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Generic noun phrases in mother–child conversations*

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ABSTRACT

Generic noun phrases (e.g. *Tigers* are fierce) are of interest for their semantic properties: they capture 'essential' properties, are timeless, and are context-free. The present study examines use of generic noun phrases by preschool children and their mothers. Mother–child pairs were videotaped while looking through a book of animal pictures. Each page depicted either a single instance of a particular category (e.g. one crab) or multiple instances of a particular category (e.g. many crabs). The results indicated a striking difference in how generics vs. non-generics were distributed, both in the speech of mothers and in the speech of preschool children. Whereas the form of non-generic noun phrases was closely linked to the structure of the page (i.e. singular noun phrases were used more often when a single instance was presented; plural noun phrases were used more often when multiple instances were presented), the form of generic noun phrases was independent of the information depicted (e.g. plural noun phrases were as frequent when only one instance was presented as when multiple instances were presented). We interpret the data as providing evidence that generic noun phrases differ in their semantics and conceptual organization from non-generic noun phrases, both in the input to young children and in children's own speech. Thus, this simple linguistic device may provide input to, and a reflection of, children's early developing notion of 'kinds'.

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INTRODUCTION

This paper examines how young children and their mothers talk about 'kinds'. By 'kinds', we mean categories that are richly structured and are assumed to capture deep regularities. Examples include *gold*, *tigers*, or *introverts*. Kinds play an important role in human cognition because they are used to guide inductive inferences about novel properties. Upon learning that an atypical exemplar is a member of a kind (e.g. that a penguin is a bird), children and adults draw novel inferences from typical instances of the kind to the atypical member (Gelman & Markman, 1986, 1987). Moreover, children and adults use knowledge about kinds to form 'over-hypotheses' such as 'kinds of animals each have a characteristic sound', thus leading to novel inferences even in the absence of specific information about a novel kind (e.g. that armadillos have a characteristic sound) (Shipley, 1989, 1993).

Kinds can be distinguished from other forms of conceptual organization (Gelman, in press; Lakoff, 1987; Gopnik & Meltzoff, 1997). On the one hand, they are distinct from individuals (e.g. Lassie is an individual; the set of dogs is a kind). On the other hand, they are distinct from a variety of other categories or groupings in which instances share only a small number of superficial features with one another. For example, the set of 'white things' is not a 'kind' because it captures only a single, superficial property; it is not richly structured and does not capture deep regularities (cf. 1843; Markman, 1989). Similarly, the *ad hoc* category of 'things to take on a camping trip' does not form a kind (Barsalou, 1991).

We are interested in how people talk about kinds, for two primary reasons: when parents talks about kinds, it may provide input to young children's growing concepts, and when children talk about kinds, it provides us with a window onto their earliest understandings.

One piece of evidence for the notion of 'kind' is lexicalization of the concept with the word 'kind' itself, as in 'Robins are a kind of bird' (Wierzbicka, 1994). From her review of a variety of unrelated languages, Wierzbicka concludes that not only do all languages sampled have a lexical entry for 'kind', but also that they distinguish 'kind' from 'like'. This finding is intriguing and may imply a universal conceptual distinction. However, tracking the word 'kind' does not seem to be a very sensitive measure of how this notion is expressed early on, either in speech TO young children or in the speech OF young children. One difficulty is that the word is relatively late-emerging and infrequent, indicating a metacognitive level of understanding. That is, use of the word 'kind' requires explicit reflection on (and talk about) the concept. Secondly, the word 'kind' is frequently used in reference to one narrow sense of kind, that of nested subtypes (e.g. 'What kind of cereal do you like best?'). A category need not be a subtype in order to be construed as richly structured and promoting inferences.

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A more promising linguistic index of kinds is the generic construction (e.g. *The madrigal is polyphonic*; *Tigers are fierce*). Generic noun phrases in English are expressed with bare plurals (e.g. '*Bears* hibernate in winter'), definite singulars (e.g. '*The elephant* is found in Africa and Asia'), or indefinite articles (e.g. '*A male goose* is called a gander'), and are accompanied by verbs that are typically non-past and non-progressive.[1] Because there is no one-to-one relation between form and generic function, meaning and context are required in order to reach a generic interpretation (e.g. 'the elephant' may refer to a particular elephant or to the kind). What distinguishes generics is that they refer to a category as an abstract whole, rather than referring to an individual or group of individuals (e.g. Lawler, 1973; Carlson & Pelletier, 1995). For example, consider the sentence 'Bats live in caves.' 'Bats' here does not refer to any particular group of bats. Instead, it refers to the abstract set of 'bats' in general. Furthermore, generics refer to qualities that are 'essential' (i.e. non-accidental),[2] enduring (not transient), and timeless (not contextually bound). Use of a generic thus implies that a category is a coherent, stable entity.

Unlike utterances containing universal quantifiers such as *all*, *every*, or *each*, generic statements allow for exceptions. The statement 'Birds lay eggs', for example, is considered true, even though less than half the bird population does so (e.g. excluding male birds and chicks). In contrast, 'ALL birds lay eggs' is false. As a consequence, generic statements are perhaps more powerful than utterances with universal quantifiers. Whereas even a single counterexample would negate the generalization 'All boys play with trucks', the generic statement 'Boys play with trucks' can persist in the face of numerous counterexamples. Indeed, some generics make claims for which no evidence is available (e.g. stereotypes of social categories).

Despite long-standing linguistic interest in the semantics of generic noun phrases, there has been little systematic work examining their use in natural language. Much of the available evidence is anecdotal. For example, Shipley (1989) mentions that, in her studies, preschool children (some as young as three years of age) referred to animal kinds with statements including: 'Dogs go ruff-ruff and them have long tails' or 'Animals can't talk' – both of which are generic. Similar examples can be found in Adams & Bullock (1986) and Callanan (1990). Perhaps the only systematic investigation of generics in spontaneous speech is that of Gelman, Coley, Rosengren, Hartman & Pappas (in press), who tallied the generics used by mothers of children aged 1;8 and

[1] Form of expression differs across languages, but generics appear to be available even in widely different languages, including Chinese (Krifka, 1995) and a variety of other Indo-European and non-Indo-European languages (Dahl, 1995).

[2] Properties predicated of generics, although characterised as 'essential', need not be defining in the Aristotelian sense (i.e. comprising individually necessary and jointly sufficient conditions for category membership).

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2;11 in a middle-class sample living in a university community. In that series of three studies, most of the mothers used at least one generic during a brief (15–30-minute) session of reading two picturebooks with their child. Overall, generics accounted for 3–4% of utterances referring to animals and less than 1% of utterances referring to artefacts. Thus, the results suggest that generics are relatively frequent in ordinary speech, and that they are available to young children learning about category structure.

Although the research cited above documents that generics are available in ordinary speech, it does not tell us how this linguistic construction functions for speakers. At a most fundamental level, the work does not tell us whether generics are conceptually distinct from non-generic utterances. What is implied when a speaker uses 'a crab' in a generic versus a non-generic manner? How distinct, if at all, is the generic 'pigs' from the non-generic 'the pigs'? What independent evidence do we have that speakers use generics to refer to kinds as opposed to individual instances? Two findings are suggestive in this regard, though not definitive. First, mothers displayed a substantial domain difference, producing significantly more generics for animals vs. artifacts, even when we control for the frequency of talk in the two domains. Taken in conjunction with work suggesting that animal categories are more coherent and richly structured than artefact categories (e.g. Gelman, 1988; Keil, 1989), this domain difference suggests that generics are reserved for talking about categories with a particular structure.

A second piece of evidence from the Gelman *et al*. (1997) study was an occasional mismatch between the number of available category instances and the plurality of the noun phrase used by mothers. Specifically, mothers at times used plural generics even when only a single instance was visible in the picture (e.g. 'That's a chipmunk. And *they* eat the acorns'). Similarly, sometimes mothers shifted between singular and plural forms (e.g. 'Did you know when *a pig* gets to be big, *they're* called hogs?'). This pattern is striking, because, on the face of it, it seems to be a blatant error: reference to a single individual with a plural noun. However, we suggest that the 'error' is in fact not an error at all, but rather reflects the semantics of generic nouns. Specifically, 'they' in the chipmunk example refers not to the chipmunk identified in the previous sentence, but rather to chipmunks as an abstract kind. If our interpretation is correct, then these mismatches suggest that generics are not tied to a particular set of instances present in the immediate context but rather refer to the category as a larger whole. It is unclear, however, how characteristic these mismatches are for generics, and whether they differ systematically from the use of non-generic noun phrases.

Present study

The present study was designed to address whether generics are distinct in function from non-generics, by looking more closely at the phenomenon

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discussed above, of mismatches between context (one vs. multiple instances) and linguistic form (singular vs. plural). Specifically, preliminary evidence suggests that generics may be used to refer to categories in general (e.g. squirrels as an abstract whole). However, in order to argue that generics refer to categories as distinct from individuals in immediate contexts, two alternative explanations need to be ruled out. (a) First, the use of plural noun phrases in the context of a single instance could simply be an error. Parents may occasionally use the wrong form, due to forgetfulness or slips of the tongue. For example, a mother may have intended to say '*it eats* the acorns', but came out with '*they eat* the acorns' instead. (b) A second possibility is that the number mismatch reflects use of 'they' as a gender-neutral pronoun. Because it was not possible to detect whether the animals in the picturebook were male or female, perhaps subjects, uncertain of whether to say 'he' or 'she', opted for 'they'. If either alternative account is apt (errors or gender-neutral pronouns), then we should find the same mismatch between plural noun phrases and single-exemplar contexts with non-generic utterances as with generics. For example, if the gender interpretation is correct, then parents should just as often say things like, 'See this bat? *They* came from the cave over there' (i.e. using 'they' in a non-generic sentence) as 'See this bat? *They* live in caves' (i.e. using 'they' in a generic sentence). In contrast, if the number mismatch pattern is distinctive to generics, this would provide indirect evidence for a conceptual distinction between generic and non-generic constructions.

Because we are interested in how children acquire concepts of kinds and in the nature of the input they receive, we focus on mother–child speech rather than adult–adult speech. Moreover, there is much evidence that speech to young children is simplified in certain ways (Snow, 1972). By examining child-directed speech, we can determine whether these forms are distinguished even in the simple speech that children hear. Mother–child speech also allows us to examine whether and how young children use generics themselves. As noted earlier, anecdotal evidence suggests that three-year-olds can produce them, yet we are unaware of any systematic investigation of generics in children's own speech.

Finally, we also examined the relation between generics and category familiarity. We predicted that generics would be found more often when categories are relatively more familiar, as subjects would have a greater knowledge base to draw on.

To summarise, the present study examines the distribution of generic utterances relative to non-generic utterances. If generics and non-generics are semantically and conceptually equivalent, then they should not differ from one another with respect to the distribution of linguistic form (singular vs. plural) across depicted contexts (individual instance vs. multiple instances depicted on a page). However, if generics and non-generics are semantically

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and conceptually distinct, then their distributions should differ, with generics eliciting more plural forms in single-instance contexts.[3] The database consisted of mother–child pairs looking through picturebooks about animals. The books were specially created so that each page included either a single instance of a category (e.g. one crab) or many instances of a category (e.g. many crabs), thus manipulating contexts by varying the number of items on a page. We focused exclusively on the animal domain, given past findings that generics are much more frequent for animals versus artefacts.

METHODS

Subjects

Subjects were 26 mother–child pairs: 12 younger children (range 1;11–3;0), mean age 2;6) and 14 older children (range 3;2–4;9, mean age 3;9). Subjects were of middle-class backgrounds and living in the suburbs of a large midwestern city in the U.S.

Materials

Two picturebooks were created for use in the study. Each contained colourful, realistic drawings of animals and no text. There were 16 pages per book, with each page depicting either one or many (i.e. 10–15) animals of a given category (see Table 1). The pages were laminated and loosely bound, permitting the pages to lie flat when turned. Half the pages each contained a single animal; the remaining pages each contained multiple animals of the same type. The number of instances were counterbalanced across books (e.g. book A included one crab and many rabbits; book B included many crabs and one rabbit). The single and multiple versions of each category were comparable except for the number of instances (e.g. background, colour, and setting were similar across the two versions). The pages of the book were randomly ordered, with single-instance and multiple-instance pages intermingled. For half the subjects, the first page of the book depicted a single instance; for the remaining subjects, the first page of the book depicted multiple instances.

Procedure

Each mother–child pair was tested individually, in the first author's home. Subjects were seated on chairs at a table and told that they would be given a picturebook for them to look through and talk about as they typically would at home, for whatever length of time they wished. The only constraint

[3] We did not make the parallel prediction that generics would elicit more singular forms in many-instance contexts, because non-generics may readily elicit singular forms even in such contexts, if the speaker is focusing on a single one of the depicted instances.

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TABLE 1. *Categories portrayed in the picturebooks, with mean parent familiarity ratings (1 = child spontaneously said the word before, 2 = child understands the word but never said it, 3 = child neither understands nor says the word)*

	Book A: no. of instances	Book B: no. of instances	Mean familiarity rations
bird	one	many	1·00
cat	many	one	1·00
dog	one	many	1·00
rabbit	many	one	1·00
fish	one	many	1·04
chicken	many	one	1·15
tiger	one	many	1·23
giraffe	many	one	1·46
hippo	many	one	1·73
skunk	one	many	1·81
crab	one	many	1·96
donkey	many	one	1·96
raccoon	many	one	1·96
porcupine	one	many	2·19
ostrich	one	many	2·31
beaver	many	one	2·35

provided was that they were asked to say something about each page. Subjects were permitted to look through the book in whatever order they wished (though most proceeded through the book from left to right), and to look through pages more than once (which many subject pairs did). The session was videotaped with the mothers' prior consent. In order to reduce distractions, the camera equipment was hidden behind a curtain, with only a small opening available for the camera lens. Videotaping was conducted at an angle that permitted full view of the open pages of the book.

After completion of the videotaping, mothers filled out a brief questionnaire concerning their child's knowledge of the 16 category names of the animals used in the books (see Table 1 for the list of words). For each word, mothers were asked to judge whether their child (a) had spontaneously said the word before, (b) understood the word but had never said it, or (c) did not know the word.

Coding

All utterances from both mother and child were transcribed. All page turns were also noted on the transcription, thus providing information concerning which page was visible for each utterance. Next, a coder identified all noun phrases referring to the target items (e.g. on the fish page, all noun phrases referring to fish, whether depicted on the page or not). These included

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proper nouns (e.g. 'Goldy'), common nouns (e.g. 'the fish', 'a fish', 'fish'), pronouns (e.g. 'it', 'he', 'they', 'those'), and definite descriptions ('the big one', 'the one we saw at Sea World'). We refer to these as CODED UTTERANCES. The coder excluded off-task utterances (e.g. 'Are you hungry?'), utterances referring to the cover page, and noun phrases referring to non-target items (e.g. those referring to seaweed, even though seaweed was also in the picture), and utterances without nouns (e.g. 'no', 'What do you see?').

Utterances containing the target noun phrases were then coded for number (singular vs. plural) and generic status (generic vs. non-generic). See Appendix for coding criteria. Coders were extensively trained in identifying both singular and plural generic noun phrases, and during training were provided with numerous examples of generics of both types from a different data set. A second coder coded 6 transcripts (3 younger subjects, 3 older subjects) for generic status, to check for reliability. Overall agreement between coders was 98% (i.e. 98% of the time coders agreed on the coding of an utterance as either generic or non-generic). A more conservative measure of agreement involves excluding from consideration those utterances that both coders agreed were non-generic. On this measure, 79% of those utterances identified as generic by either coder are identified as such by the other coder.

RESULTS

Generics accounted for a small but consistent subset of the noun phrases produced: 92% of the mothers produced at least one generic noun phrase; overall this accounted for a mean of 11% of the targeted utterances that mothers produced. Additionally, more than half the children (65%) produced at least one generic noun phrase; overall this accounted for a mean of 3% of the targeted utterances children produced. In order to examine group differences in overall frequency, we conducted a (2) speaker: mother, child × (2) age: younger group, older group ANOVA, with the dependent measure being the mean proportion of coded utterances that were generic. Mothers produced proportionately more generics than children, $F(1, 24) = 21{\cdot}68$, $p < 0{\cdot}001$. There was also a main effect for age, indicating that subjects in the older group (collapsing across mothers and children) produced proportionately more generics than subjects in the younger group (Ms = 10% and 4%, respectively), $F(1, 24) = 5{\cdot}69$, $p < 0{\cdot}05$. The interaction between age and speaker was non-significant.

We than examined effects of page type and linguistic form. Means are displayed in Table 2. Data from the mothers and children were analysed separately. For each group, we conducted a (2) age × (2) page type: one target pictured vs. many × (2) generic status: generic vs. non-generic × (2) linguistic form: singular vs. plural ANOVA, with the number of utterances as the dependent measure.

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TABLE 2. *Mean number of generic and non-generic utterances as a function of speaker, page type, and linguistic form* (*SDs are in parentheses.*)

	Generics		Non-generics	
	One instance[a]	Multiple instances[a]	One instance[a]	Multiple instances[a]
Mothers				
Singular NP[b]	1·42 (1·88)	1·08 (1·67) n.s.	38·00 (18·06)	21·23 (17·75) *
Plural NP[b]	5·42 (8·14) †	3·38 (4·14) n.s. †	2·08 (3·25) †	26·81 (16·97) * n.s.
Children				
Singular NP[b]	0·04 (0·20)	0·08 (0·27) n.s.	19·69 (10·82)	9·81 (11·42) *
Plural NP[b]	1·04 (2·18) †	0·46 (0·76) n.s. †	0·58 (0·99) †	12·61 (9·13) * n.s.

[a] Number of category instances depicted on a page (one or many).
[b] Form of noun phrase produced by speaker (singular or plural). Sixteen pairwise comparisons were performed: eight within each row of the table, for generics and non-generics separately, and eight within each column of the table, for mothers and children separately.
* Significant difference between one instance and multiple instances, $p < 0{\cdot}001$.
† Significant difference between singular and plural NPs, $p < 0{\cdot}05$.

Mothers

As expected, non-generic utterances were more frequent than generic utterances, as indicted by a main effect of generic status, $F(1, 24) = 82{\cdot}73$, $p < 0{\cdot}001$. There was also a main effect of linguistic form, $F(1, 24) = 19{\cdot}28$, $p < 0{\cdot}001$, indicating that utterances with singular noun phrases were overall more common than utterances with plural noun phrases. However, this interacted with age, $F(1, 24) = 4{\cdot}71$, $p < 0{\cdot}05$. When speaking to their younger children, mothers were significantly more likely to use singular than plural NPs (Ms = 64·55 and 28·33, respectively), $F(1, 24) = 5{\cdot}00$, $p < 0{\cdot}05$, simple-effects test. In contrast, when speaking to their older children, mothers produced singular and plural NPs equally often (Ms = 59·48 and 45·71, respectively), n.s.

Most interesting for our purposes were the two- and three-way interactions involving generic status, page type, and linguistic form, all of which were significant. There was a page type × generic status interaction, $F(1, 24) = 4{\cdot}25$, $p = 0{\cdot}05$, indicating that NON-GENERIC NPs were more frequent for multiple-instance than single-instance pages ($p = 0{\cdot}058$ by simple-effects *post hoc* test), whereas GENERIC NPs tended to be more frequent for single-instance than multiple-instance pages (although this difference was non-significant by a simple-effects test). There was also a generic status × linguistic form interaction, $F(1, 24) = 50{\cdot}88$, $p < 0{\cdot}001$: For non-generics, mothers produced more singular than plural NPs ($p < 0{\cdot}001$, simple-effects

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test), whereas for generics, mothers produced more plural than singular NPs ($p < 0{\cdot}01$, simple-effects test). There was also a page type × linguistic form interaction, $F(1, 24) = 91{\cdot}86$, $p < 0{\cdot}001$, indicating that overall, singular NPs were more frequent for single- than multiple-instance pages, whereas plural NPs were more frequent for multiple- than single-instance pages. Both these effects were significant by simple-effects tests, ps $< 0{\cdot}05$.

Finally, there was a three-way interaction involving page type, generic status, and linguistic form, $F(1, 24) = 94{\cdot}93$, $p < 0{\cdot}001$. We approach the three-way interaction by considering the patterns for generics and non-generics separately. All p-values reported for this interaction are the results of Newman–Keuls *post hoc* tests. For non-generics, linguistic form (singular or plural) interacted with page type: utterances containing singular noun phrases were more frequent when the page depicted just a single instance than when it depicted multiple instances ($p < 0{\cdot}01$); utterances containing plural noun phrases were over ten times more frequent when the page depicted multiple instances than when it depicted a single instance ($p < 0{\cdot}01$). Thus, when producing non-generics, the form of the language (singular or plural) closely matched what was depicted on the page (one or many instances). The only lack of correspondence was due to the fact that mothers also used many singular noun phrases for pages with multiple instances. However, this finding is consistent with the fact that one can focus on an individual animal even when multiple instances are displayed.

In contrast, for generics, linguistic form was wholly independent of page type: both singular noun phrases and plural noun phrases were produced as often when the page depicted just one instance as when it depicted multiple instances (n.s. for all *post hoc* comparisons). Thus, generics do not appear to be tied closely to the numerical information on the page.

Finally, we conducted correlations, on a page-by-page basis, between maternal familiarity ratings[4] and (a) the number of maternal generic utterances produced and (b) the percentage of coded utterances that were generic. Thus, the question is whether mothers were more likely to produce generics for more familiar categories. Both correlations were non-significant: 0·02 between maternal ratings and number of generics, and −0·01 between maternal ratings and percentage of utterances that were generic.

Children

For children, the patterns were remarkably similar. Again, non-generics were more frequent than generics, as indicated by a main effect of generic status, $F(1, 24) = 63{\cdot}78$, $p < 0{\cdot}001$. Also, singular noun phrases were more

[4] Each page was assigned an overall mean score, averaged across all mothers (see Table 1). This procedure was used in order to test for familiarity effects while controlling for individual variation across dyads in child age, maternal talkativeness, etc.

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frequent than plural noun phrases, $F(1, 24) = 18{\cdot}45$, $p < 0{\cdot}001$. As with the mothers, the comparisons of primary interest are those involving generic status, linguistic form, and page type. As with the mothers, we found a generic status × linguistic form interaction, $F(1, 24) = 22{\cdot}90$, $p < 0{\cdot}001$: For non-generics, children produced more singular than plural NPs ($p < 0{\cdot}001$, simple-effects test), whereas for generics, children produced more plural than singular NPs ($p < 0{\cdot}01$, simple-effects test). There was also a page type × linguistic form interaction, $F(1, 24) = 94{\cdot}44$, $p < 0{\cdot}001$, indicating that, overall, singular NPs were produced more often for single- than multiple-instance pages ($F(1, 24) = 51{\cdot}21$, $p < 0{\cdot}001$, simple-effects test), whereas plural NPs were produced more often for multiple- than single-instance pages ($F(1, 24) = 50{\cdot}43$, $p < 0{\cdot}001$, simple-effects test).

Finally, there was a three-way interaction involving page type, generic status, and linguistic form, $F(1, 24) = 88{\cdot}71$, $p < 0{\cdot}001$. Here again, to interpret the three-way interaction we consider the patterns for generics and non-generics separately. All p-values reported for this interaction are the results of Newman–Keuls *post hoc* tests. For non-generics, linguistic form (singular or plural) interacted with page type: singular noun phrases were approximately twice as frequent when the page depicted just a single instance than when it depicted multiple instances ($p < 0{\cdot}01$); plural noun phrases were over 20 times more frequent when the page depicted multiple instances than when it depicted a single instance ($p < 0{\cdot}01$). As with the adults, children frequently used singular noun phrases when talking about pages with multiple instances. Otherwise, for non-generics, the form of the language (singular or plural) closely matched what was depicted on the page (one or many instances).

For generics, linguistic form was independent of page type: for both singular noun phrases and plural noun phrases, frequency of generics did not differ significantly as a function of how many pictures were displayed on the page (n.s. for all *post hoc* comparisons). These non-significant comparisons need to be interpreted with caution, given the small means and large standard deviations (see Table 1). Nonetheless, it is notable that the means for generics are in the OPPOSITE DIRECTION of those for non-generics (e.g. for generics, more plural NPs in response to a single instance than in response to multiple instances). These patterns underscore the differences between generics and non-generics.

As with the adults, we conducted correlations, on a page-by-page basis, between the maternal familiarity ratings (as indexed by an overall mean score, averaged across all mothers; see Table 1) and (a) the number of generic utterances produced and (b) the percentage of utterances that contained generics. Again, neither of the correlations was significant, although in both cases there was a tendency for children to produce more generics for LESS familiar items: 0·27 between the maternal ratings and number of generics;

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0·28 between maternal ratings and percentage of utterances that were generics.

DISCUSSION

The present data replicate earlier findings of Gelman *et al*. (in press), demonstrating that generic noun phrases are consistently used in speech addressed to young children. Twenty-four of the 26 mothers produced at least one generic, with rates ranging across mothers from 0 to 41% of all utterances produced. Overall, fully 11% of mothers' utterances produced during the picturebook reading sessions included a generic. More surprisingly, generics were also found in the speech produced BY young children. Although the overall percentage of generics was rather modest (1% of the utterances produced the two-year-olds and 5% of the utterances produced by three- and four-year-olds), more than half the subjects produced at least one generic noun phrase during the book-reading session (50% of the two-year-olds and 79% of the three- to four-year-olds).

Most importantly, the data clearly show that generics are distributed differently from non-generics, for both mothers and children. Whereas the linguistic form of non-generics closely matched the number of pictures in the context (with singular noun phrases typically used for single-instance pages and plural noun phrases typically used for multiple-instance pages), such was not the case for generics. Indeed, generic plurals were used slightly MORE often in the context of single-exemplar pages than in the context of multiple-exemplar pages, though this difference was not significant. At times this led to the sort of 'mismatches' described in the introduction. For example, in one transcript, the mother referred to an individual ostrich as 'ostrich', and the child replied, 'They stink', using a plural pronoun following reference to an individual.

Although we had predicted that generics would be relatively more independent of context than non-generics, the size of the effect was rather surprising: for generics, linguistic form was wholly independent of context, as measured by number of items on the page. In other words, subjects were no more likely to access the larger category when presented with many instances than when presented with just one. The fact that even a single instance of the category could serve to trigger a generic utterance suggests that subjects may be thinking about individual animals in two ways, both as individuals and as instantiations of a kind.

Another surprising result was the lack of relation between generic frequency and item familiarity. We had assumed that subjects would produce more generics when talking about categories for which they had more knowledge. If generics are statements reporting known facts, then there should be a linear relation with familiarity. It may be that the lack of a correlation indicates that our measure of familiarity was not sensitive

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enough. This is plausible, in that we questioned mothers about their children's word knowledge rather than probing more deeply into their factual knowledge of each category. However, an alternative explanation of this null result is that generics may instead reflect something about the structure and coherence of a category, rather than amount of knowledge *per se*, and thus may truly be independent of familiarity. Some weak support for this latter interpretation is that a number of chidren's generics did include factual errors (e.g. 'Mom, *hippo* not bite'), and a sizeable portion (24%) were requests for information (e.g. 'Do *fishies* like, um, *octopuses*?') rather than reports of factual knowledge. However, further research is needed to investigate the relation between familiarity and generic form more fully.

In sum, we interpret the present data as providing evidence that generic noun phrases differ in their semantics and conceptual organization from non-generic noun phrases, both in the input to young children and in children's own speech. The fact that the results are so similar for mothers and children raises the question of how kind concepts change and develop ontogenetically. The data suggest that at least a rudimentary kind concept is available quite early in acquisition. This does not imply, however, that kinds are unchanging over development. Indeed, much research suggests that important developmental changes take place, including enriched knowledge, greater hierarchical flexibility, and structural reorganizations (Carey, 1985; Keil, 1989; Waxman, 1995; Gopnik & Meltzoff, 1997). Thus, we propose that the notion of kind reflected in generic noun phrases represents an initial core understanding rather than a developmental endpoint. One fundamental question that arises is which is primary: the conceptual organization or the linguistic device? That is, does the conceptual notion of 'kind' arise non-linguistically, with generics merely reflecting this conceptual structure? Or do generics play a role in the formation of natural kind concepts? At present the answer is not known, although we suspect that both directions of influence may be important. Thus, this simple linguistic device may provide input to, and a reflection of, children's early developing notion of 'kinds'.

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APPENDIX

CODING OF GENERIC NOUN PHRASES

1. A generic refers to a category IN GENERAL rather than any specific or particular individual(s) or instance(s). The form is typically either a bare plural ('*Zebras* have stripes') or *a/an* plus a singular noun ('How does *a kitty cat* go?'). Generally, noun phrases beginning with the word 'the' are not generic ('I can make a hole for *the birdies*'). Similarly, noun phrases beginning with any of the following modifiers are not generic:

(a) a number ('*two* birdies')

(b) an indexical ('I use all *my* balloons'), including the words 'these', 'which', 'his', etc., UNLESS the pronoun is the generic 'your' (meaning 'one's')

(c) quantifiers such as 'some', 'more', 'must', etc. ('I want some more balloons'), UNLESS the quantifier is a universal quantifier ('all', 'every'). Utterances with universal quantifiers MAY by generic but not necessarily;

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context must be consulted to determine whether the speaker is referring to category as a whole or to some contextually specified subset.

2. A generic is not tied to a particular situation/point in time. Thus, it must be non-progressive present tense (e.g. 'Dogs bark' or 'A dog barks' is generic; 'Dogs barked' or 'A dog is barking' is not). Commands or past tense utterances are not generic, unless they are historic past (e.g. 'Dinosaurs roamed the earth'). Similarly, future utterances cannot be generic ('I will eat jelly beans'), unless they are historic future ('Martians will rule').

3. Indefinite noun phrases are not generic. Indefinites, unlike generics, refer to a particular subset; however, they are very similar to generics in form. If the word 'some' can be inserted before the noun without changing the meaning of the utterance, then the noun phrase is coded as an indefinite, not a generic. For example, 'I like cows' is a generic; however, 'I'm going to buy cows' is an indefinite and not a generic.

4. Predicates of equivalence statements are not coded as generic (e.g. in the statement 'A cat is an animal', 'a cat' is generic but 'an animal' is not).

5. If a predicate is part of or belongs to the subject noun, then the predicate is not coded as generic, because the predicate is implicitly a subset rather than the larger set as a whole. For example, in the question 'Do *butterflies* have bones?' *butterflies* is generic, *bones* is not. Similarly, in the question 'Does *a hippo* have a tail?', *a hippo* is generic, *a tail* is not.

6. With modal verbs such as *can*, permission statements are not coded as generic (e.g. 'You can [i.e. may] have a cookie'); possibility or capability statements are sometimes coded as generic, depending on context (e.g. 'You can [i.e. are able to] play the piano').

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