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How Two-Year-Old Children Interpret Proper and Common Names for Unfamiliar Objects

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The linguistic form class of a word and the kind of object the word refers to both provide information for discovering whether a new noun refers to an object as a category member (e.g., a dog) or as an individual (e.g., Lassie). This study investigated children's use of both syntactic (i.e., form class) and semantic (i.e., type of referent) information, clarifying and extending work summarized by Macnamara. Although widely accepted, past results were inconclusive because (1) children were taught new words for objects they could already name, and (2) the earlier procedure lacked appropriate distractor items. This work eliminated these problems by using unfamiliar objects and a revised testing procedure. 32 2-year-olds were each taught 1 new noun. Linguistic form class (presence or absence of an article) and type of referent (animal-like or blocklike toy) were varied between groups. Children's interpretations of the new nouns were assessed by asking the subjects to select the named toy from an array of 4 toys (e.g., "Point to Zav"). With animal-like toys, Macnamara's claim that children interpret common nouns as category names, and proper nouns as individual names, was supported. With blocklike toys, children in our study interpreted a common noun as a category name, but there was a tendency for children in the proper noun condition to choose a particular stuffed animal as the new noun's referent rather than the named blocklike toy. These results show that 2-year-old children use both linguistic form class and their knowledge about real-world objects to interpret new words.

When children hear a new word, they must decide whether it refers to the object as a category member, or as an individual. For example, the family pet may be a cat, but it is also a distinct individual, Kitty. This conceptual distinction is basic to how we talk about certain objects, but not others. For example, individual names are given to people and ships, but not to individual pennies or particular coat hangers.

Children could use two kinds of clues to decide whether a name is for an individual or for a category member. One is semantic: knowledge about the properties and characteristics of real-world referents. It simply is not very important to keep track of every blade of grass, so we do not give each one its own name; however, people are important as individuals so each has his or her own name. A second kind of clue is syntactic: how one's language marks these two kinds of words. In English, names for category members are common nouns marked by an article—for example, "a horse." Names for individuals are proper nouns that do not take an article—for example, "Trigger."

In their spontaneous speech, children attend to form class and rarely confuse common and proper nouns (see diary observations reported in Macnamara, 1982). Children's ability to use syntactic and semantic clues to comprehend new names was investigated in a landmark paper by Katz, Baker, and Macnamara (1974) and in research reported in Macnamara (1982). Katz et al. taught children new names for objects, varying both the kind of name and the kind of object. Each child was taught one new word, either a common noun (e.g., "a dax") or a proper noun (e.g., "Dax"), for either a doll or a block. During the teaching portion of the experiment, children saw only two objects (dolls or blocks) and heard one of them labeled at least five times. Then children were asked to perform various actions with "the dax" (or "Dax," depending on the name they had been taught)—

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for example, to dress the named doll or to put the named block in a house. Children's interpretation of the new word was inferred from the proportion of times they chose the named object when carrying out the requested actions. Consistent use of one specific toy was considered evidence of a proper noun interpretation. Choosing randomly between the two toys was considered to be at least consistent with a common noun interpretation.

The results of this research showed an interaction between the syntactic clue (proper or common noun) and semantic clue (type of object named). The syntactic form of the label affected how children chose, but only for those in the doll condition. A proper noun was interpreted as referring to the single, named doll; a common noun was not. For example, if children heard a doll called "Kiv," they picked the named doll most of the time; if they heard a doll called "the kiv," they picked equally between the two dolls. This effect was not found for children in the block condition. No matter what the block was called, children chose equally between the named and unnamed blocks. Katz et al. interpreted these results as suggesting that children distinguish very early on between classes of objects for which individuation is important and classes for which it is not. Children in their study used the syntactic clues from language to interpret the new words, but only when the syntactic clues were semantically appropriate.

These results are important and have been widely cited (Carey, 1982) because they are among a handful of studies that demonstrate children's sensitivity to linguistic form class to interpret new words (see also Brown, 1957). In addition, they suggest an interesting way in which semantic and syntactic clues interact when children learn new words. However, the studies were limited in several respects, and the results are inconclusive. Interpretation of the studies is problematic because the procedure did not provide a way to distinguish between a common name interpretation of the new word and random responding. For any question, children had only two objects to choose from, either two blocks or two dolls. For example, when told to "Dress the dax," children had only two options: to dress either the doll named "the dax," or to dress the other doll. Choosing the named doll 50% of the time could be evidence that children had interpreted "a dax" as referring to the category of dolls, but it could also mean that children were just guessing. It would have been more revealing if the children had chosen an object from an array of toys that included distractor items as well as the two dolls or blocks. Under these conditions the response patterns for guessing and for interpreting the word as a common name would be distinct.

Another limitation of past research is that children were taught new words for objects that they already could name. Anecdotal and experimental evidence suggests that children of this age resist accepting a new common noun for an object with a known label (Macnamara, 1982). Given that the subjects probably already knew the category names for dolls and blocks (see Nelson, 1973), it is possible that they were simply confused when the experimenter said, "This is a wug," rather than, "This is a block" (or "This is a doll"). Therefore, the common noun conditions were not fair tests of how children interpret a new common noun.

A final limitation is that the pattern of results described above was true only for girls. Girls as young as 17 months attended to the syntactic clue for new names given to dolls, but boys up to 27 months of age performed randomly. Only one of three studies conducted with boys (Katz et al., 1974; Macnamara, 1982) yielded significant results. The findings presented for boys seem fragile and need replication.

The present study was designed to clarify and extend these findings by investigating children's sensitivity to the common-proper distinction with a procedure that avoided the problems and limitations described above. Our study differs from previous work in three respects: we used unfamiliar objects (i.e., objects that children could not easily name); we included appropriate distractor items; and we standardized the experimental procedure.

**Method**

**Subjects.**—Thirty-two children (range = 2-2 to 3-0; mean age of girls = 2-7; mean age of boys = 2-6) of middle-class and upper-middle-class backgrounds participated in the study at their nursery schools. There were eight subjects per condition, four girls and four boys. The two female researchers were familiar to the children because they participated in the nursery room activities for at least one half-day session before testing began. Three children were replaced as subjects because they refused to respond to the experimenter's requests.
Design.—The experiment was a $2 \times 2$ factorial design with type of name (proper or common) and type of toy (animal-like or blocklike) as between-groups variables.

Materials.—Four toys were used in the experiment: two blocklike toys that are known commercially by various names, including Magic Flowers and Crazy Comets, and two animal-like toys. Like the dolls in Katz et al. (1974), the stuffed animals could sensibly receive proper or common names; like the blocks, proper names were not appropriate for the Crazy Comets. The toys were selected to be relatively comparable to one another in complexity and attractiveness. Also, the two tokens of each type (e.g., both stuffed animals) were made distinct, so that the children could easily tell them apart. Each stuffed animal stood upright, about 7 inches high, had peach-colored fur, bright orange ears, long arms, a big belly, and eyes (but no other facial features). One had bright yellow hair and a bikini top; the other had lavender hair and a string of beads around its neck. Each wore a pink hair ribbon. The plastic Crazy Comets each measured about 2 x 2 x 2 inches when folded up. These toys can be folded and unfolded to form various shapes: a cube, a "star," an oblong box. One was multicolored (gold, red, and green); the other was painted a solid blue.

These toys were undoubtedly novel to our subjects, and not previously labeled for them. We did not ask a separate group of 2-year-olds to name the toys, since 2-year-old children often overextend familiar labels to unfamiliar instances outside of the relevant category (Clark, 1973), and the status of these overextensions is unclear (Rescorla, 1980). However, an informal survey of four older children (8 and 9 years old) and several adults revealed that they had never seen these toys before and could not name them.

In addition to the four toys, a basket and a small square of cloth (a "washcloth") were used in the experiment.

Procedure.—Subjects were tested individually in a private room at their nursery school. The experimental session had two parts: a naming portion and a testing portion. During the naming portion, children were shown all four toys: two stuffed animals and two Crazy Comets, and one of the toys was named six times. Children in the proper noun conditions heard a proper noun (e.g., "Zav"); children in the common noun conditions heard a common noun (e.g., "a zav"). For children in the animal conditions, the name's referent was one of the stuffed animals, in the Comet conditions, one of the Crazy Comets. The particular toy named (e.g., lavender-haired animal or blonde animal) was counterbalanced across subjects in each condition.

For each child, the word that was used as the toy's name was randomly chosen from a list of nine nonsense syllables, selected from Katz et al. (1974), including "zav," "mef," "kiv," "jop," "wug," "zon," "tiv," "vit," and "cak." To teach the name to the child, the experimenter named the toy six times during a short play session. For example, the experimenter took the toys out of a basket one at a time and, on coming to the target object, said, "Look, this is Zav [a zav]!" The experimenter referred to the other toys as "this one" or "this." The toys were handled in random orders throughout the session.

During the testing portion of the task, children were asked to perform nine simple actions. For each child, five of the actions were randomly designated as test items, in which children had to choose an object on the basis of its new name (e.g., "Put Zav in the basket"), and four were randomly designated as filler items, in which the experimenter handed the child the object to be manipulated (e.g., "Put this in the basket"). Each of the four toys had a turn as the object used in the fillers. Filler questions were included so that children would be less tempted to choose a toy simply to handle it, and so that the test session would not seem to concentrate exclusively on the named toy. The order of questions was randomly determined for each child, with the constraint that no more than two questions in a row were either fillers or test items. All four objects were within the child's reach at all times. By including distractors (e.g., the stuffed animals were present when the child was being taught a name for a Crazy Comet) we could distinguish random guessing from interpreting a word as a common noun.

The nine actions were: put in a basket, hide, wash, drop, hold, put over (child's) head, throw in a basket, turn upside down, and point to. Before each request the experimenter asked, "Do you know how to [requested action]?

After each test trial, the child's choice of toy to manipulate was recorded on a data sheet, along with any spontaneous comments. Recording the chosen toy was straightforward, with one exception. When asked to put "Kiv" in a basket, one child threw all the toys into the basket but one,
then cradled that one in her arms and said to it, "Hi, Kiv!" For this trial, the child was scored as having chosen the toy she spoke to, because her interpretation of the word "Kiv" seemed clear from her behavior.

At the end of the session, the experimenter pointed to each toy in turn, in random order, and asked the child if it was "[a] Zav" (using the name the child had learned).

Results

Each child was given three scores indexing the proportion of times he or she chose: (a) the named object when performing the requested actions, (b) the unnamed object from the same category, and (c) either object from outside the category. These data are shown in Table 1.

A 2 x 2 ANOVA on the mean proportion of trials that children selected the named toy (a proper noun interpretation) yielded a significant type of name x type of toy interaction, F(1,28) = 4.33, p < .05. Neither main effect was significant. This was similar to the analysis used by Katz et al. (1974) and Macnamara (1982) and replicated their results. Children picked the named toy more often in the proper animal condition than in the other three conditions. A follow-up analysis showed that children who heard a proper noun chose the named animal more (69%) than those who heard a common noun (44%), t(28) = 1.79, p < .05, one-tailed test.

We then calculated a contrast score to measure children’s tendency to select either toy within the category of the named object. This tendency would indicate a common name interpretation of the new word (for discussion of contrasts, see Keppel, 1973). This score was calculated by assigning weights of +1 for the number of times the children chose either toy from the named category and -1 for the number of times they chose either toy from the unnamed category. For example, if a child in a stuffed-animal condition chose an animal four times and a Comet once, the child would obtain a score of 3. Subjects received high scores if they interpreted the word as referring to either or both members of the category of objects named by the new word. For the seven children who did not answer on one or two items, the contrast score was calculated as the proportion of trials the child chose either toy from the named category multiplied by 5, minus the proportion of trials the child chose either toy from the unnamed category multiplied by 5. This adjustment gave equal weight to every subject in the experiment, because all other subjects had five trials each.

A 2 x 2 ANOVA on the contrast scores yielded a significant main effect for type of name, F(1,28) = 4.94, p < .05, and a significant type of name x type of toy interaction, F(1,28) = 3.95, p = .054. There was no significant main effect for type of toy. In both animal conditions and the common Comet condition, children picked predominantly within the category of the named object. The mean contrast scores were: proper animal condition, 4.3; common animal condition, 4.4; common Comet condition, 4.8. However, in the proper Comet condition (M = 1.4), half the children chose outside of the category. These children chose a stuffed animal instead of a Comet. This strategy was used predominantly by boys and accounts for the one significant sex difference, a toy x name x sex interaction, F(1,24) = 4.11, p = .051. It seems that these children attended to the form-class of the word—that is, the absence of an article—and searched for an object that could sensibly receive a proper name—that is, an individual, animate object. This view is supported by the finding that every child who showed this pattern consistently chose only one of the stuffed animals throughout a session. For example, one child might choose the lavender-haired animal, another might choose the yellow-haired animal, but once

Table 1

<table>
<thead>
<tr>
<th>OBJECT CHOSEN</th>
<th>Stuffed Animal</th>
<th>Crazy Comet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proper</td>
<td>Common</td>
</tr>
<tr>
<td>Named object</td>
<td>69.1</td>
<td>44.4</td>
</tr>
<tr>
<td>Other category member</td>
<td>23.5</td>
<td>60.0</td>
</tr>
<tr>
<td>Outside category</td>
<td>7.5</td>
<td>5.6</td>
</tr>
</tbody>
</table>
children chose a stuffed animal, they continued to choose the same one. Furthermore, this does not seem to be simply chance responding, since every subject who chose outside of the category in this condition chose *predominantly* outside of the category. This pattern could not have been discovered with Katz et al.’s (1974) procedure, which precluded choosing outside of the category.

An additional analysis was performed on the within-category choices only. It was possible that children in the proper Comet condition who were not choosing outside of the category were also sensitive to the syntactic clue and preferred the named toy. For this analysis, the proportion of within-category trials on which each child chose the named toy was calculated. The four children who chose predominantly outside the category (i.e., on more than half of the trials) were not included in this test. A \(2 \times 2\) ANOVA calculated on these scores yielded a significant main effect for type of word, \(F(1,24) = 4.123, p = .051\). The type of word \(\times\) type of toy interaction was not significant, \(F(1,24) = .073\). Children in both animal and Comet conditions chose the named toy more often in the proper noun conditions (\(M = 72\%\)) than in the common noun conditions (\(M = 51\%\)). However, the difference between common and proper conditions was significant only with stuffed animals (proper condition \(M = 76\%\), common condition \(M = 47\%\)), \(t(24) = 2.114, p < .05\). Although children did choose the named Comet more on hearing a proper noun (\(M = 66\%\)) than a common noun (\(M = 56\%\)), this difference was not significant, \(t(24) = .605, p > .1\). In fact, these children often chose both Comets at once when given the proper name.

We analyzed children’s responses to the yes/no questions (“Is this [a] zav?”), but found them uninterpretable. Across the conditions, only four children answered the set of four questions correctly. There were no discernible patterns to the answers the other children gave.

**Discussion**

Even with unfamiliar kinds of toys, children use semantic and syntactic clues when interpreting new nouns. Our data replicated previous findings (Katz et al., 1974; Macnamara, 1982) that children interpret a new proper noun as referring to the named individual when a proper noun is semantically appropriate. Our data showed this effect for both boys and girls, perhaps because our children were slightly older than Katz et al.’s subjects. In addition, our use of distractor items revealed the strategies that had appeared as random responding in the earlier work. Given a common noun (e.g., “a zav”), children in both animal and Comet conditions interpreted the word as a category name. Given a proper noun (e.g., “Zav”) for a blocklike toy, some children interpret it as referring to a single stuffed animal; others seemed to interpret it as a category name.

It is interesting that children in the common noun conditions clearly generalized the new word beyond the named instance to others in the category. We can say this with assurance because, unlike Katz et al. (1974), we included distractor items to distinguish between chance responding and choosing within the named category. It is somewhat surprising that children were willing to generalize the word meaning—for example, to select an unnamed toy when asked to “Put a zav in this basket.” One might think that, to be safe, children would continue to choose the object the experimenter had labeled. However, subjects did not hesitate to generalize the common noun to other category members. This was not simply because of forgetting which was the named animal, since children consistently chose the named animal when given a proper noun.

Our data suggest that children are more sensitive to linguistic form than indicated by the Macnamara (1982) findings. Even when the children heard names for blocklike toys, they attended to the form class of the word—for example, “Zav” versus “a zav”—to derive meaning. Half the children in the proper Comet condition showed a preference for picking outside the named category, seeming to search for a single, animate referent for the proper noun, even though the name had been given to a Crazy Comet. What process could account for this error? Perhaps the initial pairing of proper noun and Crazy Comet made no sense to these children. During the naming portion of the session, they may have ignored the label completely. Then, during testing, they may have tried to figure out the meaning of the word anew. This possibility suggests that children may be able to interpret new common and proper nouns without any teaching whatsoever. Brown (1957) has demonstrated that 4- and 5-year-old children can rely on form class to interpret novel count nouns, mass nouns, and verbs. It seems clear from our results that, even for 2-year-olds, linguistic form class is a powerful source of information for children acquiring new words.


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