Acquiring and Using a Grammatical Form Class: Lessons from the Proper-Count Distinction

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The distinction between individuals and kinds is crucial in the representation of knowledge. Some information is idiosyncratic and tied to the identity of a specific individual, while other information is characteristic of a kind and can be generalized to other members. As a result, whether we treat objects as individuals or as members of a kind has important implications. For example, treating objects as members of a kind allows us to make inductive inferences from one member to another (Gelman and Markman 1986), while treating objects as individuals allows us to track particular objects through space and time (Littschwager 1995), and to enumerate sets of objects, all of which could be of like kind (Wynn 1992; Xu and Spelke 2000). Notions of kind membership and individuality may play off each other such that one can (but does not always have to) use knowledge of kind membership in order to individuate objects (Xu 1999; Xu and Carey 1996).

Languages have several devices for highlighting the difference between individuals and kinds. Forms of definite reference and description can be used to identify and pick out individuals, making it clear what the scope of reference should be. Another linguistic device is the distinction between proper and common names. Labels can refer to an object as a specific individual or as a member of a kind. Some ostensive contexts can be found where there is only minimal information that distinguishes these two types of reference, yet children as young as 24 months and probably younger (e.g., Katz,
Baker, and Macnamara 1974) are able to make this subtle distinction. Proper names have captured the interest of researchers for this reason. Moreover, the acquisition and use of the proper-count distinction can provide a window on a range of important issues in lexical acquisition.

In this chapter, we raise a number of questions about the acquisition of proper names versus count nouns that have implications for word learning more broadly. In particular, we address issues about how specific lexical items can be treated as proper names versus count nouns before a general proper-count contrast is learned, how the contrasting grammatical form classes might first be acquired, and how once acquired, the contrast plays a role in further lexical acquisition. We also use the acquisition of proper versus count nouns to explore issues about fast mapping, about acquiring vocabulary through indirect versus direct means, and about when a lexical item is still open to revision and when it is considered fully learned. Some of these issues are barely discussed in the literature, yet must be resolved before we have a full understanding of lexical acquisition.

12.1 Selective Review of Children's Use of the Proper-Count Distinction

Before we turn to the main focus of this chapter, we provide a brief and selective summary of issues that have been addressed in the experimental literature on the acquisition of proper names and point to other reviews for more details. It is by now well accepted that children make use of a number of sources of information when learning words, and that a theory of lexical acquisition needs to specify how children coordinate, weigh, and integrate information from these various sources (for reviews, see Hollich, Hirsh-Pasek, and Golinkoff 2000; Woodward and Markman 1998). In addition to learning words through the brute-force, associationist learning mechanisms proposed by thinkers as early as Locke ([1690] 1964), children can exploit pragmatic information (e.g., Baldwin 1991, 1993; Bloom 1993; Tomasello 2001), grammatical information (e.g., Brown 1957; Gelman and Gillette 1999), semantic cues (e.g., Goodman, McDonough, and Brown 1998), word-learning constraints (e.g., Markman 1989, 1994; Waxman 1991), phonological cues (e.g., Kelly 1992), and distributional analyses (e.g., Cartwright and Brent 1997; Maratsos 1988; Saffran, Aslin, and Newport 1996).

A number of authors have considered how these kinds of sources of information can be integrated to facilitate the acquisition of proper names (Hall 1999; Imai and Haryu, chapter 13, this volume). Katz, Baker, and Macnamara's (1974) classic work in this area asked whether children could use grammatical cues in conjunction with the animacy of the named referent in order to decide whether a new name was proper or common. In English, proper names are not preceded by a determiner (e.g., a, the, and so on), while common names often are. Additionally, as we will discuss in detail later, animate things are more likely to be called by proper names than inanimate ones. Katz et al. found that girls as young as 17 months treated a common name (e.g., a dax) as referring to a kind, regardless of the animacy of the labeled item. A proper name (e.g., Dax), by contrast, was treated as referring to the particular item labeled—but only if the labeled item was animate; if the item was inanimate, the name was treated as referring to a kind, even though it had been provided in a proper-name frame.

Gelman and Taylor (1984) replicated and extended this work with preschoolers, and a number of researchers since then have taken up the issue. One line of inquiry has considered whether children truly make proper-name interpretations of proper names or whether they may instead make subordinate-level kind interpretations. A proper-name interpretation would mean that the name applied to a specific individual, regardless of any transformations that individual might undergo (e.g., a haircut, wardrobe change, and so on; see Littschwager 1995). In Littschwager and Markman 1993, preschoolers who saw a distinctive marker (e.g., a bib) removed from an animate object that had been labeled with a proper name still treated the proper name as referring to that individual only. Indeed, Sorrentino (1999) found that even when the distinctive marker was actually placed on another identical toy, preschoolers continued to treat the proper name as referring to the originally labeled object only.

Other researchers have been interested in evaluating pragmatic sources of information that children might use in deciding whether a
new word is a proper name. For example, in a sentence like “This is Dax,” Dax could be construed as a proper name or as an adjective. Hall (1996) found that preschoolers who heard Dax applied to a single animate object treated the word as a proper name, but those who heard it applied to two different animate objects treated it like an adjective. Thus, the number of things a speaker labels with the same word provides information about the appropriate interpretation of the word. In another study, Birch and Bloom (2002) have suggested that preschoolers may be sensitive to information indicating whether the speaker is familiar with the animate object being labeled—in a sense, evaluating the plausibility that the speaker could know its proper name.

Word-learning constraints are a further source of information available in learning proper names. Young children make preliminary assumptions, or best first guesses, on hearing new words that help them quickly narrow down the inductive space of possible referents (e.g., Golinkoff, Mervis, and Hirsh-Pasek 1994; Littschwager and Markman 1994; Markman 1994; Markman and Wachtel 1988; Waxman and Markow 1995). Although a full discussion of word-learning constraints is beyond the scope of this chapter (but see, for example, Bloom, Tinker, and Margulis 1993; Bloom 2000; Deak 2000; Markman 1989; Nelson 1988), we believe that expectations children have about words play an integral role in the acquisition of proper names. For instance, experimental research has suggested that infants as young as 15 months abide by mutual exclusivity, one of the proposed constraints that holds that children expect a single object to have only one kind term (Markman 1992). Thus, children who hear a term applied to an already-named object will be motivated to seek out an interpretation of this term that avoids attributing two category labels to the same object (Markman and Wachtel 1988). Indeed, Hall (1991) found that preschoolers were more likely to make proper-name interpretations of names applied to animate objects for which they knew the kind label (e.g., cats) than for those they did not (e.g., monsters; in which case, they tended to make common-name interpretations).

Clearly, children can draw on a number of sources of information when learning proper names. All of the research on this topic to date, however, has focused on children above 17 months, and most has examined children 2 to 3 years old—children old enough to have acquired the grammatical form class distinction that distinguishes proper names from common ones in English. Very little is known about how babies or younger children learn proper names, or how they could actually use the sources of information described earlier to learn the grammatical form class distinction. We turn now to some speculations about how this might be achieved.

12.2 How the Proper-Count Distinction Could Be Learned

On hearing a new word applied to a new object, a word learner must first decide whether the word applies to the whole object or to some other aspect of the object—for example, a part or property. Under a constraint known as the whole-object assumption, word learners assume that new words name objects as wholes (e.g., Baldwin 1989; Kobayashi 1998; Markman and Wachtel 1988; Woodward 1992). Once the word learner has decided that the word applies to the whole object, he or she must decide whether it is being used to refer to an individual qua individual, or an individual as a member of a kind. P. Bloom (1994) proposes that children treat noun phrases as referring to individuals, rather than objects, and that they will treat proper names as referring to individuals and count nouns as generalizing. This assumes, however, that children can distinguish between the proper names and count nouns, which is the problem at hand.

12.2.1 The Taxonomic Assumption as Part of the Problem

Deciding that a name refers to an individual poses a challenge because of the taxonomy assumption, a word-learning constraint that motivates children to extend newly learned labels to other members of like kind. The taxonomic assumption was originally postulated to explain why children extend words to things of like kind rather than to things strongly associated with each other (Markman and Hutchinson 1984). This assumption, as well as other related ones such as “object scope” (Golinkoff, Mervis, and Hirsh-Pasek 1994; Golinkoff et al. 1995), suggests that children will generalize newly learned
words. Using this assumption, children would run into trouble in learning proper names. How is it that children come to treat proper names as referring to individuals if, on the taxonomic assumption, they expect labels to refer to kinds?

12.2.2 Do Children First Adopt a Conservative Strategy?

One solution to this problem would be for children to begin with a much more conservative strategy of word learning where they refrain from generalizing a newly learned word beyond the first exemplar until they are given positive evidence to the contrary. Once they have reason to generalize a term, they would generalize according to like kind as the taxonomic assumption specifies. If babies first operated according to the strategy “assume this word does not extend beyond this exemplar unless given positive evidence to the contrary,” they would readily find positive evidence that many count nouns generalize. On first hearing the word spoon, for example, a child would treat spoon as referring to that individual spoon, but as soon as another spoon was labeled the child would assume spoon generalizes to other spoons (or silverware, or teaspoons—the precise scope of the category is another issue). In everyday situations, common objects are routinely labeled. A baby starting to eat might drop his spoon and his mother might get him another one, saying “use this spoon, that one’s dirty.” Routine comments on artifacts, pieces of clothing, pieces of furniture, or animals in the child’s everyday environment or in books would provide ample opportunity for positive generalization of a term. This conservative strategy would prevent the overgeneralization of proper names while at the same time allowing for ready generalization of count nouns on the basis of a small amount of evidence. The problem with this explanation is that, so far, there is no evidence to support it, although there are reports of some of children’s earliest object labels being overly narrow and highly context dependent (Bates 1979; Bloom 1973).

In some unpublished research, Markman tested this hypothesis by teaching babies a novel count noun and then seeing if they generalized it. There is an important methodological issue here: babies may require only minimal positive evidence that an object label generalizes before overriding a conservative “proper-name” bias, if one exists. If babies need only one instance of the newly learned term being applied to a second object to generalize the term, some kinds of test trials could themselves provide that positive evidence, thus invalidating the test. Suppose, for example, you showed a baby a terrier and said it was a dog. In the conservative strategy view, the baby should start out assuming dog refers to that specific terrier and nothing else. Now suppose you gave a test trial that showed a different terrier, or a collie—some other dog—and a distractor item, say a shoe, and asked the child for a dog. The question itself implies that there is a dog present and yet the original item is nowhere in sight. So this form of the question provides a kind of positive evidence that at least one of these things is a dog, and, under the right circumstances, it will be easy for children to see which it is. With this kind of test, then, we could find a great deal of generalization, but it would not rule out the conservative strategy.

To avoid this problem, Markman used the following two kinds of test trials. On one, the original item was paired with a distractor. This test would reveal whether babies learned the word at all. The second kind of trial paired the original item with another similar item. The question here was whether the original was selected at above-chance levels or whether children chose both exemplars equally—a test for generalization analogous to the one Katz, Baker, and Macnamara (1974) used in their investigation of whether babies treated a word as a common or proper name. Briefly, the results were as follows: babies as young as 15 months spontaneously generalized a newly learned word without positive evidence. In other words, 15-month-olds, as well as 18-month-olds, were not using a conservative strategy. Using this procedure with 13-month-olds yielded ambiguous results because there was no clear evidence that the babies learned the word in the first place. So the question of whether they were generalizing could not be addressed.

Related findings are reported in two studies by Hennon et al. (1999). Using a preferential-looking procedure, they found that 14- and 19-month-olds extended a newly learned word to another exemplar of the same category. However, the design of their extension trial was flawed in that it paired a novel exemplar of the category
with a distractor. This is exactly the design that Markman avoided because, as described earlier, the trial itself provides some evidence that the word generalizes. Thus, from Hennon et al., it is not clear that 14- or 19-month-olds generalize spontaneously, but given Markman’s unpublished studies finding generalization in 15-month-olds, we assume this would. Hennon et al. also claim that 12-month-olds fail to generalize a newly learned label, which looks like support for the conservative strategy. However, their data do not show that these infants learned the word in the first place. In their first study, following training on a novel label on one test trial, babies were shown the originally labeled object and a distractor and heard the novel label. On this trial, 12-month-olds showed no preference for the target object over the distractor, meaning there was no evidence that they learned the word at all. So it is not meaningful to evaluate whether babies generalized the word to another member of the category since there is no evidence that they learned the word in the first place. In a second study, Hennon et al. included only a generalization trial, again failing to provide evidence that these infants had learned the word. So it is impossible to evaluate whether 12-month-olds failed to generalize or whether they just had not learned.

Another study that, at first glance, appears to support an early conservative strategy is by Samuelson and Smith (1999). These authors argue that “young children do not generalize novel names for solid things by shape until they already know many names for solid things in shape-based categories” (p. 29). Instead, Samuelson and Smith argue that, in the process of acquiring their earliest nouns, children detect statistical regularities between object properties and category organizations—and in particular, they learn that solid objects are named by shape. In one study (Study 2) 17- to 33-month-old children watched as the experimenter named a novel solid, nonrigid, or non-solid target object (e.g., “This is my lom”). The experimenter then pushed a tray with two objects toward the child: one object matched the target in shape (but not material), and the other matched it in material (but not shape). Samuelson and Smith found that children with small productive-noun vocabularies (<150 nouns on the MacArthur Communicative Development Inventory) were no more likely to select the shape-based match for the solid target object than for the nonrigid or nonsolid target objects. Children with larger noun vocabularies were. This might suggest that those with smaller noun vocabularies were adhering to a conservative strategy—either waiting for further positive evidence, or needing to develop the expectation that solid objects are named by shape.

We do not, however, find Samuelson and Smith’s (1999) study to be convincing evidence of such a conservative strategy. First, the experimenter named the novel target object just once. Given this minimal training, it is possible that these very young children (who may or may not have been paying attention at that time) failed to learn the word. What is needed is a test of learning in which the target object is actually paired with a distractor that is neither of the same shape nor of the same material as the target. As was the case in Hennon et al. ‘s (1999) second study, there is no way to interpret children’s failure to generalize appropriately without evidence that they have learned the word in the first place. Indeed, there is good evidence that when young children have demonstrated that they have learned a new word, they do extend it to other members of like kind. For example, Woodward, Markman, and Fitzsimmons (1994) found that 18-month-olds who heard a novel object labeled nine times both learned that word and extended it to other members of like kind (differing in color). It is also noteworthy that the average productive vocabulary of these infants was 119 words; recall that Samuelson and Smith found that successful generalization for solid objects on the basis of shape took place only for groups with productive vocabularies of more than 150 nouns.

At present, then, there is no good evidence for a conservative strategy study by which babies would wait for positive evidence that a term should be generalized. Instead, the evidence shows that as soon as babies have demonstrated clear learning of a word, they also generalize that word to new exemplars. Research demonstrating clear learning of a new label by younger babies is needed to provide a definitive test of this hypothesis, but for now, we turn to other ways babies might be able to restrict the scope of proper names. If it turns out that younger babies do have a very conservative “proper-name” strategy, these other mechanisms would still serve to bolster the learning.
12.2.3 Detecting Correlational Structure

If babies start out applying the taxonomic assumption broadly, how do they then determine which labels are restricted to individuals and which refer to kinds? One way, maybe the only way, is to figure out the correlation between proper names and the kinds of referents they take. The question then becomes how babies use information from input to figure out the relevant correlations between the referents of proper names and the names themselves, and the referents of kind terms and the terms themselves.

There are several different ways to think about what kinds of correlations children need to work out in order to acquire the proper-count distinction in English. One is the range of grammatical markers that distinguish count nouns from proper names, such as use of determiners, plural markings, and other forms of quantification. The presence or absence of articles is the main issue that experimental work on the acquisition of proper names has explored, but there are many other grammatical correlates of the proper-count distinction in English. For fluent speakers, hearing a term quantified—for example, “Some candy”—should be sufficient to rule out a proper-name interpretation. Hearing quantification plus a determiner—for instance, “Those five girls”—provides even more redundant information that would rule out a proper-name interpretation of the noun.

Another source of information loosely correlated with the proper-count distinction is the more limited range of entities that accept proper names. Experimental work here has focused mostly on animate versus inanimate as the conceptual domains, the assumption being that proper names are more likely to be attributed to animate objects. Obviously there are many exceptions. All animate objects can be referred to by a large number of count nouns (e.g., boy, person, cousin, enemy, obstacle). And inanimate things take proper names (e.g., Canada, Stanford). Another relevant correlation is whether any given lexical item, such as John or boy, functions as a count noun or proper name, in terms of the range of referents it is applied to. That is, with no grammatical information at all, one might still detect that particular words are used for only one individual, while other words are used more generally. Which of these relations children work out at different ages is not yet fully documented, although we know from several studies that the presence or absence of articles and whether the object being labeled is animate have been sorted out at least to some extent by 24-month-olds (Hall, Lee, and Béflanger 2001) and maybe by 17-month-olds, or perhaps only 17-month-old girls (Katz, Baker, and Macnamara 1974). How these relations are worked out has barely been studied and is not yet well understood.

Although there are no experiments directly studying how infants establish the relevant relations to acquire the proper-count distinction, there have been striking demonstrations of infants’ abilities to detect other kinds of correlations. Safran, Aslin, and Newport (1996) discovered that 8-month-olds can use the statistical relationships between speech sounds to segment speech into words. In fluent speech there may not be pauses or acoustic cues that signal word boundaries. How then might babies hearing continuous speech segment the speech into discrete words? Suppose, for example, a baby hears “Hello Daddy.” How will the baby determine that the adjacent sounds in loda (from “Hello Daddy”) do not form a word while the transitional sounds in Daddy do? One possibility is to rely on the transitional probabilities of adjacent speech sounds. Typically the transitional probabilities will be higher for adjacent speech sounds from the same word, such as Daddy, than for adjacent sounds that cross word boundaries, such as loda.

Safran, Aslin, and Newport (1996) asked whether 8-month-old infants can compute and use these kinds of transitional probabilities. Babies were familiarized to a 2-minute tape of continuous speech made up of four 3-syllable nonsense words presented in a random order. The only information that specified word boundaries was the transitional probability between adjacent syllables. In this study, the transitional probability was set at 1.0 within words and 0.33 between words. After the babies listened to the 2 minutes of continuous speech, they were presented with test items that either were three-syllable words from the artificial language or “nonwords” composed of the same three syllables but in a different order. These 8-month-olds were capable of distinguishing the words from nonwords, listening longer to the novel nonwords.

From this and related research (e.g., Elman et al. 1996; Safran et al. 1999), we know that babies are quickly able to calculate rough
correlations between adjacent elements in speech and also in music. Could this same ability help in the acquisition of grammatical form class and, in particular, in distinguishing proper from common names? There are enough differences between the two kinds of problems that it is hard to know whether the same statistical ability could underlie both. The problem for segmentation is to use transitional probabilities between elements of a given type—for example, syllables for words. But at least some of the problem for making the proper noun—common noun distinction involves noting correlations between linguistic elements (say the presence or absence of an article) and nonlinguistic elements—the kind of referents and the scope of the reference category. There is no adjacency or segmentation at issue. The experimental paradigm also sets some limits on the generalizability to the question of distinguishing proper from common nouns. In Saffran, Aslin, and Newport 1996, the within-word boundary transitional probability was set at 1. How good would babies be at detecting weaker correlations? In addition, the statistics were computed over a steady, uninterrupted stream of repeated speech segments. But the task for the child in figuring out the proper-common contrast must be to register and compute correlations over input presented sporadically over longer periods of time. (This is probably true for word segmentation in natural contexts as well.) A child might, for example, one day hear someone comment on a cat that walked into their yard, but it could be days before another discussion about a cat takes place. Still, it is tempting to extrapolate from these demonstrations of babies’ abilities to detect correlations in speech and tones to say that such abilities could help them work out the various correlations surrounding the contrast between proper and common nouns. While we are not really justified in drawing any strong conclusions about whether this statistical capacity is available for a quite different kind of problem, it remains an intriguing possibility.

12.2.4 Noticing the Nonoccurrence of Labels

Proper names must not be generalized. If babies are computing correlations about the use of proper names, an important part of the correlation is the nonoccurrence of the proper names to items similar to the one named. This poses a problem closely related to learnability arguments about the absence of negative evidence (e.g., Pinker 1989; Wexler and Culicover 1980). In those arguments about the acquisition of grammar, one important question was how children avoid postulating grammars that are overly general. And if they did postulate such a grammar, how would they be able to correct it given the lack of negative evidence? Suppose a child interprets a word to be more general than the correct use. For example, a child might think that dog refers to cats or even to any four-legged animal. If a child incorrectly calls a cat “a dog,” then an adult can readily correct that mistake with explicit feedback. So as long as the child makes a clear, explicit error, negative feedback should be straightforward. The same would be true in the case of proper names. If a child called many boys John, for example, this could be explicitly corrected. The problem (and an important part of the puzzle) is that there is little evidence suggesting that babies overextend proper names. There are, of course, reports that some children call other men Daddy, but Daddy clearly is not a typical proper name. Other men are appropriately called Daddy by their children, children hear about Mommy and Daddy bears, they encounter stories with characters called Mom and Dad, and so on. There are not many other reports of misuses of proper names. On the contrary, Macnamara (1982) comments on the remarkable accuracy of children’s ability to restrict proper names from the start. So one assumption is that, however proper names are learned, it is not by explicit correction of errors since these errors do not seem to exist. Or to be more accurate, these errors do not appear in children’s productions.

Given the lack of explicit feedback because of the absence of errors, we have a situation analogous to the problem presented in learnability theory (e.g., Pinker 1989; Wexler and Culicover 1980). Suppose that in comprehension, a child assumes that John refers to boys or brunette boys. Because this takes place prior to production, the child’s assumptions are not made apparent. How would the child, with no feedback, figure out that he or she was wrong? The child must come to realize that John is restricted to one individual and not generalized to others, which requires noting the failure of a
speaker to label other boys or brunette boys as _John_. The problem here is that adults are failing to label most things in the child's environment most of the time. Do we take every failure to comment on the ceiling, walls, radio, furniture, every piece of clothing on every person around as evidence about the semantic restriction of a given lexical item? Such a mechanism would be computing like mad all the time and nonoccurrences of labels would swamp all other data. So how could nonoccurrences enter into the correlations babies need to compute? The answer may lie with a pragmatic ability that would drastically narrow the range of nonoccurrences of labels that would be noticed and, ironically, with children's reliance on the taxonomic assumption—the same assumption that at first seemed to pose a problem for children figuring out proper names but that now can be seen as part of the solution.

_The Taxonomic Assumption as Part of the Solution_

Recall that the question posed earlier was that if children tend to generalize newly learned object labels to things of like kind, how do they rein in these generalizations in the case of proper names? If children made many overextensions that were explicitly corrected by adults, that would be one way to correct the tendency to generalize, but as we just mentioned, children do not tend to use proper names erroneously but, from the start of production, appear to use proper names to refer to specific individuals. If children were very conservative learners and refused to generalize until given positive evidence that a word referred to more than a single instance, that would account for their early restriction of the scope of proper names. But, again, children seem to generalize a newly learned word, at least in comprehension, at the youngest ages tested so far. So the problem is that if children generalize a newly learned term—that is, if they honor the taxonomic assumption—how do they come to quickly limit the scope of proper names? We now think that the taxonomic assumption, coupled with some pragmatic ability described next, could provide a way for children to notice the nonoccurrence of a label, which is critical for working out the semantics of proper names. In particular, because the taxonomic assumption leads children to expect a term to extend to things of like kind, it would lead children to expect an object similar to one given a proper name to be labeled similarly. This expectation is then violated. So, the nonoccurrence may become more salient and informative because it violates an expectation on the part of the child. There is still the problem that most objects are not being labeled most of the time, and that is where the pragmatic knowledge we describe next comes in.

_Pragmatics: Indications of a Speaker's Intent to Refer_

The problem of detecting the failure of a term to be used is that we are usually surrounded by objects we are not labeling. As mentioned earlier, even if it were possible to register and retain information about these failures to label, they would be misleading and largely irrelevant to figuring out the scope of reference of a term. What is needed is a mechanism for determining which failures to label are informative. Such a mechanism is likely to be found in children's understanding of some pragmatic principles, especially ones related to monitoring a speaker's intent to refer. There is ample evidence that children as young as 18 months register information about a speaker's focus of attention, such as eye gaze, and use it in determining the intended referent of a novel word (e.g., Baldwin 1991, 1993; Baldwin and Tomasello 1998; Tomasello 2001). Young children will avoid mapping a novel label to a novel object they were attending to if it turns out that the speaker was not attending to the same object.

From this work we know that when a speaker does provide a label, children attend to information relevant to determining which object the speaker intended to refer to. The argument we are now making is that children could use their sensitivity to a speaker's intent to refer to notice significant failures to label. The idea here is that if a child could be confident that a speaker in fact intended to refer to an object, say, because the speaker actually did refer to the object, maybe even labeled the object, but did not use the label the child expected based on the taxonomic assumption, then that failure would be salient, relevant, and informative and should be used by children in assessing the scope of a given term. Framed this way, this set of principles could explain how children narrow a number of
kinds of overextensions, not just proper names. Imagine, for example, that a child has overextended the term cow to refer to horses. When an adult looks at, points to, or otherwise designates a horse, and says “Oh, look at the . . .,” the child who thinks horses are called cows will expect to hear cow. On hearing horse instead, the child’s expectation is violated and the nonoccurrence of cow made salient. A single instance is not sufficient evidence to narrow the scope of a word. The adult could well say “Look at that” or “Look at that animal” or “What a beauty,” and these alone should not restrict the scope of a noun. But at least this provides a mechanism that would furnish input into the data children could use to establish a correlation. This same principle would help in restricting subordinate terms—for example, that poodle applies only to some kinds of dogs—as well as helping children narrow overextended terms. Whether children lacking an understanding of grammatical form class interpret a new word as a proper name (as in Fido), a subordinate term (as in poodle), or an adjective (as in friendly) will be determined, in part, on what this mechanism detects on repeated exposures to the word. Over multiple occasions, some of which might confirm an expectation and some of which might violate an expectation, children could continue to refine their hypotheses about the scope of the word.

A variant on this use of pragmatic signals of an intent to refer could occur when the adult provides clear evidence of noticing an object but does not label it, while at the same time labeling another similar object. The child’s expectation that the same label be extended would again be violated and the nonoccurrence of the label noted. Again, this could be used to narrow overextended count nouns as well as proper names, and to learn the narrower range of subordinate compared to basic-level terms. In the case of subordinate classification, there is some empirical evidence for this mechanism at work. Merriman et al. (1995, 1890) propose a pragmatic principle they termed exhaustive reference that they define as follows: “When a novel generic word is used to name something, expect it to be extended to all entities in a situation that the speaker perceives and believes to be exemplars of the name.” This formulation starts out assuming that the term used is a “generic” term, which we believe is overly constraining and telescopes the propensity to generalize and the monitoring of the speaker’s intent to refer into a single expectation on the part of the child. We prefer to keep these two abilities distinct. Additionally, Merriman et al. seem to suggest that exhaustive reference operates in a particular situation involving multiple potential exemplars. We suggest instead that a mechanism that notes occurrences and nonoccurrences very likely stores and analyzes this input over extended periods of time.

Despite these differences, the principle of exhaustive reference captures the kind of processes we have in mind. Merriman et al. (1995, 1891) argue that the principle of exhaustive reference entails the nominal passover effect that they formulate as: “If a speaker labels only one object in an array with a novel term, the addressee should construe this behavior as evidence that the other object or objects are not referents of the term.” As we discussed earlier, we do not want to restrict this kind of inference to novel terms. Familiar terms that have been overextended could be corrected by this kind of reasoning. Proper names that have been originally construed as count nouns could be reassessed to be proper names by this kind of mechanism. In broad strokes, then, this is the kind of mechanism that could help with the problem of noting nonoccurrences of labels.

Merriman et al. (1995) found evidence for the nominal passover effect in two experiments with 3-year-olds. Children saw two novel objects designed to be fairly similar. The experimenter said “Look at these” and went on to label one of them with a novel label (e.g., “This one is a jegger”) and comment on it (e.g., “Isn’t it neat”). This object was commented on and labeled ten times, while the other similar object next to it was either ignored or referred to with a pronoun (e.g., “Look at this one”). After this training, there were two kinds of tests for how children extended the novel term. One was a forced-choice generalization task where the two objects were placed in front of the child, who was asked to perform four actions with, for example, “a jegger.” The second test involved free-choice name generalization, where several objects were placed on the table and the child asked, for instance, to “put the jeggers in a bag.” The sets included the two training objects plus another similar object as well as other objects. The results from the forced-choice, but not the
free-choice, procedure provided evidence for the nominal passover effect: 3-year-olds asked to find a *jogger* selected the target object that had been labeled more often than the similar object that had not been labeled.

There is some evidence, then, that pragmatic assumptions about when a speaker is intending to refer to an object yet fails to label it could make nonoccurrences of labels salient. The evidence is limited in several ways. First, the results of the Merriman et al. 1995 studies were not particularly robust. On the other hand, this particular methodology may underestimate the power of the effect under more naturalistic circumstances. Second, only 3-year-olds were tested in the Merriman et al. studies, so there is no direct evidence about whether 18-month-olds or even younger babies would be sensitive to such pragmatic cues. Third, Merriman et al. tested children’s use of this principle for forming subordinate categories, not proper names per se. At least in principle, however, the problem of noticing failures to label and thereby having nonoccurrences entered into the tabulations of correlations could be solved by the combination of pragmatic principles and the expectations generated by the taxonomic assumption. The evidence from Merriman et al. is encouraging, but studies with much younger children are needed to see if this account is empirically correct.

12.2.5 How These Mechanisms Explain the Acquisition of the Proper-Count Distinction in Languages without the Syntactic Distinction

To summarize, we propose several mechanisms that could account for two related problems. They could help explain how very young children who have not yet acquired the grammatical distinction between proper and common nouns determine that a given lexical item, say *Bob* or *boy*, labels a single individual or a category, and they help explain how children register the relevant data for determining the grammatical distinction. The mechanisms include a conservative strategy that limits generalization of a term to referents other than the initial one only when positive evidence is provided in input. So far there is no evidence for this conservative strategy, but it may exist in children younger than 15 months of age. Alternatively, the problem of noting nonoccurrences of labels could be solved by the taxonomic assumption that would lead children who learned a label to expect it to generalize coupled with pragmatic knowledge that a speaker had the opportunity and intent to refer to an object with the expected label but did not. Children would also need the capacity to perform some kind of statistical or distributional analysis on the input.

There is a third problem that these same mechanisms could help solve: they could explain the acquisition of proper names versus count nouns in languages that do not have as explicit a grammatical contrast as does English. Take Japanese, for example. According to Imai and Haryu (2001, 789), “In Japanese, all nouns, including count nouns, mass nouns, and proper nouns, are syntactically treated the same. That is, no syntactic marker distinguishes the names for particular individuals, object types, and substances. Nor is there any syntactic device marking the singular/plural distinction.” We suspect that this is somewhat of an overstatement. Although there may be no explicit grammatical marker that occurs in all contexts to distinguish these types of nouns, there still are likely to be other correlated constructions that do distinguish them.

In English, for example, certain sentence frames fail to distinguish between adjectives, mass nouns, and proper names. In a sentence of the form “This is X,” X could be an adjective as in “This is expensive,” a mass noun as in “This is clay,” or a proper name as in “This is Jim.” But from this we would not conclude that there are no grammatical distinctions between these grammatical form classes; there are constructions in English that do distinguish between them. For example, adjectives can be preceded by *very*, while mass nouns and proper names cannot; mass nouns can be preceded by *some*, while adjectives and proper names cannot; and so on. Likewise, in Japanese, although proper and count nouns are not distinguished by articles or by a plural making, count nouns are more readily modified by adjectives, and proper names are more likely to take titles such as *Mr.* or *Honorable*. Other contexts such as number (five boys versus five Johns) and other forms of quantification (many, few) may distinguish the two. There is also the possibility that some phonological
distinctions may be correlated with proper names. In English, many nicknames have a diminutive ending, as in Becky, Suzie, Connie, Bobby, Jimmy, Ricky, Larry, and so on. So although in any given sentence there may be nothing to distinguish proper names from count nouns, adjectives, or mass nouns, an analysis of the distribution of contexts in which they occur would.

Even in languages where the grammatical distinction between proper and common names is not as clear as in English, the mechanisms we have just reviewed could enable children to acquire a lexical item in exactly the same way as English-speaking children who have not yet acquired the form class distinction learn that Bob is a proper name. One possibility is that children learning such languages rely on a conservative strategy that does not allow for generalization until given evidence to the contrary. However, there is no evidence that this strategy exists. The second possibility, and, given the evidence, the one we favor, is that they have the ability to evaluate whether someone had the opportunity and intent to refer to a given object with an expected count noun but did not.

So far we have considered how babies and young children might acquire specific proper names versus count nouns and how they could build up a general grammatical contrast between them. We turn now to how this distinction, once learned, could facilitate lexical acquisition.

12.3 Using the Proper-Count Distinction to Acquire New Words: Importance of Animacy

One of the most robust findings in the literature on the acquisition of proper names is that, from an early age, children expect that the referent for a proper name will be animate. Katz, Baker, and Macnamara (1974) argue that the expectation that proper names refer to animate things reflects a learned semantic distinction that it is more important for us to individuate and track animate things than inanimate ones. Indeed, when we give a proper name to a person, for example, it allows us to pick that person out from the set of all other people (except for those who have the same name). Of course, at times it is important for us to individuate inanimate things, too—

for example, it is quite important that we use our own toothbrush, and yet we do not give our toothbrushes proper names. Instead, inanimate things are typically individuated by some other linguistic device, such as a possessive or prenominal adjective—for instance, "my toothbrush" or "the red shoes."

As mentioned earlier, in their classic study, Katz, Baker, and Macnamara (1974) taught young children a new label for an object, modeled in a proper-name frame (e.g., "This is Dax") or a common-name frame (e.g., "This is a dax"). Some of the participants heard the common or proper name applied to a doll and others heard it applied to a block. Subsequently, children were provided with two objects: the one the experimenter had just named and another, highly similar one. They were asked to perform several actions with an object requested by the same name used in training (e.g., "Dax" or "a dax", depending on which condition the child had been in).

Results from Katz, Baker, and Macnamara 1974 showed that, as expected, when asked to perform actions with an object requested by a common name, children tended to select the originally labeled object and the other category member about equally. This was true regardless of whether the originally labeled object had been a doll or a block. However, when asked to perform actions with an object requested by a proper name, an important sensitivity to animacy emerged. When a doll had been labeled with a proper name, girls as young as 17 months selected primarily that same doll; in contrast, when a block had been labeled with a proper name, they selected that block and the other block about equally—essentially treating the proper name as a common one. Boys tended to treat the proper name as a common one regardless of the animacy of the object. Using a different procedure and only animate stimuli, Hall, Lee, and Bélanger (2001) found evidence for a proper-count distinction at 24 months in boys and girls, but not at 20 months.

In languages that do not make a syntactic distinction between proper and common names, animacy might be particularly important, interacting with whether a basic-level count noun is already known for the object. For example, as mentioned earlier, in Japanese, the same expression ("Kore wa dax desu") could mean "This is Dax," "This is a dax," "Those are daxes," "This is some dax," or
“This is dax [e.g., red].” Imai and Haryu (2001) found that if a count noun is not known for the object being referred to, Japanese preschoolers treat a new word applied to it like a count noun, extending it to other members of like kind at the basic level. In contrast, in accord with the mutual-exclusivity assumption, second labels for animate things are treated like proper names and second labels for inanimate things like subordinate-level nouns. Recall that Hall (1991) found that English-speaking children were also more likely to make proper-name interpretations for proper names given to animate objects for which they already had a label than for those they did not.

Things that young children come into contact with that receive proper names do tend to be animate—that is, they possess physical features like fur or skin, a face with eyes, biological shape, and so on. Indeed, outside the experimental situation, they also possess many more cues to animacy, such as self-propelled motion and correlated limb movements. Children may be exposed to many commercial and/or storybook characters that are normally inanimate, but that receive proper names (e.g., “Thomas the Train”). In most cases, however, these characters are likely to be anthropomorphized, with faces and the ability to talk and/or move.

It is interesting to note that certain things like insects are animate, but they lack some of the more common features correlated with animacy, such as a face. Hall (1994) showed that children were unlikely to treat a proper name given to an insect as referring to that particular individual unless it was described as being owned by someone (e.g., “This is my caterpillar. This caterpillar is Daxy”). Expressing ownership of an inanimate object (e.g., a boat), however, did not lead to a proper-name interpretation. Another way to induce a proper-name interpretation for a new name given to an object that would not normally take a proper name is to describe that object as having mental states. Sorrentino (1997) found that when a toy that was neither animal-like nor a typical artifact was described as having hopes, likes, and wants, 2-year-old girls (but not boys) tended to treat a new proper name as referring to that particular toy. In another condition where the toy was described with nonmental information (e.g., location, weight, tactile qualities), they did not. Thus, animal-like perceptual features may be a sufficient cue as to whether some-

thing is a candidate referent for a proper name, but they are not necessary.

One potentially interesting line of research could consider the range of cues that might lead a child to view an otherwise ambiguous object as a candidate for a proper name. From Sorrentino 1997, we know that the use of mental-state vocabulary in describing the object is sufficient (at least for 2-year-old girls), but it might also be interesting to consider whether attributes intrinsic to the object might lead to the same interpretation. For example, if the object appeared intentional by, say, demonstrating goal-directed motion (e.g., Woodward 1998), would that make it a candidate for a proper name? If it responded contingently to the child or another object (e.g., Johnson, Slaughter, and Carey 1998), would that suffice? Clearly, there is much to be worked out with regard to what aspects of an object make it likely to take a proper name.

In all of the work just mentioned, children acquired a proper name more readily when it was used to refer to something they could construe as animate. In a serendipitous finding, Gelman and Taylor (1984) noted that children would treat a proper name as referring to an animate object even when that was not what they had been taught. Their study was designed as a replication of the original Katz, Baker, and Macnamara 1974 study, using unfamiliar stimuli and changing the procedure slightly. In their revised version (which used 2.5-year-olds), the stimulus set consisted of a labeled object and a member of like kind (as before), but also two distractors of the opposite animacy. For example, in training, an unfamiliar monsterlike creature was called Dax. Later, in testing, the child was asked to perform a number of actions with Dax, selecting from an array consisting of the same monsterlike creature, a similar creature, and two (different) blocklike toys. The results were generally in line with those of Katz et al., but the addition of the distractor category led to an unexpected result: when the experimenter labeled a blocklike toy with a proper name, half of the children ignored this training and, at test, consistently selected one of the monster toys instead. This finding is noteworthy because the blocklike toy was unambiguously labeled not just once, but six times, and the monster toys were also present during training and were clearly not labeled with the name
(see Merriman et al. 1995 and above for a discussion of the effects of nonnaming). Clearly, many children were unwilling to accept an inanimate referent for a proper name despite direct, ostensive input.

Taking this expectation one step further, in a pilot study, Liittschwager and Markman (1993) simply presented preschoolers with a pair of objects, one animate and one inanimate, and asked them to “point to Dax” (proper-name condition), “point to a dax” (common-name condition), or “point to one” (baseline condition). The results were striking: even without training of any kind, children overwhelmingly selected the animate object as the referent for the proper name, but had no preference in the common-name or baseline conditions.

12.3.1 Direct vs. Indirect Instruction

In a series of studies, we have taken advantage of children’s ability to infer that the referent for a proper name should be animate to investigate the functional strength of word-referent mappings following two types of learning: direct and indirect. In direct instruction, the researcher names an object (e.g., “This is Blicket”), while pointing to, looking at, and clearly intending to refer to a particular item. In indirect instruction, in contrast, the researcher requests an object (e.g., “Where is Blicket?”), and the child, on the basis of this linguistic information and the range of possible referents, must decide which object to select; the researcher does not indicate the referent through overt pragmatic cues.

Although ostension has sometimes been treated as the prototypical word-learning situation, we know that children learn much of their vocabulary in nonostensive contexts (Akhtar, Jipson, and Callanan 2001; Akhtar and Tomasello 1996; Bloom 1993). Several experimental studies have shown that, in the absence of ostension, children successfully integrate a number of linguistic and nonlinguistic cues to identify a referent and then to infer at least some aspects of the word’s meaning—a process called fast mapping (Au and Markman 1987; Carey 1978; Carey and Bartlett 1978; Dockrell and Campbell 1986; Hall, Quantz, and Persoage 2000; Heibeck and

Markman 1987). For example, in Carey and Bartlett 1978, 3- and 4-year-olds were introduced to a new color word in a sentence contrasting it with another known color word. In their study, a teacher requested one of two differently colored trays, saying “You see those two trays over there? Bring me the chromium one, not the red one, the chromium one.” Children readily complied with this request, bringing the nonred tray, and many children demonstrated some appropriate understanding of the word a week later.

We were interested in whether direct instruction about the referent for a new word conferred any advantage over indirect instruction in terms of the robustness of the word-referent mapping. One might reasonably expect that direct instruction, with all of its overt social-pragmatic cues, might result in a stronger mapping than a fast mapping that required the child to identify the referent. Our studies were therefore designed with the explicit goal of comparing a word-learning situation where the child had to infer the referent for a new word with an analogous situation where no such inference was required.

Accuracy of Direct vs. Indirect Learning

In the first set of studies (Jaswal and Markman 2001), 2- and 3-year-old children were presented with a pair of novel objects. One object possessed physical features common to animate things (e.g., a face, hair, biological body shape), while the other was a novel artifact. Children in the direct-instruction condition watched as the researcher labeled the animate object four times with either a proper or common name: “This is [a] Dax. Would you like to look at [a] Dax? Here, why don’t you have a look at [a] Dax. This is [a] Dax.” The children were then allowed to play with both the animate and inanimate objects. Children in the indirect-instruction condition heard the researcher request one of the two objects by a proper or common name: “Point to [a] Dax.” After a selection had been made, the researcher provided neutral feedback (e.g., “Thank you”), and allowed the children to play with both objects. To ensure that the objects in each pair were equally attractive, either before or after the labeling or selection, we asked the children in both conditions simply to “Point to one” of the objects.
As in Liittschwager and Markman 1993, the children showed no preference for animate or inanimate objects when asked to point to one. When children in the indirect-instruction condition were asked to select the referent for a common name, they also showed no preference. However, when the same children were asked to select the referent for a proper name, they showed a clear preference, selecting the animate object 84 percent of the time.

The key extension of the Liittschwager and Markman 1993 results was the generalization trial, which was identical for children in the direct-instruction condition and those in the indirect one. We knew that children could identify the referent for a new proper name on the basis of animacy and grammatical form class, but did they also represent it as referring to a specific individual? We presented children with an array of three objects: the one that had just been labeled by the researcher or the one they had just selected as the referent for the new word (target); a second, very similar object to the target, but differing in coloring or clothing (generalization stimulus); and a third object, of the same animacy, but different kind (distractor). For example, suppose that during the first part of the trial, a child in the indirect-instruction condition was presented with a koosh-like doll (animate) and a bendable wand, and asked to “Point to Dax.” Most children would select the koosh-like doll. On the second part of the trial, that child would be presented with the same koosh-like doll, another koosh-like doll with differently colored and styled hair and clothing, and a mosquito-like stuffed animal. In the direct instruction condition, the researcher always labeled the animate object, and so children in this condition always saw the originally labeled animate object, a member of like kind, and a distractor.

At this point, we asked the children to perform a series of actions with an object requested by the same name used previously. For example, we asked them to “Put Dax down the chute [in a bucket, in a box, etc.].” Following Katz, Baker, and Macnamara (1974) and Gelman and Taylor (1984), we predicted that, if children treated a newly learned word as a proper name, they would make selections primarily of the target object. If, on the other hand, they treated it as a common name, they would be equally likely to select the target or generalization object. In neither case, however, should they select the distractor.

Results for the 3-year-olds were directly in line with these predictions. Following both proper- and common-name requests, they selected the target more frequently than chance; however, they were more likely to select the target object following a proper-name request than a common-name one. This pattern of results held true regardless of whether the children had been in the direct- or indirect-instruction condition. Results for the 2-year-olds were generally very similar. In short, children who inferred that the proper name should apply to the animate object restricted its scope as much as children directly taught the proper name. Similarly, children who inferred that the common name applied to either the animate or inanimate object extended its scope as much as (or more than) children directly taught the common name.

Maintenance of Learning Over a Delay
It is possible that differences between ostensive and inferential word learning may only emerge when increased demands are placed on the child. In the next studies (Jaswal and Markman 2003), we explored how the method of word learning (indirect vs. direct) affected 3-year-olds’ comprehension of novel proper and common names when testing occurred with a memory delay of at least 2 days. The procedure was basically the same as that described earlier: children were shown a pair of animate-inanimate objects, and were either trained on the referent for a new proper or common name (direct instruction), or made an inference about it (indirect instruction). As before, children had no preference in the baseline trial. Similarly, those in the indirect-instruction condition had no preference when a common-name request was made. When the request was made in a proper-name frame, however, they preferred the animate object, selecting it 81 percent of the time.

Rather than immediately proceeding to the generalization test with the target, generalization, and distractor stimuli, we inserted a delay of at least 2 days, thus providing a more challenging measure of the strength of the word-referent mappings. Results were
remarkably consistent with those obtained from the immediate testing studies. Children selected the target more than the generalization stimulus following all types of requests, but they were more likely to do so following proper-name requests than common-name ones, regardless of whether the training at the earlier session had been direct or indirect. In short, even after a delay of at least 2 days, 3-year-olds who inferred the referent for a novel proper or common name performed as well on a comprehension test as those who received training on the name.

It is interesting to note that many fast-mapping studies with preschoolers suggest that the mapping resulting from a brief exposure to a new word is partial, and requires additional experience to align with an adult meaning (e.g., Carey and Bartlett 1978; Dockrell and Campbell 1986; Goodman, McDonough, and Brown 1998). For example, Carey (1978) reviews evidence suggesting that children quickly learn certain aspects of, say, color words and spatial adjectives (e.g., semantic domain, polarity), but they take much longer to work out other aspects of those words (e.g., scope, dimensionality). Dockrell and Campbell (1986) argue that there are some semantic domains (e.g., shape, animal terms) where an initial fast mapping can provide a rather complete meaning of the term, and others (e.g., pattern, color) where this is not the case.

Our studies cannot address this issue directly because there are no partial meanings of proper names. Once children have figured out that a word is a proper name (through grammatical form class and animacy cues in our studies), they do not have to work out anything further about its meaning; it refers to one particular individual under all circumstances. Children in our studies seemed to understand this, regardless of whether they learned the new proper name directly or indirectly. Nor can our studies address how complete the meanings of the common names are. Although non-basic-level terms in particular may require more experience before children produce and comprehend them appropriately (see Callanan 1989; Liu, Golinkoff, and Sak 2001; Tenenbaum and Xu 2000), in our studies, we did not vary the similarity of the generalization stimulus and the target; they were quite similar. Thus, beyond saying that children extend new common names to similar, but not extremely different, items (i.e.,

the distractor), our results do not address questions about the scope of generalization of common names.

Resistance to Inconsistent Information
Although we cannot use proper names to evaluate how complete mappings are following indirect and direct instruction, we can use them to address further the question of how robust the mappings are. In particular, we can ask whether direct instruction makes children more confident in their mappings, and therefore more resistant to later information that is inconsistent with that mapping. For example, from the studies described so far, we know that children will treat a proper name as referring to a particular individual and not to another member of like kind. However, what if the researcher provides social-pragmatic cues indicating that another member of like kind shares the same name as the target? How might children deal with inconsistent information about a proper name’s referent? Although there is not much experimental evidence on this issue, there are logically three alternatives:

1. Ignore the inconsistency altogether. This is what adults are likely to do if a word is well known. For instance, Naigles, Gleitman, and Gleitman (1992) showed that adults and many older preschoolers tended to treat an intransitive verb in a transitive frame (e.g., *“The elephant comes the giraffe”) as if the speaker had meant the frame to be intransitive (e.g., “The elephant comes to the giraffe”). In other words, they ignored the transitive frame, treating it like an error. Thus, children might simply treat inconsistent information about a proper name’s referent as if it were an error.

2. Incorporate the inconsistent information into an existing representation. For example, younger preschoolers in the Naigles, Gleitman, and Gleitman 1992 study treated the ungrammatical sentence above as if it actually were transitive, which necessitated a causal action (e.g., “The elephant (pushes, carries, moves, brings) the giraffe”). The youngest preschoolers, it seems, “assume that not all structures [in which a verb can appear] have as yet been heard and therefore that certain properties of even common verbs (such as whether or not they can encode causation) may as yet be unknown
to them” (p. 126). Given inconsistent information about the referent for a proper name, children may try to reconcile the inconsistency by assuming that both objects have that proper name (as in two Barbies; a “brand-name interpretation”), that the word is actually an adjective (Hall 1996), or that the proper name is actually a common name and that the researcher erred by not using an article.

3. Ignore the original information, and replace it altogether with the most recently encountered information. Indeed, one might expect that children who inferred the meaning of a new name would have a very fragile initial mapping, capable of being overwritten very easily, whereas children who received direct instruction initially would be less likely to discount that original information.

Reasoning that children who learned a new proper name indirectly might be less confident and therefore more likely to revise or discount their initial mapping, we designed a study to probe the fragility of mappings following indirect and direct instruction (Jaswal and Markman 2003). Three-year-olds learned new proper and common names, again either indirectly or directly. As before, most children in the indirect condition selected the animate object when a request was made in a proper-name frame, but had no animacy preference when the request was made in a common-name frame. Following the selection of the referent in the indirect condition or the training of the referent in the direct one, the researcher cleared the table and provided additional information in the following way: He moved an opaque box containing the original object (target), a member of like kind (generalization), and an object of the same animacy but different kind (distractor) into view, saying that he needed to “get a few things ready before going on to the next part.” The target and distractor were removed from the box one at a time (in a random order), and placed on a small overturned box. As each was placed on the box, the researcher said “We’re going to need this.” Lastly, as the researcher removed the generalization stimulus and placed it on the overturned box, he referred to it with the same proper or common name that had earlier been associated with the target (e.g., “And we’re going to need [this] Bicket”). Although the information was provided in a fairly subtle manner, there was no ambiguity about the referent for the label. It is important to point out that this information is only inconsistent in the proper-name frame, where our previous studies showed that children would expect the name to be restricted to the target. The information could be called “additional” in the common-name frame, because the researcher actually provided accurate information about the scope of the new word, namely, that it applied to another member of like kind.

Following the inconsistent or additional information, all children participated in an unrelated 1-minute distraction task designed to reduce demand characteristics, particularly following inconsistent information. As in the studies described earlier, children were then asked to perform a series of actions with an object requested by the same name used previously. A common-name (or “brand-name”) interpretation would be one where the target and generalization objects were both treated as referents of the name. A proper-name interpretation would be one where a single object was treated as the only referent of the name.

Our additional/inconsistent information manipulation did indeed have an effect on the generalization results. Briefly, regardless of whether they learned the new word directly or indirectly, children were more likely than in previous studies to extend a new proper or common name to the generalization object. In fact, overall, they tended to select the generalization object more frequently than the target following both direct and indirect instruction—the opposite of what they did in the earlier studies. These results alone could simply indicate that our 1-minute delay-and-distraction task did not overcome the demand characteristic to select the last-labeled object. After all, the researcher had just called the generalization object by that very name. However, for the first time, there was also a hint of a difference between direct and indirect instruction: overall, children in the indirect condition were marginally more likely to select the generalization stimulus than children in the direct condition. There was no interaction with whether the request had been made in a proper- or common-name frame. In other words, children who learned the names indirectly may have given more weight to the inconsistent or additional information provided by the researcher,
perhaps implicitly marking it in some way as learned indirectly and therefore more open to revision (see also Sabbagh and Baldwin 2001). On the other hand, an additional study failed to replicate this effect.

12.4 Conclusion

We now briefly summarize some of the conclusions we have reached about the acquisition and use of the proper-count distinction and speculate about the broader implications of these ideas for the general acquisition and use of grammatical form class. We have distinguished between the issues that need to be addressed in considering the acquisition of a grammatical form class in the first place versus its subsequent use in lexical acquisition once acquired. Obviously there is a continuum here as a distinction is becoming acquired and useful and not a simple dichotomy.

We turned first to issues in the initial acquisition of the grammatical distinction. Before the general grammatical distinction is learned, children may figure out that a given lexical item functions as a proper name—that is, a particular word, such as Bill, refers to a specific person while another particular word, like chair, refers to many different chairs. They could learn the appropriate referents and scope of Bill and chair with no knowledge at all of the grammatical form class cues that distinguish proper from common names in English. Information about these individual words could serve as data to enter into a distributional analysis that would yield the grammatical distinction. It is too glib, however, to say that children perform distributional analyses on these data without saying how the data are selected and determined to be relevant. As we argued, in the case of proper names, it is the nonoccurrence of labels that must be entered into the analysis. Because “nonoccurrence of labels” is far too undifferentiated and unspecified, no learning mechanism could register and compute all the different things that were not mentioned at any given point in time. A proposed solution to this problem is in the combined effects of the taxonomic assumption, which would lead children to expect a given word to generalize to things of like kind, and pragmatic knowledge, which allows children to notice when someone intends to refer to a given object. Given a speaker’s explicit intent to refer to a given object but his or her failure to use an expected label, children would register the nonoccurrence of the label, and that could be entered into the statistical analysis they need to perform. As Gelman and Williams (1998) emphasize, all learning in any domain is selective. Although the details of the argument will differ for different grammatical categories, the general problem of selectivity must be solved. In the case of grammatical form class cues, examining the interplay between word-learning assumptions and pragmatic knowledge might be a fruitful way to consider how children work out grammatical contrasts beyond the proper-count distinction.

The second broad set of issues addressed how a grammatical distinction, once learned, facilitates the learning of new words. Knowing a word is a count noun or a proper name leads children to have different hypotheses about the appropriate referent of a word and, of course, its scope. In the case of proper names, animacy is one very salient feature that has been correlated with proper names—so much so that in an ambiguous situation where a proper name is used without the speaker making it clear which object is being referred to, children will assume a proper name refers to an animate over an inanimate object. This form of fast mapping—of quickly inferring the referent of a term in the absence of a speaker’s explicit eye gaze, pointing, or other explicit cues as to their focus of attention—generates questions about the relative robustness of terms acquired through direct versus indirect means that go well beyond the example of proper names versus count nouns. In the work to date on proper names, we found no differences in the accuracy of learning—that is, children who inferred that a proper name referred to an animate object limited the scope of the name to that specific object just as much as children who were explicitly told that the proper name referred to that object. There were no differences in the robustness of the learning as measured by memory for the term after a delay of several days, with children showing excellent memory regardless of whether the term was taught directly or inferred. In one study there were at least slight differences in children’s resistance to countersuggestions about the meaning of the term, suggesting that
words learned indirectly may be more open to revision than those learned directly. This research is a first step in addressing issues about the stability and robustness of lexical learning, and we expect that differences will eventually emerge. Our results so far, however, point out that learning through inference can be as compelling as learning through direct ostensive instruction. In fact, we suspect there are indirect word-learning situations that may result in more elaborated meanings of new words than some direct learning ones. To take an example from Keil 1979, on hearing a phrase like “The boojum is angry,” a word learner may be able to make many inferences about the boojum that a very straightforward ostensive labeling like “This is a boojum” might not license. Much of word learning is a protracted process requiring updating, revising, and enriching the first lexical entries established for a word. How this is accomplished is a question we need to address not just for proper versus count nouns, but for all of lexical acquisition.

References


Acquiring and Using a Grammatical Form Class


Acquiring and Using a Grammatical Form Class


