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Accuracy Trumps Accent in Children's Endorsement of Object Labels

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Past research provides evidence that children use at least 2 potentially competing strategies when choosing informants: they attend to informants' past accuracy and to their social identity (e.g., their status as native- vs. foreign-accented speakers). We explore how children reconcile these 2 strategies when they are put in conflict and whether children's response changes across development. In Experiment 1 ($N = 61$), 3-, 4-, and 5-year-old children watched a native- and a foreign-accented English speaker label novel objects with novel names. All 3 age groups preferred the names provided by the native speaker. Next, 1 of the 2 speakers named familiar objects accurately, whereas the other speaker named them inaccurately. In a subsequent series of test trials, again with novel objects, 4- and 5-year-olds, but not 3-year-olds, were likely to endorse the names provided by the accurate speaker, regardless of her accent. In Experiment 2 ($N = 72$) 4-year-olds first watched a native- and a foreign-accented speaker name familiar objects, but the relative accuracy of the 2 speakers varied across conditions (100% vs. 0% correct; 75% vs. 25% correct). Subsequently, the 2 speakers provided novel names for novel objects. In each condition, 4-year-olds endorsed the names provided by the more accurate speaker, regardless of her accent. We propose that during the preschool years, children increasingly rely on past reliability when selecting informants.

Keywords: preschoolers, social cognition, testimony, language

Past research demonstrates that preschool children use at least two distinct strategies when selecting between informants who provide discordant information (Harris & Corriveau, 2011). First, children keep track of the accuracy of an informant's past statements. They prefer to pose questions to, and accept information from, informants whose statements converge with their own knowledge base (e.g., Birch, Vauthier, & Bloom, 2008; Corriveau & Harris, 2009; Jaswal & Neely, 2006; Koenig, Clément, & Harris, 2004; Nurmsoo & Robinson, 2009; Pasquini, Corriveau, Koenig, & Harris, 2007; Sabbagh & Baldwin, 2001). Second, children use individuals' social identity (e.g., their familiarity, accent, and facial appearance) when deciding whom to trust. Not only do children choose ingroup members as friends (e.g., Kinzler, Shutts, DeJesus, & Spelke, 2009) but they also are more likely to endorse information provided by individuals who are similar to themselves (e.g., Chen, Corriveau, & Harris, 2011; Chen, Corriveau, & Harris, in press; Kinzler, Corriveau, & Harris, 2011).

The evidence for children's attention to both past accuracy and social identity when deciding an actor's trustworthiness is persuasive, but past research has investigated each strategy in isolation. For instance, it has been shown that children's preference for a previously accurate informant changes over the preschool years. Although 4-year-olds track both accuracy and inaccuracy information when selecting between informants, 3-year-olds track inaccuracy information only (Corriveau, Meints, & Harris, 2009; Pasquini et al., 2007). With respect to social information, children selectively trust information provided by native-accented speakers, even when that information is completely nonlinguistic (i.e., silent demonstrations of the functions of novel objects) and neither informant has relayed meaningful semantic content to the child (i.e., each spoke in nonsense speech; Kinzler et al., 2011). Yet we know little about the ways in which children respond in circumstances where these two strategies are put in conflict. Understanding children's selective trust based on accent is of particular interest because an individual's accent might signify both her membership of a social group and also her access to knowledge (both linguistic and otherwise) that is of relevance to a particular cultural or linguistic group. In the present article, we presented monolingual, English-speaking 3-, 4-, and 5-year-olds with two potential informants. In an initial familiarization phase, children could hear both informants speak and observe that one spoke English with a native accent, whereas the other spoke English with a non-native (Spanish) accent. Next, in a pre-accuracy test phase, children could learn about the names of novel objects from the two informants. In line with the findings of Kinzler et al. (2011), we expected that children would prefer to put their questions to, and agree with the answers offered by, the native as opposed to the non-native, accented speaker.

In the next phase of the experiment, children had the opportunity to monitor the relative accuracy of the two speakers as they named familiar objects. One speaker named the objects accurately,

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whereas the other speaker named them inaccurately. For half the children, it was the native speaker who was accurate and the accented speaker who was inaccurate. For half the children, this arrangement was reversed: The native speaker was inaccurate and the accented speaker was accurate.

In a subsequent post-accuracy test phase, children were given a second opportunity to hear novel names from the two informants. We anticipated three possible outcomes. First, children might focus on an informant's accent, to the exclusion of information provided by her relative accuracy. More specifically, children might continue to show a preference for learning from the native speaker, rather than the accented speaker, regardless of who provided the more accurate testimony in the immediately preceding accuracy phase. To the extent that accent signals not just membership of a social group generally but membership of a linguistic ingroup specifically, it is plausible that children might regard accent as an especially potent cue in deciding which informant to choose when acquiring new object labels.

A second possibility is that children might use the availability of accuracy information to recalibrate any preference they initially had for the native over the accented speaker. For example, having established that the native speaker was accurate and the accented speaker inaccurate, children might show an even more pronounced preference for the native speaker. Conversely, having established that the native speaker was inaccurate and the accented speaker accurate, children might switch their initial preference for the native speaker and instead select the accented—but accurate—speaker. Thus, according to this hypothesis, accuracy information can either reinforce or override preferences based on accent.

A third, more nuanced, possible outcome is predicted by past research investigating age-related changes in children's responses based on a speaker's familiarity versus accuracy. Corriveau and Harris (2009) introduced children to two speakers who varied in terms of familiarity. One was a preschool teacher known to the children; the other was a preschool teacher who was a relative stranger to them. (Which teacher was familiar vs. a stranger was counterbalanced across children.) Children displayed a marked initial preference for learning from the familiar speaker. However, after exposure to the differential accuracy of the two speakers in naming familiar objects, children reacted differently depending on their age. Three-year-old children showed little change in their initial preference for the more familiar speaker whether she was subsequently accurate or inaccurate. By contrast, 4- and especially 5-year-old children showed a considerable change in response to information about each speaker's accuracy. Older children's preference for the familiar speaker over the unfamiliar speaker intensified if she had proven to be more accurate, but it was attenuated and even reversed if she had proven to be less accurate. In light of these findings, it seems plausible that a similar developmental pattern may emerge when children are invited to weight accent and accuracy. Three-year-olds may ignore relative accuracy, whereas 4- and especially 5-year-olds may prioritize accuracy over accent. Such a result would indicate a broad developmental shift in children's reliance on epistemic compared to social cues in making decisions about whom to trust. We return to this possibility in the general discussion.

Experiment 1 also offered an opportunity to assess children's explanations for speaker inaccuracy. Children might attribute inaccuracy to a speaker's lack of knowledge (Harris et al., 2012). Previous research lends some support to this possibility. For example, when Koenig and Harris (2005) asked 3- and 4-year-olds to explain why one of the two informants had been inaccurate, a considerable proportion were unable to volunteer an explanation but among those who did so, the most frequently cited reason was speaker ignorance ("She didn't know the things," "She doesn't know what they are"). However, children might also ascribe mistakes—especially a series of mistakes—to a speaker's deliberate deviation from conversational norms. For example, they might think of the speaker as making deliberate (and potentially playful) errors if he or she consistently mislabels familiar objects. To assess how often children endorsed these two explanations, they were reminded at the end of the test session of one of the inaccurate speaker's mistakes and asked whether the speaker had made the mistake because she "did not know" what the object was called or because she was "just pretending." To the extent that children think of non-native speakers as less competent than native speakers, they might be especially likely to endorse speaker ignorance when probed about the mistakes of a non-native speaker compared to a native speaker. In support of this idea, Hoicka and Akhtar (2011) found that 3-year-old children are more likely to correct foreigners than native individuals when they provide inaccurate word labels, and children are more likely to respond to the native individuals as if they are joking. Similarly, recent research by Corriveau and Harris (2009) indicated that preschoolers weigh alternative explanations of inaccuracy depending on the social identity of the speaker. In this task, preschool-aged children were presented with a comparison between a familiar teacher and an unfamiliar teacher; one provided correct labels for familiar objects, but the other did not. At the end of the test session, children were invited to say why they believed the teacher mislabeled the familiar objects. More than three quarters of preschoolers judged that the unfamiliar teacher "didn't know" the label, with the remaining preschoolers judging that she was "just pretending." By contrast, just over half of preschoolers attributed ignorance to the familiar teacher when she mislabeled familiar objects. Thus, a greater proportion of children attributed ignorance to the unfamiliar teacher.

Experiment 1

Method

Participants. Sixty-one children participated in this study: twenty 3-year-olds (M age = 3;6, SD = 3 months, range: 3;0–4;0, nine female), twenty 4-year-olds (M = 4;7, SD = 4 months, range: 4;1–4;11, 10 female), and twenty-one 5-year-olds (M = 5;5, SD = 3 months, range: 5;0–6;0, 13 female). Most children (92%) were White, and all spoke English as their first language. Children participated with the consent of their parent. A subset of the participants had participated in an earlier experiment (Kinzler et al., 2011) at the beginning of the testing session.

Materials. Two female, college-aged, bilingual speakers of English and Spanish each recorded accent training videos twice: once in English with an American accent and once in English with a Spanish accent. The use of bilingual speakers, each able to speak English with either a native or non-native (Spanish) accent, ensured that children's choices were not guided by extraneous cues such as the visual appearance, voice quality, or demeanor of either

speaker. In all videos, the speakers faced forward and remained neutral in affect. During accent familiarization videos, each speaker spoke the first four sentences from H.A. Ray's (1941) *Curious George* (videos were each 12 s in length, with 10 s of speech). Note that adults rated the speakers as equally comfortable when speaking in either a native or non-native accent (Kinzler et al., 2011). For pre- and post-accuracy videos (four of each) and for accuracy training videos, speakers held up a novel or a familiar object and produced a novel or familiar name (see Table 1 for a full list of objects and names).

Procedure. All children received four blocks of trials, in a fixed order: accent familiarization, pre-accuracy trials, accuracy familiarization, post-accuracy trials. Each of these blocks is described in more detail below.

Accent familiarization. To introduce the task, the experimenter pointed to a still frame of the two speakers and said, "See these two girls? This one is wearing a blue shirt, and this one is wearing a green shirt. They're each going to tell you a short story. I want you to listen very carefully. Let's listen." Each informant then spoke in turn. The order in which they spoke, their lateral position on screen, and the pairing of speaker to accent (i.e., whether Speaker A spoke with a native and Speaker B with a foreign accent) was systematically varied across participants.

Pre-accuracy trials. Immediately following the accent familiarization, children were presented with four pre-accuracy videos. For each video, children were first shown a still frame of a novel object and were asked, "Do you know what this is called?" Children were then shown a still image of each of the two speakers on screen and presented with an *Ask Question:* "I bet one of these people can help us find out. Which person would you like to ask?" Children who claimed to know the name of the object were told, "Actually, I don't think that's what it is called. I bet one of these people can help us find out. Which person would you like to ask, the girl in the green shirt, or the girl in the blue shirt?"

Next, children saw a video clip in which the speakers provided a different, novel name for the object. For example, one speaker might say "This is a *wug*," whereas the other speaker might say "This is a *dax*." The order in which the speakers named the objects and the novel name that they produced was counterbalanced within and across participants. *Endorse Questions* were posed after children had watched each video clip. The experimenter paused the video, repeated the two names, and asked children what they thought the object was called (e.g., "The girl in the blue shirt said it was a *wug* and the girl in the green shirt said it was a *dax*. What do you think it is called?" Either nonverbal (pointing at one of the two speakers), or verbal (e.g., "A dax," "What the blue girl said") responses were accepted.

Accuracy familiarization trials. To introduce this block of trials, the experimenter pointed to a still frame of the two speakers and said, "Now they're going to tell you what some more objects are called. They're each going to say a name and then I'm going to ask you what you think it's called. Let's watch." The accuracy of the speakers' claims was not mentioned.

On each of the four accuracy familiarization videos, speakers held up a familiar object (e.g., spoon; see Table 1 for a full list of objects) and provided different, familiar names. One speaker named all four objects correctly (100% correct). The other speaker named all four objects incorrectly (0% correct). For example, when presented with a brush, the inaccurate informant said, "That's a plate." For half of the participants, the native speaker was 100% correct and the non-native speaker was 0% correct. For the other half, the non-native speaker was 100% correct and the native speaker was 0% correct. Across videos, the order in which the speakers were asked to name the familiar object was alternated. Objects were presented in a fixed order (see Table 1).

Immediately after viewing each video, the experimenter pointed to a still frame of the two speakers and the object and asked children what they thought the object was called. For example, the experimenter said, "The girl in the green shirt said it's a *brush* and the girl in the blue shirt said it's a *plate*. What do you think it's called, a *brush* or a *plate*?"

Post-accuracy. Immediately following the fourth accuracy familiarization video, children received four *post-accuracy trials* involving novel objects and three *Explicit Judgment Questions*. In the four *post-accuracy trials* children were posed both *Ask* and *Endorse Questions*, following the same format as the four pre-accuracy trials for novel object names. Immediately following the fourth and final post-accuracy trial, children were asked the *Explicit Judgment Questions*. To pose the *Explicit Judgment Questions*, the experimenter referred to a still frame of the video and asked, "Was M. in the green shirt very good or not very good at answering these questions?" The experimenter then repeated this question in reference to the other speaker (S. in the blue shirt). Children were then asked to make a judgment about the relative

Table 1
Stimuli Used in Pre-Accuracy Trials, Accuracy Trials, and Post-Accuracy Trials

Trial type	Novel objects	Informant 1 labels	Informant 2 labels
Pre-accuracy trials	Grey rubber squeegee	"That's a snegg"	"That's a hoon"
	Blue toilet flapper	"That's a yiff"	"That's a zazz"
	Metal cocktail pourer	"That's a crut"	"That's a larp"
	Metal bathroom hook	"That's a linz"	"That's a slod"
Accuracy trials	Spoon	"That's a duck"	"That's a spoon"
	Bottle	"That's a bottle"	"That's an apple"
	Brush	"That's a brush"	"That's a plate"
	Doll	"That's a cup"	"That's a doll"
Post-accuracy trials	Orange hose attachment	"That's a lig"	"That's a job"
	Gold and red sprinkler head	"That's a doap"	"That's a thaf"
	Green toilet flapper	"That's a tark"	"That's a chab"
	Metal lemon juicer	"That's a nevi"	"That's a mogo"

accuracy of the two speakers, "Which person was better at answering the questions?"

Finally, an *Explanation Probe* was asked following the *Explicit Judgment* questions. Children were reminded of a specific error that one of the speakers made during a familiarization trial and were asked why the error was made. For example, children might be asked, "Remember when S. in the blue shirt said that the brush was a plate? Why do you think she said that? Was it because she didn't know what it was called, or because she was just pretending?" The order of the two forced-choice alternatives was varied across children.

Results

We first examine pre-accuracy trials to test whether children preferred to ask for and endorse information from the speaker with the native accent. We then report on children's replies to the name checks during the accuracy familiarization trials. Next, we analyze how often children chose the speaker with the native accent in post-accuracy trials both compared to chance and compared to pre-accuracy trials. Finally, we examine children's replies to the Explicit Judgment Questions and to the Explanation Probe.

To anticipate, all three age groups showed a preference for the speaker with the native accent in pre-accuracy trials. The pattern of responding in post-accuracy trials varied with age. Four- and 5-year-old children chose the native speaker even more often if she had proved accurate but switched their preference to the non-native speaker if the native speaker had proved inaccurate. In contrast, 3-year-old children were less reliably affected by the differential accuracy that the two speakers had displayed during the accuracy trials.

Comparisons to chance on the pre-accuracy novel label trials. Children's scores did not differ between the four ask and four endorse questions (McNemar χ^2-test, *ns*). Moreover, children's total ask and endorse scores were significantly correlated, $r(61) = .26$, $p < .05$. Accordingly, these data were combined to create total Pre-Accuracy Novel Name scores. All three age groups performed above chance in the proportion of times they asked for and endorsed the names provided by the native speaker: 3-year-olds $M = .65$, $SD = .11$, $t(19) = 6.01$, $p < .001$; 4-year-olds $M = .70$, $SD = .11$, $t(19) = 8.24$, $p < .001$; 5-year-olds $M = .78$, $SD = .07$, $t(20) = 18.23$, $p < .001$.

Name checks during accuracy familiarization. Most 3-, 4- and 5-year-olds accurately chose the correct name for the familiar objects in all four accuracy familiarization trials. However, seven children (three 3-year-old children, three 4-year-old children, and one 5-year-old) chose the name provided by the incorrect informant on one of the accuracy trials. However, when the experimenter prompted the children by saying "What is this really?" all seven children chose the correct label. For all seven of these children, the incorrect informant was also the native speaker. A binomial test confirmed that this result was significantly different from chance ($p < .01$).

Comparisons to chance on the post-accuracy novel label trials. In the post-accuracy trials, children's scores again did not differ between the four ask and four endorse questions (McNemar χ^2-test, *ns*) and were significantly correlated, $r(61) = .37$, $p < .01$, so these data were combined to create total Post-Accuracy Novel Name scores. When the native speaker was also accurate all three age groups performed above chance in the proportion of times they asked for and endorsed the names provided by the native speaker, 3-year-olds $M = .73$, $SD = .15$, $t(9) = 4.63$, $p < .001$; 4-year-olds $M = .88$, $SD = .14$, $t(8) = 8.10$, $p < .001$; 5-year-olds $M = .80$, $SD = .20$, $t(11) = 4.99$, $p < .001$. By contrast, when the native speaker was inaccurate, 3-year-olds performed at chance, $M = .49$, $SD = .18$, $t(9) = 0.21$, *ns*, whereas 4- and 5-year-olds selectively preferred the information provided by the non-native accurate speaker, 4-year-olds $M = .30$, $SD = .20$, $t(10) = 3.33$, $p < .01$; 5-year-olds $M = .25$, $SD = .20$, $t(8) = 3.80$, $p < .01$.

Comparison of children's overall performance on pre-accuracy and post-accuracy trials. Figure 1 shows the proportion of choices directed at the native speaker as a function of age, phase (pre- vs. post-accuracy) and condition (native speaker accurate, native speaker inaccurate). To assess the impact of accuracy familiarization trials on children's selection of the speaker with the native accent, we compared children's scores on the combined Ask and Endorse probes during post- compared to pre-accuracy trials. A three-way analysis of variance (ANOVA) with Age (3,4,5) and Condition (native speaker accurate, native speaker inaccurate) as the between-subjects variables and Phase (pre-accuracy, post-accuracy) as the within-subject variable was calculated for the number of choices directed at the native speaker. This revealed a main effect of Phase, $F(1, 55) = 32.32$, $p < .001$, $\eta^2 = .37$, and a three-way interaction of Age × Condition × Phase, $F(2, 110) = 4.40$, $p < .05$, $\eta^2 = .10$. This interaction is evident in Figure 1. Inspection of Figure 1 shows that in the pre-accuracy phase, all three age groups preferred the native speaker (and not surprisingly showed that preference whether she would go on to be accurate in the subsequent accuracy familiarization trials). In the post-accuracy phase, 3-year-olds made only a modest adjustment to their selection of the native speaker. By contrast, 4- and 5-year-olds sharply increased or reduced their selection of the native speaker depending on whether she had been accurate or inaccurate during the accuracy familiarization. To confirm these conclusions, the simple effect of Phase was calculated for each of the six possible combinations of Age and Condition. Three-year-old children showed no increment from pre- to post-accuracy trials in their selection of the native speaker when she had been accurate, $F(1, 55) = 2.11$, *ns*, and only a trend toward a decrement when she had been inaccurate, $F(1, 55) = 3.09$, $p < .1$. By contrast, 4- and 5-year-old children chose the native speaker more often in post- compared to pre-accuracy trials if she had been accurate during familiarization—4-year-olds $F(1, 55) = 8.89$, $p < .001$; 5-year-olds $F(1, 55) = 8.34$, $p < .001$—but less often if she had been inaccurate—4-year-olds $F(1, 55) = 64.91$, $p < .001$; 5-year-olds $F(1, 55) = 95.99$, $p < .001$. These different patterns of adjustment meant that there was only a trend for 3-year-olds to choose the native speaker more often in post-accuracy trials when she had been accurate, rather than inaccurate, $F(1, 55) = 3.54$, $p = .08$. By contrast, this effect was very systematic among 4- and 5-year-olds, who chose the native speaker significantly more often when she had been accurate rather than inaccurate—4-year-olds $F(1, 55) = 154.70$, $p < .001$; 5-year-olds $F(1, 55) = 236.6$, $p < .001$.

Explicit judgment performance. After the final post-accuracy trials, children were asked three questions about how well the two informants answered the questions. The proportion of times that children responded appropriately (by evaluating the accurate speaker positively and the inaccurate speaker negatively) is shown

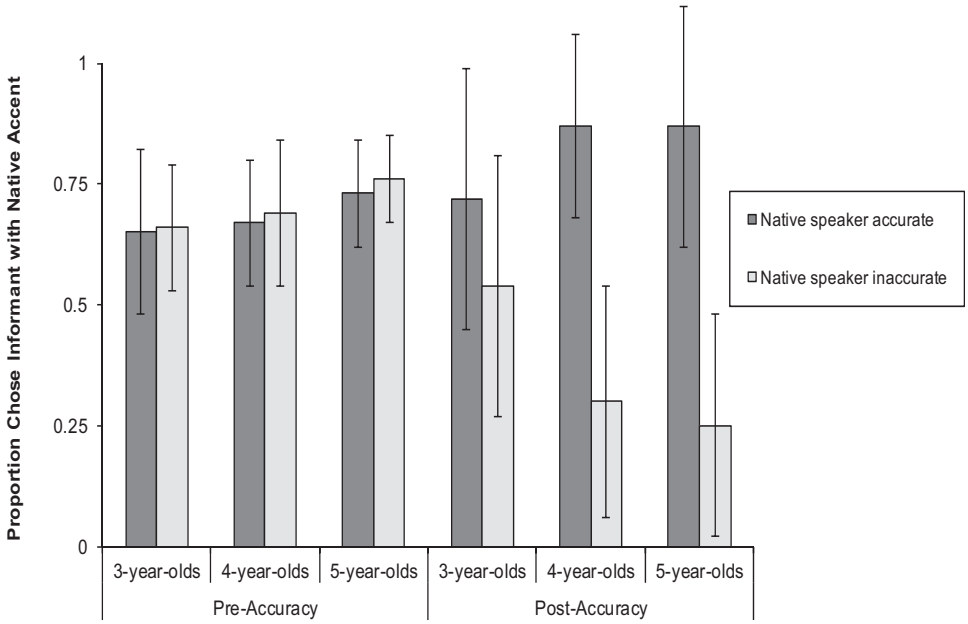

Figure 1. Proportion of times children chose the informant with the native accent by age group (3, 4, 5) and condition (native speaker accurate, native speaker inaccurate). Error bars indicate standard deviations.

in Table 2. Inspection of Table 2 reveals that overall 4- and 5-year-old children gave more appropriate replies than 3-year-old children. In addition, children generally replied appropriately if the native speaker had been accurate but were less likely to reply appropriately if the native speaker had been inaccurate. A two-way ANOVA with age (3, 4, 5 years) and condition (native speaker accurate, native speaker inaccurate) as the between-subjects variables was calculated for the number of correct replies. The main effect of Condition, $F(1, 55) = 6.78$, $p < .01$, $\eta^2 = .11$, confirmed that children gave more appropriate replies when the native speaker had been accurate. In addition there was a main effect of Age group, $F(2, 55) = 3.34$, $p < .05$, $\eta^2 = .11$. Post hoc Bonferroni tests confirmed that 5-year-old children gave significantly more appropriate replies than 3-year-old children ($p < .05$). No significant difference was found between the performance of 3- and 4-year-old children or 4- and 5-year-old children. The Age Group × Condition interaction was not significant, $F(2, 55) = .56$, *ns*.

Explanation probe. When the native speaker had been inaccurate, 30% of 3-year-olds, 36% of 4-year-olds, and 44% of 5-year-olds said that she "didn't know" the names of the familiar objects. The remaining children—70% of 3-year-olds, 64% of 4-year-olds, and 55% of 5-year-olds—said that she was "just pretending." When the non-native speaker had been inaccurate, 80% of 3-year-olds, 77% of 4-year-olds, and 58% of 5-year-olds said that she "didn't know" the names of the familiar objects. The remaining children—20% of 3-year-olds, 23% of 4-year-olds, and 42% of 5-year-olds—said that she was "just pretending." Thus, a greater proportion of children attributed inaccuracy to ignorance in the case of the non-native speaker, $\chi^2(1) = 8.66$, $p < .01$, $\phi = .38$.

Table 2
Proportion and Standard Deviation of Correct Replies to Explicit Judgment Questions by Age Group and Condition

	3-year-olds		4-year-olds		5-year-olds	
Condition	*M*	*SD*	*M*	*SD*	*M*	*SD*
Native speaker accurate	.73	.34	.85	.24	.89	.16
Native speaker inaccurate	.40	.34	.73	.33	.70	.45

Discussion

In previous research, we found that preschoolers preferred to acquire novel functional information from an informant with a native rather than a non-native accent (Kinzler et al., 2011). Experiment 1 was conducted with two objectives in mind. First, in the pre-accuracy phase, we asked if preschool children's selective preference for the information provided by a native over a non-native speaker would also apply to the acquisition of novel names. Second, we asked whether any initial preference for the information provided by a native speaker would be influenced by her subsequent accuracy.

In the pre-accuracy phase, children selectively asked for and endorsed novel names provided by the native, over the non-native speaker. This was true for all three age groups tested. One possibility is that accent serves as a guide to children's social preferences, which, in turn, influences their choices of whom to trust. This interpretation is consistent with other recent indications of an early emerging sensitivity to accent as a social marker. Having listened to a native and non-native speaker, 5- to 6-month-old infants look preferentially at the native speaker, and 5-year-olds prefer the native speaker as a potential friend (Kinzler, Dupoux, & Spelke, 2007). Thus, the same mechanism that subserves children's social judgments may encourage them to endorse labels provided by the individual whom they prefer.

An alternative interpretation is that—above and beyond any social affinity for native-accented speakers—children regard na-

tive speakers as more linguistically competent than non-native speakers. To the extent that a non-native speaker may deviate from the native phonological and prosodic patterns that children have come to regard as typical, this interpretation is plausible. Indeed, the explicit judgment findings provide evidence that this second hypothesis may be correct. Children were more likely to attribute the speaker's naming errors to ignorance if she was a non-native as opposed to a native speaker, suggesting that children indeed view native-accented speakers as more knowledgeable. Nonetheless, this conclusion warrants further investigation. Children's attributions of ignorance were made in the wake of the four naming errors of the inaccurate speaker and in response to a forced-choice question by the experimenter; it is therefore not known whether children make such attributions spontaneously when they first encounter a non-native speaker, as in the pre-accuracy phase. Furthermore, it is possible that *both* preferences for native speakers and inferences about different speakers' linguistic abilities may guide children's choices on this task. As noted in the introduction, previous research has shown that 3-, 4-, and 5-year-olds are inclined to endorse silent demonstrations of object functions modeled by a native rather than a non-native speaker; it seems unlikely that children's reasoning about linguistic capacities would translate to their expectations about others' knowledge of silent object functions. Nevertheless, children may view native-accented speakers as socially preferred, culturally knowledgeable, *and* linguistically competent, which would explain the pattern of results observed both here and in previous studies.

Turning to the second question concerning the post-accuracy phase, children modified their choice of the native over the non-native speaker to varying degrees depending on their age. Three-year-olds showed little systematic evidence of modifying their choices from pre- to post-accuracy trials; in post-accuracy trials they showed only a nonsignificant trend toward choosing the native speaker more often if she had been accurate. By contrast, 4- and 5-year-olds systematically modified their choices. Their selection of the native speaker became more frequent from pre- to post-accuracy trials if she had been accurate but less frequent if she had been inaccurate. Moreover, in post-accuracy trials, they chose the native speaker more often if she had been accurate rather than inaccurate.

In Experiment 2, we explored the sensitivity with which older children privilege accuracy over a native accent by presenting children with a situation in which the speakers again differed in their accent but displayed a more subtle difference in their relative accuracy. It could be argued that the accuracy difference between speakers in Experiment 1 was dramatic and unusual, given that one of the speakers named four familiar objects correctly, whereas the other speaker named the same objects incorrectly. Indeed, such consistent mislabeling could be considered a gross and unnatural violation of conversational norms. Yet previous research has shown that preschoolers are also sensitive to more moderate violations. In particular, by 4 years of age, children selectively endorse information from an informant who has proven *mostly* reliable (e.g., 75% reliable), compared to one who has proven *mostly* unreliable (e.g., 25%). In this past experiment both speakers spoke with a native accent, so that they differed only in accuracy. We therefore do not know whether a preference for a mostly accurate speaker would emerge, even if she spoke with a non-native accent. Accordingly, Experiment 2 amounted to a more probing assessment of children's tendency to privilege accuracy over accent.

To assess whether children are sensitive to a more subtle, and less consistent difference in accuracy, we borrowed the method of previous research that presented 4-year-old children with two types of accuracy familiarization (Pasquini et al., 2007). In one condition, one speaker was consistently (100%) accurate and the other speaker was never (0%) accurate, as in Experiment 1. In the other condition, we presented a more subtle contrast: one speaker was mostly but not consistently (75%) accurate and the other speaker was occasionally (25%) accurate. With this method, we could test whether children would similarly learn from a mostly accurate foreign-accented speaker over an occasionally accurate native-accented speaker. We did not include 3-year-olds in Experiment 2 because they did not display selective trust when presented with the more subtle contrast (Pasquini et al., 2007).

Experiment 2

Participants

Seventy-two 4-year-old children participated in this study (M age = 4;7, SD = 4 months, range: 4;0–5;2, 35 female). Most children (93%) were White and all spoke English as their first language. Children participated with the consent of their parent.

Materials

Experiment 2 used the same materials as Experiment 1. The same two female, college-aged, bilingual speakers of English and Spanish each recorded stimuli in both English with an American accent and English with a Spanish accent. During accent familiarization videos, speakers spoke the first four sentences from H.A. Ray's *Curious George* (videos were each 12 s in length, with 10 s of speech). In accuracy familiarization and in post-accuracy trials (four of each), speakers held up a familiar or a novel object and produced a familiar or novel label.

Procedure

The procedure was identical to the procedure used in Experiment 1, with the following modifications. First, because our focus was on children's selectivity after accent and accuracy information, and because Experiment 1 had replicated the strong effect of accent during pre-accuracy trials, we dispensed with pre-accuracy trials in Experiment 2. Thus, children received three blocks of trials, in a fixed order: accent familiarization, accuracy familiarization, and post-accuracy trials.

Second, children were assigned to one of three conditions. In one condition, 32 children were presented with two native speakers during accent familiarization, and one of these speakers proved inaccurate during subsequent accuracy familiarization. In a second condition, 20 children were presented with a native and a non-native speaker during accent familiarization, and the native speaker proved inaccurate during accuracy familiarization. In a third condition, 20 children were presented with a native and a non-native speaker during accent familiarization, and the non-native speaker proved inaccurate during accuracy familiarization. Finally, within each of the three conditions, half the children

received one of two types of accuracy familiarization (100% vs. 0% correct, 75% vs. 25% correct), for a total of six between-subjects conditions. We describe the accent and accuracy videos below.

Accent familiarization. As in Experiment 1, the experimenter pointed to a still frame of the two speakers and said, "See these two girls? This one is wearing a blue shirt, and this one is wearing a green shirt. They're each going to tell you a short story. I want you to listen very carefully. Let's listen." Each speaker then spoke in turn. The order in which they spoke, their lateral position on screen, and the pairing of speaker to accent varied across participants.

Accuracy familiarization. As in Experiment 1, children watched four accuracy familiarization videos where speakers held up a familiar object and provided different, familiar names. In each video, the order in which the speakers were asked to name the familiar object was alternated.

As noted, for half of the children within each condition, one speaker labeled all four objects correctly (100% correct), whereas the other speaker labeled all four objects incorrectly (0% correct). For example, when presented with a brush, the inaccurate speaker said, "That's a plate." For the remaining children, one speaker named three objects correctly, and one object incorrectly (75% correct), whereas the other speaker named three objects incorrectly and one object correctly (25% correct). The trial where the more accurate speaker erred and the less accurate speaker was correct varied across participants.

Results

We first examine children's responses to the name checks during accuracy familiarization and then their post-accuracy performance as a function of condition and accuracy information. Next, we examine children's replies to the Explicit Judgment Questions and to the Explanation Probe. To anticipate, 4-year-old children preferred the more accurate speaker, regardless of her accent and regardless of whether she had been completely accurate or mostly accurate.

Name checks during accuracy familiarization. As in Experiment 1, children were asked to endorse one of the two names for the familiar object. Most 4-year-old children accurately chose the correct name for the familiar objects in all four accuracy trials. Four 4-year-old children chose the name provided by the incorrect informant on one of the accuracy trials, but when the experimenter prompted the children by saying "What is this really?" all four children chose the correct label. For all of these children, the incorrect informant was also the informant with the native accent. A binomial test confirmed that this was unlikely to be due to chance ($p = .06$).

Comparisons to chance on post-accuracy trials. Children's scores did not differ between the four ask and four endorse questions (McNemar χ^2-test, *ns*.) and were significantly correlated, $r(72) = .53$, $p < .001$. Accordingly, these data were combined to create a total Novel Name score.

Table 3 displays the proportion of times children chose the more accurate informant and comparisons to 50% chance for the total Novel Name score (Ask and Endorse). When children were asked to choose between the two speakers on the basis of accuracy alone (two native speakers condition), they selectively asked for and endorsed the information provided by the more accurate speaker. Similarly, when children were provided with both accuracy and accent information, they selectively asked for information from and endorsed the information offered by the more accurate informant—even when the more accurate speaker had a non-native accent. A 3 × 2 ANOVA with condition (Both have native accent, More accurate has native accent, More accurate has non-native accent) and accuracy familiarization (100% vs. 0%, 75% vs. 25%) as between-subjects variables was calculated for the number of correct replies. The analysis revealed a significant main effect of accuracy familiarization, $F(1, 66) = 8.00$, $p < .01$, $\eta^2 = .11$. Children showed a stronger preference for the more accurate speaker during post-accuracy trials when one speaker had been consistently accurate (100%) rather than mostly accurate (75%) during accuracy familiarization. No other significant main effects or interactions were found.

Explicit judgment performance. The proportion of times that children responded appropriately to the set of Explicit Judgment Questions is shown in Table 3. Inspection of Table 3 reveals

Table 3
Performance on the Post-Accuracy Questions by Condition and Accuracy Familiarization for Novel Name Scores and Explicit Judgment of Accuracy

	Accuracy familiarization					
	100% versus 0% correct			75% versus 25% correct		
Condition	*M*	*SD*	*t*	*M*	*SD*	*t*
Both have native accent						
Post-accuracy Novel Names	.77	.13	8.29***	.63	.17	3.79**
Explicit Judgment	.83	.21	6.32***	.69	.31	2.42*
Native accent more accurate						
Post-accuracy Novel Names	.75	.14	5.47***	.71	.18	3.79**
Explicit Judgment	.67	.22	2.37*	.80	.28	3.37**
Non-native accent more accurate						
Post-accuracy Novel Names	.78	.14	6.13***	.64	.14	3.16**
Explicit Judgment	.73	.26	2.80*	.63	.36	1.14

Note. Scores represent the proportion of times children chose the informant who had been more accurate during accuracy training trials.

that except when the non-native speaker was 75% accurate, 4-year-olds were able to appropriately respond to the explicit judgment questions. A 3 × 2 ANOVA with condition and accuracy familiarization as between-subjects variables was calculated for the number of correct replies. No significant main effects or interactions were found, suggesting that children were generally able to identify the more accurate speaker across the three accent conditions and regardless of the type of accuracy familiarization.

Explanation probe. To examine performance on the explanation probe, we collapsed across the two types of accuracy familiarization and compared children's explanations of the mistake made by the more inaccurate speaker when she spoke with a native accent, with a non-native accent, or when both speakers had a native accent. When the more inaccurate speaker had a native accent (and the more accurate speaker a non-native accent), 30% of the children said that inaccurate speaker "didn't know" the names of the familiar objects. The remaining 70% of the children said that she was "just pretending." By contrast, when the more inaccurate speaker had a non-native accent (and the more accurate speaker a native accent) and also when both speakers had a native accent, 65% and 67% of children said that the inaccurate speaker "didn't know" the names of the familiar objects. The remaining children 35% and 33% of children said that she was "just pretending." Thus, as in Experiment 1, a smaller proportion of children attributed ignorance to the inaccurate speaker when her native accent contrasted with the other speaker's non-native accent, $\chi^2(2) = 7.32$, $p < .01$, $\phi = .32$.

Discussion

The results of Experiment 2 were straightforward. When invited to seek or endorse information, 4-year-olds displayed a selective preference for the more accurate speaker. This preference emerged whether the two speakers had proven consistently different during accuracy familiarization (100% vs. 0% correct) or mostly different (75% vs. 25% correct), and it emerged when the two speakers both had native accents, when only the more accurate had a native accent and also when only the less accurate had a native accent. The only observable variation was in the strength of children's preference for the more accurate informant: This preference was stronger if the more accurate informant was consistently more accurate (100% vs. 0%) rather than generally more accurate (75% vs. 25%).

Children's explicit judgments also followed a straightforward pattern. Children judged the more accurate speaker to be more accurate in both accuracy conditions and in all accent conditions with one exception. Only when the non-native speaker had proven to be generally more accurate (but not consistently so) did children not systematically judge her to be more accurate.

Finally, children mostly attributed the less accurate speaker's mistakes to ignorance. However, as in Experiment 1, when the less accurate speaker's native accent contrasted with the more accurate speaker's non-native accent children mostly attributed her mistakes to the fact that she was just pretending. This suggests that children may infer different mechanisms underlying a speaker's inaccurate claims based on her status as a native versus a non-native speaker.

General Discussion

When considered together, Experiments 1 and 2 provide a relatively detailed and comprehensive picture of how preschoolers weight two different cues to the trustworthiness of an informant—whether she speaks with a native or a non-native accent and whether her claims have proven accurate in the recent past.

In Experiment 1, when provided with only accent information, all three age groups preferred to ask for and to endorse names provided by the speaker with the native accent in the pre-accuracy phase. After accuracy familiarization, 4- and 5-year-olds attended reliably to relative accuracy. Four to 5-year-old children either intensified or weakened their preference for the native-accented speaker depending on whether she had proven accurate or inaccurate during the accuracy familiarization, whereas 3-year-old children did not reliably adjust their choices. A similar result emerged among 4-year-old children in Experiment 2: They preferred the more accurate speaker regardless of whether she spoke with a native or non-native accent. Moreover, that preference emerged even when the more accurate speaker was typically—but not consistently—more accurate than the less accurate speaker. This finding is particularly striking given that the dependent measure involved learning names for novel object—an area of expertise about which a native speaker might be considered especially knowledgeable.

The findings of the first experiment underscore an age change. With age, children increasingly attended to the relative accuracy of speakers. Two different explanations of this age change warrant discussion. First, it could be argued that 3-year-old children do not register the mistakes made by the less accurate speaker so that their failure to prefer the more accurate speaker is to be expected. However, this argument conflicts with a considerable body of evidence showing that 3-year-old children do attend to accuracy when they are invited to choose between two native-accented speakers. For example, in cases where the more accurate speaker has made no errors, whereas the less accurate speaker has either been consistently or mostly inaccurate, 3-year-old children prefer the consistently accurate speaker (Corriveau, Meints, & Harris, 2009; Pasquini et al., 2007). Moreover, they do so even when post-testing occurs up to 1 week after accuracy information (Corriveau & Harris, 2009). Taken together, these various studies indicate that 3-year-olds do register mistakes and display selective trust in the wake of those mistakes (Harris, 2012).

Turning to the second explanation, it could be argued that although 3-year-old children are capable of registering an informant's mistakes, other indices of his or her relative trustworthiness are weighted more heavily. In particular, 3-year-old children may be especially sensitive to social or relational cues, or information about individuals' social identity or familiarity, as opposed to cues such as relative accuracy. Recent findings lend support to this speculation. Corriveau and Harris (2009) found that when 3-, 4-, and 5-year-old children interacted with two preschool caregivers, all age groups preferred to seek and endorse information from the caregiver who was familiar to them rather than unfamiliar. In contrast, when one of the two caregivers proved consistently accurate and the other consistently inaccurate, only 3-year-old children ignored this accuracy information and continued to seek and endorse information from the more familiar informant. Four- and 5-year-old children adjusted their information gathering from

the informants depending on her recent history of accuracy. In summary, although 3-, 4-, and 5-year-olds show a robust preference for a speaker who has proven more accurate, that preference can be compromised among younger children when the inaccurate speaker is familiar to them.

More generally, among 4- to 5-year-old children who demonstrate a robust preference for relative accuracy, why do children prefer the more accurate speaker? Two different interpretations of this preference seem plausible, one focusing on epistemic reliability and the other on the pragmatics of conversation. First, when a speaker mislabels a familiar object, children might conclude that the speaker is poorly informed or ignorant. Therefore, in post-accuracy trials, they prefer to consult the accurate and presumably better informed speaker. On this hypothesis, children assume that the two speakers differ not in terms of their intentions as conversational partners but in terms of their epistemic standing. A second possibility is that when a speaker mislabels a familiar object, children conclude that he or she is not following the norms of ordinary conversation—in particular, they might view the informant as being uncooperative with respect to the Gricean maxim of making truthful rather than deviant or misleading contributions. On this hypothesis, children see the inaccurate speaker as being silly or unhelpful rather than poorly informed.

The findings from the explanation probe in both experiments suggest that both of these interpretations have some merit, with children thoughtfully making inferences about others' knowledge states based on both their accent and their history of reliability. In Experiment 1, children viewed a video that included a native and a non-native speaker. In that context, they were likely to attribute errors to ignorance rather than intent if they were produced by the non-native speaker but to intent, rather than ignorance, if they were produced by the native speaker. A similar pattern emerged in Experiment 2. When children watched a video that included a native and a non-native speaker, they were again more likely to attribute errors to ignorance than intent if they were produced by the non-native speaker, whereas the reverse was true for errors produced by the native speaker. These results imply that children do not simply view the incorrect names produced by a non-native speaker as unusual or deviant. Children go beyond that surface characterization in the sense that they more readily view a non-native speaker as lacking knowledge of the language. Thus, preschoolers realize that adult speakers vary in their linguistic competence, and one indication of that competence is their accent. These findings accord with recent evidence that when a native speaker labels an object in a "silly" way, preschoolers are likely to imitate her; if, however, a speaker of a foreign language is similarly facetious, children are likely to correct her (Hoicka & Akhtar, 2011). Note that these findings are also consistent with Corriveau and Harris (2009), who found that preschoolers were more willing to explain inaccurate labeling in terms of ignorance (rather than "just pretending") when the informant was an unfamiliar rather than a familiar teacher.

One further aspect of children's attributions of knowledge states warrants comment. Recall that in one condition of Experiment 2, children were given information by two native speakers. Under these circumstances, most children attributed the native speaker's mistakes to ignorance. They made this attribution of ignorance to a native speaker less often when she was paired with a non-native speaker (both in Experiment 2, and as noted above, in Experiment 1). By implication, when a native speaker was side-by-side with a non-native speaker, her linguistic competence was highlighted so that children were less prone to think of her mistakes as caused by ignorance and, rather, thought she was intentionally pretending. Again, this finding underscores the claim that preschoolers realize that accent is a cue to linguistic competence.

In conclusion, the present findings add to a growing body of research investigating how children weight different cues to trustworthiness, especially when those cues are placed in opposition to one another. Future research should be able to shed additional light on how children resolve such conflicts. For example, recent findings highlight preschoolers' sensitivity to a consensus (Corriveau, Fusaro, & Harris, 2009; Fusaro & Harris, 2008). They prefer to endorse information provided by several people in agreement with one another as opposed to a lone dissenter. But what would happen if the lone dissenter was the only person to speak with a native accent or to have a superior record of accuracy? Investigations along these lines will help to test and refine the working hypothesis set out above, namely, that in the course of the preschool years children increasingly weight direct indices of epistemic competence, notably past accuracy, over indices associated with the familiarity and social identity of individual informants.

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