RELATIONS BETWEEN LANGUAGE EXPOSURE AND SOCIAL BEHAVIOR IN CHILDHOOD

by

Aleyda Arreola, B.A.

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Committee Members:

Katherine R. Warnell, Chair

Jennifer M. Clegg

Amy Weimer

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ABSTRACT

Previous studies have examined children's sensitivity to language when forming social preferences, but less research had examined how a social partner's language influences children's sharing behaviors, or if language-based preferences are evident amongst bilingual children. The goal of the current study was to understand how language-based social preferences in early childhood (ages 4-7 years) affect monolingual and bilingual children's choices to engage in the prosocial behavior of sharing. The study consisted of a paradigm in which children were shown scenarios of four different language pairings of two speakers:(1) native-accented English vs. Spanish, (2) native-accented English vs. Spanish-accented English, (3) Bilingual vs. native-accented English, and (4) Bilingual vs. Spanish, and were asked to share 5 pretend food items between the two speakers. Results indicate that monolingual children preferred other native monolingual speakers but that bilingual children showed no preferences. There were no relations between age and the magnitude of children's preferences. These findings extend our knowledge of in-group biases in early childhood, with implications for conceptualizing language as a group marker.

I. INTRODUCTION

Literature Review

According to the 2016 U.S Census, 21.6 percent of people living in the United States five years of age and older reported speakng a language other than English at home, with over half of these (13.3 percent) reportedly speaking Spanish at home. Given the growing number of bilingual speakers, it is important to understand how language influences social behavior. Language is not only a form of communication amongst humans, but also serves as a sociocultural marker (Hauser et al.2002). Given language's role in signaling group membership, individuals often make social choices guided by the language spoken by a social partner. For instance, adult research indicates that monolingual individuals (who only speak one language) prefer someone who speaks their same language over someone who speaks an unfamiliar language or even someone who speaks their own language with an accent (e.g., Carlson & McHenry, 2006; Mai & Hoffmann, 2014; Danziger & Ward, 2010; Giles & Billings, 2004; Gluszek & Dovidio, 2010; Labov, 2006).

The use of spoken language to formulate social preferences can be seen across development, even before children understand the content of language. For example, infants as young as 2 days have been shown to prefer speakers of their native language (i.e., the language spoken by the mother) over speakers of a nonnative language (Moon, Cooper, & Fifer, 1993). These language-based social preferences continue as children get older (Bosch & Sebastián-Gallés, 1997; Nazzi, Jusczyk, & Johnson, 2000; Nazzi & Ramus, 2003). For example, monolingual children choose to be friends with people who speak their native language over nonnative speakers (Kinzler, Shutts, & Spelke 2012).

Similarly, monolingual children prefer native-accented speakers over nonnative-accented speakers, even when the native-accented individuals are of a different race (Kinzler, Shutts, DeJesus, and Spelke, 2009). Alongside these language-based social preferences, monolingual children also might develop negative attitudes towards non-native accents (Cremona & Bates, 1977; Dailey, Giles, & Jansma 2005; Day, 1980; Kinzler & DeJesus, 2013).

Although the literature suggests that monolingual children prefer their native language spoken with a native accent, there are several gaps in our current knowledge. Relatively few studies have examined the social preferences of bilingual children, particularly toward other bilinguals. Additionally, almost all existing research has examined children's preferences (e.g., via looking time to a particular speaker in younger children, asking older children who they would like to be friends with, or assessing attitudes for hypothetical individuals), as opposed to examining children's social behaviors toward their a conversational partner. One important and early-emerging social behavior is prosocial behavior (i.e., altruism), but very little research has examined how language might influence children's willingness to engage in prosocial behaviors.

A large body of studies suggests that infants prefer their native and familiar language over new unknown languages (DeCasper & Fifer, 1980; Mehler et al., 1988; Moon, Cooper, & Fifer, 1993; Vouloumanous & Werker, 2007). For example, Moon et al., (1993) had 16 two-day old Spanish and English monolingual infants listen to recordings of both Spanish and English speakers and, through infants' sucking patterns, they found that infants preferred to listen to their native language over a nonnative language. These language-based social preferences persist as children become older (Bosch et al., 1997;

Nazzi et al., 2000; Nazzi et al., 2003). For instance, when presented with the choice of who to be friends with, monolingual Xhosa-speaking children chose to be friends with the native Xhosa speakers over nonnative French speakers (Kinzler et al., 2012). Additionally, even when monolingual children are immersed in bilingual communities, monolingual children still choose to be friends with other monolingual speakers. For example, in a study conducted by Byers-Heinlein and colleagues (2016), English monolingual and French monolingual children from either a generally monolingual or a generally bilingual community were asked to choose to be friends with either a native speaker (e.g., English for native English speakers) or a bilingual English-French speaker, who repeated declarative sentences in both English and French. Children from both areas chose to be friends with speakers of their native language (e.g., English speaking children chose native English speakers).

One possible explanation for these findings is that monolingual children prefer to befriend those who speak in an understandable language, but this perspective does not account for evidence that monolingual children prefer native-accented speakers over nonnative-accented, but still easily comprehensible speakers. For example, Kinzler, Dupoux, and Spelke (2007) found that five- and six-year-old monolingual English-speaking children preferred to be friends with American-accented English speakers over the French-accented English speakers. In addition to friendship preferences, there is evidence that monolingual children also choose to trust native-accented speakers over nonnative-accented speakers even when it is clear that the native-accented speakers are misinforming the children (Corriveau, Harris, & Kinzler, 2013; Kinzler, Corriveau, & Harris, 2011; McDonald & Ma, 2016). For example, Corriveau and colleagues (2013)

had monolingual English-speaking children observe both native-accented speakers and nonnative-accented speakers while they named objects familiar to them. They had both types of speakers name the objects either correctly or incorrectly and found that three-year olds were more likely to trust native-accented speakers over nonnative-accented speakers even when the native-accented speaker was wrong in their naming of familiar objects.

Although the research clearly shows a preference for the native language in monolingual children, far less research on language-based social behaviors has been done with bilingual children and the findings from these limited studies are mixed.

Some studies suggest that like monolingual children, bilingual children exhibit social preferences based on the accents of others. For example, Souza, Byers-Heinlein, and Poulin-Dubois (2013) tested 5- to 6-year-old English French bilingual children in Montreal. First, in order to assess language dominance, experimenters used parent reports of children's language exposure and proficiency. After assessing for language dominance, children were presented with photos of European adults and audio clips of declarative sentences by native-accented speakers of their dominant language (e.g., native English speakers spoke English while native French speakers spoke in French) and nonnative-accented speakers who spoke in an unfamiliar accent (e.g., native Haitian Creole speakers spoke in either English or French). In this study, bilingual children preferred native-accented English and French speakers in the same way that monolingual children prefer native-accented speakers.

However, while Souza et al., (2013) gave bilingual children the choice between an unfamiliar accent and the accent of their dominant language, DeJesus, Dautel, and

Kinzler (2017) gave bilingual children the choice between the accents of their two languages. First, English French bilingual children were recruited from a French immersion school and Korean-English bilingual children were recruited from Chicago's Korean American community. They found that French-English bilingual and Korean-English bilingual children preferred to be friends with native-accented English speakers over accented speakers, even when that accent matched their parent's native language (e.g., Korean-accented English) and regardless of their own language dominance or the familiarity of the nonnative accents. Additionally, Yow & Li, (2018) also found that Mandarin-English bilingual children had a preference for English speakers over bilingual Mandarin-English speakers.

Although Souza et al., (2013), DeJesus et al., (2017), and Yow & Li, (2017) demonstrated that bilingual children display language-based social preferences similar to the preferences of monolingual children (i.e., a preference for a native speaker), other studies suggest they have different preferences than monolingual children. In one study, Spanish-English bilingual children were presented with photos of adults along with audio recordings of either a monolingual English speaker, an English-Spanish bilingual speaker, or an English French bilingual speaker (Stevens, 2017). Each speaker repeated the same sentence two times (i.e. both in English, once in English and once in Spanish, once in English and once in French). In this study, researchers found that bilingual children overall had no preferences. However, it is important to note that only eight bilingual children were included in this sample and it is from an unpublished thesis.

In a study with a larger sample of 4- to 6-year-old children, Byers-Heinlein and colleagues (2016) asked the parents of French-English bilingual children to rate their

children's language proficiency and exposure to assess their language dominance. Children were then presented with narratives in their native languages and asked their friendship preference between speakers of their dominant language and speakers of their non-dominant language. They found that bilingual participants had no social preference, indicating that language dominance did not contribute to friendship preference.

This literature illustrates the complexity of language-based social preferences in children. Findings show that monolingual children prefer both native speakers and native-accented speakers. Additionally, while less is known about bilingual children's preferences, some literature shows a bilingual preference for native speakers. Given that social preferences are found in both the monolingual and bilingual children, questions arise over how exactly these social preferences influence the daily social interactions of children.

Prosocial behaviors are any behaviors expected to benefit others (Eisenberg, 1986). There are three main types of prosocial behaviors: sharing (e.g., distribute stickers amongst friends), helping (e.g., assist a friend in need), and comforting (e.g., hugging a friend who is crying; Dunfield, 2014; Dunfield & Kuhlmeir, 2013).

Although sharing, helping, and comforting all involve different mechanisms, studies have shown that children's social preferences influence their display of each type of behavior (Dunham et al. 2011; Sparks et al., 2017). For instance, to examine how intergroup membership influenced sharing, Dunham, et al., (2011) some children were placed in minimal groups and some were placed in gender-based groups. Children were then presented with photos of in-group and outgroup members and asked to divide five coins. They found that children tended to give more coins (i.e., share more) with their in-

group members in both the minimal group and the gender group.

While studies have shown that prosocial behaviors such as sharing are influenced by group membership, Plötner, Harriet Over, Carpenter, and Tomasello (2015) also demonstrated the real-world applications of helping and group membership in 5- to 7-year-old children. In their study, children were placed into teams, yellow or green, and presented with both a yellow and green puppet. In the sharing task, just as previous literature suggests, they tended to give more stickers to their in-group members over outgroup members. Additionally, when children were placed in the helping task, they were told that the puppets had dropped their blocks and were asked by the experimenter to help. Children tended to help their in-group member before outgroup members.

Thus, one set of literature shows how children's prosocial behaviors are influenced by group membership and another line of literature illustrates that language serves as a social group maker, suggesting that language-based social preferences might influence prosocial behavior. Research investigating this question, however, is extremely limited. In one study, 5- to 10-year-old children from four different Amazonian towns were presented with photos of two puppets paired with voice recordings. One puppet spoke the same with children's native accent while the other spoke with a nonnative accent (Cohen & Haun, 2013). Children were given the option to share sweets with each puppet (e.g., make a prosocial action) and then asked who they preferred to be friends with. Overall, children chose self-gain in sharing trials, but the local-accented puppet was chosen more often than the nonnative-accented puppet in friendship trials. It is important to note however, that children in this study were not assessed for bilingualism. Rather, their towns were classified as either having accent diversity or one dominant accent and

children were asked three questions to assess who they believed spoke more like them. Overall, accent guided children's choice of friendship.

To date, only one unpublished dissertation has directly explored the relation between language group and prosocial behavior, although this study only assessed monolingual English-speaking children (Menjivar, 2013). Children were promoted to share and help by either an English speaker or Spanish speaker. For example, in one trial, while the children colored with the experimenter, the experimenter would purposely use a marker that did not work, then express disappointment and wait for children to respond. Children in this study helped and shared with both speakers equally, although it is important to note that overall rates of helping and sharing were low. This could be in part because children always had the option not to engage in the behavior. Additionally, the between-subjects design precluded the comparison of the same child's behavior toward different speakers and only two language groups were examined. Thus, several open questions remain about how language-based social groupings affect prosocial behavior in young children.

Aims and Hypotheses

The goal of the current study was to extend previous work on monolingual speakers by identifying if preferences for other monolingual native speakers would persist beyond friendship preferences and would be observable in sharing behaviors. Additionally, this study sought to detect whether bilingual children show preferences for other bilinguals and if those preferences are visible through sharing behaviors. Both monolingual English-speaking children and native bilingual English-Spanish speaking children heard two puppets express a desire for food and then children chose how to allocate five pretend food items between the two puppets. All children were presented with four different language pairings (1) native-accented English vs. Spanish, (2) native-accented English vs. Spanish-accented English, (3) Bilingual vs. native-accented English, and (4) Bilingual vs. Spanish.

The present study had two main aims. First, to replicate past studies finding in-group biases in monolingual speakers, and second, to examine whether bilingual children showed a similar in-group preference for bilingual speakers. It was hypothesized that monolingual English speakers would show a sharing preference for native-accented English, whereas bilingual children would show a sharing preference for bilingual speakers. Additionally, analyses were conducted to explore for age effects and, amongthe bilingual children, to explore the possible effects of parental acculturation.

II. METHODS

Participants

Following the Living Lab model, a research team set up booths in San Marcos, Texas parks (Corriveau et al., 2015)Families were approached by research assistants and asked if their child wanted to participate in the research study. Eligibility criteria were that children had to be proficient in English and between four and seven years of age. Informed consent was collected from all parents and informed assent was collected from all children aged seven. Caregivers had the option of completing consent forms, demographic questions, and the acculturation scale in English or Spanish. The testing paradigm administered to children was given in English. Upon completion of the study, children received a book worth roughly $5 and a sticker.

In total, 91 children participated (54 females; mean age = 5.69 years). Due to miscommunication with parents during initial screening, two three-year-olds were included in the final sample, one who was 3.87 years and one who was 3.98 years. In the sample, 62 children were monolingual and 29 were Spanish-English bilinguals (see details on bilingual assessment below; children multilingual in other languages were not included in this sample).

Measures and Procedures

Given the brief nature of testing in a Living Lab context, we necessarily conducted abbreviated assessments of children's bilingualism. Consistent with previous work (i.e., DeJesus et al., 2017; Souza et al., 2013; Byers-Heinlein et al., 2017; Yow et al., 2017), bilingualism was assessed by asking parents if their child was bilingual, to rate the child's language dominance, and, if the child was enrolled in school, thelanguage(s)

in which the teacher's used at school (e.g., some children could have been enrolled in bilingual programs). Children were classified as bilingual if caregivers listed both Spanish and English (and no other languages) as languages spoken by and to the child. All but one child in the bilingual sample heard Spanish at home and the remaining child was in a bilingual school.

While children completed the prosocial task (described in the following section), parents were asked to answer a demographics questionnaire and to complete the Short Acculturation Scale for Hispanics (SASH) developed by Marín and colleagues (1987). Measuring parent acculturation (defined as the process of cultural and psychological changes that result from the merging of cultures; Sam & Berry, 2010) was important not only for understanding the different levels of bilingualism, but also to better understand the home environments of children and how that may influence their own cultural identities.

Although monolingual and bilingual children did not differ in average age or in gender breakdown, there were significant differences in parental education (Table 1). Additionally, as expected, there were significant differences in language exposure and proficiency.

Table 1. Descriptive Statistics ($N = 91$)

	Child Group		
	Monolingual $n = 62$	Bilingual $n = 29$	Group Comparison
Age in years, mean (SD)	5.64 (1.17)	5.81 (1.07)	$t(89) = -.66$
Gender			$\chi^2(1) = .009$
Female	37	17	
Male	25	12	
Parental Education (%)			**χ^2 (7) = 22.04****
Less than high school	0	20.7	
Some high school	3.2	3.4	
High school	3.2	13.8	
Some college	25.8	20.7	
Technical/AA degree	3.2	0	
College degree	40.3	13.8	
Some post-graduate	6.5	6.9	
Post-graduate	12.9	20.7	
Acculturation, mean (SD)	4.84 (.34)	2.77 (1.3)	**$t(86) = 11.65$****
English First Language %	100	37.9	**$\chi^2(1) = 47.97$****
Language scores (Out of 5)			
How well does your child understand English?	4.73	3.90	**$t(87) = 3.51$*****
How well does your child understand Spanish?	1.35	3.97	**$t(87) = -11.21$****
How well does your child speak English?	4.68	3.83	**$t(87) = 3.83$*****
How well does your child speak Spanish?	1.33	3.62	**$t(87) = -9.94$******

Note: Acculturation is an average of four items scored on a 1-5 scale, such that 5 represents the most acculturation (e.g., viewing English-only media). Parental education was based on the parent present at the parks to fill out the survey (59% mothers). Three participants were missing parental education data, three participants were missing acculturation scores, and two were missing language proficiency scores. **, $p < .01$ ***, $p < .001$; ****, $p < .0001$.

In order to control for potential race bias (e.g., Annis, & Corenblum, 1986; Silva, Langhout, Kohfeldt, & Gurrola, 2015) trials included videos of animal puppets instead of people (see Cohen et al., 2013; Plötner et al., 2015 for examples of similar language-preference studies using puppets). Additionally, animal puppets are often used in counseling settings to reduce threatening situations or stigmas (Carter & Mason, 1998; Pitre, Stewart, Adams, Bedard, & Landry, 2007), and to reduce feelings of power differential that might happen if presented with an adult (see Cohen et al., 2013). Each trial consisted of videos where puppets were side-by-side, were the same animal, (e.g., two elephants), but were wearing different colored scarfs (Figure 1). Prerecorded stimuli were presented to control for any inconsistencies that might arise through in person presentations (Byers-Heinlein et al., 2017; DeJesus et al., 2017; Kinzler et al., 2007; Souza et al., 2013).

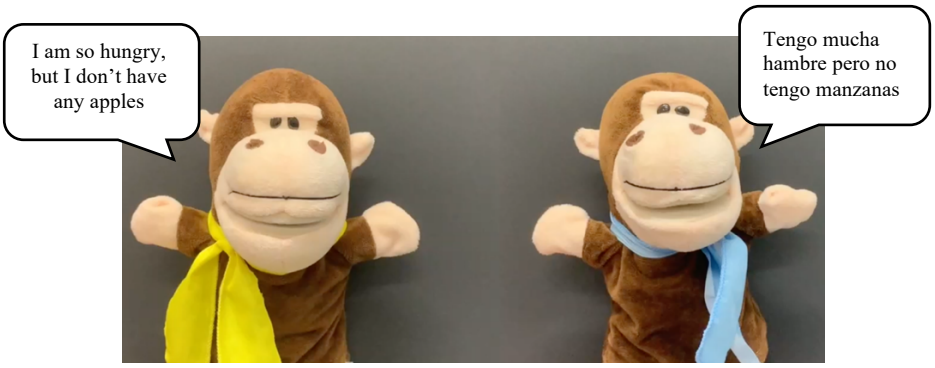

Figure 1. Screenshot of sample stimuli. Children watched video of one speaker and then the other. Stimuli depicted here are from an English vs. Spanish trial. After listening to both speakers, children divided five food items between them.

Children viewed four trials, each containing a different language contrast: (1) native-accented English vs. native-accented Spanish, (2) native-accented English vs. Spanish-accented English, (3) native-accented English vs. native bilingual, and (4) native-accented Spanish vs. native bilingual. All speakers were female, consistent with

similar developmental research, and no speaker was repeated (e.g., the English speaker in Contrast 1 was different than the English speaker in Contrast 2). Bilingualism was indicated by fluent code-switching. That is, speakers switched between native-accented English and native-accented Spanish in their sentences. Trials were presented in a counterbalanced order and, within trials, which puppet spoke first (e.g., native bilingual vs. Spanish), was also counterbalanced, as was the scarf color for that particular speaker (e.g., for half the children, the English speaker wore yellow and for half the children, the English speaker wore green). For more detail, the full experimental script is included in Appendix A.

In each video pair, both puppets expressed that they were hungry. The experimenter then handed children 5 pretend snacks and told children that they could share the snacks however they wanted. The use of an odd number of snacks ensured that children had to display a preference. Children completed the sharing task for all four pairs of puppets and thus, over the course of the sharing condition, children allocated a total of 20 pretend snacks (Five snacks for each of the four language comparisons). Additionally, after allocating the snacks to a particular pair, the experimenter asked the child who they preferred to be friends with and which speaker they thought liked the same things as them, resulting in four friendship and four commonality preferences throughout the experiment. Exploratory results from these analyses are also reported in the results section.

Data Analysis

Data analysis was conducted in SPSS 24.0 and *R* 3.5.2. Data were analyzed in two phases. Analysis 1 consisted of Contrasts 1& 2 (1: native-accented English vs. Spanish, 2: (native-accented English vs. Spanish accented English), in order to replicate and extend past findings of a monolingual bias for native-accented English speakers in both of those contrasts. Analysis 2 examined Contrast 3 (3: native-accented English vs. bilingual) and Contrast 4 (4: native-accented Spanish vs. bilingual), to determine if bilingual children showed an in-group bias to allocate resources to other native bilinguals.

On each language contrast, children divided five tokens between the two speakers. The majority of children split their tokens either 2/3 or 3/2 (Contrast 1: 81% of sample; Contrast 2: 82%; Contrast 3: 77%; Contrast 4: 78%). Treating the number of tokens given to a particular puppet as a continuous variable was therefore inappropriate, as this number was almost always 2 or 3. The sharing variable was dichotomized such that a 1 indicated that a particular puppet received a majority of the snacks and a 0 indicated that a particular puppet received a minority of the snacks. In the first analysis, given the interest in the bias to share with a native-accented English speaker, sharing a majority of snacks with this particular puppet was coded as a 1. In contrast, the second analysis was focused on sharing the bilingual speakers, so for these trials, giving a majority of snacks with the bilingual puppet was coded as a 1. Similar coding was employed for questions about friendship preference and perceived commonality (e.g., for the first analysis, a friendship preference for the native-accented English puppet was coded as a 1).

III. RESULTS

Analysis 1: Monolingual Sharing Preferences for Native-Accented Speakers

A mixed-model binary logistic regression was conducted to examine if the likelihood of sharing the with the native-accented English speaker was impacted by child group (monolingual vs. bilingual), contrasted language (Spanish vs. nonnative-accented English; i.e., Contrast 1 vs. Contrast 2), and the interaction between the two (e.g., were monolinguals particularly affected by one language contrast?). To account for our repeated measures design, a random effect of participant was also included in the model as a random intercept.

Consistent with past research showing an in-group bias in monolingual children, a main effect of child group was found (*odds ratio* = 1.8, p= .039), indicating that monolingual children were more likely to share the majority of their snacks with the native-accented English speaker (Figure 2). There was no effect of language contrast (i.e., Spanish vs. native-accented English; *odds ratio* = 1.19, p = .59), nor was there an interaction between child group and language contrast (*odds ratio* = .74, p = .45). That is, resource allocation rates were unaffected by the language paired with native-accented English for either monolingual or bilingual children. Post-hoc binomial proportion tests indicated that, compared to chance, monolingual speakers were significantly more likely to share a majority of their resources with native-accented English speakers than Spanish speakers (z = 2.67, p = .008) and marginally more likely to share with nonnative-accented English speakers (z = 1.91, p = .057). In contrast, bilingual children showed no preferences for native-accented English compared to Spanish (z = -.37, p = .71) and compared to non-native accented English (z < .01, p > .99).

Analyses were then repeated with the addition of a main effect of age and all associated interaction terms. There were no significant main effects of age nor significant interaction terms involving age (*p*s > .1). Similarly, there were no main effects or interactions with gender (*p*s > .1).

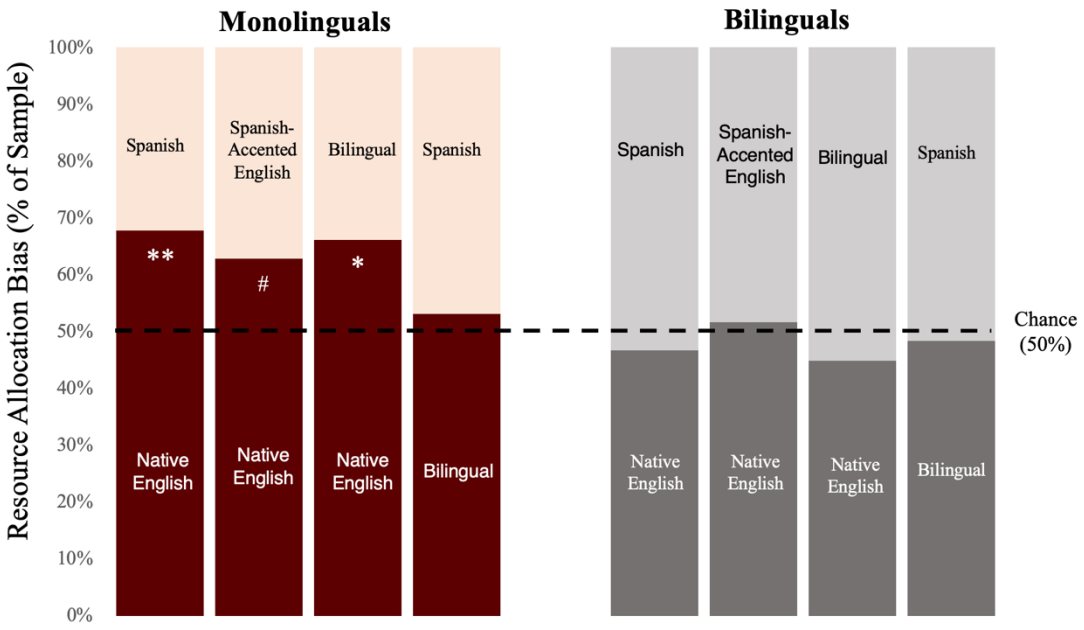

Figure 2. Influence of language and accent on resource allocation in monolingual and bilingual children. The figure depicts the percentage of the total sample who gave a majority of their resources to that particular language group. Proportions were tested against chance (50%) to determine significance. Monolingual children on shown on the left and bilingual children are shown on the right.
Note: Symbols represent # $p < .1$; * $p < .05$; **, $p < .01$.

Analysis 2: Bilingual Sharing Preferences for Bilingual Speakers

A mixed-model binary logistic regression also was conductedto examine if the likelihood of sharing with the native-accented Spanish speaker was impacted by child group (monolingual vs. bilingual), language contrast (e.g., native-accented English vs. native-accented Spanish; i.e., Contrast 3 vs Contrast 4), and their interaction. Again, participant was included as a random intercept to account for our repeated measures

design.

There was a significant main effect of language contrast (*odds ratio* = 1.64, *p* =. 03), such that the probability of allocating a majority of resources to the bilingual puppet was higher when the contrast language was Spanish versus English. There also was marginal main effect of child group (*odds ratio* = 1.73, *p* =. 056), such that bilingual speakers were more likely to give to the bilingual puppet than monolingual speakers. This finding, however, is contextualized by the marginal interaction between child group and language contrast (*odds ratio* = .511, *p* = .095). Post-hoc comparisons indicate that although monolingual English speakers were significantly more likely than chance to share a majority of their resources with the native English versus bilingual speaker (*z* = 2.41, *p* = .016), they showed no significant biases for Spanish versus bilingualism (*z* =. 38, *p* =. 70), and bilingual children did not show resource allocation biases toward bilingual speakers compared to either English (*z*=. 37, *p*= .71) or Spanish (*z* = 0, *p*> .99). That is, English monolingual children maintained a preference for native-accented English even contrasted with a puppet fluently code switching between both languages, but bilingual children showed no preferences.

As with Analysis 1, there were no significant main effects or interactions with either age or gender when these variables was added to the model (*p*s > .1).

Influence of Acculturation on Bilingual Children's Sharing

Given that acculturation values were not informative for monolingual participants (i.e., 85% of participants scored at least 4.75 out of 5), the effect of acculturation scores was only examined on the preferences of bilingual children.

First, Analysis 1 (native –accented English vs. Spanish and native-accented

English vs. Spanish-accented English) was repeated for just the bilingual children, including main effects of language contrast, main effects of acculturation, and the interaction between the two. There was no main effect of acculturation (*odds ratio* = 1.26, *p*=.23). There was a marginal effect of language contrast (*odds ratio* = 4.30, *p* = .08), indicating increased likelihood of bilingual children giving to the native-English accented puppet when that puppet was contrasted with accented English versus Spanish, but given that this effect did not come out in the full sample, and that none of the giving rates were different from chance for bilingual children, we are hesitant to interpret this marginal effect is warranted.

We also found a marginal interaction between language contrast and acculturation (*odds ratio* = .63, *p* = .09). To probe this effect further, we conducted a median split based on parental acculturation level in the bilingual sample, dividing into low and high acculturation (Table 2). Although the results suggest that children with low acculturated parents show a stronger preference for Spanish versus native-accented English whereas children with highly acculturated parents show a stronger preference for native-accented English versus Spanish. This effect of acculturation seems to disappear when native-accented English is compared to non-native accented English; both groups split resources evenly. Importantly, however, none of the values are significantly different from chance, necessitating conservative interpretation. Additionally, English and Spanish parent-reported proficiency scores were also significantly different between the two groups, such that English scores were significantly higher in the high acculturation group and Spanish scores were significantly lower (*p*s < .001), making it impossible to disentangle effects of acculturation versus proficiency.

Table 2. Effects of Parental Acculturation on Resource Allocation of Bilingual Children.

Language contrasted to English	Low Acculturation (n = 15)	High Acculturation (n = 13)
	% sharing majority of tokens with English speaker	
Contrast: Spanish	33.3%	61.5%
Contrast: Spanish-accented English	53.3%	53.8%

We the acculturation analyses for Analysis 2 were conducted to determine if acculturation impacted bilingual children's willingness to share with bilingual speakers. In a model again containing language contrast, average acculturation score, and the interaction between the two variables, there wereno significant main effects or interactions (*p*s > .1).

Exploratory Analyses of Friendship and Commonality Preferences

After asking children to allocate resources, they were then askedwho they would rather be friends with and who they had more in common with. Analysis 1 was repeated(comparing native English vs. Spanish and native English vs. accented English) twice, first using children's friendship preferences (i.e., who would you rather be friends with?) using the dependent variable and then using commonality judgements (i.e., who do you have more in common with?) as the dependent variable. This was again a mixed-model binary logistic regression with child group and language contrast included as fixed effects and participant included as a random intercept. For friendship judgements, there was a marginal main effect of child group (*odds ratio* = 1.62; $p = .099$), such that monolingual speakers were more likely to choose the native-accented English puppet (Figure 3). As with sharing, there was no effect of language contrast nor was there an interaction (*p*s > .1), although monolingual children did show a significant native English

friendship preference when contrasted with Spanish ($z = 3.94$, $p < .001$) but not nonnative-accented English ($z = .38$, $p = .70$). For commonality judgements, there was no main effect of child group, language contrast, nor was there an interaction (ps > .1; Figure 4).

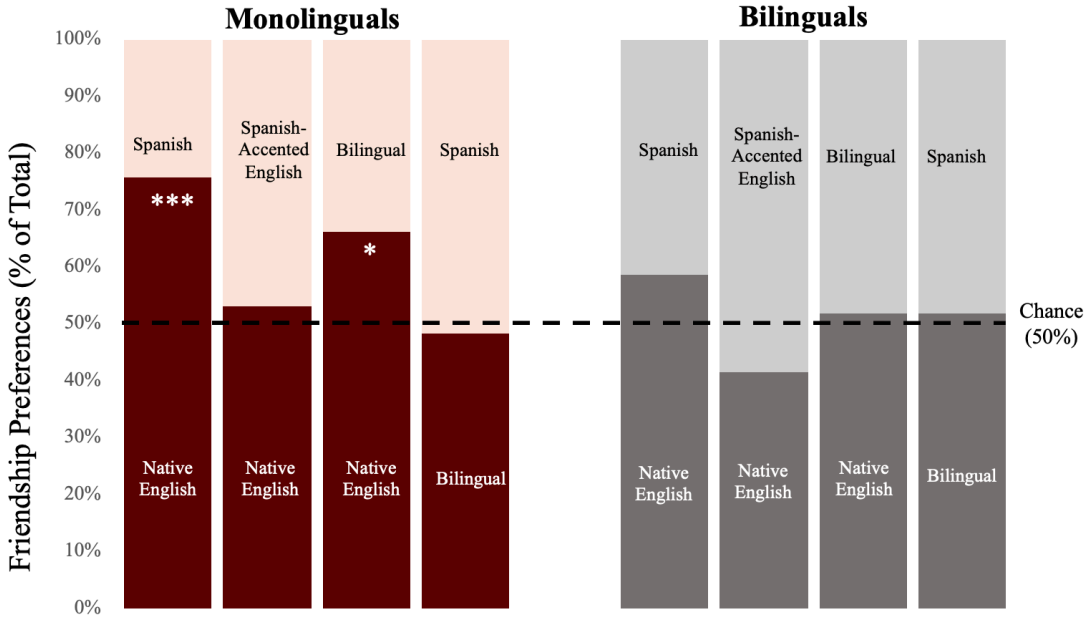

Figure 3. Influence of language and accent on friendship preferences in monolingual and bilingual children. The figure depicts the percentage of the total sample who preferred to be friends with that particular speaker. Proportions were tested against chance (50%) to determine significance. Monolingual children on shown on the left and bilingual children are shown on the right.
Note: Symbols represent * $p < .05$; ***, $p < .001$.

Analysis 2 (bilingual vs. native English and bilingual vs. Spanish) was repeated, again using friendship preference and commonality judgements as the new dependent variables. Specifically, a mixed model binary logistic regression was conducted to examine how friendship preferences and commonality judgements were influenced by child group (monolingual vs. bilingual), contrasted language (e.g., native-accented

English vs. native-accented Spanish; i.e., Contrast 3 vs Contrast 4), and their interaction. Preference for the bilingual speaker was coded as 1, and participant was included as a random intercept to account for our repeated measures.

For the friendship analyses, there was no effect of child group, but there was a marginal effect of language contrast (*odds ratio* = 1.49, $p = .093$), such that the odds of picking the bilingual puppet as a friend were higher when comparing to a Spanish versus English speaker. This effect did not interact with child group. For the commonality analyses, there was a significant effect of child group (*odds ratio* = 1.86, $p = .031$), such that bilingual children were more likely than monolingual children to say they had more in common with the bilingual puppet. There also was a marginal effect of language contrast (*odds ratio* = 1.46, $p = .099$), indicating, as with the friendship analyses, an increased chance of picking the bilingual puppet when contrasted with the Spanish as opposed to the English speaker. The effects of child group and language contrast had a significant interaction (*odds ratio* = .40, $p = .026$), which was probed via post-hoc analyses. For commonality, monolingual children were significantly more likely than chance to prefer the native English-speaking puppet ($z = 2.41$, $p = .016$), but none of the other commonality preferences were different from chance. Thus, although bilingual children were more likely to pick the bilingual puppet than English speaking children, this effect was driven by English speaking children picking English speaking puppets.

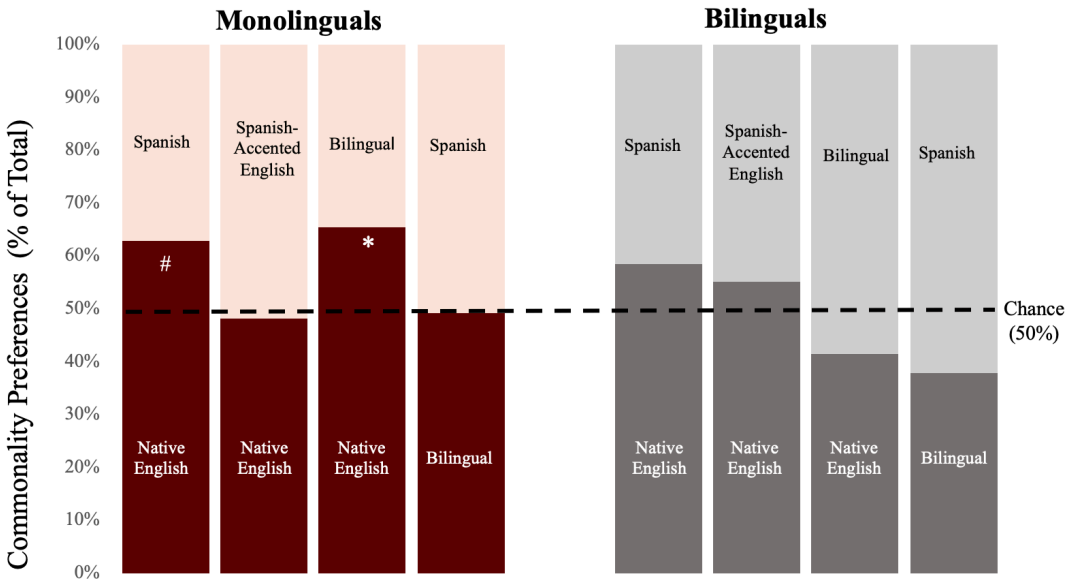

Figure 4. Influence of language and accent on commonality judgements in monolingual and bilingual children. The figure depicts the percentage of the total sample who thought they had more in common with that particular speaker. Proportions were tested against chance (50%) to determine significance. Monolingual children on shown on the left and bilingual children are shown on the right.
Note: Symbols represent # $p < .1$; * $p < .05$.

Finally, acculturation analyses for friendship preferences and commonality judgements were conducted. For Analysis 1, there were no significant effects of acculturation on friendship or commonality toward native English speakers. For Analysis 2, there was no significant effect of acculturation on friendship preferences, but there was for commonality preferences. Specifically, higher levels of acculturation were associated with diminished commonality judgements for the bilingual speaker (*odds ratio* = .49, p =. 017). There also was a significant main effect of language contrast (*odds ratio*=.06, p = .016) such that children were less likely to endorse the bilingual speaker as having something in common with them when compared to a Spanish versus English speaker. The interaction between language contrast and acculturation was also significant (*odds ratio* = 2.24, p = .028). We again split our bilingual sample into two acculturation bins (Table 3). The results indicate that for children of more highly acculturated parents, their

commonality endorsements are at chance, whereas for children with lower levels of parental acculturation, they are significantly more likely than chance to think they have more in common with the bilingual than the English speaker ($z = 2.07$, $p = .039$), but are at chance when picking between bilingual and Spanish speakers.

Table 3. Effects of Parental Acculturation on Commonality Preferences of Bilingual Children.

Language contrasted to bilingual	Low Acculturation (n = 15)	High Acculturation (n = 13)
	% of commonality endorsements for bilingual speaker	
Contrast: English	**80.0%***	30.8%
Contrast: Spanish	46.7%	30.8%

Note: *, $p < .05$ when compared to chance (50%).

IV. DISCUSSION

Although previous studies have examined children's sensitivity to language when forming social preferences, less research has tackled two other important questions: first, whether a social partner's language influences children's prosocial behaviors, and second, whether bilingual children show in-group preferences for bilingual speakers. Thus, the present study sought to detect whether and how English monolingual children and Spanish-English bilingual children are sensitive to language (i.e., Spanish vs. English vs. bilingualism) and accent (i.e., native vs. non-native) when allocating resources between two speakers. For English monolingual speakers, our findings complement and extend previous research, showing that children's in-group biases extend to sharing more with other native monolingual speakers. Findings for bilingual children, in contrast, found no in-group preference for bilingualism. Bilingual children instead showed no clear sharing preferences regardless of the specific language contrasts they were exposed to.

The majority of past research on how the impacts of language and accent on monolingual children has examined social preferences and attitudes (e.g., who children would rather have as a friend or who they liked more). To date, only one study has examined resource allocation and language preferences specifically (Spence & Imuta, 2020), but this study only included variations in accents, as opposed to variations in accent, language, and bilingualism. Thus, findings from the present study extend existing research on language preferences by finding that monolingual English-speaking children chose to share with the English speakers as contrasted to Spanish speakers, Spanish-accented English speakers, and bilingual speakers. The finding that the patterns were equally strong even for accented trials suggests that it is not simply an issue of

understanding the speaker's request. Interestingly, English monolingual children did not show a sharing preference for bilingual speakers over Spanish speakers, even though the bilingual speakers spoke half of their dialogue in native-accented English. Although this study was not able to address the exact mechanisms driving children's preferences, our findings are in line with a general own-language bias present from infancy. Researchers have pointed to in-group affiliation as a possible explanation for such robust social preferences (Byers-Heinlein et al., 2016). Additionally, some researchers use an evolutionary hypothesis which points to use of accent as a group marker within societies (Kinzler et al., 2009). Regardless of the specific mechanism, these findings illustrate that social preferences in language are robust enough to affect children's social interactions and the ways in which children might play with or treat out-group members.

Interestingly, however, our findings of a monolingual bias toward other native speakers were weaker when selecting friends and assessing commonality as compared to resource allocation. One possible explanation is that there were order effects. Children were asked who they wanted to share with first and then every time or asked who they wanted to be friends with and then who thought they had more in common with. As our main focus was on children's sharing, we wanted this data to be uncontaminated by other procedures. However, asking these questions in the same order every time could have resulted in effects. For example, if a child chooses to be friends with one speaker, the guilt may lead them to choose the other speaker when judging commonality. Alternatively, however, it is possible that resource allocation judgements are more strongly affected by language biases than friendship or commonality judgements, potentially due to a desire to protect the material possessions of in-group members.

Future work should look at order and task selection to see if perhaps children's choices might be influenced by their sharing behaviors or vice versa.

In contrast to the in-group bias observed in monolingual children, systematic language preferences were not observed in bilingual children, even when the reference language group was other native bilingual speakers. Although our study cannot identify the exact reason why bilingual children did not show a preference for bilingual speakers, there are several potential explanations. One explanation is that bilingual sensitivity to bilingualism is driven by social context and this paradigm did not create the context to induce a preference. For example, although children may be hearing and speaking one language at home, they may be hearing and speaking a different or the same language around their friends, thus creating different preferences depending on social partner (De Jesus et al., 2017). Thus, rather than a universal preference for a specific language, as seen in monolingual children, bilingual preferences only emerge in specific contexts. For example, if they are speaking to adults, Spanish-English bilingual children might prefer to speak and interact in Spanish, however, around a child of their same age, children may prefer English speaking partners. This could explain why the past literature is so mixed. For example, while studies (Souza et al., 2013; DeJesus et al., 2017; & Yow et al., 2017) indicate that bilingual children are sensitive to accent and language, other studies (Stevens et al., 2017 & Byers-Heinlein et al., 2016) indicate that bilingual children are not sensitive to accent and language. As the present study did not have a strongly cued social context, the preferences of bilingual children might have been at chance. Future research could identify context-dependent preferences by assessing attitudes for hypothetical individuals using stories or vignettes. Findings might show that children's

preferences for bilingualism depend on whether the hypothetical speaker uses code switching, English, or Spanish in what the child deems as the correct context.

In addition to bilingual preferences only emerging in certain social contexts, our findings could also indicate perceived equivalency between all of bilingual child's language groups, regardless of context. Supporting this idea, one study on the preferences of bilingual speakers suggests that bilingual children prefer both of their native languages over unfamiliar languages (Souza et al., 2013) which strengthens the idea that a bilingual's language groups are seen as equal. Additionally, children's language experiences, or how much a child is exposed to each of their languages, may suggest that individuals need not be bilingual to be in-group members. For example, many individuals in the child's own life may be unable to code switch but are still close to the child. Assessing how many bilinguals versus monolingual individuals a child comes into contact with could help disambiguate this issue, as evidence suggests that language dominance may relate to linguistic experience (De Jesus et al., 2017). Alternatively, although the group of bilingual children as a whole was at chance, each individual child's choice may reflect a real preference for an idiosyncratic reason, reasons which we would not be able to disambiguate without additional follow-up testing. Overall, the idea of bilingual children having a broadened in-group is intriguing and worthy of future study. There are also implications for whether exposing monolingual children to more languages would similarly broaden their group affiliations.

Another potential explanation for studyfindings that bilingual children did not share more with other bilinguals is that bilingual children do treat bilingual speakers as in-group members but, in our paradigm, they assumed that all puppets speaking only

English or only Spanish were also bilingual. Given that bilingual children often grow up in community contexts where bilingualism is common (Dailey et al., 2005), just because they hear a few sentences in one language does not mean that the social partner cannot also speak the other language. To address this question, a follow-up study that includes an exchange between puppets where one puppet code switches and the other puppet explicitly notes that they do not speak that second language is currently underway. Findings in the present study might indicate that bilingual children do treat bilingualism as an in-group when they know that one speaker is clearly not bilingual. If bilingual children in this study still share equally amongst bilingual and monolingual speakers, this could indicate that they treat bilingual the same as each constituent language.

In addition to examining main effects of children's language, age and acculturation also were examined in an attempt to explain differences in children's behavior. There was nosignificant main effect of age on children's sharing behaviors, nor were there any interactions with age and language contrast or child's language group. These null findings with regards to age could be due to the fact that language preferences emerge early in life and that, by the time children reach the ages between four and seven, children's preferences have reached ceiling. Another possibility is that preferences or biases are changing in this age range, but this task was too simple to detect them. Finally, it could be that there are developmental effects, but these are not seen until older ages than the population sampled here. In order to grasp a better understanding of bilingual children's preferences, future work should involve more complex tasks.

The findings with regards to acculturation are difficult to interpret. While the findings found werein the expected directions, such that higher acculturation was related

to greater native-accented English preferences and lower acculturation was related to greater bilingual or Spanish preferences, they were surprisingly not found in all conditions. Specifically, there was a marginal effect of acculturation on sharing, such that that bilingual children with more highly acculturated parents showed a greater preference for sharing with the native-accented English speaker than did children of less acculturated parents, but this effect was only present for native-accented English versus Spanish, as opposed to native-accented English versus nonnative-accented English. Similarly, there was significant evidence that bilingual children from less acculturated backgrounds were more likely to endorse a bilingual speaker as having more in common with them, and that this effect was strongest for bilingual versus English speakers., Acculturation effects were not found in the friendship judgements. Additionally, scores on the acculturation measure were highly correlated with parent ratings of children's language abilities, suggesting that linguistic proficiency rather than acculturation per se might be driving the findings. This parental acculturation measure also did not directly assess children's experiences. For example, caregivers might be less acculturated than their children ifschool and peer influences havehelped a child become more acculturated at a faster pace compared to their caregivers (Costiga & Dokis, 2006). When community's language landscape is mostly English, as is the case in our sample, parents' low acculturation rates could be overshadowed by the linguistic environment of the host country (Dailey et al., 2005). Future work might consider looking at acculturation more closely while also considering whether the children are first generation, second generation, or third generation. Such studies should also consider looking more carefully into children's home life, school, and peers in order to grasp a better picture of language exposure and to

dissociate language proficiency alone from other aspects of acculturation. This might allow researchers to better understand individual differences when it comes to language as a group marker.

One strength of the study is the inclusion ofa robust representative sample, which was challenging in a community sample and given that all of our participants came from local parks in the city of San Marcos, Texas. As these parks are free and widely used, this increased the ability of us to target a full spectrum of community members. Due to the constraints of testing in the parks, however, there were some methodological limitations. For instance, thelimited time with each family meant that standardized assessments of bilingual proficiency (e.g., Woodcock et al, 2005) could not be administered, and thus the present study relied solely on caregiver reports of bilingualism. The present study also lacked measures of children's empathy or social cognitive skills, which could explain some individual differences in performance. Future work should attempt to replicate this study in longer sessions, including more measures.

Another limitation of the study is that children were asked to share with puppet instead of real-world social partners. While research exists on the benefits of using puppets when working with children (Cohen et al., 2013), future work should consider using real-world interactions. In the case of monolingual children, results might look the same, however, our bilingual sample may have shown a stronger preference based on a combination of language and race. Additionally, we might have seen different results if the tester spoke in Spanish rather than English, but given that we wanted to create equivalency among monolingual and bilingual sessions, all sessions were administered in English.

Conclusion

Given increasing bilingualism in the United States, research examining the real-world effects of language as a group marker is needed. Language as a group marker had been found to effect children's friendship preferences but minimal research work had been done on children's real-world behaviors like sharing, particular with regards to these behaviors in bilingual children. This study aimed to understand how a social partner's language group influenced monolingual and bilingual children's willingness to act prosocially (i.e., share) with that speaker. Robust in-group biases in monolingual children were found such that they were significantly more likely to share with native-accented English speakers than Spanish speakers, non-native accented English speakers, or bilingual speakers. In contrast, bilingual children showed no clear pattern of preferences across language contrasts. These biases likely impact children's everyday behaviors with peers, with implications for how a growing multilingual population interacts with monolingual individuals. While the study cannot identify the exact mechanisms driving children's preferences, our findings nonetheless shed light on language-based biases and can influence future research, including research on how to reduce such biases.

APPENDIX SECTION

Date: _____

Participant ID: #_____

Sharing Task

Experimenter: Today we are going to be playing some games. I'm going to be showing you some videos of animals who may need your help, so I need you to listen very closely. After you watch the videos, I am going to ask you some questions about the animals because I want to know what you think about them. If you can't hear the animals just let me know and I will play the videos again. Also, I need you to keep your hands in your lab because if you touch the tablet all the videos will go away. Are you ready?

Story 1: English/Spanish

Play Video **After video plays**

Experimenter: Look! Here are 5 apples **Place the 5 apples in a line** you can share these apples however you want. If you want to share SOME with this puppet **point to either puppet** you put the apples here **point to corresponding bin** and if you want to share SOME with this puppet you put the apples in here. Now, how would you like to share these apples?

Number	Language: Color:	Language: Color:
1		
2		
3		
4		
5		

remove all snacks Experimenter: lets watch the animals again. **play the video again**

Experimenter: who would you want to be friends with?

LEFT RIGHT

Experimenter: who do you think likes the same things as you?

LEFT RIGHT

Experimenter: you said you wanted to be friends with this puppet **point to corresponding puppet** why do you think you'd want to be friends with this puppet?

Story 2: English with American/Spanish Accent

Great! Now here are two new animals. Are you ready?

Play Video* *After video plays

Experimenter: Look! Here are 5 sandwiches **Place the 5 sandwiches in a line** you can share these sandwiches however you want. If you want to share SOME with this puppet **point to either puppet** you put the sandwiches here **point to corresponding bin** and if you want to share SOME with this puppet you put the sandwiches in here. Now, how would you like to share these sandwiches?

Number	Language: Color:	Language: Color:
1		
2		
3		
4		
5		

remove all snacks Experimenter: lets watch the animals again. **play the video again**

Experimenter: who would you want to be friends with?

LEFT RIGHT

Experimenter: who do you think likes the same things as you?

LEFT RIGHT

Experimenter: you said you wanted to be friends with this puppet **point to corresponding puppet** why do you think you'd want to be friends with this puppet?

Story 3: Bilingual/ English

Great! Now here are two new animals. Are you ready?

Play Video* *After video plays

Experimenter: Look! Here are 5 pizzas **Place the 5 pizzas in a line** you can share these pizzas however you want. If you want to share SOME with this puppet *point to either puppet* you put the pizzas here *point to corresponding bin* and if you want to share SOME with this puppet you put the pizzas in here. Now, how would you like to share these pizzas?

Number	Language: Color:	Language: Color:
1		
2		
3		
4		
5		

remove all snacks Experimenter: lets watch the animals again. **play the video again**

Experimenter: who would you want to be friends with?

LEFT RIGHT

Experimenter: who do you think likes the same things as you?

LEFT RIGHT

Experimenter: you said you wanted to be friends with this puppet **point to corresponding puppet** why do you think you'd want to be friends with this puppet?

Story 4: Bilingual/ Spanish

Great! Now here are two new animals. Are you ready?

Play Video* *After video plays

Experimenter: Look! Here are 5 cookies **Place the 5 cookies in a line** you can share these cookies however you want. If you want to share SOME with this puppet **point to either puppet* you put the cookies here* *point to corresponding bin* and if you want to share SOME with this puppet you put the cookies in here. Now, how would you like to share these cookies?

Number	Language: Color:	Language: Color:
1		
2		
3		
4		
5		

remove all snacks Experimenter: let's watch the animals again. **play the video again**

Experimenter: who would you want to be friends with?

LEFT RIGHT

Experimenter: who do you think likes the same things as you?

LEFT RIGHT

Experimenter: you said you wanted to be friends with this puppet **point to corresponding puppet** why do you think you'd want to be friends with this puppet?

Experimenter: Okay, we are almost done and now I am going to ask you a few questions about you, ready?

1. When you're at your house, what language does mom speak most, English or Spanish?
2. When you're at your house talking to mom, what language do you speak most, English or Spanish?
3. What language do other people in your family speak most, English or Spanish?
4. When you're at school talking to your friends, what language do you speak the most, English or Spanish?
5. When you're at school, what language does your teacher speak the most, English or Spanish?
6. ¿Te gustaron los videos?
7. ¿Te gusta venir al parque?

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