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Preschoolers' Use of Morphosyntactic Cues to Identify Generic Sentences: Indefinite Singular Noun Phrases, Tense, and Aspect

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Generic sentences (e.g., ''Birds lay eggs'') convey generalizations about entire categories and may thus be an important source of knowledge for children. However, these sentences cannot be identified by a simple rule, requiring instead the integration of multiple cues. The present studies focused on 3- to 5-year-olds' (N = 91) use of *morphosyntactic* cues—in particular, on whether children can (a) interpret indefinite singular noun phrases (e.g., ''a strawberry'') as generic and (b) use a verb's tense and aspect (e.g., ''A bat *sleeps/slept/is sleeping* upside down'') to determine whether its subject noun phrase is generic. Children demonstrated sensitivity to both cues. Thus, solving the in-principle problem of identifying generics may not be beyond the reach of young children's comprehension skills.

Generic sentences (e.g., ''Birds lay eggs'') are a linguistic expression of our knowledge about categories. Although categorization and related processes have been studied intensively for decades (see Markman, 1989; Murphy, 2004; E. E. Smith & Medin, 1981, for reviews), much less is known about how people *talk* about categories. A coherent theory of the semantics of generic sentences has eluded linguists and philosophers (e.g., Carlson & Pelletier, 1995), and psychological investigations of this topic have only cropped up in recent years (e.g., Gelman, Coley, Rosengren, Hartman, & Pappas, 1998). Generic language is of particular importance to developmental researchers because children's conceptual development is driven, at least in part, by conversations with more knowledgeable adults (e.g., Gelman, 2009; Harris, 2002; Tomasello, 1999). It is possible, then, that the growth and elaboration of children's concepts may depend on their ability to decode adults' generic sentences. Surprisingly, however, generic meaning is not explicitly marked in English or in many other languages (e.g., Dahl, 1995). The lack of a straightforward generic marker, and the interpretive difficulties this lack may lead to, raise the question of whether young children are in fact able to distinguish between generic and nongeneric sentences. This is the question we address here.

How Do Children Identify Generic Sentences?

Given the absence of overt markers, the process of identifying generic sentences relies on a range of cues—both linguistic (e.g., articles, tense) and extralinguistic (e.g., context, background knowledge)—that are relevant but not deterministic. None of these cues is individually sufficient: It is only when considering them together that a listener can determine with certainty whether an utterance is generic or nongeneric. In what follows, we describe some of the cues that are involved in distinguishing between generic and nongeneric statements, and we highlight the proposed contributions of our studies.

First, however, we would like to make a terminological clarification. In this article, we use the term *generic* for any sentence containing a noun phrase

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(NP) that *refers to a kind*. Although there are sentences that do not contain such NPs but are still generic because they express generalizations across situations and events (e.g., ''John walks to school''; e.g., Carlson & Pelletier, 1995; Cimpian, Arce, Markman, & Dweck, 2007), they are beyond the scope of our article. Here, we are concerned only with kind-referring generic statements.

The Noun Phrase

Cues provided by the grammatical structure of a sentence are among the most immediate and relevant sources of information for identifying generics. In English, a variety of NPs can refer to a category; the most prototypical include bare plural NPs (e.g., ''*Cacti* grow in the desert''), indefinite singular NPs (e.g., ''*A cactus* doesn't need much water''), and definite singular NPs (e.g., ''*The cactus* is a forgiving house plant''). Note, however, that a sentence containing one of these prototypical generic NPs is by no means guaranteed to be generic, as all of them can also refer to nongeneric sets: For example, ''*Cacti* have sprouted all over the back yard,'' ''*A cactus* had been planted next to the flowers,'' and ''*The cactus* was right in the middle of the garden.'' Thus, the type of NP used in a sentence is not sufficient, by itself, to lead to a generic interpretation. It is nevertheless informative—a sentence with one of these NPs becomes a candidate for generic meaning, even though whether it is ultimately interpreted as such will also depend on other factors (e.g., the tense of the verb, the nature of the property).

Despite the range of potentially kind-referring NPs, previous studies have focused mainly on children's comprehension of bare plural generics (e.g., Chambers, Graham, & Turner, 2008; Gelman & Bloom, 2007; Gelman & Raman, 2003; Gelman, Star, & Flukes, 2002; Hollander, Gelman, & Star, 2002; Stock, Graham, & Chambers, 2009). As a consequence, much less is known about children's ability to interpret other NPs as generic. Thus, one goal of the present research (Experiment 1) is to test whether children can extend this interpretation to *indefinite singular* NPs (e.g., ''a cactus''), which are a common vehicle for generic meaning (Gelman, Goetz, Sarnecka, & Flukes, 2008; Gelman et al., 1998).

The Verb: Tense and Aspect

In English, most generic sentences have verbs in the simple present tense (e.g., ''Cacti *grow* in the desert''), arguably because this combination of tense and aspect is best suited to express the law-like facts typically conveyed through kind-referring generic statements (Dahl, 1975). The temporal restrictions imposed on the predicate by other tenses and aspects (e.g., ''Cacti *have sprouted* all over the back yard'') typically make them less suitable for expressing timeless generalizations and instead more appropriate for talking about particular events (e.g., Brinton, 2000; Comrie, 1976; C. S. Smith, 1983). Again, although tense and aspect cues are certainly relevant to generics' interpretation, they are not entirely reliable. For example, there are many sentences with verbs in the simple present tense that do *not* refer to kinds (e.g., ''Cacti *grow* all over my garden''). Also, acceptable generic sentences in other tenses and aspects are in fact possible (e.g., ''Cacti *evolved* from leafy trees'').

Very little is known about whether children can use information about verb tense and aspect in the process of distinguishing between generic and nongeneric statements (for some preliminary evidence, see Pérez-Leroux, Munn, Schmitt, & DeIrish, 2004). Thus, the other main goal of this research is to provide an investigation of this question (Experiment 2).

Extralinguistic Cues

As the grammatical composition of a sentence cannot unambiguously specify whether it is generic, a listener often has to rely on extralinguistic sources of information as well. Although these cues are not the focus of our studies, we nevertheless discuss them here because in many instances they are an essential part of identifying generic meaning. One type of extralinguistic information is provided by the *physical context* of an utterance. For example, if shown a single tailless horse and asked, ''Do *they* have tails?'' 3- and 4-year-old children interpreted ''they'' as referring to horses in general and said ''yes'' (Gelman & Raman, 2003). Hearing a plural NP in a context where a specific plural set was not available probably led to the pragmatic inference that the generic set (i.e., horses in general) was the intended referent. By contrast, when the same question (''Do *they* have tails?'') was asked in the context of *two* tailless horses, the dominant interpretation of ''they'' was that it refers to the tailless horses in the picture (nongeneric) and the answer was ''no.''

The listener's *background knowledge* can also be useful in trying to discern whether a sentence refers to a category (e.g., Cimpian, Gelman, & Brandone, 2010; Cimpian & Markman, 2008). Compare, for instance, ''The cow is soft-hoofed'' and ''The cow is sick.'' The temporary, idiosyncratic nature of a property such as *being sick* prevents the second sentence from being interpreted generically; *being soft-hoofed*, on the other hand, is much more conducive to a generic reading because it is the type of biological property that can plausibly characterize an entire animal kind. Even 3-year-olds are able to integrate this type of background knowledge into their interpretation of a sentence as generic versus nongeneric (Cimpian & Markman, 2008). Prior knowledge about the *speaker* can factor into this interpretation as well. To illustrate this point, consider the following study by Cimpian and Markman (2008). Children were shown a picture of two animals (e.g., two birds) and heard an ambiguous sentence (e.g., ''They have rocks in their tummy'') that was spoken either by a teacher or by a veterinarian. The speaker's identity may matter in this case because teachers tend to share general facts about the world, whereas doctors give specific diagnoses. Strikingly, 4-year-olds were sensitive to this manipulation, interpreting the teacher's sentences as generic more often that they did the vet's.

Again, note that none of these extralinguistic cues are sufficient for a generic interpretation. A speaker can refer to a category regardless of what is in the physical context of the conversation. Similarly, knowledge cues can easily be overridden by other cues. For example, a sentence such as ''*My cow* is soft-hoofed'' is clearly nongeneric despite the generalizable biological property it makes reference to.

The Present Studies

The two studies described here explore children's ability to use *morphosyntactic cues* to distinguish between generic and nongeneric sentences. Specifically, we tested whether children are able to (a) interpret indefinite singular NPs as kind referring and (b) use verb tense and aspect as cues to whether a sentence is generic.

Indefinite Singular NPs

These NPs are a common way of expressing generic meaning in child-directed speech. For example, Gelman et al. (2008) found that 23% of adults' generics in conversations with children aged 2–4 were singular in form. Similarly, Cimpian and Markman (2008) calculated that about 16% of the generics produced by parents of 20- to 35-month-olds in Gelman et al.'s (1998) picture-book reading study were indefinite singulars (e.g., ''A chipmunk's a little smaller than a squirrel''). Thus, although indefinite singular generics are not quite as frequent as plural ones, they certainly account for a significant proportion of the generic input parents provide to their young children.

But do children actually interpret these NPs as generic? So far, the evidence available on this question is inconclusive. First, Gelman et al.'s (2008) analysis of CHILDES data indicated that children produce what appear to be indefinite singular generics from the age of 2. However, with production data (and particularly young children's production), the possibility that generic meaning was mis- or overattributed to children's NPs by the adult coders cannot be ruled out, as the authors themselves acknowledge. This interpretive problem is exacerbated by the fact that generic meaning has such a loose, complex relation to the surface linguistic forms that express it and that were used to code for it. The second piece of evidence relevant to this question was provided by Gelman and Raman (2007, Experiment 4). In one condition, 4-year-olds were asked to remember across a short delay a number of sentences with indefinite (e.g., ''*A bear* climbs trees'') and demonstrative (e.g., ''*This bee* has five eyes'') singular subjects. When recalling the indefinite singular sentences, children made an interesting error: They switched about 25% of them to bare plural form (e.g., ''*Bears* climb trees''), which is the prototypical means of referring to a category in English (e.g., Gelman et al., 2008). Thus, it is possible that children made these recall errors because they understood the original indefinite singular sentences as kind-referring. However, children also made decidedly *nongeneric* memory errors about as often as they made bare plural errors, recalling over 25% of the indefinite singulars in demonstrative form (e.g., ''*This bear* climbs trees''). Moreover, children mistakenly recalled as generic over 30% of the sentences they had originally heard in demonstrative form (e.g., ''*This bee* has five eyes'' was recalled as ''*A bee* has five eyes'' or ''*Bees* have five eyes''). On the whole, then, children's memory errors in this study were not selective and thus cannot justify strong conclusions about their generic comprehension of indefinite singular NPs.

There is also an in-principle reason to think that young children might have difficulties interpreting indefinite singular NPs as generic, and it has to do with how these NPs achieve kind reference. A sentence such as ''A bear climbs trees'' refers to the kind not directly but via a *single* instance (e.g., Carlson, 1977; Carlson & Pelletier, 1995), which can, under certain circumstances, come to be understood as *any* instance and thus the entire generic set of bears. The number of steps involved in arriving at a generic reading here led Declerck (1991) to argue that, for an indefinite singular NP, ''it is the nongeneric interpretation that is the unmarked one,'' and that ''the possibility of interpreting the statement as holding for any member of the set . . . follows only indirectly (via implicatures)'' (pp. 93–94). By contrast, bare plurals are, at least on one analysis, ''names of kinds of things'' (Carlson, 1977, p. 77), so their referential connection to kinds is about as direct as that between proper names as individuals.

A final consideration relevant to children's ability to interpret indefinite singulars as kind referring has to do with the common occurrence of these NPs in labeling phrases (e.g., ''That's a dog''). The main function of a labeling phrase is to identify an object as *an instance of a kind* and to provide the name of that kind (e.g., Cimpian & Markman, 2005; Markman & Hutchinson, 1984; Waxman & Markow, 1995). The focus on the referent as a member of a broader kind is very explicit here, more so than in many other linguistic contexts (e.g., ''Look at that dog!'' or ''That's my dog''). Thus, labeling phrases might be particularly likely to highlight for children the connection between indefinite singular NPs and kinds. On the other hand, though, indefinite singular NPs are typically used to label *a single object*. If children come to associate indefinite singulars with this type of referential context based on labeling input, as might be predicted by associative learning theories (e.g., L. B. Smith, Jones, Landau, Gershkoff-Stowe, & Samuelson, 2002), children should find it difficult to understand these NPs as referring to an entire category. In sum, the use of indefinite singular NPs in labeling phrases may facilitate children's ability to understand these NPs as generic in some ways and hinder it in others; whether the net effect is positive or negative is unclear.

Experiment 1 tested whether children are in fact able to interpret indefinite singular NPs as generic. Adapting the logic of Gelman and Raman (2003), we showed 3-, 4-, and 5-year-olds a single object with an atypical feature (e.g., a yellow strawberry) and asked them a question about this atypical feature using either an indefinite singular NP (e.g., ''What color is *a strawberry*?'') or a definite singular NP (e.g., ''What color is *the strawberry*?''). If children are able to interpret the indefinite NP generically, they should base their answers on what is true of the relevant category (e.g., strawberries are red), ignoring the atypical object. On the other hand, if they can only interpret it nongenerically —as referring to a single instance—their answers will likely be based on the features of the object in front of them (e.g., this strawberry is yellow). The definite NP question served as a control: If, regardless of NP, children simply cannot inhibit their categorical knowledge (e.g., that strawberries are red) when answering the experimenter's questions, they should also answer ''What color is *the strawberry*?'' as if it was generic. If, however, children are sensitive to the definiteness of the NP, they should interpret this question as referring to the salient, uniquely identifiable object they are looking at.

Verb Tense and Aspect

Comprehension studies suggest that, by preschool age, children's understanding of tense and aspect is close to adult levels (e.g., Wagner, 2001; Weist, 1991). Evidence from children's production reinforces this conclusion. For example, 3-year-olds appropriately use the simple present tense when describing general event scripts (e.g., at a birthday party, you *have* cake, you *open* presents, etc.) but the simple past tense when describing events they participated in (e.g., at yesterday's birthday party, we *had* cake, she *opened* presents, etc.; Hudson, 1986; Nelson & Gruendel, 1986). Although preschoolers appear to have a good grasp of the tense and aspect system of English, it is by no means clear whether they would be able to use this information to decide whether a statement refers to a kind. To address this question, in Experiment 2 we contrasted children's interpretation of sentences that were in the simple present tense (e.g., ''A bat *sleeps* upside down'') with their interpretation of sentences that (a) differed in tense but not aspect (e.g., ''A bat *slept* upside down''; simple past) and (b) differed in aspect but not tense (e.g., ''A bat *is sleeping* upside down''; present progressive). If children can capitalize on the verb cues provided, they may interpret the sentences in the simple present tense as generic and the other two types—which seem to describe specific past or ongoing events —as nongeneric.

Experiment 1

Method

Participants

The participants were 13 three-year-old children (6 girls; mean age = 3 years 7 months, range = 3 years 1 month to 3 years 11 months), 12 four-year-old children (6 girls; mean age = 4 years 5 months, range = 4 years to 4 years 11 months), and 12 five-year-old children (6 girls; mean age = 5 years 3 months, range = 5 years to 5 years 7 months). All children were recruited from a university-affiliated preschool in California. Although demographic information was not collected formally, children were predominantly European American and came from middle- and upper-middle-class families.

Materials, Design, and Procedure

Children were tested in a quiet room in their preschool by a familiar experimenter. Children were introduced to a stuffed animal (e.g., a bunny) and told that it was going to ask them some questions. Then, the experimenter pulled out the first picture of an atypical object (e.g., a purple banana; see Table 1 for full list) and, speaking as the stuffed animal, asked about the atypical feature with either an indefinite question (e.g., ''[Child's name], what color is *a banana*?'') or a definite question (e.g., ''[Child's name], what color is *the banana*?''). When asking the question, the experimenter always looked straight at the child until an answer was given; he did not look at or point to the picture. Each child saw 10 pictures, five accompanied by indefinite questions and five by definite questions. The order of the pictures was determined by three random orders, each used with approximately a third of the participants. Within a session, each picture was presented either with a definite question or an indefinite question, but not both. Across children, however, each picture was paired with an indefinite question for half the participants and with a definite question for the other half. The five definite and five indefinite questions in a session were presented as separate blocks, and the order of the blocks was counterbalanced across participants. To provide a brief break (and also disrupt response patterns that may have formed), after the first block the experimenter said that the stuffed animal was feeling sleepy and was going to take a nap. A second stuffed animal was then brought out and the game continued with this other toy asking the child questions.

Coding

Children's responses were recorded by the experimenter, but all 37 experimental sessions were videotaped as well. The videotapes were used to obtain a complete record of children's responses. Following Gelman and Raman (2003), we coded

Table 1
Items Used in Experiment 1

Item	Question	Expected answer
Blue apple	Indefinite: What color is *an apple*?	Red/green/yellow
	Definite: What color is *the apple*?	Blue
Purple banana	Indefinite: What color is *a banana*?	Yellow
	Definite: What color is *the banana*?	Purple
One-winged bird	Indefinite: How many wings does *a bird* have?	Two
	Definite: How many wings does *the bird* have?	One
One-eared cat	Indefinite: How many ears does *a cat* have?	Two
	Definite: How many ears does *the cat* have?	One
Tailless crocodile	Indefinite: Does *a crocodile* have a tail?	Yes
	Definite: Does *the crocodile* have a tail?	No
Three-legged dog	Indefinite: How many legs does *a dog* have?	Four
	Definite: How many legs does *the dog* have?	Three
Trunkless elephant	Indefinite: Does *an elephant* have a trunk?	Yes
	Definite: Does *the elephant* have a trunk?	No
Blue ladybug	Indefinite: What color is *a ladybug*?	Red
	Definite: What color is *the ladybug*?	Blue
Green lion	Indefinite: What color is *a lion*?	Brown/yellow/orange
	Definite: What color is *the lion*?	Green
Yellow strawberry	Indefinite: What color is *a strawberry*?	Red
	Definite: What color is *the strawberry*?	Yellow

the responses into three categories. First, a response was coded as *category-wide* if it made reference to category-typical features (e.g., ''red'' in response to ''What color is a/the strawberry?'' and ''yellow'' in response to ''What color is a/the banana?''). These answers signaled a generic interpretation of the experimenter's question. Second, a response was coded as *specific* if it made reference to features of the object in the picture (e.g., ''yellow'' for the strawberry item; ''purple'' for the banana item). These answers signaled a nongeneric interpretation of the experimenter's question. Third, responses that did not fit into either of these categories were coded as *other* (e.g., ''no ears'' in response to ''How many ears does a cat have?'' when the stimulus in fact depicted a one-eared cat). The *other* category accounted for only 3.3% of children's responses and did not show any definite/indefinite differences, so we will not discuss it further.

To assess reliability, two researchers coded all 37 participants' responses. The coding was completely blind to the format of the question; that is, the researchers coded children's answers unaware of whether the experimenter's questions had been definite or indefinite. Agreement was excellent (97.6%; kappa = .96). Where disagreements did occur, the first coder's judgments were used.

Data Analysis

Children's category-wide and specific responses were summed up within the definite and indefinite blocks (range = 0–5). A preliminary exploration of these dependent measures revealed that they were not normally distributed (Shapiro–Wilk *p*s < .001), with most children scoring around 0 on some measures (e.g., specific responses to indefinite questions) and around 5 on others (e.g., category-wide responses to indefinite questions). In addition, significant Levene's tests revealed that the error variance differed across some of the cells in our design. Due to these violations of the assumptions underlying analysis of variance (ANOVA), we used an alternative statistical test: a repeated measures ordinal logistic regression (RM-OLR), computed through the Generalized Estimating Equations procedure in SPSS 17.0 (SPSS Inc., Chicago, IL). This analysis assumes neither normality nor homoscedasticity, and it outputs Wald chi-square tests of significance for main effects and interactions that are analogous to the *F* tests in an ANOVA output. It does not, however, output a measure of effect size. We thus report Cohen's *d* (Cohen, 1988) for any comparisons involving two groups (e.g., main effects in the RM-OLR, follow-ups).

Results and Discussion

The analyses reported here tested the following main prediction: If children are able to interpret indefinite singular NPs as generic, they should produce significantly more category-wide responses and fewer specific responses when asked, for example, ''What color is *a* strawberry?'' than when asked, for example, ''What color is *the* strawberry?''

Category-Wide Responses

We first performed an RM-OLR on children's category-wide responses, with (a) NP type (indefinite vs. definite; within subject), (b) age group (3- vs. 4- vs. 5-year-olds; between subjects), and (c) block order (indefinite-first vs. definite-first; between subjects) as predictors. Preliminary analyses indicated no significant effects or interactions involving participants' gender, so this variable was not included in the regression.

As predicted, children produced significantly more category-wide responses when they heard questions with indefinite NPs (M = 3.19 on five trials, SD = 1.75) than when they heard questions with definite NPs (M = 1.54, SD = 1.82), Wald χ^2 = 22.71, df = 1, p < .001, d = 0.92. For example, they were more likely to answer questions about the color of *a strawberry* by saying ''red'' than questions about the color of *the strawberry*. As shown in Figure 1, this difference held up for all three age groups (3-year-olds: Wilcoxon Z = 2.04, p = .043, d = 0.62; 4-year-olds: Wilcoxon Z = 2.66, p = .006, d = 1.41; 5-year-olds: Wilcoxon Z = 2.33, p = .023, d = 0.83). Thus, children's ability to understand indefinite NPs generically emerges quite early.

The RM-OLR also revealed a significant main effect of block order, Wald χ^2 = 8.24, df = 1, p = .004, d = 0.94. When children started out with the indefinite question block, they ended up giving significantly more category-wide responses over the course of the session (M = 6.00 on 10 trials, SD = 2.69) than if they had started out with the definite question block (M = 3.39, SD = 2.89). This result suggests that it was difficult for children to switch from responding based on the category to responding based on the instance in front of them and vice versa. Once they gave a certain type of response several times, they perseverated in giving that response even when the format of the questions changed. This pattern is consistent with the evidence that young children have trouble inhibiting prepotent responses (e.g., Zelazo, Frye, & Rapus, 1996).

Finally, there was also a significant three-way interaction between NP type, block order, and age group, Wald χ^2 = 6.65, df = 2, p = .036. An examination of the relevant means revealed that although the effect of block order described earlier held up consistently across age groups and NP types, it was

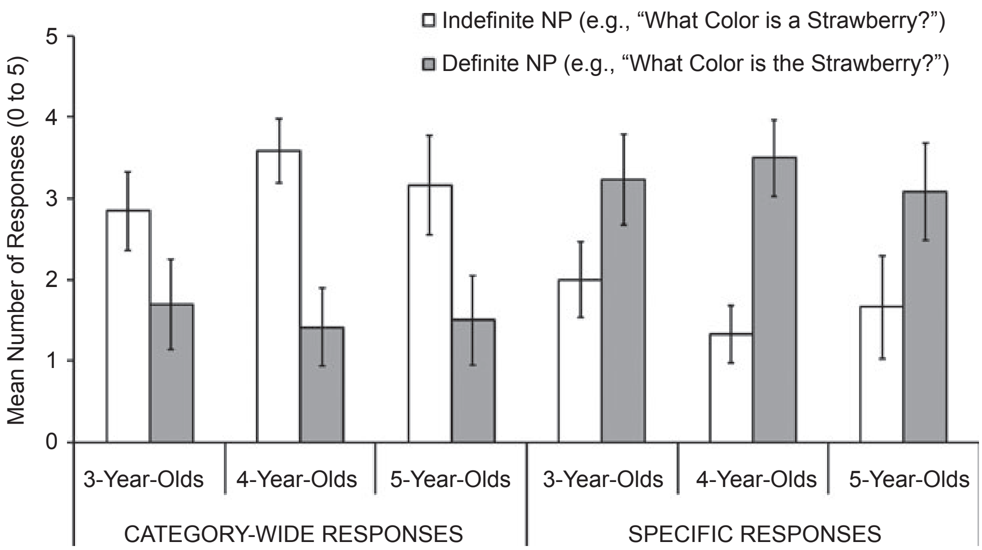

Figure 1. The mean number of category-wide and specific responses produced by 3-, 4- and 5-year-old children in response to the indefinite and definite noun phrase (NP) questions in Experiment 1.
Note. The error bars represent ± 1 *SE* of the mean.

actually reversed for 4-year-olds' responses to indefinite questions. That is, 4-year-olds provided slightly fewer category-wide responses to these questions when they came first than when they followed the definite question block. The reason for this reversal is unclear; we suspect it may be an artifact of the small cell sizes involved.

Specific Responses

The RM-OLR on children's specific responses revealed the same major pattern of results. Most importantly, the predicted main effect of NP type was again significant, Wald $\chi^2 = 24.72$, $df = 1$, $p < .001$, $d = 0.89$: Indefinite questions such as ''What color is *a strawberry*?'' were given specific responses (e.g., ''yellow'') less often than definite questions such as ''What color is *the strawberry*?'' (*M*s = 1.68 vs. 3.27 on five trials; *SD*s = 1.72 and 1.87, respectively). All age groups demonstrated sensitivity to this cue (see Figure 1): 3-year-olds (Wilcoxon $Z = 2.27$, $p = .021$, $d = 0.66$), 4-year-olds (Wilcoxon $Z = 2.68$, $p = .004$, $d = 1.50$), and 5-year-olds (Wilcoxon $Z = 2.21$, $p = .031$, $d = 0.67$).

The only other significant result in this analysis was a main effect of block order, Wald $\chi^2 = 24.72$, $df = 1$, $p < .001$, $d = 0.99$. Children seemed to also perseverate in their specific responses, providing more of them overall when the definite question block was first ($M = 6.39$ on 10 trials, $SD = 2.91$) than when the indefinite question block was first ($M = 3.58$, $SD = 2.78$).

Item Analyses

Next, we checked whether our predictions held up when analyzing the data by items. First, we calculated what percentage of children gave *category-wide* responses to each item's indefinite and definite questions. All 10 items (see Table 1) showed the predicted pattern, with more children giving category-wide responses to the indefinite than the definite questions associated with each picture, $p = .002$ by a sign test. For example, 74% of children said ''red'' in response to ''What color is *a strawberry*?'' but only 11% gave this answer to ''What color is *the strawberry*?'' Second, we calculated what percentage of children gave *specific* responses to each item's indefinite and definite questions. Again, all 10 items showed the predicted pattern, with more children giving specific responses to the definite than the indefinite questions associated with each picture, $p = .002$ by a sign test. For example, 89% of children said ''yellow'' in response to ''What color is *the strawberry*?'' but only 26% gave this answer to ''What color is *a strawberry*?'' Thus, it seems our conclusions about the interpretation of indefinite singular NPs generalize not just across participants but also across items.

Addressing an Alternative Explanation

It is possible to argue that our test was biased against specific responses to the indefinite singular questions (e.g., ''purple'' to ''What color is a banana?''). Children might have avoided giving specific responses to the indefinite singular questions not only when they interpreted these NPs generically but also when they interpreted them *nongenerically*, since nongeneric indefinite singular NPs seldom refer to an object that is uniquely identifiable in the context of the conversation (Maratsos, 1974, 1976). To refer nongenerically to such an object, one would typically use either a definite or a demonstrative NP (e.g., ''Give me the banana/that banana''). Thus, the structure of our task—in which children are asked an indefinite question while being shown a single object—may have discouraged responses based on that object (i.e., specific responses) regardless of whether children's interpretation was generic or nongeneric. If so, the low number of specific responses to the indefinite singular questions may not be, in and of itself, evidence that children's preferred interpretation was generic.

One way to make it more felicitous for children to give a specific response when their interpretation is nongeneric would be ask the indefinite question (e.g., ''What color is a banana?'') in the context of *two or more* atypical objects (e.g., a purple banana and a pink banana). In this modified context, an indefinite singular NP interpreted nongenerically could be thought to refer to one of the objects present, which would lead to a specific response (e.g., ''pink'' or ''purple''). If children still give predominantly category-wide responses (e.g., ''yellow'') in this context, then we could be confident that children's category-wide responses are indicative of a generic interpretation.

To test this idea, we conducted a mini follow-up study. A group of twelve 4- and 5-year-olds (4 girls; mean age = 5 years 2 months) were tested on modified versions of five items from the main experiment. These items now included *two* atypical exemplars from the same category (e.g., one purple and one pink banana, one yellow and one blue strawberry). Children were shown the items in a random order and were asked the indefinite singular question. A different random order was used for each child. Responses were coded as before: For example, responding ''yellow'' to ''What color is a banana?'' was coded as category-wide, while responding ''pink'' or ''purple'' was coded as specific. Overall, the average proportion of category-wide responses in this modified task was .80 (SD = 0.34). To determine whether adding the second object lowered the number of category-wide responses, we compared this average with the average proportion of category-wide responses produced by 4- and 5-year-olds (n = 24) for the same five items in the main experiment, where only one object was shown on each trial. This proportion was calculated to be .66 (SD = 0.42), which was in fact lower than the .80 obtained in the modified task, although not significantly so, Mann–Whitney Z = 0.88, p = .381, d = 0.37. In sum, the fact that the proportion of category-wide responses to indefinite singular questions was unaffected by making the specific response more available suggests that Experiment 1 did not mischaracterize children's ability to interpret indefinite singular NPs as generic.

Conclusion

This study provides strong evidence that children as young as 3 are able to interpret indefinite singular NPs as referring to a kind. Children disregarded the salient features of object in front of them (e.g., the yellow color of the strawberry) and answered questions such as ''What color is *a strawberry*?'' by invoking properties of the entire category (e.g., red). Furthermore, our follow-up study suggested that children's category-wide answers truly reflected a generic interpretation and were not simply the result of a task-induced bias to avoid specific responses. The fact that children answered the *definite* singular questions based on the pictured object also suggests that they were not just automatically reporting the relevant generic facts (e.g., that strawberries are red), regardless of question format. Instead, their category-wide answers were selectively prompted by our use of indefinite singular NPs.

Experiment 2

In this experiment, we tested children's sensitivity to tense and aspect cues by comparing their interpretation of sentences in the simple present tense (e.g., ''A bat *sleeps* upside down'')—which are plausible candidates for generic meaning—with their interpretation of sentences that differed either in tense (e.g., ''A bat *slept* upside down'') or in aspect (e.g., ''A bat *is sleeping* upside down''). (As a side note, the English simple present and simple past may differ not only in tense but also in aspectual meaning. Unlike the simple present, the simple past is often *perfective*, in that it refers to an event as a whole; e.g., Comrie, 1976; C. S. Smith, 1983.)

Two complementary strategies were used to probe children's interpretation. First, we simply asked them whether the sentences are about ''just one'' category instance or about ''a whole lot of'' instances, expecting that children would answer with ''a whole lot'' (which signals a generic interpretation) most often for the sentences in the simple present tense. Second, we asked children to recall these sentences after a short delay (à la Gelman & Raman, 2007), expecting that they would make generic errors (e.g., ''*Bats* sleep upside down'') selectively for the sentences in the simple present tense and nongeneric errors (e.g., ''*The bat* slept upside down'') selectively for the sentences in the simple past and present progressive.

Method

Participants

The participants were 54 four- and five-year-old children (26 girls; mean age = 4 years 11 months; range = 4 years to 5 years 8 months). An additional four children were tested but were not included in the final sample because of experimenter error (n = 2) or because they did not complete the task (n = 2). The children, all of whom were recruited in a small Midwestern city, were predominantly European American and came from a range of socioeconomic backgrounds (although demographic information was not collected formally). None had participated in Experiment 1. In addition to the children, 36 adults (23 females) were tested and received either course credit or $5 for their participation.

Materials, Design, and Procedure

Children were randomly assigned to one of three conditions that differed in the type of sentence tested (see Table 2 for full list). One third of the children (n = 18) heard sentences with verbs in the present tense and simple aspect (e.g., ''A spider *doesn't chew* its food''), one third heard sentences with verbs in the past tense and simple aspect (e.g., ''A spider *didn't chew* its food''), and the remaining one third heard sentences with verbs in the present tense and progressive aspect (e.g., ''A spider *isn't chewing* its food''). Aside from the tense and aspect of the verb, the sentences in the three conditions were identical.

Using indefinite singular NPs (e.g., ''a spider'') in this study allowed us to further investigate children's interpretation of these NPs and thus to elaborate on the conclusions of Experiment 1. In addition, these NPs have several characteristics that make them suitable to our goal in Experiment 2. The fact that, when nongeneric, indefinite singular NPs refer to a *single* object was advantageous because it allowed us to probe children's interpretation by asking the straightforward ''just one'' versus ''a whole lot'' question. Bare plurals, by contrast, refer to a *plurality* of instances regardless of whether they are generic or nongeneric, so they do not lend themselves to this task. Moreover, because indefinite singular NPs are *not* the most frequent means of expressing generic meaning (e.g., Gelman et al., 2008), using them may increase the probability of informative NP substitutions during the recall task: That is, children who interpret these NPs generically based on the verb's tense and aspect may often default to a more prototypical form of kind reference (e.g., ''*Spiders* don't chew their food'') after a few minutes' delay, thereby revealing their generic interpretation.

The properties used in our items were chosen to be relatively unfamiliar to children in order to avoid biasing them toward a generic interpretation. However, they were also meant to be plausibly generalizable to an entire category (rather than temporary or idiosyncratic) in order to avoid biasing children in the opposite direction, toward a nongeneric interpretation.

Children were tested either in the laboratory or in a quiet room in their preschool. At the beginning, the experimenter introduced children to a stuffed animal (e.g., Mr. Doggy) and told them they would play a game with it. The experimental session was divided into three parts.

Table 2
The Items Used in Experiment 2

Present tense/simple aspect	Past tense/simple aspect	Present tense/progressive aspect
A bat *sleeps* upside down	A bat *slept* upside down	A bat *is sleeping* upside down
A bee *works* all day	A bee *worked* all day	A bee *is working* all day
A lion *doesn't sleep* at night	A lion *didn't sleep* at night	A lion *is not sleeping* at night
A monkey *eats* meat	A monkey *ate* meat	A monkey *is eating* meat
A snake *doesn't eat* for days	A snake *didn't eat* for days	A snake *is not eating* for days
A spider *doesn't chew* its food	A spider *didn't chew* its food	A spider *is not chewing* its food

1. *''Just one'' versus ''a whole lot'' task.* This part consisted of six trials. On each trial, the experimenter provided children with a sentence in the appropriate tense and aspect (as determined by the child's condition), repeating it once. The experimenter then asked the children to repeat it as well. Next, the experimenter said,

> Okay, so I'll say it one more time, and then I'll ask you a question about it. I said, [e.g.] ''A spider doesn't chew its food.'' Now, are we talking about *just one* spider or *a whole lot* of spiders?

While asking the question, the experimenter pointed first to a single dot (''just one'') and then to a group of about 50 dots (''a whole lot''), printed on separate halves of a letter-size piece of paper. The dot illustrations were provided in order to help children remember the question while they thought about their answer and to allow them to respond by pointing, if they so chose. This script was followed on all six trials. The order of the items was counterbalanced across children.

2. *Distractor task*. After the first part, the experimenter asked children to do some coloring. This task lasted approximately 4 min (Gelman & Raman, 2007).
3. *Memory test*. In this part, children were asked to remind the stuffed animal ''about some of the things we said before we did the coloring.'' In order to prevent children from trying to memorize the sentences verbatim, we had not warned them about this memory test. In this part of the experiment, our dependent measure is the *errors* children make in recalling the form of the NPs. For example, recalling ''*A spider* doesn't chew its food'' as ''*Spiders* don't chew their food'' probably signals that the original sentence was interpreted generically; conversely, recalling ''*A spider* didn't chew its food'' as ''*The spider* didn't chew its food'' might signal a nongeneric interpretation of the original sentence. Such NP substitutions are more likely to occur if children have to rely on the gist of what they originally heard rather than its intentionally memorized surface form—hence the surprise memory test.

For each of the six items, the experimenter showed children a photograph of a single animal from the relevant category (e.g., a spider) and said, ''Here's a clue. Think about it for a little bit. Can you remind Mr. Doggy what we said?'' (No photographs had been shown in the first part of the session.) If the children provided an answer, the experimenter recorded it and went on to the next trial. If they hesitated or said they did not remember, the experimenter provided them with a second clue, which was the unmodified form of the relevant verb (e.g., ''chew''):

> Okay, I've got another clue that might help you. The clue is [e.g.] ''chew.'' So now you have two clues: the picture and the word ''chew.'' Can you remind Mr. Doggy what we said?

By providing the verb as a second clue, we hoped to increase the probability that children would remember enough to produce a full sentence and thus an NP, whose form we were ultimately interested in. If the child could not recall anything even after this second clue, the experimenter moved on to the next item. The order of the items was the same as in the first part. At the end of the session, children were thanked for their participation and received a small prize.

The adults were tested individually or in small groups on a paper-and-pencil version of the ''just one'' versus ''a whole lot'' task. The instructions asked them to read the sentences very carefully and answer the accompanying questions (e.g., ''How many spiders are we talking about?'') by circling one of the two options (''just one'' vs. ''a whole lot''). They were also allowed to explain their answers in the margins if they wanted to. As with the children, adults were randomly assigned to one of three tense/aspect conditions (n = 12 participants in each).

Coding

Children's answers were written down as they were given, but all the sessions were also videotaped to check for accuracy. From the first part of each session, we recorded whether children answered the questions with ''just one'' or ''a whole lot.'' From the memory part, we recorded any instances in which the children produced sentences with bare plural or definite singular NPs in the subject position (e.g., ''*Bees* work,'' ''*The snake* didn't eat for years''). These NP substitutions provide an implicit means of determining whether children interpreted the original sentences as referring to a category or to a single individual. We used bare plurals as markers of kind reference because they are the prototypical form for expressing this meaning in

English (Gelman et al., 1998, 2008). By contrast, definite singulars are a common means of talking about a single referent, especially when that referent is identifiable in the context (as in our picture clues) or has been talked about previously (e.g., Maratsos, 1974). Although we used only information about the NP to infer children's interpretation, this cue was in fact reliable in the restricted context of our task. For instance, sentences with definite singular NPs were likely nongeneric regardless of the verb's tense and aspect (e.g., ''The lion doesn't sleep at night,'' ''The lion didn't sleep for months,'' ''The lion is not sleeping for nights'')—especially since generic uses of these NPs are so rare in speech to children (Gelman et al., 1998, 2008). Moreover, all but two of the mistakenly recalled bare plural NPs were accompanied by verbs in the simple present tense (e.g., ''Lions can't sleep at night''); this combination of features makes it very likely that these sentences were in fact kind referring (e.g., Gelman et al., 2002; Hollander et al., 2002). For all intents and purposes, then, the type of NP with which children replaced the original indefinite singular NPs can be used as a proxy for their interpretation. To assess reliability, two researchers coded all 54 transcripts. Agreement was 100% for the ''just one'' versus ''a whole lot'' coding, 98.5% for the bare plural coding (kappa = .91), and 95.6% for the definite singular coding (kappa = .87). Disagreements were resolved through discussion.

Two additional measures were derived from the memory task. First, we tallied how often each child needed the second, optional clue (the unmodified verb). The more often this clue was needed, the more likely it was that the child had trouble remembering the sentences. To obtain a more direct measure of children's recall, we also asked two researchers to rate children's memory for the predicate of each sentence on a scale from 1 to 5, where 1 signified *no recall* or *completely inaccurate recall* and 5 signified *verbatim recall*. (Children's memory for the noun labels was at ceiling because of the picture clues, so it was not formally rated.) The two researchers' ratings of the predicates were highly correlated, $r(322) = .90$, $p < .001$. We averaged these scores for use in data analyses, except for cases where the ratings were off by two or more points—the researchers discussed these cases and provided a new, mutually agreeable rating.

Results

The main analyses reported here tested whether children are able to use information about a verb's tense and aspect to distinguish between generic and nongeneric sentences. If so, we predict that children will (a) answer ''a whole lot'' more often for sentences in the simple present tense than for sentences in the simple past or the present progressive and (b) make *more* bare plural recall errors and *fewer* definite singular recall errors for sentences in the simple present tense than for the other two sentence types.

Adults' Responses on the ''Just One'' Versus ''A Whole Lot'' Task

None of the 24 adults in the past and progressive conditions *ever* selected ''a whole lot,'' which suggests that their interpretation of sentences such as ''A bat *slept* upside down'' and ''A bat *is sleeping* upside down'' was nongeneric. By contrast, adults in the simple present tense condition answered ''a whole lot'' for an average of 2.83 items (of a possible 6; $SD = 3.01$).

Since participants were extremely consistent in their answers across items (35 of 36 chose ''a whole lot'' either 0 or 6 times), we compared the three conditions with Fisher's Exact Tests on the number of participants who selected ''a whole lot'' at least once. Significantly more participants did so in the present condition (6 of 12) than in the other two (0 of 12), ps = .014. These results confirm that adults use tense and aspect information to distinguish between generic and nongeneric sentences.

However, why did only half of the participants say that the simple present tense sentences (e.g., ''A bat *sleeps* upside down'') refer to ''a whole lot'' of instances? One possibility is that these sentences were ambiguous between a generic and a nongeneric reading. Another possibility is that the generic reading was in fact preferred, but the magnitude of this preference was underestimated by the frequency of ''a whole lot'' responses. Recall that, grammatically, sentences such as ''A bat sleeps upside down'' do refer to just one category member, except it is an *arbitrary* one that can be understood, by virtue of being arbitrary, as standing for *all* members of the category (e.g., Carlson, 1977; Declerck, 1991). It is possible, then, that some participants in the simple present tense condition interpreted these NPs generically and still thought the appropriate answer was ''just one.'' Some qualitative aspects of their behavior during the task supported this possibility: For example, one participant first circled ''a whole lot'' for all sentences, then crossed out everything and circled ''just one'' instead; for the *bat* item, she wrote in the margins, ''a single bat but not one specific bat—I was carrying the sentence on to a whole lot of bats, which actually started to confuse me.'' In this case, it is fairly clear that she interpreted ''a bat'' generically but chose ''just one'' based on the NP's surface singular form.

Regardless of which of these possibilities one thinks is more likely, there is no doubt that participants factored the tense and aspect information into their decisions about the scope of the NP, as revealed by the significant condition differences in the frequency of ''a whole lot'' responses. It is these cross-condition comparisons we will rely on to determine whether children too are sensitive to the verb cues. We will not, however, use the absolute level of ''a whole lot'' responses *within* any one condition to draw inferences (e.g., by comparing it against chance) because, as argued earlier, this level may be only a rough index of participants' interpretation.

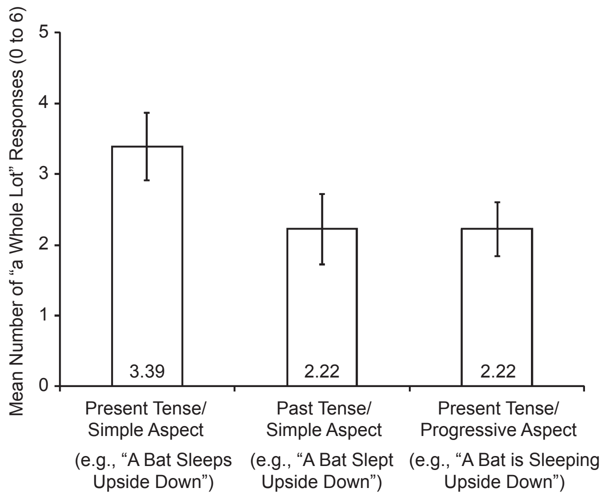

Figure 2. The mean number of ''a whole lot'' responses provided by children in the three tense/aspect conditions in Experiment 2. *Note.* The error bars represent ± 1 *SE* of the mean.

Children's Responses

''Just one'' versus ''a whole lot'' task. We used the number of ''a whole lot'' responses children made across the six trials of the task as a dependent measure (range = 0–6). This variable was not normally distributed within the three tense/aspect conditions (Shapiro–Wilk $ps<.037$), so we again used an OLR for our analysis. The predictors were (a) tense/aspect condition (simple present vs. simple past vs. present progressive; between subjects), (b) participant gender (boys vs. girls; between subjects), and (c) age group (4-year-olds vs. 5-year-olds; between subjects). Age was not an a priori feature of our design, but it was added to the model because preliminary analyses revealed some strong age-related differences in children's behavior. Half of the children in each tense/aspect condition were 4 and half were 5, and the age groups were also roughly balanced by gender.

The OLR revealed a significant main effect of tense/aspect condition, Wald $\chi^2 = 7.63$, $df = 2$, $p = .022$. As predicted, follow-up OLRs suggested that children chose ''a whole lot'' more often when the sentences were in the simple present tense ($M = 3.39$ on six trials, $SD = 2.03$) than when they were either in the simple past ($M = 2.22$, $SD = 2.10$), Wald $\chi^2 = 4.86$, $df = 1$, $p = .028$, $d = 0.56$, or in the present progressive ($M = 2.22$, $SD = 1.63$), Wald $\chi^2 = 6.45$, $df = 1$, $p = .011$, $d = 0.63$ (see Figure 2). For example, children were more likely to think that a whole lot of bats sleep upside down when they heard that ''A bat *sleeps* upside down'' than when they heard that ''A bat *slept* upside down'' or that ''A bat *is sleeping* upside down.'' This result also generalized across items: For all six of them (see Table 2), the version that drew the most ''a whole lot'' responses was the one in the simple present tense, $p = .031$ by a sign test.

The only other significant effect was that of age group, Wald $\chi^2 = 9.73$, $df = 1$, $p = .002$, $d = 0.83$, with 5-year-olds ($M = 1.85$ on six trials, $SD = 1.77$) selecting overall fewer ''a whole lot'' responses than the 4-year-olds ($M = 3.37$, $SD = 1.90$). To speculate, this effect may be due to developments in children's metalinguistic understanding—and specifically to an increasing awareness that indefinite singular NPs such as ''a spider'' are in fact *singular* and thus likely to refer to just one object. One of the 5-year-olds even justified his choice of ''just one'' by saying, ''One spider, because you said *a*.'' Importantly, though, this overall change in children's responses did not affect their sensitivity to the tense and aspect information, as indicated by a nonsignificant interaction between age and tense/aspect condition, Wald $\chi^2 = 0.38$, $df = 2$, $p = .829$.

Memory test. The three tense/aspect conditions were equivalent in terms of children's general recall of the sentences: There were no significant differences in the number of second clues needed ($Ms = 1.89$, 2.56, and 2.11 [of a possible 6] for the present, past, and progressive conditions, respectively; $SDs = 1.23$, 1.89, and 1.53, respectively) or in children's memory for the predicates (mean ratings = 3.39, 3.02, and 3.29 [on a 1–5 scale] for the present, past, and progressive conditions, respectively; $SDs = 0.87$, 0.99, and 0.96, respectively).

Our main interest in this task, however, lies with the types of errors children made in recalling the form of the NPs. Because many children made no NP errors, these data were relatively sparse and led to computational errors when entered into an OLR. As a result, we collapsed the data across gender and age and then tested our main predictions with pairwise comparisons between the simple present tense condition and the other two on (a) the average number of bare plural and definite singular errors, using Mann–Whitney *U* Tests, and (b) the number of children who made at least one of these errors, using Fisher's Exact Tests.

As seen in Figure 3 (top), children made more *bare plural* errors (e.g., recalling ''a bat'' as ''bats'') in the present condition ($M = 1.28$ on six trials, $SD = 1.99$) than either in the past condition ($M = 0.00$, $SD = 0.00$), Mann–Whitney $Z = 3.13$, $p = .003$, $d = 0.91$, or in the progressive condition ($M = 0.39$, $SD = 1.42$), Mann–Whitney $Z = 2.13$, $p = .044$, $d = 0.51$. This pattern was mirrored by the number of children who made at least one bare plural error: 8 (of 18) in the present condition, as compared to 0 in the past condition, Fisher's Exact $p = .003$, and 2 in the progressive condition, Fisher's Exact $p = .060$ (see Figure 3, bottom). These latter results suggest that the condition differences in the frequency of bare plural errors were not artificially driven by one or two outliers but rather were due to a substantial proportion of the children. Finally, note that the past and progressive conditions were not significantly different from each other either in the number of bare plural errors, Mann–Whitney $Z = 1.43$, $p = .486$, $d = 0.39$, or in the number of children who made at least one such error, Fisher's Exact $p = .486$.

As expected, the *definite singular* errors (e.g., recalling ''a bat'' as ''the bat'') were distributed in a pattern opposite to that of the bare plurals. Children made *fewer* of these errors in the present condition ($M = 0.11$ on six trials, $SD = 0.47$) than either in the past condition ($M = 2.28$, $SD = 2.19$), Mann–Whitney $Z = 3.95$, $p < .001$, $d = 1.37$, or in the progressive condition ($M = 1.17$, $SD = 1.95$), Mann–Whitney $Z = 2.13$, $p = .042$, $d = 0.74$. Only one child (of 18) made definite singular errors in the present condition, as compared with 13 in the past condition, Fisher's Exact $p < .001$, and 6 in the progressive condition, Fisher's Exact $p = .088$.

Unexpectedly, the past and progressive conditions also appeared to diverge on this measure: There were more definite singular errors, Mann–Whitney $Z = 1.96$, $p = .051$, $d = 0.54$, and more children who made at least one of these errors, Fisher's Exact $p = .044$, in the past than in the progressive condition. We speculate that this difference may be, at least in part, an artifact of the procedure used to elicit children's memory. Recall that the first clue always consisted of an encyclopedia-style picture of an animal from the relevant category. For example, children were shown a picture of a prototypical bat midflight and asked to remind the stuffed toy what was said. In order to make a definite singular error, children in the progressive condition would have to produce, for example, ''*The bat* is sleeping upside down'' in the context of a picture that would make that sentence false—a right-side-up, flying bat. In the past tense condition, however, one can felicitously produce a sentence such as

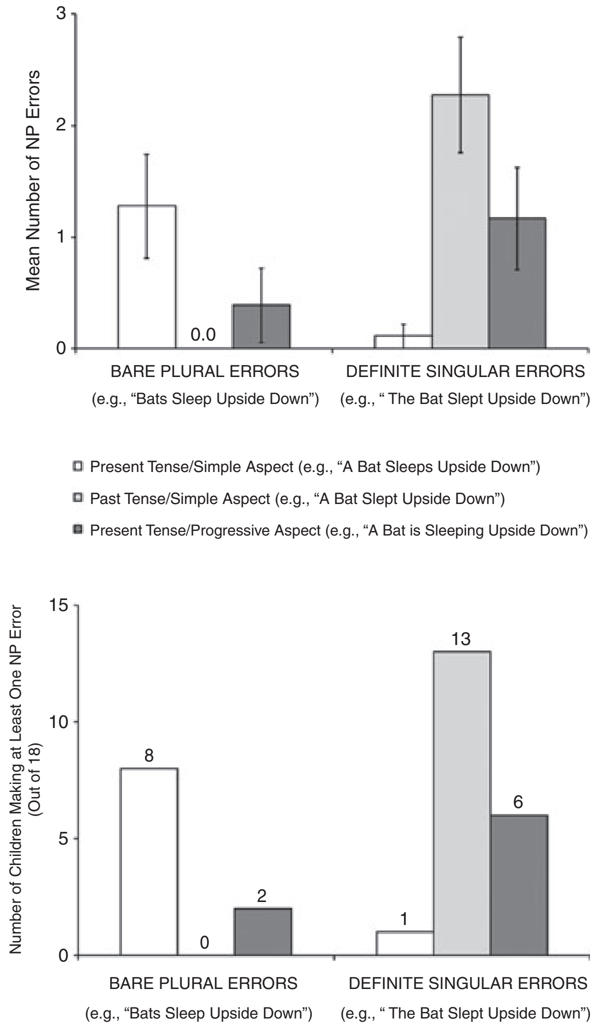

Figure 3. The mean number of noun phrase (NP) errors (top) and the number of children making at least one NP error (bottom) in the three tense/aspect conditions in Experiment 2.
Note. The error bars represent ± 1 *SE* of the mean.

''*The bat* slept upside down'' in the context of this clue because the (past) event described need not be reflected in the animal's current appearance. Although this explanation does not apply equally well to all stimuli, it may have nevertheless contributed to the observed difference between the past and progressive conditions.

Finally, we checked whether children's recall errors were predicted by their ''just one'' versus ''a whole lot'' answers on the preceding task. Once children responded with ''a whole lot'' to a particular item, were they also more likely to recall that item's NP as a bare plural? It seems plausible that these responses would co-occur, since they both signal a generic interpretation. Interestingly, the data indicated otherwise: Bare plural errors occurred on 9.2% of the items that had received ''a whole lot'' answers but also on 9.3% of the items that had received ''just one'' answers. We also checked whether, once children responded with ''just one'' to a particular item, they were more likely to recall that item's NP as a definite singular. Definite singular errors occurred on 18.6% of the items that had received ''just one'' answers but also on 21.3% of the items that had received ''a whole lot'' answers, suggesting again that children's forced-choice answers and their recall errors were unrelated. The dissociation between these two measures is intriguing; we provide some speculative reasons for it in the General Discussion.

In sum, this experiment provides conclusive evidence that preschool-age children are able to use information about a verb's tense and aspect in the process of distinguishing between generic and nongeneric sentences. In line with our hypothesis, children thought that the experimenter's sentences were about ''a whole lot'' of exemplars significantly more often in the simple present tense condition (e.g., ''A spider *doesn't chew* its food'') than in the past tense (e.g., ''A spider *didn't chew* its food'') or progressive aspect (e.g., ''A spider *isn't chewing* its food'') conditions. Children's recall errors reinforced the conclusion that the tense and aspect differences led to differences in generic/nongeneric interpretation.

General Discussion

The process of determining whether a sentence refers to a kind relies on many cues, none of which is entirely reliable. The present studies focused on children's sensitivity to grammatical information as a cue to generic meaning. Specifically, we demonstrated that preschool-age children are able to (a) interpret indefinite singular NPs (e.g., ''a strawberry'') as kind referring and (b) use information about the tense and aspect of a verb to determine whether its subject NP is kind referring. Children's sensitivity to these ubiquitous morphosyntactic cues puts them in a position to take advantage of the wealth of information expressed through generic language. There is now a sizable literature showing that generic sentences are not only frequent in child-directed speech (e.g., Gelman et al., 1998, 2008; Gelman & Tardif, 1998; Gelman, Taylor, & Nguyen, 2004; Pappas & Gelman, 1998) but are also interpreted by children as conveying conceptually central, essential facts about the relevant categories (Cimpian & Markman, 2009, 2011; Hollander, Gelman, & Raman, 2009). Thus, by bringing further evidence for children's ability to identify generic sentences despite the lack of deterministic cues, the research presented here bolsters the case for the causal role of generic language in conceptual development.

Our results are also informative with respect to the process of language acquisition more generally. Previous developmental work on the indefinite article investigated the acquisition of the various components of its *nongeneric* meaning—for example, determining when children realize that it is used for a nonspecific member of a class rather than for objects that are unique or that can otherwise be identified in the conversational context (Maratsos, 1974, 1976). Ours are the first studies to show that, by age 3, children can also interpret these NPs to refer to a *category*. Furthermore, 4- and 5-year-olds' use of information about the verb to determine the generic–nongeneric status of the noun (Experiment 2) speaks to the development of their sentence comprehension skills. As discussed later, this is some of the earliest evidence that children can use a morphological marker on the verb to constrain the scope of the subject NP.

Children Interpret Indefinite Singular NPs as Generic

Previous developmental studies of indefinite singular NPs focused on young children's understanding of what types of (nongeneric) individuals these NPs refer to (e.g., Cziko, 1986; Emslie & Stevenson, 1981; Maratsos, 1974, 1976). In English, the singular indefinite NP is typically used for individual referents that are either *nonspecific* or specific but *not presupposed* in the context of the conversation—that is, not already part of the common ground (Clark, 1996) between interlocutors. For example, a statement such as ''I'd like to get *a dog*'' refers to a single dog, but not any specific dog. Even if the speaker does have a specific referent in mind, but this referent is new for the addressee, an indefinite singular NP is still the appropriate way to refer to it (e.g., ''*A dog* bit me this morning''). It seems that children understand the mapping to nonspecific referents first (by 3 years) and only later use indefinite singular NPs for specific referents that are new for the listener (Maratsos, 1974, 1976; though see Cziko, 1986, for a detailed review of the evidence and some debate).

The fact that the semantic link between indefinite singulars and nonspecific reference develops early is potentially relevant to children's ability to understand these NPs generically. The interpretation of an indefinite singular NP as referring to *any* member of the kind (and thus to the entire kind) may emerge when the NP is understood as having a nonspecific referent and is accompanied by a similarly nonspecific predicate (e.g., a simple present tense verb, which is unlikely to point to a specific event; Brinton, 2000; Dahl, 1975). On this account, understanding the nonspecificity of indefinite singulars' referents would thus be a precondition to understanding them as kind referring. This point fits well with Gelman's (e.g., Gelman, 2003) argument that children identify generic sentences by ''filtering out the specific'' (p. 225)—in other words, that they understand as generic any sentence whose components are *all* nonspecific in reference, in that they do not point to any particular individual, time, context, and so forth.

Regardless of whether these speculations are on the right track, the present results show that children can in fact interpret indefinite singular NPs as generic starting as early as age 3. In Experiment 1, 3- to 5-year-old children who were shown objects with an atypical feature (e.g., a purple banana) and asked about this unusual feature using an *indefinite* singular NP (e.g., ''What color is *a banana*?'') talked mostly about category-typical features (e.g., a banana is yellow), which suggested that they understood these indefinite singular NPs as kind-referring. Our second study confirmed that children can interpret indefinite singulars generically. For example, in this study children often misremembered the indefinite singular NPs as bare plural (e.g., ''Bats sleep upside down'') when they occurred in sentences with verbs in the simple present tense. These errors suggest that children interpreted the original indefinite NPs as generic but, due to the delay, they forgot the form in which the generic meaning had been delivered, so they defaulted to a bare plural NP to express this meaning instead.

Children Use a Verb's Tense and Aspect to Determine the Scope of the NP

Children's responses in Experiment 2 demonstrated that they take into consideration the tense and aspect of a sentence's verb when determining whether its subject NP refers to a category. This conclusion is in agreement with the results of a preliminary study by Pérez-Leroux et al. (2004), which suggested that Spanish-speaking children's interpretation of definite plural NPs (e.g., ''los tigres'' [''the tigers'']) is modulated by whether the accompanying verb is in the present tense or in the (imperfective) past.

Children's sensitivity to tense and aspect cues in Experiment 2 was captured by two different measures. First, children often said that sentences with verbs in the simple present tense (e.g., ''A bat sleeps upside down'') were about ''a whole lot'' of exemplars. By contrast, sentences with verbs either in the past tense (e.g., ''A bat slept upside down'') or in the progressive aspect (e.g., ''A bat is sleeping upside down'') were judged to be about ''a whole lot'' of instances significantly less often. This pattern suggests that the simple present tense was most compatible with a generic interpretation of the NP. Children's errors in recalling the form of the NPs led to the same conclusion. Bare plural errors (e.g., ''Bats sleep upside down''), which are indicative of a generic interpretation, clustered in the simple present tense condition, while definite singular errors (e.g., ''The bat hanged upside down''), which are indicative of a nongeneric interpretation, clustered in the simple past and present progressive conditions.

Although children's forced-choice responses and their recall errors agreed when analyzed at the condition level (in that they pointed to the same conclusion), at the trial level they seemed to be completely uncorrelated. That is, children's ''a whole lot'' responses were as likely to be followed by a bare plural error as their ''just one'' responses, and definite singular errors were likewise evenly spread between the two forced-choice responses. Several factors may have led to this surprising dissociation. As pointed out before, ''just one'' responses are not incompatible with a generic interpretation of the sentence (because ''just one'' could refer to an arbitrary instance).

Aggregated to the condition level, these responses did capture the predicted tense and aspect differences in interpretation; however, *trial*-level inferences about children's interpretation based on their ''just one'' responses may be much noisier, which may in turn introduce noise in the correlation with memory errors. Another important factor here may be that the forced-choice responses are an *explicit* measure of children's interpretation, while recall errors assess their interpretation *implicitly*. It may be, for example, that the children who succeeded on the more demanding explicit task have better (meta)linguistic and cognitive abilities and are thus more likely to have *verbatim* memory for the NPs. By contrast, the children who commit NP recall errors may also be the ones who are less likely to succeed on the explicit task. The data seemed to support these speculations. For example, children in the simple present condition who were relatively successful on the explicit task (≥ 4 ''a whole lot'' responses) produced only about half as many bare plural errors as the children who were less successful (≤ 2 ''a whole lot'' responses), $M_{\text{successful}} = 0.82$ versus $M_{\text{unsuccessful}} = 1.82$. Along the same lines, children in the present progressive condition who did well on the explicit task (≤ 2 ''a whole lot'' responses) produced only about a quarter as many definite singular errors as the children who did not do so well (≥ 4 ''a whole lot'' responses), $M_{\text{successful}} = 0.38$ versus $M_{\text{unsuccessful}} = 1.60$. If children did in fact reveal their interpretation in only one of these two ways (correct performance on the forced-choice task *or* NP errors), it follows that the two measures would be uncorrelated at the trial level.

Whatever the true cause of the dissociation between children's forced-choice responses and their recall errors, it is still clear that they can use tense and aspect information to determine the scope of an NP. What is it about the meaning of these tense and aspect combinations that makes them compatible or incompatible with kind reference? Although the simple past and the present progressive differ on several semantic dimensions (e.g., whether they describe something as past vs. current, or as completed vs. ongoing; see Comrie, 1976), they both prototypically refer to events. It is probably this shared semantic feature that makes them less compatible with kind reference, since it is implausible for an entire kind to take part in an event. Categories are not the types of entities that can perform discrete actions, and they rarely have things happen to them, regardless of temporal scale. Thus, there is very little that can be said about them in the simple past or the present progressive. The occasional acceptable generics in these tense and aspects (e.g., ''Dinosaurs *became extinct* a long time ago'') seem to describe exactly this sort of rare situation.

The simple present tense differs from the other two in this respect because it does not typically denote ongoing actions or events, as its name might suggest (Brinton, 2000; Dahl, 1975). Rather, it is used to express a heterogeneous collection of temporal and *nontemporal* meanings such as habits (e.g., ''Mary walks to work''), states (e.g., ''John loves chocolate''), timeless and proverbial statements (e.g., ''The sun sets in the west''), and so on. The simple present tense thus seems *less specific* in meaning than the simple past and the present progressive, and this may make it suitable for expressing generalizations and, as a result, conducive to kind-referring interpretations of NPs. Again, this account agrees with Gelman's (e.g., Gelman, 2003; Gelman et al., 2008) idea that children arrive at a generic interpretation by what amounts to a process of elimination, with any cue to specificity (such as a verb in the past tense or progressive aspect) drastically decreasing the probability that the relevant sentence will be understood as kind referring.

It is a testament to young children's sentence comprehension skills that they are able to use information about the *verb* to disambiguate the scope of the *noun*. The sensitivity to tense and aspect documented here is all the more notable since these verb features are only probabilistically relevant to the noun's interpretation, in that they place some (defeasible) general plausibility constraints on the types of entities that could be denoted (e.g., past tense verbs most often describe events, and events most often involve individuals rather than kinds). Verbs do carry other information that is more immediately relevant to the scope of the NP—for example, number agreement morphology. In English, the final /s/ inflection on a present tense verb (e.g., ''The duck swims in the water'') is an obligatory marker of subject–verb number agreement that is added in the presence of a (third-person) singular subject. (The singular interpretation becomes more complicated when the NP is generic, as in our experiments, or a collective noun [e.g., ''the crowd''], but even these examples are grammatically singular.) Interestingly, children show evidence of using the agreement information on the verb to judge the number of an ambiguous NP only around age 5 (Johnson, de Villiers, & Seymour, 2005; see also Fraser, Bellugi, & Brown, 1963), despite the strong association in the input between singular subjects and the final /s/ on the verbs and, even more surprisingly, children's close-to-perfect production of the agreement morphemes by the age of 3 (Brown, 1973). The fact that it takes children so long to realize the numerical implications of this number agreement morpheme highlights that the ability we documented here in 4- to 5-year-olds (i.e., using general semantic properties of the verb to constrain the NP's scope) is no small feat.

Conclusion

The mapping between generic meaning and the linguistic forms that realize it is quite complex. A listener cannot rely on a straightforward if–then rule to distinguish between generic and nongeneric sentences and must instead integrate several sources of information (grammatical, contextual, semantic, etc.). We should point out that, given the complexities involved, it would not have been in the least surprising if young children had been oblivious to this semantic distinction. The fact that they are not oblivious to it—quite the contrary—may suggest that children are motivated from an early age to *seek out* cues that allow them to distinguish between sentences that refer to kinds and ones that do not. Without some prior awareness of this dimension of meaning, and without a motivation to look for the cues that are relevant to it, it is not at all clear what would enable children to be so successful at identifying generics at such a young age—the raw input is certainly not organized in such a way to allow this category to simply emerge.

The studies presented here demonstrated that children are attuned to the implications of the grammatical composition of a sentence for its generic–nongeneric status. With all other linguistic and nonlinguistic factors equated, children interpreted indefinite singular NPs (e.g., ''a strawberry'') as generic more often than definite singular NPs (e.g., ''the strawberry''). Analogously, with all other linguistic and nonlinguistic factors equated, children interpreted sentences with simple present verbs (e.g., ''sleeps'') as generic more often than sentences with simple past verbs (e.g., ''slept'') or present progressive verbs (e.g., ''is sleeping''). The range of genericity-relevant cues to which children are sensitive suggests that they are in fact able to decode adults' generic utterances and learn the conceptual information contained therein.

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