We examined whether similarity, familiarity, and reliability cues guide children’s learning and whether these cues are weighed differently with age. Three- to 5-year-olds (n = 184) met 2 informant puppets, 1 of which was similar (Experiment 1) or familiar (Experiment 2) to the participants. Initially, children’s preference for either informant was measured. Children selected similar and familiar informants—over dissimilar and unfamiliar ones—as information sources at above-chance levels. In Experiment 1 the similar informant later provided accurate or inaccurate information (counterbalanced). Children’s initial preference for similar sources was modified by reliability cues. However, 5-year-olds continued to be influenced by similarity, being less likely to avoid inaccurate sources if similar than dissimilar. In Experiment 2 the familiar informant was later portrayed as interpersonally similar or dissimilar (counterbalanced). Only 5-year-olds were influenced by similarity, preferentially interacting with similar informants regardless of familiarity. These results suggest that similarity influences children’s learning and that children’s relative weighing of social cues varies with age—with younger children being especially focused on familiarity and older children being particularly attentive to similarity.

**Keywords:** trust, speaker reliability, similarity, familiarity, in-group favoritism
early in people’s development: By 3 months of age infants show a marked preference for same-race over other-race faces, as indicated by their looking time for each face (e.g., Kelly et al., 2005). Likewise, 11-month-olds prefer to interact with someone who shows similar food preferences to theirs (Mahajan & Wynn, 2012).

Finally, physical and psychological similarities have been related to perceived trustworthiness (e.g., Siegrist, Cvetkovich, & Roth, 2000; Ziegler & Golbeck, 2007) and ingroup favoritism (i.e., the tendency to favor the ingroup over the outgroup in perception, attitudes, and preferences; Billig & Tajfel, 1973; Tajfel, Billig, Bundy, & Flament, 1971). For instance, adults judge as more trustworthy unfamiliar targets whose facial features subtly resemble their own (DeBruine, 2002) and are more likely to select an unknown amount of money allocated by members of an ingroup (e.g., those attending the same university) than of an outgroup (Foddy, Platow, & Yamagishi, 2009). Likewise, children from ethnically homogeneous schools tend to judge ambiguous events (i.e., depictions of actions that can be interpreted as well- or ill-intended) more negatively if performed by other-race than same-race actors (McGlothin & Killen, 2006). Although there is consistent evidence about the influence of similarity on children’s judgments, the findings typically document social (e.g., choice of toys, friendships) as opposed to epistemic (e.g., learning generalizable knowledge such as novel objects’ names) decisions. To our knowledge, there is only indirect support of the influence of similarity on epistemic situations: Adults and children with role models of their same race or gender perform better in particular academic tasks than do those without similar role models (e.g., Marx, Ko, & Friedman, 2009; Marx & Roman, 2002; Zirkel, 2002). Consequently, one of the aims of this study was to determine if—in the absence of any other information about the sources—similarity also guides young children’s selective learning.

Another important, but rarely explored, developmental issue is whether children’s attentiveness to and relative weighing of distinct types of social information (e.g., similarity vs. reliability) vary with age. Recent developmental findings seem to support this possibility. First, as previously discussed, children make use of a target’s commonalities to inform their social preferences. However, some attributes (e.g., gender) seem to exert greater influence than do others (e.g., race) early in development (e.g., Shutts, Banaji, & Spelke, 2010). Second, children’s ability to monitor an informant’s behavior improves with age; 2-year-olds can monitor a single informant’s labeling performance (Koenig & Woodward, 2010; Krogh-Jespersen & Echols, 2012), whereas 3-year-olds keep track of the accuracy of two informants simultaneously (e.g., Birch, Vauthier, & Bloom, 2008). By the age of 4, children can also monitor partial accuracy (Pasquini, Corriveau, Koenig, & Harris, 2007).

At least two studies have provided indications of age differences in children’s weighing of social information, such as an affiliation cue (e.g., familiarity) versus actual behavior (e.g., labeling). Corriveau and Harris (2009) presented 3- to 5-year-olds with a set of novel objects and tested whether children preferred to request and endorse labels from a familiar rather than an unfamiliar source, in the absence of recent accuracy information. Children showed a strong preference for requesting and endorsing novel objects’ labels from the familiar informant. Notably, after one of the two informants then mislabeled familiar objects, 4- and 5-year-olds prioritized the informants’ recent accuracy over familiarity when choosing from whom to learn. Conversely, 3-year-olds discounted the familiar informant’s mislabeling and continued to select her as a source over an unfamiliar, yet accurate, informant. Although in the Corriveau and Harris study familiarity was not completely isolated from accuracy (i.e., the familiar informant was the child’s own teacher, from whom the child presumably had received accurate information in the past), their findings suggest that children’s relative weighing of distinct social attributes varied with age. Yee and Brown (1992) provided additional evidence of age-related changes in relative weighing, though with a somewhat different pattern. They found that when preschoolers had to evaluate their own and the other team’s speed on a competitive task (i.e., a race) 5-year-olds, but not 3-year-olds, showed marked ingroup favoritism by characterizing their team as faster performers regardless of actual team performance. Thus, two studies comparing children’s relative weighing of affiliation cues (familiarity, group membership) versus actual behavior (true/false labeling, slow/fast performance) provided evidence of age differences, albeit with rather opposing developmental trajectories.

Consequently, another goal of the present study was to directly examine potential developmental differences in children’s relative weighing of multiple cues of trustworthiness. In two experiments we tested whether (a) when no other information is available, children use an informant’s similarity and familiarity to guide their preferences in epistemic situations; (b) children update any initial preferences in the face of actual reliability; and (c) there are potential age differences in children’s relative weighing of these three social characteristics. In Experiment 1 it was similarity and reliability that intersected, whereas in Experiment 2 it was familiarity and similarity.

### Experiment 1

In Experiment 1 we examined whether children prefer to learn from similar over dissimilar informants, in the absence of other information. Because previous research has shown age variations in children’s relative weighing of affiliation cues versus actual behavior, we also tested whether children’s relative weighing of similarity and reliability varied with age. This second point was assessed via two comparisons: children’s post- versus prereliability performance and children’s “forgiving” of inaccurate informants—as indicated by their willingness to select that informant as a source even after he or she was seen to be unreliable.

Perceived similarity was manipulated by introducing the children to two puppets, one of whom shared hair color and food preferences with the child and one of whom was dissimilar in both areas. After being introduced to the puppets, children had an opportunity to request labels for an unfamiliar object from one of the puppets. Both puppets then labeled the novel object with different names, and children were asked to endorse one of the names. Measuring both requesting and endorsing helped better characterize the extent to which children may trust a particular informant. Specifically, requesting and endorsing were treated as two interrelated but different steps in proactive learning (with the epistemic costs for selecting the incorrect source arguably higher in the latter than former step). Thus, this initial phase revealed any preferences that children may have had for the informants, while providing a nuanced framework for examining children’s learning decisions. After requesting and endorsing labels for novel objects,
children learned about the informants’ accuracy by hearing one informant label familiar objects accurately while the other labeled inaccurately, with the similar puppet being accurate for half the participants. Finally, children were again given an opportunity to request and endorse labels from either informant with a second set of novel objects. This tested if any initial preferences changed once children learned who the reliable source was. We expected that in the initial phase children would prefer similar over dissimilar informants—extending documented preferences for similar others from social to word-learning tasks.

Familiar, similar, and ingroup targets are considered more psychologically proximal to the self than are unfamiliar, dissimilar, and outgroup others (Liberman, Trope, & Stephan, 2007). In light of the reported findings (i.e., Corriveau & Harris, 2009; Yee & Brown, 1992), we expected either one of two potential outcomes. To the extent that both similarity and familiarity produce comparable effects (i.e., increased attraction; see Zajonc, 2001), we expected an improved ability with age to favor the informants’ actual behavior (i.e., accurate labeling) over their social attributes (i.e., similarity). Conversely, to the degree that children use similarity cues as a marker of group membership (see Mahajan & Wynn, 2012), we expected older children to be more likely than younger ones to discount an informant’s labeling based on affiliation cues.

Method

Participants. Forty 3-year-olds ($M_{age} = 3$ years 3 months; range = 3 years to 3 years 9 months; 22 girls, 18 boys), forty 4-year-olds ($M_{age} = 4$ years 3 months; range = 4 years 1 month to 4 years 10 months; 20 girls, 20 boys), and forty 5-year-olds ($M_{age} = 5$ years 3 months; range = 5 years to 5 years 11 months; 22 girls, 18 boys) participated in the study. An additional 14 children were excluded from the analysis; eight did not request or endorse labels, four were excluded due to experimental error, and two had insufficient English-language skills. All children were recruited using a participant database maintained at a university research lab after receiving approval from the university’s Institutional Review Board. Parents received invitation letters, followed up by a phone call or e-mail. Most children were Caucasian (90 out of 120), but other ethnicities were represented (20 Hispanic, 5 African American, 5 Asian). After parents provided informed consent, children were tested in a child-friendly lab room by two experimenters: a puppeteer and an interviewer.

Materials. Participants were introduced to two realistic looking, childlike hand puppets. For each gender there was a blond-, black-, and brown-haired puppet with a green shirt. The puppets’ gender was matched with the child’s. Puppets’ names were reviewed by parents to ensure that they did not correspond to a close friend or family member. Perceptions of similarity were manipulated by presenting to each child a puppet that matched in hair color and shared a food preference with the child (see Fawcett & Markson, 2010, for an effective manipulation of these variables with 3-year-olds). Pictures of children’s most and least favorite foods—as identified by parents prior to the study—were used to make the food preference more concrete. Parent-recognized foods for which children had specific associations (e.g., spinach makes you smarter) were avoided. To establish the accuracy of an informant’s labels, three familiar objects were used: a toy duck, a soccer ball, and a plastic spoon. To measure children’s preference for the informants’ labels, six novel objects were used: a visor clip, a spiky ball, a tea infuser, a U-lock bracket, a leaf-shaped toy with suction cups, and a horseshoe-like toy.

Design and procedure. The experiment was partly adapted from Corriveau and Harris (2009) and consisted of a series of consecutive phases: similarity, uncertainty, history, and testing. During the similarity phase children were introduced to two puppet informants and learned about shared and nonshared characteristics with each of the puppets. During the uncertainty phase children’s preferences for requesting and endorsing labels from the similar and dissimilar informant (in the absence of reliability information) were measured. During the history phase children learned which informant was a reliable source of accurate labels. Then during the testing phase children’s willingness to request and endorse an informant’s labels was reassessed with a second group of three novel objects. Each phase is described below in more detail.

Similarity phase. The goal was to increase children’s perception of similarity with one of the informants. The manipulation included both physical (hair color) and psychological (food preference) commonalities so as to make the impression of similarity more robust. After introducing the puppets to the participant, the experimenter highlighted, with equal enthusiasm, the physical similarity (e.g., “Look! You and Sally have the same color hair!”) and dissimilarity (e.g., “Lauren has a different color hair!”) between participants and puppets. Each puppet supported the experimenter’s claim (e.g., “Yes, we both have ___ hair”). Including a physically salient attribute ensured that children had an ever-present reminder of who was the similar informant throughout the experiment. Then children were presented with pictures of their least and most favorite foods and were asked, “Which of these foods do you like more?” After children responded the experimenter asked the puppets, “How about you, kids? Which one do you like more?” The similar puppet claimed to like the same type of food as the participant (e.g., macaroni and cheese), whereas the dissimilar puppet preferred the food that was disliked by the child. Children’s memory was tested after each similarity-establishing event by asking, “Can you tell me who has ___ hair/likes ___?”

Uncertainty phase. Children’s preference for the informants’ labels, when reliability information was not available, was measured. Children played briefly with three novel objects (e.g., visor clip) and, for each object, were first asked, “Do you know what this is called?” If the child claimed to know what the object was called, the experimenter replied, “It looks like one, but I think it is called something else. Do you have any other idea of what this is called?” After admitting ignorance children were invited to choose an informant to provide a label (e.g., “I bet one of our friends can help us. Who would you like to ask?”) Children’s preferred informant provided a label, followed by a label given by the other informant. Having both informants label the same object closely resembled the Corriveau and Harris (2009) procedure and ensured that children had two mutually exclusive options to choose from. Once both informants had provided a label (e.g., “I think it is a toma”; “I think it is a mido”), the experimenter repeated each label and asked the child, “What do you think it is called? Is it a toma or a mido?” The location (left/right) and word set used by each informant were counterbalanced.
Results

Analyses for the uncertainty phase examined children’s potential preference to request and endorse labels from a similar over dissimilar informant, in the absence of other information. Analyses for the history phase evaluated children’s monitoring of an informant’s accuracy, whereas those for the testing phase assessed the interplay between similarity and reliability.

Similarity phase. Children were asked to identify the informants’ characteristics. There were two memory evaluations each for hair color and food preference (maximum score = 4). Because of our interest in the effects of similarity on children’s learning, only data from children who were willing to respond to the memory prompts, and recalled the informants’ characteristics at above-chance levels (score > 2), were considered. Consequently, seven children (3 years: 3, 4 years: 1, 5 years: 3) were excluded from the following analyses.

Uncertainty phase. Every time children requested or endorsed a novel label from the similar informant (SI) over the dissimilar informant (DI), their response was coded as 1 (and 0 otherwise; maximum score = 3, per question type). A repeated-measures analysis of variance (ANOVA) with question type (requesting, endorsing) as the within-subject variable and age (3, 4, and 5 years of age) as the between-subjects variable revealed only a main effect of question type, $F(1, 110) = 6.50, p = .012, \eta^2_p = .056$. Children’s average requesting was greater than their endorsing, $F(2, 110) = 1.22, n.s.$ or endorsing, $F(2, 110) = 0.72, n.s.$

History phase. Children were asked to identify which informant was accurate during the history phase. Children were generally accurate and significantly above chance at identifying the reliable source (86% correct; binomial test, $p < .0001$). A logistic regression analysis confirmed that neither age ($b = 0.44, SE = 0.35$, Wald = 1.56, $p = .21$) nor condition ($b = 0.50, SE = 0.56$, Wald = 0.78, $p = .38$) predicted children’s performance.

Testing phase. After learning about the informants’ reliability, children had another opportunity to request and endorse information from them. Two analyses were performed to evaluate the interplay between similarity and reliability: (a) post- versus prereliability comparisons, which would reveal the effect of reliability on children’s initial similarity preferences, and (b) children’s discounting of inaccuracy, which would examine the potential influence of similarity on children’s consideration of reliability information.

Post- versus prehistory phase comparison. To determine whether reliability information influenced children’s subsequent preference for the SI, we compared their post- versus prereliability preferences (see Figure 1). Separate repeated-measures ANOVAs were conducted for each question type (request, endorse), with history phase (before/after reliability information is provided) as the within-subject variable and condition (SI accurate/inaccurate) and age (3, 4, and 5 years of age) as between-subjects variables.

Requesting behavior. Results revealed only a main effect of condition, $F(1, 107) = 7.66, p = .007, \eta^2_p = .067$, on children’s requesting. Generally, children were more likely to request labels from an accurate rather than inaccurate SI. There was also a nonsignificant trend for the effect of history phase, $F(1, 107) = 3.31, p = .072, \eta^2_p = .030$; children’s requesting of the SI’s labels tended to decrease after the history phase.

Endorsing behavior. There was a significant History Phase × Condition interaction, $F(1, 107) = 10.13, p < .001, \eta^2_p = .12$. Generally, when the SI was accurate children significantly increased their endorsement of the SI’s labels. Conversely, if the SI was inaccurate children significantly reduced their support (see Figure 1).

Preference for an inaccurate source. Last, it was examined whether children’s willingness to excuse an informant’s inaccuracy—as indicated by their willingness to select him or her as a source even after the informant became unreliable—varied by similarity and age. Every time the children requested or endorsed information from the inaccurate informant their response was coded as 1 (and 0 otherwise; maximum score = 3). Then, separate ANOVAs were conducted with age (3, 4, 5 years) and similarity condition (SI inaccurate, DI inaccurate) as the between-subjects variables for children’s requesting and endorsing (see Figure 2, top panels). There was a main effect of condition for children’s requesting, $F(1, 107) = 15.33, p < .001, \eta^2_p = .13$; children were significantly more likely to continue requesting labels from a previously inaccurate source if similar than dissimilar.

Regarding children’s endorsing, there were only nonsignificant trends for the effect of condition, $F(1, 107) = 3.79, p = .054, \eta^2_p = .034$, and for a Condition × Age interaction, $F(2, 107) = 2.29, p = .11, \eta^2_p = .041$. A propos of the latter, previous research has shown important changes with age on children’s weighing of actual behavior in relation to other cues (e.g., familiarity, group membership; Corriveau & Harris, 2009; Yee & Brown, 1992). To investigate the developmental pattern of children’s ability to prioritize one cue (reliability) over the other (similarity), we computed simple effects of condition for each age group. These analyses revealed that 3-year-olds, $F(1, 35) = 0.01, p = .94,$ and
4-year-olds, $F(1, 37) = 0.49, p = .49$, were equally likely to avoid the testimony of an inaccurate source, regardless of interpersonal similarity (see Figure 2, top panels). In contrast, 5-year-olds were significantly more likely to continue endorsing the labels of an inaccurate informant if similar rather than dissimilar, $F(1, 35) = 7.30, p = .011, \eta^2_p = .17$. The differences by age in relative weighing remained even after applying corrections to alpha due to three additional tests (i.e., $p$ value $\times 3$; 3 years: $p = 1$; 4 years: $p = .98$ vs. 5 years: $p = .033$).

Discussion

One of the main goals of Experiment 1 was to evaluate if, when knowing little about the informants, children would use similarity cues to evaluate the informants’ trustworthiness on epistemic tasks. Generally, children differentiated preferred to request and endorse labels from the similar informant (SI) over the dissimilar informant (DI). These results confirm our initial expectation that young children’s typical favoring of similar others extends into the realm of word learning.

A second goal was to examine potential age differences in children’s relative consideration of similarity and reliability. Therefore, once children watched the informants differ in their accuracy, children’s preference for the SI was reassessed. We first compared children’s post- versus prereliability performance, which showed the effect that reliability had on similarity preferences. These analyses provided initial evidence that, regardless of age, children’s requesting and endorsing of the SI was significantly affected by whether that informant had labeled accurately or inaccurately. This outcome is somewhat consistent with previous studies showing children’s attentiveness to an informant’s history of accuracy (e.g., Koenig et al., 2004).

We then compared children’s propensity to discount inaccuracy, which helped document the influence of similarity on children’s attentiveness to reliability. This comparison provided initial indications that, at least in their endorsing, children’s relative weighing of similarity information might actually increase with age. Specifically, 3- and 4-year-olds avoided endorsing an inaccurate source’s subsequent testimony at equal rates, regardless of similarity level. Conversely, 5-year-olds were significantly more likely to “forgive” the informant’s false claims if interpersonally similar rather than dissimilar. Five-year-olds’ behavior is somewhat consistent with research documenting older children’s more negative perception of actions if performed by dissimilar compared to similar targets (e.g., McGlothlin & Killen, 2006), as well as other forms of ingroup favoritism (Yee & Brown, 1992). Importantly, the finding that older children’s preference for similar others was more robust
in that their discounting of the inaccurate source’s mislabeling seemed more affected by similarity than was younger children’s) reveals a different pattern from that found by Corriveau and Harris (2009) for familiarity during an identical word learning task; in their study, younger—rather than older—children were more likely to discount the more familiar source’s inaccuracy. Taken together, these findings provide initial indications that children’s preferences for similar informants can be overcome by reliability information, that similarity cues might be used by preschoolers as a marker of group membership, and that children’s prioritization of familiarity and similarity could have potentially opposing developmental trajectories.

An alternate interpretation of the apparent age variations in Experiment 1 is that younger but not older children seemed less concerned with similarity because of a cognitive load. Specifically, by the time they reached the testing phase (after having been exposed to reliability information) younger children might have not remembered which informant was interpersonally similar and therefore emphasized accuracy over similarity information. To examine this hypothesis, an additional 10 children ($M_{age} = 3$ years 9 months; range = 3 years 4 months to 3 years 11 months; female = 5; accuracy condition counterbalanced) were tested to determine if they still remembered at the end of the testing phase who was the similar informant. We followed the exact procedure of Experiment 1, except for the inclusion of a second similarity-recall test at the end of the last phase (i.e., “Can you please tell me again who likes [child’s favorite food]/has [similar] hair color?”). Children were generally accurate and significantly above chance ($50\% = 1$) at identifying the similar source after the testing phase was over ($M = 1.70$, $SD = 0.48$), $t(9) = 4.58$, $p = .001$, $d = 3.05$. There were no significant differences in children’s recall of physical and psychological attributes, $t(9) = 0.56$, $p = .59$: Only one child misremembered which informant shared her own food preference, whereas only two children misidentified which informant had similar hair color. These trends suggest that younger children’s relative weighing of reliability versus similarity is unlikely to have been caused by memory constraints.

Figure 2. Average number of times (maximum = 3 per question type) by similarity level that children selected an inaccurate (Experiment 1) or familiar (Experiment 2) informant. Error bars indicate standard errors. Exp. = experiment.
In summary, children make use of similarity cues when judging trustworthiness in epistemic tasks and modify such preferences in the presence of reliability information. Notably, two experiments with closely related methodologies have provided indications of potential developmental changes in children’s attentiveness to familiarity and similarity. On the one hand, Corriveau and Harris (2009) found that younger children seemed to have placed relatively more weight on familiarity information than did older children—as indicated by their apparent discounting of the familiar source’s false claims. On the other hand, the current experiment provided initial evidence of an opposite tendency for similarity: Older children appeared to have placed relatively more weight on similarity information than did younger children—as suggested by their greater consideration of the inaccurate source’s similarity level. Might these cues of trustworthiness (familiarity and similarity) be considered differently with age? Experiment 2 directly addressed this possibility.

Experiment 2

In Experiment 2 we examined (a) if repeated exposure to an unfamiliar informant is enough to trigger an epistemic preference for that source and (b) if children’s relative weighing of familiarity and similarity changes with age. The first question would contribute evidence about whether familiarity—defined as the number of times children are exposed to one of the informants—actually guides their preference for that informant. This manipulation differs from that of Corriveau and Harris (2009) in that in their study the informants were the teachers of the children. This allowed for potential confounds such as the previous history of testimony from each informant, as well as the maternalistic and/or authoritative figures that the informants may have represented for the younger participants.

Findings related to the second question—determining whether children’s weighing of these two different social attributes varies as a function of age—also can have important theoretical and practical contributions. First, it has been proposed that children’s preference for a member of the same social category can be explained by either familiarity or similarity. For instance, children’s preference for same-race targets has been explained, at least partly, as a product of repeated exposure (e.g., Cameron, Alvarez, Ruble, & Fuligni, 2001; Cantor, 1972). It has also been argued that children’s greater playing time with same-gender targets is explained, partly, as a product of repeated exposure (e.g., Cameron, Alvarez, Ruble, & Fuligni, 2001; Cantor, 1972). The rationale behind using sock puppets was two-fold: First, using genderless, minimally anthropomorphic puppets helped control for physical similarity with the children. Second, using handmade puppets helped control for previous exposure and familiarity to the children. Pictures of children’s most and least favorite foods, colors, and television shows—as identified by parents prior to the study—were used to make the similarity manipulation more concrete. To measure children’s preference for a particular informant’s labels, the same six novel objects of Experiment 1 were used.

Design and procedure. The experiment consisted of a series of consecutive phases: familiarity, testing I, similarity, and testing II. During the familiarity phase, children were introduced to one puppet informant but were immediately after distracted with several tasks. During testing phase I, children’s preferences for requesting and endorsing labels from the now familiar informant and a second, unfamiliar informant were measured. During the similarity phase, children learned about shared and nonshared preferences with each of the puppets. During testing phase II, children’s willingness to request and endorse an informant’s labels was reassessed with a second group of novel objects. Each phase is described below in more detail.

Familiarity phase. The main objective was to increase children’s perception of familiarity with one of the informants. Familiarity was defined as the number of previous encounters with the puppet. The familiarity phase was conducted during a first appointment, whereas the rest of the phases were conducted during a second appointment 6–8 days after the first one. During this first appointment, the child was briefly introduced to one of the puppets (counterbalanced) and was invited to play three games with the experimenter while the puppet watched: a card game, a storytelling game, and a sticker game. These tasks were designed so that direct interaction between child and puppet was minimal yet kept the puppet exposed to the child throughout the phase. Minimal interaction with the puppet ensured that the child could not ask it questions requiring answers that might help the child infer any state of knowledge from the puppet or lead to judgments of similarity. The puppet intervened only once, before the sticker game, with a neutral comment to indirectly remind the child of its presence (i.e., “The sticker game sounds like fun”). The rest of the time it would just stand there turning its head slightly every 10 s. Finally, to reinforce the memory of the child, a picture of the puppet was sent to the parents 3–5 days after the first appointment.
via e-mail. Parents were instructed to show the picture to the children and ask them if they remembered the name of the puppet. If the child did not remember, parents were instructed to provide the name (and only that information) and to remind the child (regardless of whether the child remembered the name) with a neutral voice tone that the puppet would be there when they visited the lab for the second appointment.

**Testing phase I.** Children’s preference for requesting and endorsing labels from the puppet informants was measured during a second appointment. It was expected that, because the child had already been exposed to one of the puppets during the first appointment, that puppet was more familiar to the child than was the second one, which had just been introduced. The procedure for this phase was identical to the uncertainty phase in Experiment 1.

**Similarity phase.** The goal was to increase children’s perception of similarity with one of the informants. As in Experiment 1, the experimenter highlighted, with equal enthusiasm, the similar and dissimilar preferences between child and puppets in three categories: foods, colors, and television shows. For the first and third categories, the puppets were asked to state their preferences first, followed by the child, whereas for the second category the order was reversed.

**Testing phase II.** After children had the opportunity to learn during the previous phase which informant was interpersonally similar, their willingness to request and endorse the labels from either informant was reassessed. This measured if children’s potential preference for a familiar source would change in the presence of similarity information. Testing phase II was identical to testing phase I, with a second group of three novel objects.

### Results

Analyses for testing phase I examined whether children preferred to request and endorse labels from familiar over unfamiliar informants, in the absence of other information. Analyses for testing phase II assessed the interplay between familiarity and similarity.

**Testing phase I.** Every time the children either requested or endorsed a label from the familiar informant (FI) over the unfamiliar informant (UI), their response was coded as 1 (and 0 otherwise; maximum score = 3, per question type). A repeated-measures ANOVA with question type (requesting, endorsing) as the within-subject variable and age (3, 5 years old) as the between-subjects variable revealed only a Question Type × Age interaction, $F(1, 62) = 5.41, p = .023$, $\eta^2_p = .08$. Simple effect analyses indicated that 3-year-olds’, $F(1, 31) = 5.07, p = .032$, $\eta^2_p = .14$, but not 5-year-olds’, $F(1, 31) = 1.00, p = .33$, $\eta^2_p = .031$, average requesting was greater than their endorsing (see below). Therefore, children’s requesting and endorsing scores were analyzed separately.

To examine whether children differentially preferred one informant over the other, the mean number of times that children requested and endorsed the FI’s labels was compared to chance (1.5) via $t$ tests (i.e., to keep the analyses consistent with those in both Experiment 1 and Corriveau and Harris, 2009). Children generally preferred to request ($M = 1.97, SD = 0.87$), $t(63) = 4.30, p < .001$, $d = 1.08$, and later endorse ($M = 1.86, SD = 0.79$), $t(63) = 3.62, p = .001$, $d = 0.91$, labels from the FI more frequently than would be expected by chance. Identical conclusions were supported by chi-square tests: The number of children providing 0, 1, 2, or 3 FI choices differed from a chance distribution (8, 24, 24, and 8, respectively, for $N = 64$); requesting: 3, 16, 25, and 20, respectively; $\chi^2(3, N = 64) = 23.83, p < .001$; endorsing: 2, 19, 29, and 14, respectively; $\chi^2(3, N = 64) = 11.08, p = .011$. Separate independent $t$ tests for each question type (request, endorse) with age as the grouping factor confirmed effects of age on children’s requesting, $t(62) = 2.71, p = .009$, $d = 0.68$. Three-year-olds ($M = 2.25, SD = 0.95$) were significantly more likely than 5-year-olds ($M = 1.69, SD = 0.69$) to request labels from the FI. Notably, 5-year-olds’ requesting did not differ from chance, $t(31) = 1.53, p = .14$. There were no age effects on children’s endorsing.

**Similarity phase.** Children were asked to identify the informants’ characteristics. There were two memory evaluations each for food, color, and TV shows preferences (maximum score = 6). Due to our interest in the interplay of similarity and familiarity, only data from children who responded to the memory prompts and recalled the informants’ characteristics at above-chance levels (score > 3) were considered. Thus, three children (3 years: 2, 5 years: 1) were excluded from later analyses.

**Testing phase II.** To determine if children’s preference for the FI varied as a function of similarity, the mean number of times (maximum score = 3, per question type) that children selected the FI was determined (see Figure 2, bottom panels). Separate ANOVAs were conducted for each question type (request, endorse) with condition (FI similar/dissimilar) and age (3 and 5 years of age) as between-subjects variables. Only children’s requesting revealed a significant Age × Condition interaction, $F(1, 57) = 5.34, p = .025$, $\eta^2_p = .086$. To better understand this interaction, simple effects of condition were calculated per age group. Five-year-olds, $F(1, 29) = 7.52, p = .010$, $\eta^2_p = .21$, were significantly less likely to request labels from a dissimilar than a similar FI. Conversely, 3-year-old’s support for the FI did not vary by similarity condition, $F(1, 28) = 0.83, p = .37$, $\eta^2_p = .029$. There were no main effects or interaction between age and condition in children’s endorsing.

**Post- versus presimilarity phase comparison.** To determine if there were within-subject effects of similarity condition on children’s behavior, their responses before and after the similarity phase were compared.

**Requesting behavior.** To verify if children’s requesting behavior varied as a function of age and condition, a repeated-measures ANOVA was conducted with similarity phase (requesting before/after similarity information) as the within-subject variable and condition (FI similar/dissimilar) and age (3 and 5 years of age) as between-subjects variables. Results revealed a main effect of age, $F(1, 57) = 6.11, p = .023$, $\eta^2_p = .09$; a significant Age × Condition interaction, $F(1, 57) = 4.68, p = .035$, $\eta^2_p = .076$; and a nonsignificant trend for a Similarity Phase × Condition interaction, $F(1, 57) = 3.70, p = .059$, $\eta^2_p = .061$. Regarding the first interaction, simple effects of condition per age group indicated that 5-year-olds tended to change their preference for the FI depending on whether that informant was portrayed as interpersonally similar ($M = 1.83, SD = 0.65$) or dissimilar ($M = 1.44, SD = 0.51$), $F(1, 29) = 3.60, p = .068$, $\eta^2_p = .11$. Conversely, 3-year-olds’ requesting did not vary significantly, $F(1, 28) = 1.78, p = .19$, for a similar FI ($M = 1.87, SD = 0.95$) or dissimilar FI ($M = 2.30, SD = 0.82$). To clarify the nonsignif-
icant interaction between similarity phase and condition, simple effects of similarity phase were determined for each condition group. The results suggest that learning about the FI’s preferences significantly affected children’s requesting if these preferences were dissimilar to the children’s: before: $M = 2.03$, $SD = 0.80$, versus after: $M = 1.68$, $SD = 0.91$; $F(1, 30) = 10.55$, $p = .003$, $\eta^2_p = .26$, as opposed to similar: before: $M = 1.83$, $SD = 0.95$, versus after: $M = 1.87$, $SD = 0.90$; $F(1, 29) = 0.039$, $p = .85$, $\eta^2_p = .001$.

**Endorsing behavior.** There were no main effects or interactions for children’s endorsing.

**Discussion**

The main goals of Experiment 2 were to examine whether in the absence of other information children would prefer a more familiar over an unfamiliar informant and whether children weighed familiarity versus similarity differently when judging trustworthiness. Before other information was available, children differentially preferred to learn from the familiar informant (FI) over the unfamiliar informant (UI). This finding indicates that the mere exposure effect (see Zajonc, 2001) also applies to children’s learning decisions. Moreover, it extends research documenting greater preference for familiar versus unfamiliar entities by suggesting that repeated exposure to a source—even when it is not markedly friendly or cooperative (see Corriveau & Harris, 2009)—is enough to trigger an epistemic preference for the source. Notably, there was a main effect of age: 3-year-olds were significantly more likely to request labels from the FI than were 5-year-olds. Once children watched the informants differ in their stated preferences, indications of a developmental variation also emerged: Younger children seemed to place relatively more weight on familiarity than on similarity, as 3-year-olds were equally likely to request and endorse the FI’s labels regardless of whether the FI was similar or dissimilar. Conversely, 5-year-olds appeared to have placed relatively more importance on similarity information—at least in their requesting behavior—for only they were significantly influenced by similarity condition. Specifically, 5-year-olds were significantly less likely to request labels from a dissimilar than a similar FI and significantly less likely to request a dissimilar FI’s labels than were 3-year-olds.

Further, inspection of children’s behavior before and after the similarity phase provided additional evidence that, although 5-year-olds appeared to be more strongly affected by dissimilarity information than were 3-year-olds, this effect was limited to their requesting behavior. Neither 3- nor 5-year-olds significantly changed their endorsing of labels provided by the FI, regardless of similarity condition. Interestingly, the overall results of Experiment 2 stand in contrast to those of Experiment 1, in which indications of children’s selectivity were most evident in their endorsing, as opposed to their requesting. At least one methodological distinction may explain why children seemed more reluctant to actively adjust their endorsing in Experiment 2. Children in Experiment 1 received labeling accuracy information, an expertise cue directly relevant to the task at hand (word learning), which may have encouraged an even stricter selectivity in children’s endorsing. Conversely, children in Experiment 2 received contrasting affiliation information (i.e., familiarity, similarity), which, although related to trustworthiness, does not explicitly indicate who the labeling expert is. Considering that in the absence of reliability information children have shown endorsing preferences for both similar (Experiment 1) and familiar (Experiment 2) informants, it is not surprising that they did not show endorsing selectivity when these cues intersected. Why, then, were they selective in their requesting?

Differences in children’s requesting and endorsing has been documented in previous research (e.g., Pasquini et al., 2007; Sobel & Corriveau, 2010). In our view, these differences might be explained by the motivation and epistemic costs behind these two decisions. It is possible that when choosing from whom they want to request labels, children may be motivated by their desire to interact or associate with a particular informant. This would be consistent with the Fawcett and Markson (2010) finding that children preferred similar others as playmates. Conversely, children’s endorsing indicates who they deem as more truthful. Arguably, endorsing information from an unreliable source may represent a greater epistemic cost than requesting it, especially when generalizable knowledge (i.e., name of objects) is being taught. Should children be sensitive to the costs of each question type, one would expect to see children’s criterion be stricter for requesting information than for requesting it. This appears to be the case; in both experiments, initial comparisons of children’s performance by question type showed that children’s average requesting was significantly greater than their endorsing. However, further research is needed to conclusively verify this distinction.

Finally, the finding that children were especially affected by dissimilarity information is consistent with the contention that children are particularly attentive to negative, rather than positive, information about an informant when judging his or her trustworthiness. For example, Koenig and Jaswal (2011) found that children made use of an informant’s incompetence (negative information) but not his or her competence (positive information) when deciding from whom to learn across domains of knowledge (see Vaish, Grossmann, & Woodward, 2008, for a review of this asymmetry). Taken together, the results described in this section provide indications of developmental differences in the relative importance that children may place on these two core social categories. Three-year-olds appeared to be more attentive to familiarity, being significantly more likely to request labels from the FI than were 5-year-olds in the absence of similarity information. Conversely, 5-year-olds seemed especially affected by similarity, being significantly less likely to request labels from a familiar–dissimilar informant than were 3-year-olds.

**General Discussion**

The main objectives of this study were to examine whether (a) when uncertain about the sources’ other characteristics, children use similarity and familiarity to guide their learning during an epistemic task and (b) with age children weight differently the informants’ various social attributes (i.e., reliability, similarity, familiarity) when judging their trustworthiness. Generally, children differentially preferred to learn from a similar rather than a dissimilar (Experiment 1) and a familiar rather than an unfamiliar (Experiment 2) informant. Additionally, children’s consideration of an informant’s social attributes tended to vary as a function of age.
The results from Experiment 1 provided evidence that, when knowing little about the sources, children use similarity to select from whom to learn: Preschool-age children differentially requested, and subsequently endorsed, labels from the similar—compared to the dissimilar—informant. Experiment 1 also addressed the question of how children might weigh different types of social information, in this case similarity and reliability. Reliability affected similarity preferences in that children’s endorsing of the SI increased if the SI labeled accurately and decreased if he or she labeled inaccurately. However, similarity also affected children’s reliability preferences, as older—though not younger—children were more likely to continue to trust an informant who had erred if similar rather than dissimilar. Although there is evidence in past research of an improved ability with age to disregard initial social information in the presence of reliability evidence (Corriveau & Harris, 2009), this was not necessarily the case with the similar-peer-like informants in our study. Instead, our findings contained suggestions of an opposite trend: Children’s discounting of the SI’s negative performance (i.e., inaccurate labeling) appeared to increase with age, an outcome rather comparable to that of Yee and Brown (1992).

The results of Experiment 2 also provided indications of age differences in the relative importance that children place on affiliation cues, in this case familiarity and similarity. First, although both age groups endorsed the familiar informant’s (FI) labels at above-chance levels, only 3-year-olds requested labels from the FI more frequently than would be expected by chance. Additionally, 3-year-olds were significantly more likely than 5-year-olds to request the FI’s labels before hearing the puppets state similar and dissimilar preferences. Thus, prior to similarity information, both age groups showed some evidence of familiarity preferences, though the evidence was stronger in the 3-year-olds. Once children learned whether the FI was similar or dissimilar to them, only 5-year-olds were significantly affected by similarity condition; that is, only 5-year-olds were significantly less likely to request labels from a dissimilar than a similar FI. Conversely, 3-year-olds’ preference for requesting labels from the familiar source was not influenced by whether that source was similar or dissimilar. Comparing children’s post- versus presimilarity phase performance confirms this trend: Only 5-year-olds’ requesting tended to be affected by similarity information, as shown by their decreased support for an FI when portrayed as dissimilar. Neither 3- nor 5-year-olds modified their endorsing of the FI significantly, regardless of whether the FI was portrayed as similar or dissimilar. Therefore, these results provided evidence of a similarity influence in both age groups, though it was most evident in 5-year-olds.

When similarity intersected with reliability (Experiment 1), there were indications of an increase in the relative attention to similarity with age. Additionally, when familiarity intersected with similarity (Experiment 2), there was suggestive evidence of a decreased influence of familiarity with age. Taken together, these findings argue in favor of the contention that younger children might be particularly focused on familiarity cues and older children on similarity cues.

Why might children’s preference to learn from similar others appear to increase with age? It is plausible that children’s preference for similar others was driven, in part, by ingroup favoritism. By highlighting the similarities and dissimilarities between children and informants, participants may have been prompted to implicitly categorize themselves and the similar informant as part of the same group (“us”) and the dissimilar informant as a member of an outgroup (one of “them”). Similarity-based implicit groupings have been shown to produce substantial discriminatory responses toward the outgroup, parallel to those obtained by explicit divisions of groups (Billig & Tajfel, 1973). Turner, Brown, and Tajfel (1979) suggested that favoring members of one’s own group serves to foster a positive self-image and higher self-esteem.

Ingroup favoritism has also been documented in younger and older children, with a peak in ingroup favoritism beginning at about 5 years of age (Aboud, 1988; Yee & Brown, 1992). Five-year-olds in the current study might have endorsed a similar—inaccurate informant (Experiment 1) and selected an unfamiliar—similar informant (Experiment 2) more often than 3-year-olds did because of their greater concern with ensuring a favorable intergroup comparison (and, consequently, a positive self-evaluation). To the degree that children use similarity cues as a marker of group membership, our findings are consistent with the idea that young children are capable of identifying and reasoning about group members (Spelke & Kinzler, 2007).

An alternate explanation, however, is that older (but not younger) children might have placed special attention on similarity cues in Experiment 1 because of pragmatic demands of the task. Perhaps 5-year-olds perceived similarity to be rather important to the experimenter, who explicitly highlighted the commonalities between participants and puppets. However, the experimenter also appeared especially interested in reliability cues; he or she first encouraged the children to endorse each of the three correct familiar labels during the history phase and later explicitly asked children to judge who was “very good at answering correctly.” It is thus unlikely that pragmatic demands accounted for older children’s greater attentiveness to similarity cues.

In summary, these results make three important contributions to the study of selective trust. To our knowledge this is the first study to provide evidence that preschoolers’ favoring of similar over dissimilar others extends to their epistemic preferences. In the absence of other information, preschoolers made functional use of similarity cues to choose from whom they wanted to request and endorse novel objects’ names. Second, these results suggest that all informants might not be evaluated equally, in that an informant’s inaccuracy can be somewhat overlooked as a result of apparent ingroup favoritism: 5-year-olds were significantly more likely to continue to trust a source who had erred if similar rather than dissimilar. Considering that making mistakes is only human, it may prove advantageous to be perceived as sharing some commonalities with one’s learning audience.

Finally, these findings provide indications of developmental differences in children’s attentiveness to various social cues when judging an informant’s trustworthiness. Regarding their consideration of familiarity cues, both 3- and 5-year-olds preferred to endorse labels from the familiar over the unfamiliar source, but only 3-year-olds differentially preferred to request labels from the FI and did so significantly more frequently than did 5-year-olds. Once similarity information was presented, 3-year-olds favored the familiar over unfamiliar informant in their requests regardless of similarity level, whereas 5-year-olds did not. That is, 5-year-olds were significantly less likely to request labels from a familiar—dissimilar source than were 3-year-olds. Notably, 5-year-olds seemed to be particularly attentive to dissimilarity; there were no
age differences in children’s requesting or endorsing of labels from familiar–similar informants.

These results are important not only for their contributions to our understanding of children’s selective learning but also because of their potential practical implications. For example, they provide initial indications that, although familiarity with a source (e.g., a teacher) might increase 3-year-olds’ chances of overlooking any perceived dissimilarity (e.g., gender, age, preferences), it may be different for 5-year-olds, who seemed to be more concerned with these markers of group membership. Importantly, age differences in attentiveness to dissimilarity of familiar sources were present only in children’s requesting; that is, 5-year-olds were less likely than 3-year-olds to interact with or request labels from a familiar–dissimilar informant, but there was no evidence that they were also unwilling to accept information provided by that source. It is possible that, even when older preschoolers prefer to be friends with, interact with, and potentially request information from similar–familiar others (e.g., same-gendered peers), they could still learn from dissimilar–familiar targets if provided with new information.

Because of its potential implications, it is fitting to note that the generalizability of the present findings may be limited by at least two considerations. First, individual differences may also play a role in people’s weighing of categories such as familiarity and similarity. For example, the relative importance that someone places on familiarity might vary as a function of his or her attachment style (Corriveau et al., 2009). Likewise, prioritizing similarity over other cues might be different for someone who values the specified commonalities (e.g., similar preferences) than for someone who places more importance on other attributes. Second, our participant pool was fairly homogeneous in terms of socioeconomic status and ethnicity, limiting the generalizability of the findings to more heterogeneous populations.

The findings reported here show that children are not unbiased in their choices of learning sources: When faced with informants about whom they know little, children will choose to learn from the more similar or familiar one. These biases are not absolute—they can be modified with information, such as actual reliability, that counters the bias. However, the results also suggest that the relative weighing of similarity, familiarity, and reliability varies with age, with younger children being especially focused on familiarity and older children being particularly attentive to similarity. The finding of stronger similarity preferences in 5-year-olds could be linked to the ingroup favoritism that begins to become prominent during that period. These results advance our understanding of how children evaluate information sources, as well as highlight the role that various social attributes play in their selective learning from others.

References


Received June 11, 2011
Revision received December 26, 2012
Accepted December 31, 2012