Lexical Form Class Information Guides Word-to-Object Mapping in Preschoolers

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We demonstrate that lexical form class information can play a powerful role in directing the establishment of word-to-object mappings in referentially ambiguous situations. A total of 144 3- and 4-year-olds heard a novel label, modeled syntactically as either a proper name or an adjective, for a stuffed animal of a familiar kind. We then added a second object of the same kind and asked children (1) to choose one of the two objects as the referent of a second novel label, also presented syntactically as either a proper name or an adjective, and (2) to decide whether this second label could also apply to the object they did not choose. In each of three experiments, preschoolers were most likely to reject two words for the same object if both words were proper names (as if one dog could not be both “Fido” and “Rover”). They were significantly less likely to do so if both were adjectives (as if one dog could be both “spotted” and “furry”) or if one was a proper name and the other was an adjective (as if one dog could be both “Fido” and “furry”). Information about lexical form class thus contributed significantly to the formation of linkages between words and objects.

INTRODUCTION

An important task facing young children in learning their native language is to establish appropriate mappings between words (e.g., “dog”) and objects (e.g., dogs). Children’s great skill at acquiring vocabulary has motivated many researchers to try to determine precisely what types of information guide children in forming such linkages (e.g., Baldwin, 1991; Golinkoff, Mervis, & Hirsh-Pasek, 1994; Markman, 1989; Merriman & Bowman, 1989; Waxman, 1994; Woodward & Markman, 1998). This article reports three experiments that investigate the influence of one sort of information on young children’s ability to couple words suitably with objects, namely, lexical form class.

Imagine a situation in which a young child faces two objects but knows a label for only one (e.g., a dog, for which the child knows the label “dog,” and a lemur, for which the child knows no label). Imagine that the child now hears a new label (“X”) and must determine which of the objects is the referent (e.g., “Show me the X”). A number of studies have recently documented that, under these controlled conditions, preschoolers strongly prefer to map the label to the unfamiliar (i.e., unlabeled) object (e.g., the lemur; see Au & Glusman, 1990; Golinkoff, Hirsh-Pasek, Bailey, & Wenger, 1992; Hutchinson, 1986; Markman & Wachtel, 1988; Merriman & Bowman, 1989; Merriman & Schuster, 1991; Mervis & Bertrand, 1994). This preference for the unfamiliar object is not evident if children are asked simply to choose an object, in the absence of a label (e.g., Markman & Wachtel, 1988; Merriman & Schuster, 1991). Many researchers have interpreted this phenomenon as reflecting constraints on word meaning, which operate to reduce the complexity inherent in the task of lexical acquisition. For example, some have proposed that the phenomenon indicates that children are constrained to map a novel word to an unfamiliar object (e.g., the Novel Name-Nameless Category Principle; Golinkoff et al., 1994). Others have suggested that it indicates that children are constrained to avoid mapping a second label onto an object that is already labeled (e.g., the Mutual Exclusivity Assumption; Markman, 1989; Merriman & Bowman, 1989).

Now imagine a situation in which neither of the two objects in the children’s presence carries a label (e.g., a lemur and a wombat, for which they know no labels) or both objects are already labeled (e.g., a dog for which they know the label “dog” and a cat for which they know the label “cat”). Imagine children hear a novel label used in either of these circumstances and need to determine which object is the referent. Under these controlled conditions, word–meaning constraints, such as the Novel Name-Nameless Category Principle or the Mutual Exclusivity Assumption, offer children little guidance in deciding which of the two objects to choose (e.g., Golinkoff et al., 1994; Markman, 1989; Merriman & Bowman, 1989). How, then, might children determine which object is the appropriate referent in such situations? Two sources of information that have been proposed to offer children assistance are the nonlinguistic and the linguistic cues that accompany the labels.

Researchers have recently demonstrated that young
children are sensitive to a number of nonlinguistic cues when asked to map a novel word onto an object in a scene containing more than one object. For example, several studies have documented that children’s tendency to link a novel label with one object situated among other objects can be affected by a speaker’s gaze direction (e.g., Baldwin, 1991, 1993), a speaker’s affective (and/or behavioral) cues (e.g., Tomasello & Barton, 1994), and the relative novelty of objects in the discourse context (e.g., Akhtar, Carpenter, & Tomasello, 1996). Thus, young children clearly can exploit nonlinguistic cues as a guide to the intended referent object of a novel word, an ability that could be of particular assistance in contexts where word–meaning constraints make no clear predictions.

In addition to nonlinguistic cues, linguistic cues may offer word learners significant assistance in determining the referent object of a novel word in a situation with multiple possibilities. One type of linguistic information that holds particular promise as a guide to making word-to-object mappings is lexical form class. Previous research has shown that preschoolers understand that novel words modeled syntactically (and/or morphologically) as members of different form classes differ predictably in their meanings. For example, evidence from studies of how children extend a novel word (“X”) from a labeled object to other objects suggests that they know that the word modeled in the count noun context, “This is an X,” names an object category; that the same word modeled in a proper name sentence like “This is named X” designates the object as a unique individual; and that the same word modeled in an adjective context such as “This is very X” labels a property of the object (e.g., Gelman & Taylor, 1984; Hall, 1991, 1994, 1996; Hall & Moore, 1997; Hall, Waxman, & Hurwitz, 1993; Katz, Baker, & Macnamara, 1974; Liittschwager & Markman, 1993; Macnamara, 1982; Prasada, 1996; Smith, Jones, & Landau, 1992; Sorrentino, 1997; Taylor & Gelman, 1988; Waxman, 1990; Waxman & Kosowski, 1990; Waxman & Markow, 1998). Thus, there is evidence that children’s knowledge of the semantic roles played by words from different form classes can help them determine how to conceptualize an object that is directly labeled with a novel word (e.g., in terms of an object category, an individual, or a property).

With few exceptions, however, researchers have devoted little attention to documenting children’s ability to use lexical form class information to establish word-to-object mappings in referentially ambiguous situations. One exception is a seminal study by Brown (1957), in which preschoolers saw a drawing of a scene showing a novel object containing a novel substance that was being acted upon in a novel manner by a pair of hands. Brown (1957) demonstrated that 3- to 5-year-olds could use form class cues to map a novel word onto the object. When asked to choose the referent of a novel word modeled as a count noun (e.g., “Show me a picture of a SIB”), children chose the object, rather than the substance or the action. This result is consistent with the possibility that children understood that a count noun’s semantic role is to name an object category, and so a count noun can be used to pick out an object. Children did not choose the object as the word’s referent if the word was modeled as belonging to a form class whose members do not pick out objects, such as a mass noun naming a substance category (e.g., “Show me a picture of some SIB”) or a verb naming an action (e.g., “Show me a picture of SIBbING”). Brown’s study thus demonstrates that form class information can influence preschoolers’ ability to join a novel word to an object in a complex scene in which the object is only one of several possible referents.

A more recent demonstration that young children can use form class information to establish word-to-object mappings is a study by Liittschwager and Markman (1993). They found that 3-year-olds can exploit this information to make guesses about the intended referent object of a novel word in a context involving two unfamiliar objects, one animate and the other inanimate. When the speaker presented a novel word as a count noun (e.g., “Where’s a BIF?”), children picked the animate object at chance levels. This finding is consistent with the possibility that children knew that a count noun’s semantic role is to name an object category, and so it does not matter whether the labeled object is animate or inanimate (e.g., “dog” and “shoe” are both count nouns). In contrast, when the speaker modeled the novel word as a proper name (e.g., “Where’s BIF?”), children picked the animate object at chance levels. This result is consistent with the possibility that 3-year-olds knew that a proper name’s semantic role is to name an object as an individual and that to receive a proper name, people must see an object as being important as an individual, in the way that they likely see animate but not inanimate objects (e.g., we give proper names to dogs but usually not to shoes; see also Hall, 1994). Liittschwager and Markman’s (1993) results thus demonstrate that form class information can affect children’s ability to establish word-to-object linkages in situations involving multiple objects. At the same time, however, the results leave unclear whether this information has a pervasive effect on these mappings. Spe-
cifically, they motivate further exploration of whether there are other ways in which young children use form class information to direct them in this task.

In the present research, we pursued the question of whether form class information guides children’s tendency to make mappings between words and objects in situations involving more than one object. We focused on proper names and adjectives, two form classes whose semantic functions contrast clearly. As noted, a proper name is a word (e.g., “X”) that can appear in syntactic frames such as “This is named X.” Its semantic role is to refer to an individual, in all the situations in which the individual appears, regardless of the conditions of its use (e.g., Macnamara, 1986). If learners understand this semantic role, then they might expect that two proper names for one individual should be given the same interpretation. However, acquiring two words with the same interpretation would violate another expectation that learners appear to hold, namely, that all words contrast in their interpretations (e.g., Clark, 1987; Woodward & Markman, 1998; but see also Mervis, Golinkoff, & Bertrand, 1994, for counterevidence). As a result, learners might assume that there could be only one proper name for any given object (e.g., one dog could not be both “Fido” and “Rover”). Thus, children might be predicted to avoid assigning a proper name to an object that already has a proper name.

Of course, children will at some point encounter objects that are picked out by more than one proper name. For example, across situations they will eventually hear the same person referred to by both a first name and also a middle name, a surname, a title, a pseudonym, or a nickname. Thus, children must ultimately learn to accept more than one proper name in conjunction with a single object. Despite this fact, it remains possible that children approach the task of word learning with the notion that objects can have only one proper name. Such a notion might serve as a default assumption that could potentiate early learning but that could be overridden in the face of clear evidence that one object is being picked out by multiple proper names. The idea that children’s assumptions about word meaning should be characterized as revisable defaults, rather than as inviolable constraints, has been explored by several researchers (e.g., see the discussion of the Mutual Exclusivity Assumption by Merriman, 1991; Woodward & Markman, 1991, 1998). At issue, then, is whether children’s default assumption is to avoid assigning a proper name to an object that already has a proper name.

In contrast to a proper name, an adjective, as noted, is a word that can appear in sentence contexts like “This is very X.” Its semantic role is to refer to a property (e.g., Hall et al., 1993; Taylor & Gelman, 1988). Learners who understand the semantics of adjectives might expect that two adjectives for the same individual would not necessarily duplicate each other in their interpretations (i.e., they could name different properties of the individual). Thus, two words of this type for one object would not necessarily violate children’s expectation that different words should contrast in their interpretations. As a result, learners should be willing to accept two adjectives in association with one object (e.g., one dog could be both “spotted” and “furry”), and they should assume that an adjective could apply to an object already labeled with an adjective. In addition, because proper names and adjectives differ in their semantics and thus in their interpretations, learners should assume that an adjective could apply to an object already labeled with a proper name and vice versa (e.g., one dog could be both “Fido” and “furry”).

In three experiments, we explored whether preschoolers’ knowledge about the lexical form classes, proper name and adjective, affects their word-to-object mappings in a situation involving two objects as potential referents. We taught one group of children a novel label (“X”) for a familiar stuffed animal (e.g., a dog), modeling it syntactically as a proper name (e.g., “This dog is named X”). We taught another group the same label for the same object but modeled it as an adjective (e.g., “This dog is very X”). Only one word distinguished the sentences used to carry the novel label in the two groups (i.e., “named” or “very”). We then brought out a second animal of the same familiar kind (e.g., another dog). Now we asked children to choose which of the two was the referent of another new label (“Y”). Within the groups who had heard either a proper name or an adjective for the first object, half heard this second label modeled as a proper name (e.g., “Show me a dog that is named Y”); the other half heard the request formulated using an adjective (e.g., “Show me a dog that is very Y”). Again, only one word distinguished the carrier sentences used to introduce the proper name and the adjective. After children made their choice, we asked them whether this second label could also apply to the object they did not choose (e.g., “Could this dog also be named/very Y?”)

In this referentially ambiguous situation, children could not invoke word–meaning constraints to help them choose the referent object, because both objects already had familiar labels. Moreover, we held the nonlinguistic cues constant in all conditions within each experiment, and so there was no such information to direct their choices differentially in the various conditions. The only source of variation among the
conditions was the lexical form class of the first novel word we used to label the first object, and the lexical form class of the second novel word whose referent we requested. Note that by studying children’s establishment of word-to-object mappings in this situation, we did not mean to imply that we believe that word–meaning constraints or nonlinguistic cues play no role in early word learning. Rather, our intent was to determine whether lexical form class information can make an independent contribution to the establishment of word-to-object mappings in a scenario in which other sources of information cannot be exploited.

If children were sensitive to this lexical form class information, we predicted that both their choices of the referent object of the second novel word and their willingness to extend that word to the unchosen object would differ across groups. Specifically, we predicted that children would reject two proper names for the same object. Thus, we expected that they would be driven strongly to map a second proper name onto the previously unlabeled object and, having done so, to refuse to apply it to the already-labeled object. In contrast, we predicted that children would not reject two adjectives for the same object. As a result, we suspected that they would not be driven to map a second adjective onto the unlabeled object. In the case that they did so, we predicted that they would not refuse to extend it to the already-labeled object. We also predicted that children would not reject the combination of one proper name and one adjective for the same object. Thus, we anticipated that they would not be driven to map either a first proper name or a first adjective onto the unlabeled object or, having done so, to deny extending it to the already-labeled object.

In Experiments 1 and 2, the participants were 4-year-olds and young 5-year-olds. We focused on children of this age to ensure that they would have a solid understanding of the lexical form classes, adjective and proper name. Several previous studies have documented an increase in sensitivity to the semantic correlates of words from different lexical categories over the course of the preschool years (e.g., Gelman & Markman, 1985; Hall et al., 1993; Landau, Smith, & Jones, 1988; for general discussion, see Waxman, 1994). In Experiment 3, we then examined the performance of 3-year-olds.

**EXPERIMENT 1**

**Method**

*Participants.* Forty-eight 4- and 5-year-olds were tested individually in their preschools during regular school hours. They ranged in age from 4 years 0 months to 5 years 5 months. Twelve children were randomly assigned to each of four conditions differed in the lexical form classes of the two words taught on the test trials: Proper Name First–Proper Name Second (PN-PN): \( M = 4 \) years 9 months, \( SD = 6 \) months; Proper Name First–Adjective Second (PN-Adj): \( M = 4 \) years 8 months, \( SD = 6 \) months; Adjective First–Proper Name Second (Adj-PN): \( M = 4 \) years 8 months, \( SD = 6 \) months; and Adjective First–Adjective Second (Adj-Adj): \( M = 4 \) years 8 months, \( SD = 5 \) months. Each condition contained roughly equal numbers of boys and girls. Two additional children were tested but were excluded from the sample because of experimenter error.

*Stimuli.* We used two pairs of stuffed animals for warm-up trials: one pair of identical animals (brown monkeys) and one pair of different animals (a brown lion and an orange-and-yellow duck). For test trials, we used four other pairs of stuffed animals: identical white dogs with black spots, identical brown-and-white cats, identical beige-and-brown bears, and identical white rabbits. All our objects were from kinds that children could plausibly see as meriting reference by both adjectives and proper names (i.e., they were animate surrogates; see Hall, 1994). In addition, we used a hand puppet to present the labels and to make requests of the children.

*Procedure.* Children sat at a table across from the experimenter. The experimenter began by introducing the puppet to the children. We then gave them two warm-up trials to acquaint them with the procedure to be used on test trials. Each warm-up trial required children first to make a two-option forced choice and then to answer a yes-no question. On the warm-up trials, we used familiar count nouns as labels so as not to bias children with regard to the novel adjectives and proper names we used on test trials. One warm-up trial was designed to elicit a “yes” answer to the yes-no question, and the other trial was designed to elicit a “no.” For one warm-up trial, the experimenter presented children with the pair of identical monkeys (in the configuration used on test trials; see below), and the puppet asked children to show it “a monkey.” After children made a choice, the puppet pointed to the animal they did not choose (the other monkey) and asked whether this could also be “a monkey.” We required a “yes” answer to this question before we proceeded, and we corrected children in the rare instance in which they answered “no.”

The second warm-up trial was identical to the first except that the pair of animals were from different categories (i.e., lion and duck). The puppet asked chil-
dren to show it “a lion.” After children chose the lion, the puppet asked whether the animal not chosen (the duck) could also be “a lion.” The experimenter required a “no” answer and corrected any children who said “yes.” After children had completed both warm-up trials, we proceeded to the test trials.

Each of the four test trials involved one of the four pairs of test objects. The experimenter first presented children with both objects (e.g., the two dogs) to play with for several seconds and said, “See? They look the same.” She withdrew both animals and then placed the first object on the table. The puppet then labeled it using the basic-level count noun (e.g., “dog”). Next, the puppet introduced children to a novel word for this object. Half the children heard the word modeled as a proper name (e.g., “This dog is named DAXY”), while the other half heard it modeled as an adjective (e.g., “This dog is very DAXY”). The puppet repeated the sentence three times and asked children to repeat it once. Children received no other information about how to interpret the novel word.

After the puppet labeled the first object, the experimenter brought out the second object and placed it in a fixed position to one side of (on two trials to the left; on two trials to the right) and 4 in. behind the already-labeled object, but well within the child’s reach. The order of the two trials on which the unlabeled object appeared on the left was varied across children but was copied in all conditions. We placed this second object slightly further away from the child than the first object to test stringently our prediction that children would reject two proper names for one object: Children had to make a slightly greater effort to select the second object as the referent of the second word than to select the already-labeled object. The puppet labeled this second object with its basic-level count noun (e.g., “dog”).

Within the groups that had heard either a proper name or an adjective for the first object, half then heard the puppet make a request for a referent of a second novel word modeled as a proper name (e.g., “Show me a dog that is named BLICKY”), and half heard a request involving an adjective (e.g., “Show me a dog that is very BLICKY”). The puppet repeated the request three times. Once children chose an object, the puppet thanked them, pointed to the object they did not choose, and asked whether it could also be the referent of the second word (e.g., “Could this dog also be named/very BLICKY?”). The order of test trials was counterbalanced across children in each condition. Our novel words were all disyllabic and carried a “-y” suffix, meant to make each word plausibly either a proper name (e.g., “Freddy,” “Sally”) or an adjective (e.g., “furry,” “smelly”). The novel words were BLICKY, DAXY, FEPPY, GOPPY, Mody, REVY, WUGGY, and ZAVY.

Results

Forced choice selections. We examined children’s forced choice selections to determine their preferences regarding the appropriate referent of the second label. Our prediction was that the tendency to select the unlabeled object (i.e., the “second” object that had not been assigned the first novel label) would be higher in the PN-PN condition than in the three other conditions. We made this prediction because we suspected that children would assume there could not be two proper names for one object, but would allow that (1) a second adjective could apply to one object (in the Adj-Adj condition), (2) an adjective could apply to an object already labeled with a proper name (in the PN-Adj condition), and (3) a proper name could apply to an object already labeled with an adjective (in the Adj-PN condition).

Our first set of analyses focused on the mean proportions of unlabeled object choices in each condition. These appear in Table 1. Consistent with our prediction, the mean proportion was significantly greater than chance (.50) in the PN-PN condition (M = .85, SD = .25), t(11) = 4.93, p < .001. However, the mean proportion did not differ significantly from chance in the three other conditions: in the Adj-Adj condition (M = .54, SD = .41), t(11) = .35, p > .50; in the PN-Adj condition (M = .29, SD = .40), t(11) = 1.82, p > .05; or in the Adj-PN condition (M = .31, SD = .40), t(11) = 1.62, p > .10. In addition, a planned contrast revealed that the mean proportion was greater in the PN-PN condition than in the three other conditions, t(44) = 3.82, p < .001, one-tailed test. (We report one-tailed p values for all contrasts because they are always directional tests; Rosenthal & Rosnow, 1991.)

![Table 1 Results of Experiment 1](image-url)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean Proportion of Refusals to Assign New Label to Already-Labeled Object (SD; Number Contributing)</th>
<th>Mean Proportion Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-PN</td>
<td>.85 (.25)***</td>
<td>10***</td>
</tr>
<tr>
<td>PN-Adj</td>
<td>.29 (.40)</td>
<td>3</td>
</tr>
<tr>
<td>Adj-PN</td>
<td>.31 (.40)</td>
<td>3</td>
</tr>
<tr>
<td>Adj-Adj</td>
<td>.54 (.41)</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: N = 12 in all conditions. Departures from chance-level responding: * p < .05; ** p < .01; *** p < .005; **** p < .001.
We also computed two follow-up contrasts to explore our results in greater detail. The first revealed that the mean proportion of unlabeled object choices was significantly higher in the Adj-Adj condition than in the PN-Adj and the Adj-PN conditions, $t(44) = 1.84, p < .05$. The second contrast established that the mean proportion was nonetheless significantly lower in the Adj-Adj condition, by itself, than in the PN-PN condition, $t(44) = 2.07, p < .05$.

Our second set of analyses explored individual children’s consistency in choosing the unlabeled object across trials in each condition. We classified any child who made three or four out of four unlabeled object choices an Unlabeled Object Chooser (see Table 1). First, using the binomial theorem, we determined that the probability of any child’s being classified as an Unlabeled Object Chooser was .3125. We then used the binomial theorem again to calculate whether the number of Unlabeled Object Choosers in each condition exceeded what would be expected by chance. Consistent with our prediction, there were significantly more Unlabeled Object Choosers in the PN-PN condition ($N = 10$) than would be expected by chance, $p < .005$. In the three other conditions, however, the numbers of Unlabeled Object Choosers were no different than what would be expected by chance: in the Adj-Adj condition, $N = 6$; in the PN-Adj condition, $N = 3$; and in the Adj-PN condition, $N = 3$. In addition, significantly more children were classified as Unlabeled Object Choosers in the PN-PN condition than in the three other conditions combined, $\chi^2(1, N = 48) = 9.06, p < .005$.

We again computed two follow-up tests. First, unlike the result from the previous analyses, the number of Unlabeled Object Choosers was not significantly higher in the Adj-Adj condition than in the combined PN-Adj and Adj-PN conditions, $\chi^2(1, N = 36) = 1.27, p > .25$, corrected for continuity. Second, consistent with the earlier analyses, the number was lower in the Adj-Adj condition by itself than in the PN-PN condition, but the difference only approached significance, according to a Fisher’s exact test, $p < .10$. (We used a Fisher’s exact test, rather than a $\chi^2$ test, because of the relatively small $N$ involved in the comparison.)

Yes-no answers. Based on the analyses of children’s forced choices, it is unclear whether those children who selected the unlabeled object did so because they preferred to attach the novel label to the unlabeled object or because they rejected the already-labeled object. To address this issue, we focused on those trials on which children selected the unlabeled object when asked to make a forced choice. We examined whether, on those trials, children answered “no” when asked whether the already-labeled object could also be labeled with the second novel word. A “no” answer to this question suggests that children’s selection of the unlabeled object reflected a refusal to assign two new words to one object. Our prediction was that the tendency to answer “no” would be greater in the PN-PN condition than in the three other conditions. We made this prediction because we suspected that children would reject two proper names for one object but would not reject the possibility of (1) a second adjective’s applying to one object (in the Adj-Adj condition), (2) an adjective’s applying to an object already labeled with a proper name (in the PN-Adj condition), or (3) a proper name’s applying to an object already labeled with an adjective (in the Adj-PN condition).

For each child who made an unlabeled object selection on at least one trial, we computed the proportion of those trials on which they also said “no” when asked whether the label could be extended to the already-labeled object. The mean proportions of these refusals in each condition appear in Table 1. It is important to note that the number of children contributing to these means is fewer than 12 in some conditions, because some children never picked the unlabeled object. As predicted, the mean proportion of “no” answers was significantly above chance (.50) in the PN-PN condition ($M = .83, SD = .39$), $t(11) = 2.97, p < .05$. However, the mean proportion was at chance in all other conditions: in the Adj-Adj condition ($M = .47, SD = .50$), $t(9) = .21, p > .50$; in the PN-Adj condition, the mean proportion was exactly .50 ($SD = .55$), and so no statistic was computed; and in the Adj-PN condition ($M = .56, SD = .50$), $t(5) = .27, p > .50$. In addition, a planned contrast supported the prediction that the mean proportion was greater in the PN-PN condition than in the three other conditions, $t(30) = 1.95, p < .05$.

We also computed two further contrasts. The first indicated that the mean proportion of “no” answers was not significantly higher in the Adj-Adj condition than in the PN-Adj and Adj-PN conditions, $t(30) = .35, p > .25$. The second revealed that the mean proportion was significantly lower in the Adj-Adj condition, by itself, than in the PN-PN condition, $t(30) = 1.79, p < .05$.

Discussion

We found clear support for the hypothesis that lexical form class information can direct children’s word-to-object mappings in a referentially ambiguous situation. Consistent with our prediction, when 4-year-olds were asked to choose one of two identical-looking familiar objects—one previously labeled with a novel word and one unlabeled—as the refer-
ent of a second novel label, they exhibited a strong preference to choose the unlabeled object if both words were modeled as proper names. However, if both novel words were modeled as adjectives or if one was modeled as a proper name and the other was modeled as an adjective, children did not show this same preference. There was some indication that the tendency to pick the unlabeled object was greater when children were interpreting a second adjective than when they were interpreting either a first adjective or a first proper name. However, this evidence emerged only from the analyses of the mean proportions of unlabeled object choices, and did not obtain in the analyses of Unlabeled Object Choosers.

In addition, children’s tendency to refuse to assign the second novel label to the already-labeled object, having chosen the unlabeled object, was strongest if both words were modeled as proper names. This tendency was weaker if both words were modeled as adjectives, and if one word was modeled as a proper name and the other was modeled as an adjective. All in all, then, children’s decisions about word-to-object mappings were powerfully affected by the word’s form class as well as by the form class of a previously learned word for the object.

EXPERIMENT 2

The design of Experiment 2 was similar to that of Experiment 1, but now the second object in each pair of test stimuli contrasted with the first object in terms of a salient property (or properties), while still belonging to the same category as the first object. Our interest was in determining whether lexical form class knowledge influences word-to-object mappings in the same manner, regardless of the properties of the objects available as potential referents. We predicted that the presence of a property contrast between the two test objects would exert an effect on word-to-object mapping. Specifically, we predicted that it would lead children to select the unlabeled object more often in the forced choice task than was the case in Experiment 1, where the objects had identical properties. We reasoned that the contrast between the two objects would highlight the novelty of the second object, leading children to see it as a more likely bearer of the second label than was the case in Experiment 1, where its properties were not distinctive from those of the first object.

Yet despite our prediction of an overall increase in the tendency to select the unlabeled object in the forced choice task, our central predictions were identical to those in Experiment 1, for the reasons outlined earlier. First, we expected that children would show a greater tendency to choose the unlabeled object in the forced choice task in the PN-PN condition than in the three other conditions. Second, we expected that children would again reveal a greater tendency to refuse the already-labeled object as a potential referent of the second label (having chosen the unlabeled object) in the PN-PN condition than in the three other conditions.

Method

Participants. Forty-eight 4- and 5-year-olds were tested individually in their preschools during regular school hours. None had taken part in Experiment 1. They ranged in age from 4 years 1 month to 5 years 5 months. Twelve children were randomly assigned to each of four conditions, as described in Experiment 1: PN-PN (M = 4 years 8 months, SD = 5 months); PN-Adj (M = 4 years 8 months, SD = 4 months); Adj-PN (M = 4 years 8 months, SD = 4 months); and Adj-Adj (M = 4 years 8 months, SD = 6 months). Each condition contained roughly the same number of boys and girls. An additional six children failed to cooperate long enough to complete the procedure and so were excluded from the sample.

Stimuli. These were identical to those in Experiment 1, except that we changed the second object (the unlabeled object) in each of the four test pairs from one that was identical to the first to one that contrasted in a salient property (or properties) (fur color and/or fur pattern). The test pairs were as follows: one white dog with black spots and one plain brown dog; one brown-and-white cat and one gray-and-white cat; one beige-and-brown bear and one beige-and-white bear; and one white rabbit and one yellow rabbit.

Procedure. This was identical to that in Experiment 1, except that when the experimenter first presented the test pairs for children’s inspection, she said, “See? They look different.”

Results

Forced choice selections. We examined children’s forced choice selections to determine their preferences for the referent of the second label. Recall our predictions: First, children’s overall tendency to select the unlabeled object should be higher in Experiment 2 than in Experiment 1. Second, children should choose the unlabeled object more often in the PN-PN condition than in the three other conditions.

Our first set of analyses focused on the mean proportions of unlabeled object choices in each condition. They appear in Table 2. Consistent with our first prediction, the overall mean proportion of unlabeled
The mean proportion of unlabeled object choices was higher in Experiment 2 (M = .76, SD = .30) than it was in Experiment 1 (M = .50, SD = .43), t(94) = 3.48, p < .001. The increased tendency to select the unlabeled object in Experiment 2 was reflected in the results of comparisons to chance-level responding (.50). As in Experiment 1, the mean proportion of unlabeled object selections was significantly greater than chance in the PN-PN condition (M = .96, SD = .10), t(11) = 16.32, p < .0001. However, unlike Experiment 1, the mean proportion was also greater than chance in the Adj-Adj condition (M = .73, SD = .29), t(11) = 2.73, p < .05, and in the PN-Adj condition (M = .69, SD = .26), t(11) = 2.46, p < .05. Only in the Adj-PN condition (M = .67, SD = .39) did the mean proportion fail to differ significantly from chance, t(11) = 1.48, p > .10. Yet although the mean proportions of unlabeled object choices were higher in all conditions of Experiment 2 than they were in the conditions of Experiment 1, a planned contrast indicated that, consistent with our second prediction, the mean proportion was nonetheless significantly higher in the PN-PN condition than in the three other conditions, t(44) = 2.82, p < .005.

We also computed two follow-up contrasts to enrich our understanding of the results. The first established that the mean proportion of unlabeled object choices was not significantly higher in the Adj-Adj condition than in the PN-Adj and the Adj-PN conditions, t(44) = .53, p > .25. Second, the mean proportion was significantly lower in the Adj-Adj condition (by itself) than in the PN-PN condition, t(44) = 1.99, p < .05.

Our second set of analyses explored the consistency of individual children’s choices across trials in each condition. We classified any child who made three or four out of four unlabeled object choices an Unlabeled Object Chooser (see Table 2). Consistent with our first prediction, there were more Unlabeled Object Choosers in Experiment 2 (N = 35/48) than in Experiment 1 (N = 22/48), χ²(1, N = 96) = 7.30, p < .01. The increased prevalence of Unlabeled Object Choosers was evident in comparisons to chance, which we made by using the binomial theorem as outlined in Experiment 1. As in Experiment 1, the number of Unlabeled Object Choosers was significantly greater than what would be expected by chance in the PN-PN condition (N = 12), p < .0001. However, unlike Experiment 1, the number was also greater than chance in the three other conditions: in the Adj-Adj condition (N = 8), p < .05; in the PN-Adj condition (N = 8), p < .05; and in the Adj-PN condition (N = 7), p < .05. Yet although the numbers of Unlabeled Object Choosers were higher in all conditions than they were in Experiment 1, we again found that significantly more children were classified as Unlabeled Object Choosers in the PN-PN condition than in the three other conditions combined, χ²(1, N = 48) = 4.26, p < .05, corrected for continuity. This result was thus consistent with our second prediction.

We also performed two additional tests. First, consistent with the previous analyses, the number of Unlabeled Object Choosers in the Adj-Adj condition did not differ from the number in the combined PN-Adj and Adj-PN conditions, χ²(1, N = 36) = .02, p > .50, corrected for continuity. Second, also consistent with the preceding analyses, the number was significantly lower in the Adj-Adj condition by itself than in the PN-PN condition, by a Fisher’s exact test, p < .05.

Yes-no answers. We examined children’s answers to the yes-no questions to determine whether their tendency to select the unlabeled object in the forced choice task reflected a tendency to reject two words for the same object. Our prediction was the same as in Experiment 1: children would have a stronger tendency to refuse the already-labeled object as a potential referent of the second label (having chosen the unlabeled object) in the PN-PN condition than in the three other conditions.

The mean proportions of “no” answers to the question of whether the second label could be assigned to the already-labeled object (following a choice of the unlabeled object) in each condition appear in Table 2. Recall that the number of children contributing to these means may have been fewer than 12, because some children never picked the unlabeled object. As predicted, the mean proportion of “no” answers was significantly above chance (.50) in the PN-PN condition (M = .92, SD = .29), t(11) = 5.00, p < .001. However, the mean proportion was at chance in all other conditions: in the Adj-Adj condition (M = .45, SD = .48), t(11) = .35, p > .50; in the PN-Adj condition (M = .44, SD = .43), t(11) = .50, p > .50; and in the

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean Proportion of Refusals to Assign New Label to Already-Labeled Object (SD; Number Contributing)</th>
<th>Mean Proportion of Unlabeled Object Choices (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-PN</td>
<td>.96 (.10)***</td>
<td>.22 (.08)</td>
</tr>
<tr>
<td>PN-Adj</td>
<td>.69 (.26)*</td>
<td>.40 (.13)</td>
</tr>
<tr>
<td>Adj-PN</td>
<td>.67 (.39)</td>
<td>.41 (.15)</td>
</tr>
<tr>
<td>Adj-Adj</td>
<td>.73 (.29)*</td>
<td>.42 (.16)</td>
</tr>
</tbody>
</table>

Note: N = 12 in all conditions. Departures from chance-level responding: *p < .05; **p < .01; ***p < .005; ****p < .001.
Adj-PN condition \((M = .48, SD = .48), t(10) = .16, p > .50\). In addition, a planned contrast indicated that the mean proportion was higher in the PN-PN condition than in the three other conditions, \(t(43) = 3.23, p < .005\).

We also conducted two follow-up contrasts. The first revealed that the mean proportion of “no” answers was not significantly higher in the Adj-Adj condition than in the PN-Adj and Adj-PN conditions, \(t(43) = .04, p > .25\). The second indicated that the mean proportion was significantly lower in the Adj-Adj condition, by itself, than in the PN-PN condition, \(t(43) = 2.66, p < .01\).

Discussion

As predicted, the use of object pairs that contrasted in a salient property (or properties) in Experiment 2 did result in an increase in children’s tendency to select the unlabeled object in the forced choice task in all conditions compared to Experiment 1. The contrast introduced between the two objects in Experiment 2 may have accentuated the novelty of the second object, leading children to see it as a more likely bearer of the second label than was the case when its properties were not distinctive (Experiment 1). Children’s word-to-object mappings thus were significantly affected by the perceptible properties of the word’s potential referents.

The increased overall tendency to select the unlabeled object was, however, distinct from the effects of lexical form class information. As predicted, children again showed a stronger tendency to select the unlabeled object in the condition where both labels were proper names than in the three other conditions. In addition, unlike Experiment 1, there was no significant tendency on any analysis for children to select the unlabeled object more frequently when they were interpreting a second adjective than when they were interpreting a first proper name or a first adjective. Also as predicted, children had a stronger tendency to refuse to extend the second label to the already-labeled object (having chosen the unlabeled object) in the condition where both labels were proper names than in any other condition.

The results of Experiments 1 and 2 establish clearly that 4-year-olds can exploit lexical form class information to guide them in choosing the referent of a novel word in a referentially ambiguous situation. We focused on 4-year-olds in these studies because of evidence that sensitivity to the semantic correlates of words from different lexical categories increases over the preschool years (e.g., Gelman & Markman, 1985; Hall et al., 1993; Landau et al., 1988). Given the strong results we obtained with 4-year-olds, however, we decided to try to replicate Experiment 1 with 3-year-olds as participants to determine whether lexical form class information exerted as powerful an effect on word-to-object mapping among younger preschoolers as it did among 4-year-olds.

EXPERIMENT 3

Method

Participants. Forty-eight 3-year-olds were included in the final sample, tested individually in their preschools during regular school hours. They ranged in age from 3 years 0 months to 3 years 11 months. Children were randomly assigned to one of four conditions, as described in Experiment 1: PN-PN \((M = 3\) years 7 months, \(SD = 3\) months); PN-Adj \((M = 3\) years 7 months, \(SD = 3\) months); Adj-PN \((M = 3\) years 8 months, \(SD = 3\) months); and Adj-Adj \((M = 3\) years 7 months, \(SD = 3\) months.) Each condition contained roughly the same number of boys and girls. Nine additional children were excluded from the sample, eight because they failed to cooperate long enough to complete the procedure and one because of experimenter error.

Stimuli. These were identical to those in Experiment 1.

Procedure. This was identical to that in Experiment 1.

Results

Forced choice selections. We examined children’s forced choice selections to determine their preferences for the referent of the second label. Our predictions were identical to those from Experiment 1. First, we expected that, overall, children’s tendency to select the unlabeled object would be no different in Experiment 3 than it was in Experiment 1. Second, we predicted that children would select the unlabeled object more often in the PN-PN condition than in the three other conditions.

Our first set of analyses focused on the mean proportions of unlabeled object selections in each condition. These appear in Table 3. Consistent with our first prediction, the overall mean proportion of unlabeled object choices was roughly the same for the 3-year-olds in Experiment 3 \((M = .57, SD = .43)\) as it was for the 4-year-olds in Experiment 1 \((M = .50, SD = .43)\), \(t(94) = .84, p > .25\). The results of comparisons to chance-level responding (.50) were consistent with our second prediction: The mean proportion of unlabeled object selections was significantly greater than chance in the PN-PN condition \((M = .81, SD = .33), t(11) = 3.19, p < .01\). However, the mean proportion
Table 3  Results of Experiment 3

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean Proportion of Refusals to Assign New Label to Already-Labeled Object (SD)</th>
<th>Number of Unlabeled Object Choosers (SD; Number Contributing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-PN</td>
<td>.81 (.33)**</td>
<td>9***</td>
</tr>
<tr>
<td>PN-Adj</td>
<td>.40 (.42)</td>
<td>4</td>
</tr>
<tr>
<td>Adj-PN</td>
<td>.48 (.42)</td>
<td>5</td>
</tr>
<tr>
<td>Adj-Adj</td>
<td>.60 (.45)</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: N = 12 in all conditions. Departures from chance-level responding: *p < .05; **p < .01; ***p < .005; ****p < .001.

did not differ from chance in the three other conditions: in the Adj-Adj condition (M = .60, SD = .45), t(11) = .81, p > .25; in the PN-Adj condition (M = .40, SD = .42), t(11) = .86, p > .25; and in the Adj-PN condition (M = .48, SD = .42), t(11) = .17, p > .50. In addition, a planned contrast indicated that the mean proportion was significantly higher in the PN-PN condition than in the three other conditions, t(44) = 2.35, p < .05.

We again computed two supplementary contrasts to obtain a more detailed understanding of our results. The first revealed that the mean proportion of unlabelled object choices was not significantly higher in the Adj-Adj condition than in the Adj-PN or PN-Adj conditions, t(44) = 1.16, p > .10. The second contrast indicated that the mean proportion in the Adj-Adj condition was not, by itself, significantly lower than the mean proportion in the PN-PN condition, t(44) = 1.25, p > .10.

Our second set of analyses focused on the consistency of individual children’s choices across trials. We classified any child who made three or four out of four unlabelled object choices an Unlabeled Object Chooser (see Table 3). Consistent with our first prediction, the number of Unlabeled Object Choosers in Experiment 3 (N = 24/48) did not differ significantly from the number in Experiment 1 (N = 22/48), χ²(1, N = 96) = .17, p > .50. We then used the binomial theorem as described in Experiment 1 to calculate whether the number of Unlabeled Object Choosers in each condition differed from what would be expected by chance. Consistent with our second prediction, there were significantly more Unlabeled Object Choosers in the PN-PN condition (N = 9) than would be expected by chance, p < .005. In contrast, the numbers of Unlabeled Object Choosers in the three other conditions did not differ significantly from chance: in the Adj-Adj condition, N = 6; in the PN-Adj condition, N = 4; and in the Adj-PN condition, N = 5. In addition, we found that significantly more children were classified as Unlabeled Object Choosers in the PN-PN condition than in the three other conditions combined, χ²(1, N = 48) = 4.00, p < .05.

We again computed two follow-up tests. The first revealed that, consistent with the preceding analyses, the number of Unlabeled Object Choosers was not significantly higher in the Adj-Adj condition than in the PN-Adj and Adj-PN conditions, χ²(1, N = 36) = .13, p > .50, corrected for continuity. Second, also consistent with the earlier analyses, the number was not significantly lower in the Adj-Adj condition, by itself, than in the PN-PN condition, p > .15, by a Fisher’s exact test.

Yes-no answers. We explored children’s answers to the yes-no questions to determine whether their tendency to choose the unlabeled object in the forced choice task reflected a tendency to reject two words for the same object. Our main prediction was the same as in Experiment 1: Children would be more likely to refuse the already-labeled object as a potential referent of the second label (having chosen the unlabeled object) in the PN-PN condition than in the three other conditions.

The mean proportions of “no” answers to the question of whether the second label could be assigned to the already-labeled object (given a choice of the unlabeled object) in each condition appear in Table 3. The mean proportion of “no” answers approached being significantly above chance (.50) in the PN-PN condition (M = .75, SD = .45), t(11) = 1.92, p < .10. However, this mean proportion did not approach significance in any other condition: in the Adj-Adj condition (M = .28, SD = .42), t(8) = 1.58, p > .10; in the PN-Adj condition (M = .28, SD = .39), t(7) = 1.59, p > .15; and in the Adj-PN condition (M = .50, SD = .46), the mean proportion was .50 and so no statistic was computed. In addition, as predicted, a planned contrast indicated that the mean proportion was significantly higher in the PN-PN condition than in the three other conditions, t(33) = 2.55, p < .01.

We again computed two supplementary contrasts. The first established that the mean proportion of “no” answers was not significantly higher in the Adj-Adj condition than in the PN-Adj or Adj-PN conditions, t(33) = .68, p > .25. The second indicated that the mean proportion was significantly lower in the Adj-Adj condition, by itself, than in the PN-PN condition, t(33) = 2.47, p < .01.

Discussion

The 3-year-olds’ performance in Experiment 3 was similar to the performance of 4-year-olds in Experiment 1. When asked to choose one of two identical-
looking familiar objects—one previously labeled with a novel word and one unlabeled—as the referent of a second novel label, they showed a strong tendency to choose the unlabeled object and to refuse to extend the second word to the already-labeled object if both words were modeled as proper names. In contrast, if both novel words were modeled as adjectives or if one was modeled as a proper name and the other was modeled as an adjective, children did not show this same tendency. Unlike Experiment 1, however, direct comparisons of children’s tendency to choose the unlabeled object when interpreting a second adjective and when interpreting a second proper name were not significant. Taken together, then, the results indicate that 3-year-olds’ decisions about word-to-object mappings in a referentially ambiguous situation were significantly affected by the word’s form class, as well as by the form class of a previously learned word for one of the objects. However, their decisions were not affected as strongly as those of 4-year-olds in Experiment 1.

GENERAL DISCUSSION

Three-year-olds and 4-year-olds heard a novel word for a stuffed animal of a familiar kind (e.g., a dog), modeled either as a proper name (e.g., “This dog is named X”) or as an adjective (e.g., “This dog is very X”). A second object from the same kind then appeared (e.g., another dog), and children had to select one of the two objects as the referent of a second novel word, also modeled as either a proper name or an adjective (e.g., “Show me a dog that is named/very Y”). Children were then asked whether the second novel word could also apply to the object they did not choose (e.g., “Could this dog also be named/very Y?”).

Children’s choices and answers were significantly affected by the lexical form classes of the two novel words. First, if both words were modeled as proper names, children showed the strongest tendency to select the unlabeled object as the referent of the second word and, having chosen that object, to deny that the second word could apply to the already-labeled object (e.g., as if one dog could not be both “Fido” and “spotted”). This result is consistent with the possibility that children understood that the two types of word differ fundamentally in their semantics and so necessarily differ in their interpretations. Given that the two words thus would not violate children’s assumption that different words should have different interpretations, children’s tendency not to reject the combination of a proper name and an adjective for one object suggests an understanding of the distinct semantics of these two form classes.

The ability to exploit lexical form class information observed in these studies was independent of any sensitivity to either word-meaning constraints (e.g., Golinkoff et al., 1994; Markman, 1989; Merriman & Bowman, 1989) or nonlinguistic cues to word meaning (e.g., Akhtar et al., 1996; Baldwin, 1991, 1993; Tomasello & Barton, 1994) previously documented in the literature. Word-meaning constraints, like the Mutual Exclusivity Assumption or the Novel Nameless Category Principle, could not lead children to choose one object over another in the situations explored in these experiments, because both objects in each experiment were familiar (i.e., they had been previously labeled with a count noun). Nonlinguistic cues that children can exploit to direct word-to-object mappings, such as gaze direction, affect, or discourse novelty, were also of little use because they were held constant across conditions within each ex-
periment. Note that the fact that we did not manip-
ulate these other types of information within these
experiments does not imply that we believe them to
be inconsequential. On the contrary, we believe that
they play a vital role in the everyday establish-
ment of word-to-object mappings. Our interest was sim-
ply to determine whether lexical form class in-
formation can make an independent contribution
to the formation of word-to-object linkages, apart
from the assistance provided by these other sources
of information.

We did, moreover, observe the effect of one type of
nonlinguistic information on children’s object choices.
When the two object choices contrasted sharply in
terms of a perceptual property (or properties) (in Ex-
periment 2), we found an increased tendency to select
the unlabeled object in all conditions compared to
when the two objects were identical (in Experiment
1). We speculate that this increase may reflect the fact
that children saw the unlabeled object as being more
novel when it was perceptually distinct from the
already-labeled object than when it was perceptual-
similiar. However, the effect of varying the perceptual
similarity between the two choices was independent
of the influence of the words’ lexical form classes,
which were similar in both experiments. Thus, the ef-
ffects of nonlinguistic information operated separately
from, and in concert with, the effects of lexical form
class information in guiding children’s word-to-
object mappings.

Children’s rejection of two proper names for one
object in these experiments suggests that they as-
sumed that an object can have only one proper name,
an assumption that may reflect both a grasp of the se-
manetics of proper names and a conformity to a con-
trast principle. Although our data do not allow us to
draw conclusions about the origins of this assump-
tion in development, it is worth noting that the as-
sumption is probably consistent with how young
children hear proper names used by adults in many
common word-learning scenarios. Of course, what-
ever its origins, children must be willing to treat the
assumption as a default that can be overridden,
because they will eventually encounter contexts in
which one object is labeled by more than one proper
name (e.g., by a name and also by a nickname). This
fact raises the question of how children come to ac-
ccept multiple proper names for one object. One possi-
bility is that children override the principle of contrast. In
doing so, children would admit into their lexicon
multiple expressions with the same interpretation, vi-
olating a constraint on language design that is abso-
lute, according to some researchers (e.g., Clark, 1987;
Woodward & Markman, 1998). Another possibility,
however, is that children override the belief that all
proper names for one object must have exactly the
same interpretation and instead assign different inter-
pretations to the various proper names learned in as-
soociation with the object. If this possibility is correct,
then it raises the question of precisely how children
come to mark different proper names learned in asso-
ciation with one object as semantically distinct.

The results of these experiments, like those of
Brown (1957) and Liittschwager and Markman (1993),
document children’s reliance on a relatively under-
studied source of information to establish word-to-
object mappings: lexical form class. These findings
thus add to the growing body of evidence indicating
that children can draw inferences about a word’s
meaning on the basis of such information. Some of
the previous research on this topic has involved doc-
umenting preschoolers’ ability to conceptualize an
object differently and appropriately depending upon
whether it is labeled with a word modeled syntacti-
cally as an adjective (naming a property), proper
name (naming an individual), or count noun (naming
an object category) (e.g., Gelman & Taylor, 1984; Hall,
1991, 1994, 1996; Hall & Moore, 1997; Hall et al.,
1993; Katz et al., 1974; Liittschwager & Markman,
1993; Macnamara, 1982; Prasada, 1996; Smith et al.,
1992; Sorrentino, 1997; Taylor & Gelman, 1988; Wax-
man, 1990; Waxman & Kosowski, 1990; Waxman &
Markow, 1998). Other past studies have demon-
strated preschoolers’ ability to conceptualize a scene
distinctively and appropriately if a novel word for it
is presented syntactically as a mass noun (naming a
substance category), a preposition (naming a loca-
tion), or a verb (naming an action) (e.g., Bloom, 1994;
Brown, 1957; Landau & Stecker, 1990). Still other prior
work has revealed children’s ability to draw precise
inferences about the meanings of words within the
lexical form class, verb, depending upon the specific
syntactic contexts in which the verb appears (e.g.,
Fisher, Hall, Rakowitz, & Gleitman, 1994; Gleitman,

Yet despite the growing body of evidence docu-
menting the important role played by lexical form
class information in word learning, basic questions
about the origins of children’s sensitivity to this infor-
mation remain. Children cannot be born with knowl-
edge of how different lexical sensitivity to this infor-
mation remain. Children cannot be born with knowl-
edge of how different lexical sensitivity to this infor-
knowledge. But how? Some recent research sug-
gests that, at the very beginning of lexical acquisition,
children interpret novel words from any lexical cate-
gory, when applied to novel objects, as referring to
object categories (i.e., as if they were count nouns; e.g., Hall, 1991; Hall et al., 1993; Markman & Wachtel, 1988; see also Waxman & Markow, 1995). Yet during the second year of life, children rapidly acquire sensitivity to links between different lexical form classes and meanings. For example, Katz et al. (1974) have demonstrated sensitivity to the distinction between count nouns and proper names in 17-month-old girls. More recently, Waxman and Markow (1998) have revealed sensitivity to the distinction between count nouns and adjectives in 22-month-olds (see also Waxman, 1994). Further study of lexical development during the second year may yield greater insight into the question of how children initially learn and come to rely on links between specific form classes and particular meanings.

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