless you have been called on. You'll know when it's your turn to speak when you see a yellow box around your jersey.</i></p> <p><i>Before we begin, we're gonna go around and do some brief introductions. So I want everyone to tell us your initials, whether you're an ice cream person or a chip person (and that just means whether you like ice cream or chips better), and let us know how you are connecting with us today, either on a computer or a tablet. Let's start with the [IN-GROUP COLOR] team.</i></p> <p><i>[Go through the introductions.]</i></p> <p><i>All right, now let's start the trivia game. We are going to have 8 rounds of questions. Each round will have 3 questions. For some questions, I will call on only one player to answer the question. For other questions, only 2 people from each team will answer. And for some other questions, all 6 of you will be able to answer.</i></p>
Teams absent	<p><i>Let's get started with round 1.</i></p> <p><i>[Go through trivia game.]</i></p> <p><i>OK, that was a lot of fun! Now I'm going to send each of you back to the same room that you started in to do some last minute things before we let you go.</i></p> <p><i>[Click on teams absent room.]</i></p> <p><i>Hello _____, are you there? Did you have fun? OK, it's just the two of us now. I just need to ask you a couple of questions before we go. We want to see how well you remember some of the answers that you heard in the trivia game. So I'm just gonna ask some of the questions you heard earlier, and you're just gonna give me the answer, OK?</i></p>