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Preschoolers' Preference for Syntactic Complexity Varies by Socioeconomic Status

Kathleen H. Corriveau, Katelyn Kurkul, and Sudha Arunachalam
Boston University

Two experiments investigated whether 4- and 5-year-old children choose to learn from informants who use more complex syntax (passive voice) over informants using more simple syntax (active voice). In Experiment 1 (N = 30), children viewed one informant who consistently used the passive voice and another who used active voice. When learning novel words from the two informants, children were more likely to endorse information from the passive informant. Experiment 2 (N = 32) explored whether preference for the passive informant varied by socioeconomic status (SES; eligibility for free/reduced lunch). Although higher SES children selectively preferred the passive informant, lower SES children preferred the active informant. Explanations are discussed for why SES might moderate children's sensitivity to syntactic complexity when choosing from whom to learn.

Research on children's learning suggests that by the time children reach preschool, they rely on two kinds of cues to determine from whom to learn. First, preschoolers monitor an informant's previous accuracy, selectively preferring to learn from accurate over inaccurate sources (e.g., Birch, Vauthier, & Bloom, 2008; Corriveau & Harris, 2009a; Corriveau & Harris, 2009b; Corriveau, Meints, & Harris, 2009; Fusaro, Corriveau & Harris, 2011; Jaswal & Neely, 2006; Koenig, Clement & Harris, 2004; Koenig & Harris, 2005; Pasquini, Corriveau, Koenig, & Harris, 2007; Sobel & Macris, 2013). Second, preschoolers monitor social group affiliation, preferring to learn from members of their cultural in-group (Corriveau & Harris, 2009a; Corriveau, Harris, et al., 2009; Harris & Corriveau, 2011; Kinzler, Corriveau, & Harris, 2011; see Harris, 2012, for review). When children have information about both cues, prior accuracy trumps social characteristics such as age (Jaswal & Neely, 2006), familiarity (Corriveau & Harris, 2009a), and accent (Corriveau, Kinzler, & Harris, 2013; although see Reyes-Jacquez & Echols, 2013).

We propose that children selectively learn from accurate informants because they view accuracy as a marker of competence (Harris & Corriveau, 2011; Sobel & Kushnir, 2013). That is, children expect accurate informants to be more competent in similar domains than inaccurate informants. Research requiring children to make inferences across domains supports this hypothesis (e.g., labels to game rules, Rakoczy, Warneken, & Tomasello, 2009; labels to functions, Koenig & Harris, 2005; object properties to labels, Sobel & Corriveau, 2010). However, we do not know what other informant properties children view as markers of competence. Children are unlikely to encounter opportunities to learn from accurate over inaccurate informants but rather may be faced with several accurate informants who vary in other properties signaling different levels of competence. Here, we ask if children track markers of informant competence beyond accuracy.

Specifically, we ask whether children show a preference between an individual who uses more complex syntax (passive voice) and one who uses less complex syntax (active voice). We investigate syntactic complexity as a potential indicator of informant competence because passive voice is a feature of academic language and may thus be viewed as more sophisticated than active voice (Berman, 2004; Snow & Uccelli, 2009; Vasilyeva, Huttenlocher, & Waterfall, 2006). Furthermore, 4-year-olds comprehend and produce passive syntax (e.g., Bencini & Valian, 2008; Brooks & Tomasello, 1999; Crain, Thornton, & Murasugi, 2009;

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Correspondence concerning this article should be addressed to Kathleen Corriveau, Human Development, Boston University, Boston, MA, 02215. Electronic mail may be sent to kcorriv@bu.edu.

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Harris & Flora, 1982; Messenger, Branigan, McLean, & Sorace, 2012).

We anticipated one of three outcomes. First, if children only attend to accuracy, whether an accurate informant uses active or passive voice should have no effect. Second, if children view syntactically complex language as another marker of competence, they may prefer to learn from an informant who uses the more complex passive voice. Third, children may be sensitive to speakers' use of active and passive but prefer to learn from an informant who uses active voice because it is what they hear and use themselves—that is, they use active versus passive use to mark social group membership, or they find the informant who uses active voice less effortful to attend to (see Bernard, Proust, & Clément, 2014, for evidence that children selectively learn from intelligible over less intelligible informants).

We also asked if children's informant preferences were related to socioeconomic status (SES). In Experiment 2, we compared selective learning preferences of lower SES children (as indicated by a policy-relevant indicator of poverty status: eligibility for school free/reduced lunch, i.e., household family income < 185% of the federal poverty level in the prior year) and higher SES children (not eligible for free/reduced lunch). SES affects children's linguistic environments (e.g., Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges, 2007; Rowe, 2008; Snow, 1991; Tizard, Hughes, Carmichael, & Pinkerton, 1983), and in turn, language outcomes (e.g., Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Huttenlocher, Vasilyeva, & Shimpi, 2004). Parents rarely use passive voice in everyday talk, irrespective of SES (Gordon & Chafetz, 1990). However, higher SES children engage in more literacy activities, particularly book reading (Payne, Whitehurst, & Angell, 1994; Scarborough & Dobrich, 1994), which uses more syntactically complex language (Cameron-Faulkner & Noble, 2013).

Indeed, SES differences in academic performance may partly stem from differential exposure to academic language (Bernstein, 1971; Hoff-Ginsberg, 1991; Lacroix, Pommerleau, & Malcuit, 2002; Landry, Smith, Swank, & Miller-Loncar, 2000). One obvious mechanism underlying this exposure-related performance gap is that children have difficulty understanding academic language. Here, we pursue a different possibility, grounded in the selective learning literature. Even if children understand the passive—we administer a test to ensure they do—less exposure may decrease their willingness to learn from an informant who uses it. If true, this would point to cascading effects of SES-related differences that extend beyond children's syntactic competence to their trust of academic language users.

Method

Participants

Participants were 4- and 5-year-old children. In Experiment 1, 30 children (M = 5;3, 18 female, range = 4;0–6;0) were recruited from preschools in the Greater Boston area that primarily serve middle- to upper-class families. Sixty-three percent of participating children were Caucasian, 27% African American, and the remaining 10% East Asian. In Experiment 2, 32 children (M = 5;3, 18 female, range = 4;0–6;2) were recruited from four classrooms in a preschool in Somerville, MA. Half of the children (N = 16; M_{age} = 5;0; range = 4;0–6;2) were eligible to receive free/reduced lunch as indicated by school administrators (henceforth lower SES group; household family income < 185% of the federal poverty level; in 2014–2015, 64% of children of all ages in Somerville were enrolled; Kids Count Data Center, 2015). The other half (N = 16; M_{age} = 5;1; range = 4;0–6;0) were not eligible (henceforth higher SES group). Forty-four percent were Caucasian, 44% African American, 9% Hispanic, and 3% did not report race/ethnicity. Data were collected between September 2012 and April 2013.

In both experiments, teachers indicated which children spoke English as their first language. Those families received consent forms through written communication with their teacher in a one-time recruitment process, and most consented. No financial incentive was provided; children received a sticker as a thank you.

Materials

Two English-speaking women served as informants across several video clips. In each clip, the informants sat at a table with an object or picture between them. During *passive training* videos (4 in total), one informant described a picture using passive voice, whereas the other used active voice (Table 1). Note that in Experiment 2, we controlled for subtle differences between the active and passive sentences (Table 1, lower panel). Because the passive sentences were longer than the active, we added a word to the active

Table 1
Sample Descriptions Used in Training in Experiments 1 and 2

Event	Passive-voice description	Active-voice description
Experiment 1		
Girl with flower	The flower is picked by the girl	The girl is picking the flower
Boy with dog	The dog is washed by the boy	The boy is washing the dog
Experiment 2		
Girl with flower	The flower was picked by the girl	The little girl picked up the flower
Boy with dog	The dog was washed by the boy	The boy washed up his pet dog

condition—the particle "up"—that conveyed little meaning. Also, because the passive condition involved the past participle, we used the past tense in the active condition so that both presented the same form ("was picked"/"picked"). During *novel label testing* videos (4), the same informants offered different novel labels for an unfamiliar object. During *novel morphology testing* (4; adapted from Corriveau, Pickard, & Harris, 2011), the informants offered different (both plausible) irregular past tense forms for a novel action depicted in a picture (selected from Berko's, 1958, *wug* test). The past tense forms were chosen from class V and class VI verbs (Bybee & Slobin, 1982). In all phases, the order in which informants spoke and the descriptions or labels they provided were counterbalanced across children.

Procedure

There were six phases in Experiment 1 and seven phases in Experiment 2: (1) Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1997), (1a) picture description task (Experiment 2 only), (2) passive training, (3) novel label testing, (4) novel morphology testing; (5) explicit judgment, and (6) passive-voice comprehension. These occurred in a fixed order, except for novel label and novel morphology testing, whose order was counterbalanced across children.

The *PPVT*, in which children match a spoken word to one of four pictures, assesses receptive vocabulary. All children scored above 1 *SD* below the average standard score (> 85).

In Experiment 2, we included a *picture description task* to ensure that children spontaneously produce active sentences (and therefore, view the active-voice informant as a member of their linguistic in-group). We expected children to use the active voice. Thus, subsequent preference for the passive informant would require inhibiting the primed response. The experimenter elicited children's descriptions of four pictures (e.g., a child washing a dog) by asking, "What's going on in this picture?"

We then administered four *passive-voice training* trials. To introduce the task, the experimenter pointed to a still frame of the two informants and said, "This one is wearing a blue shirt and this one is wearing an orange shirt. They are going tell you about what some people in some pictures are doing." On each trial, a picture of a child performing an action was between the informants. One informant described the picture using passive voice (e.g., "The flower is being picked by the girl"), while the other used active voice (e.g., "The girl is picking the flower"). The experimenter repeated the informants' descriptions, and asked children how they would describe the scenario (e.g., "The girl wearing the blue shirt said that the girl is picking the flower, and the girl in the orange shirt said that the flower is being picked by the girl. What would you say?"). Verbal and nonverbal (e.g., pointing) responses were recorded.

On four *novel label* test trials, the experimenter said, "Now these girls are going to name some things that you have never seen before." On each trial, the experimenter presented a picture of a novel object and pointed to a still frame of the informants who had the same object, saying, "I wonder what this object is called." Each informant labeled the object differently. The experimenter asked, for example, "The girl wearing the blue shirt said it's a *dax* and the girl wearing the orange shirt said it's a *wug*. What would you say?"

On four *novel morphology* test trials, the experimenter said, "Now these girls are going to tell you about what someone is doing," then labeled a picture of an action with a novel verb (e.g., "Here is a picture of a man who is *glinging*.") and pointed to a still frame of the informants with the same picture, saying: "I wonder what he did yesterday." Each informant produced a plausible irregular past tense form (e.g., "Yesterday he *glang*," or "Yesterday he *glung*."). The experimenter asked, for example, "The girl wearing the blue shirt said yesterday he *glang* and the girl wearing the orange shirt said yesterday he *glung*. What would you say?"

This procedure, of introducing informants with particular characteristics and measuring children's subsequent inclination to learn from each, is common in selective learning studies (e.g., Koenig & Harris, 2005).

Next, the experimenter elicited an *explicit judgment*: "Do you remember when they (pointing to the informants) were talking about pictures of little girls and boys just like you? Which girl was better at talking about those things?"

Finally, we assessed *passive-voice comprehension*. On three trials, children saw two pictures of reversible actions (e.g., cat chasing a dog, dog chasing a cat). For another three trials the pairs were nonreversible (e.g., girl catching a ball, girl next to a ball). The experimenter provided a passive-voice description (e.g., "Point to the picture of the cat being chased by the dog").

Results

Experiment 1

Preliminary analyses indicated no age or gender effects on children's selective preference for the informants (Fs < 1). Therefore, we combined age groups and genders.

Training

Scores on *training trials* represent the number of trials (max = 4) on which children endorsed the sentence provided by the passive-voice informant. Endorsements did not differ from 50% chance levels, $M = 1.93$, $SD = 0.94$, $t(29) = 0.38$, *ns*.

Novel Labels and Novel Morphology

Preliminary analyses indicated no effect of task order (labels first, morphology first) on children's preferences, $F(1, 28) = 2.28$, *ns*; thus, scores were combined across order. Scores on each task indicates the number of trials (max = 4) on which children endorsed the label/morphology from the informant who previously used passive voice. Children selectively endorsed novel labels, $M = 2.80$, $SD = 0.81$, $t(29) = 5.42$, $p < .001$, $d = 0.99$, and novel morphology, $M = 2.67$, $SD = 0.99$, $t(29) = 3.67$, $p < .001$, $d = 0.68$, from the passive informant.

To examine the relationship between children's selectivity on the two tasks, we conducted a repeated measures analysis of variance (ANOVA) on the number of trials children selectively preferred the label endorsed by the passive informant with trial type (labels, morphology) as the within-subjects variable. There was no significant effect of task, $F(1, 29) = 0.54$, *ns*.

Explicit Judgment

Children received a point if they identified the passive informant as "better" at talking about the pictures; 60% of children did so, $\chi^2(1) = 1.2$, *ns*. Recall that both informants accurately described the picture; thus, chance-level performance should not be taken as unsystematic.

To determine if preference for the passive informant on test trials was related to children's relative judgment of her as "better" (see Koenig & Harris, 2005, for this relationship with informant accuracy), we repeated the ANOVA, including trial type (training, labels, morphology) as a within-subjects variable and explicit judgment (passive better, active better) as a between-subjects variable. We found a main effect of explicit judgment, $F(1, 28) = 8.12$, $p < .01$, $\eta_p^2 = .25$; children who judged the passive informant as "better" preferred her compared to children who judged the active informant as "better." No other main effects or interactions were found.

Figure 1 displays the proportion of trials where children chose the passive informant by trial type (novel labels, novel morphology) and explicit judgment. Although children who judged the passive informant as "better" selectively preferred her on novel label and morphology trials—labels: $t(17) = 6.97$, $p < .001$, $d = 1.64$; morphology: $t(17) = 7.01$, $p < .001$, $d = 1.63$, children who judged the active informant as "better" displayed no preference—labels: $t(11) = 1.48$, *ns*; morphology: $t(11) = 0.25$, *ns*.

Passive-Voice Comprehension and PPVT

On the passive-voice comprehension task, children received a point for choosing the picture that corresponded to the sentence. For both nonreversible and reversible sentences (max = 3), children scored significantly above chance—nonreversible: $M = 2.76$, $SD = 0.43$, $t(29) = 16.12$, $p < .001$, $d = 2.93$; reversible: $M = 2.53$, $SD = 0.62$, $t(29) = 9.00$, $p < .001$, $d = 1.66$. To assess whether passive comprehension or receptive vocabulary was related to choice of informant at test, we re-ran the ANOVA including passive comprehension (max = 6) and PPVT scores as covariates. We again found a main effect of explicit judgment, $F(1, 26) = 15.69$, $p < .001$, $\eta_{par}^2 = .38$, but no other main effects or interactions, suggesting that vocabulary and passive comprehension were unrelated to children's endorsement of the passive-voice informant.

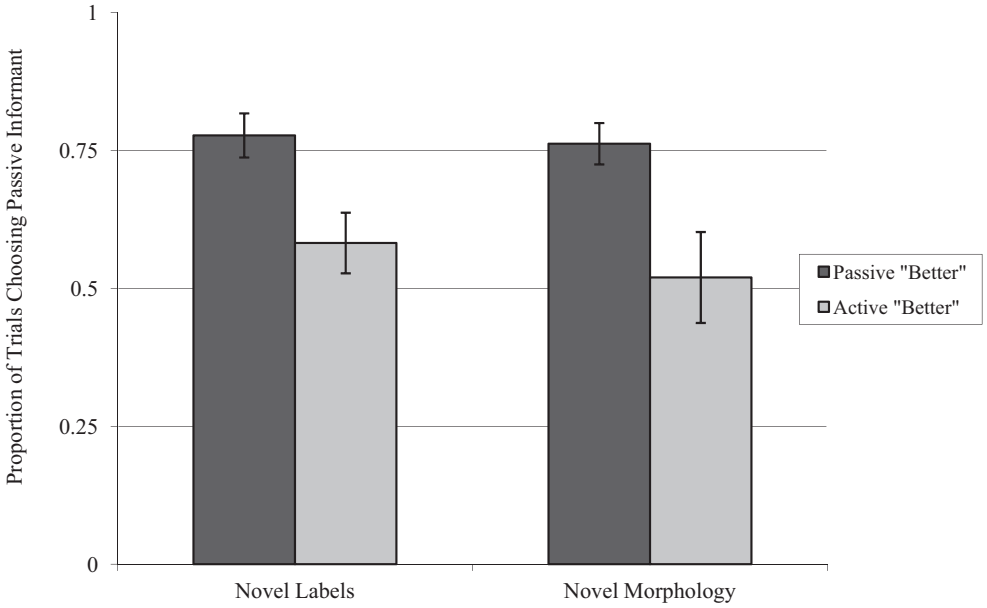

Figure 1. The proportion of trials where children chose the passive informant by trial type (novel labels, novel morphology) and explicit judgment.

Experiment 2

Preliminary analyses indicated no age or gender effects (Fs < 1). Remaining analyses collapse across age and gender.

Picture Descriptions

With the exception of one description from one higher SES child, all pictures (127 of 128) were described with active voice.

Training

Like children in Experiment 1, higher SES children were at chance in endorsing sentences provided by the passive over the active informant, $M = 2.38$, $SD = 0.96$, $t(15) = 1.57$, *ns*. Lower SES children, however, endorsed the active informant, $M = 1.31$, $SD = 1.01$, $t(15) = -2.71$, $p < .05$, $d = 0.68$.

Novel Labels and Novel Morphology

Preliminary analyses indicated no effect of task order (labels first, morphology first) on children's selectivity (Fs < 1, *ns*); thus, scores were combined across order. Higher SES children endorsed novel labels, $M = 2.94$, $SD = 0.77$, $t(15) = 4.86$, $p < .001$, $d = 1.22$, and novel verb morphology, $M = 2.56$, $SD = 0.81$, $t(15) = 2.76$, $p < .05$, $d = 0.69$, from the informant who previously used passive voice. Lower SES children, however, endorsed the informant who had used active voice—labels: $M = 1.37$, $SD = 0.72$, $t(15) = -3.48$, $p < .01$, $d = 0.88$; morphology: $M = 1.31$, $SD = 0.87$, $t(15) = -3.15$, $p < .01$, $d = 0.79$.

To explore the relationship between SES and performance, we conducted a repeated measures ANOVA with trial type (training, labels, morphology) as within-subjects variable. This yielded a main effect of SES, $F(1, 30) = 40.15$, $p < .001$, $\eta_p^2 = .57$, and no other main effects or interactions. Figure 2 displays the proportion of total choices that children directed at the passive informant by SES. Higher SES children preferred to learn from the passive-voice informant as compared to lower SES children.

Explicit Judgment

Of higher SES children, 57% designated the passive informant as "better" than the active informant, $\chi^2(1) = 0.25$, *ns*. Of lower SES children, only 25% did, $\chi^2(1) = 4.00$, $p < .05$.

As in Experiment 1, we asked whether children's explicit judgment of the relative accuracy of the informants related to their preference for the passive informant on novel label and morphology trials. A repeated measures ANOVA with trial type (labels, morphology) as a within-subjects variable and explicit judgment (passive better, active better)

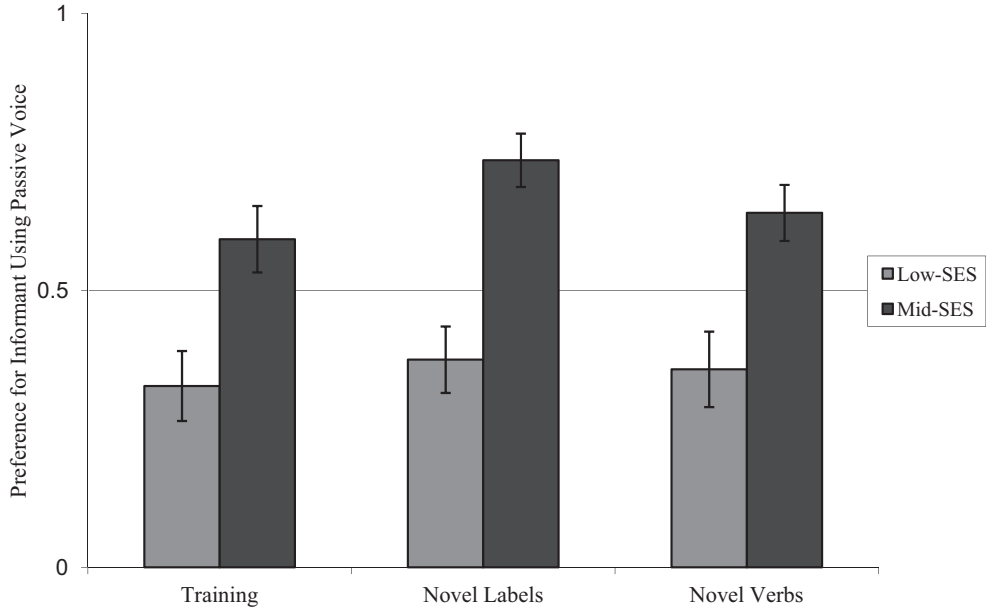

Figure 2. The proportion of total choices that children directed at the passive informant by socioeconomic status (SES).

and SES (higher SES, lower SES) as between-subjects variables yielded main effects of SES, $F(1, 28) = 28.71$, $p < .001$, $\eta_p^2 = .51$, and explicit judgment, $F(1, 28) = 4.14$, $p = .05$, $\eta_p^2 = .13$. Children who judged the passive informant as "better" preferred her compared to children who judged the active informant as "better." No other main effects or interactions were obtained.

Passive-Voice Comprehension and PPVT

Children in both SES groups scored significantly above chance on the comprehension task—nonreversible: higher SES: $M = 2.81$, $SD = 0.54$, $t(15) = 9.65$, $p < .001$, $d = 2.42$; lower SES: $M = 2.87$, $SD = 0.34$, $t(15) = 16.10$, $p < .001$, $d = 4.02$; reversible: higher SES: $M = 2.50$, $SD = 0.63$, $t(15) = 6.32$, $d = 1.58$; lower SES: $M = 2.43$, $SD = 0.72$, $t(15) = 5.15$, $p < .001$, $d = 1.34$. Performance did not vary by SES—nonreversible: $t(30) = 0.38$, *ns*; reversible: $t(30) = 0.26$, *ns*.

Although the standardized PPVT scores for lower SES children were slightly lower ($M = 98.19$, $SD = 5.5$) than higher SES children ($M = 103.00$, $SD = 9.36$), this difference was not significant, $t(30) = 1.76$, *ns*

To assess whether total passive-voice comprehension or PPVT score related to performance at test, we reran the ANOVA including these scores as covariates. We found a main effect of SES, $F(1, 26) = 22.63$, $p < .001$, $\eta_p^2 = .46$, and a trend for an effect of explicit judgment preference, $F(1, 26) = 3.40$, $p = .08$, $\eta_p^2 = .12$, but no other main effects or interactions, suggesting that receptive vocabulary and passive comprehension were unrelated to selective learning preferences.

Discussion

Taken together, these results document that preschoolers track markers of informant competence beyond accuracy. Faced with two accurate informants, preschoolers attend to the syntactic complexity of their utterances to determine from whom to learn. In Experiment 1, children preferred to learn from an informant who used more complex syntax (passive voice). Notably, this preference was not evident during training; it was only when they inferred who was a competent informant in a novel scenario that children selectively preferred the passive-voice informant. This preference extended across novel label and morphology tasks, and was related to children's explicit judgment of the passive informant as "better."

In Experiment 2, preference varied by SES. Higher SES children (as measured by eligibility for free/reduced lunch) like children in Experiment 1, demonstrated no preference for either informant during training but endorsed information provided by the passive informant during subsequent learning tasks. Lower SES children preferred the active

informant across training and test. This SES difference remained after controlling for receptive vocabulary and passive comprehension. Moreover, children in both groups labeled their preferred informant as "better," suggesting that they made an inference about informant competence based on the training (although this inference varied by SES).

We initially posed three hypotheses for how variability in syntactic complexity might influence learning preferences. Results from Experiment 1 and the higher SES data from Experiment 2 are consistent with our second hypothesis: Children's preference to learn from a speaker who uses passive voice, despite that most child-directed speech uses active voice (Gordon & Chafetz, 1990), indicates that these children use passive voice as a marker of informant competence. However, results from lower SES children in Experiment 2 indicate that preference varies by family background.

This SES difference cannot be due to failure to comprehend the passive; both SES groups performed similarly well on the passive comprehension task (see also Craig & Washington, 2002). We hypothesize that frequency and context of passive exposure are responsible. Children from higher SES families experience more literacy activities (Payne et al., 1994; Scarborough & Dobrich, 1994). Although the passive is rare in spontaneous speech, exposure to books might be one mechanism by which children associate passive syntax with competence. Indeed, children privilege text-based sources over oral informants (e.g., Corriveau, Einav, Robinson, & Harris, 2014; Robinson, Einav, & Fox, 2013). Additionally, lower SES parents use more directive child-directed speech (e.g., "go sit down") than higher SES parents, who use more democratic speech (e.g., "Where do you think you should be right now?"; Heath, 1983). Thus, higher SES child-directed speech may include more syntactically complex features (Huttenlocher et al., 2002), perhaps causing children to privilege them in learning.

In future work we will design a reading intervention to expose children to storybooks that primarily use passive voice. Vasilyeva et al. (2006) found that listening to such storybooks increased passive production and comprehension; we will further examine whether this exposure increases children's preference to learn from informants who use passive voice. If successful, this intervention would suggest that exposure to academic language during book reading may increase learning in academic settings more generally. Increasing book reading in the home will likely have even stronger effects; Hoff-Ginsberg (1991) found that lower SES mothers used more complex syntax during book reading than other activities—even when only considering spontaneous speech and not the language they read from the book. Increased exposure to book reading may thus bring children into the academic language "in-group."

Future work should also explore what other correlates of family income are related to learning. Here, we only use eligibility for free/reduced lunch as a marker of SES, but a more robust design would include measures of caregiver education and other characteristics of the home environment (such as access to books in the home; Snow, Barnes, Chandler, Goodman, & Hemphill, 1991).

Just as SES is a complex construct, passive voice is just one of many markers of academic competence. For example, young school-aged children recognize noncircular, cogent arguments as more intelligent than circular, repetitive arguments (Baum, Danovitch, & Keil, 2008; Corriveau & Kurkul, 2014; Mercier, Bernard, & Clément, 2014). Children may choose to learn from individuals who use this more academic form of speaking. We expect not only that children consider a wide range of competencies but also that what factors they weigh will vary by age and personality factors.

In summary, this is the first study demonstrating that children use syntactic complexity to determine informant competence. Importantly, we found SES differences, with lower SES children less likely to learn from an informant who used passive voice. The findings have implications for our understanding of SES differences in academic success.

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