Assumptions about Word Meaning: Individuation and Basic-Level Kinds

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HALL, D. GEOFFREY, and WAXMAN, SANDRA R. *Assumptions about Word Meaning: Individuation and Basic-Level Kinds.* CHILD DEVELOPMENT, 1993, **64**, 1550–1570. In 2 experiments, 3½-year-old children interpreted a novel count noun (e.g., "This is a murvil") applied to an unfamiliar stuffed animal as referring to a basic-level kind, rather than to a kind that individuates its members by type of situation (context or life-phase). For example, children made interpretations akin to PERSON (a basic-level kind) rather than PASSENGER (a context-restricted kind), and DOG (a basic-level kind) rather than PUPPY (a life-phase-restricted kind). These experiments also document the role of object familiarity (previous knowledge of a basic-level count noun for the animal) and explicit information (about the relevance of the animal's situation) in the learning of count nouns for situation-restricted kinds. We note that children readily learn the meanings of basic-level count nouns through ostensive definitions (e.g., "This is an X"), although ostensive definitions do not distinguish basic-level kinds from situation-restricted kinds. Therefore, we suggest that children make an implicit assumption that a count noun applied to an unfamiliar solid object refers to a basic-level kind of object, and not to a kind that individuates its members by type of situation. We illustrate the importance of this assumption by showing how it bears directly on individuation, and therefore, on quantification (e.g., counting).

Young children readily learn the meanings of words through ostensive definition, that is, through hearing the words used when things are pointed out (e.g., "This is an X"). However, an ostensive definition is insufficient in helping children to select a single correct word meaning from a vast number of possibilities. Children's success at acquiring meaning thus may reflect, at least in part, implicit assumptions about the meanings of ostensively defined words (Carey, 1982; Markman, 1989).

Count nouns, words such as "chair," "banana," and "dog," tend to be among the earliest words that children learn (e.g., Gentner, 1982). In order for children to learn the meaning of a count noun (e.g., "dog") from simple ostension, they must succeed in mapping the word applied ostensively to a solid object (e.g., a dog) onto an object kind (category) (e.g., DOG). Recent evidence suggests that children between 2 and 4 years of age will map a count noun onto an object kind, instead of onto a unique individual (e.g., Gelman & Taylor, 1984), a material kind (e.g., Soja, Carey, & Spelke, 1991), or a salient property (e.g., Baldwin, 1989; Hall, Waxman, & Hurwitz, in press; Taylor & Gelman, 1988).

Indeed, if the object is unfamiliar (i.e., if the learner knows no basic-level count noun for the kind), preschool children may take *any* word applied to it ostensively as referring to a kind of object. For example,

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Hall (1991) showed that 2-year-olds construed a proper name (e.g., "This is Zav") applied to an unfamiliar, but not a familiar, object as referring to a kind of object. Markman and Wachtel (1988; see also Soja et al., 1991) provided evidence that 3-year-olds will interpret a mass noun (e.g., "This is pewter") applied to an unfamiliar, but not a familiar, object as referring to a kind of object. And Hall et al. (in press) have shown that 4-year-olds are more likely to take an adjective (e.g., "This is very feppish") applied to an object as referring to a kind of object if the object is unfamiliar than familiar.

The ability to map a word applied to an object onto a kind of object is crucial to the ability to learn count nouns, but by itself, even this ability does not constrain children's interpretation sufficiently to account for their success. Any unfamiliar solid object can be construed as a member of many different object kinds. For example, a word applied to a dog could be interpreted as referring to kinds such as DOG, ANIMAL, POODLE, PAW, TAIL, or PUPPY. How do children know which is the appropriate kind?

Children's success at learning from ostension suggests that the interpretative assumption that guides them must be more specific. Children must have some way of converging on a *unique* kind following an ostensive definition. Researchers have shown that children *do* appear to converge on a specific kind when learning a new word for an unfamiliar object through ostension; moreover, this developmentally privileged kind has properties associated with the basic-level kind.

Basic-level kinds have a particular psychological salience (see Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). In the hierarchy POODLE, DOG, ANIMAL, the basic-level kind is DOG, referred to by the basic-level count noun "dog." Rosch et al. (1976) have shown that the basic-level kind is the most inclusive kind in a hierarchy in which individuals possess significant numbers of attributes in common, elicit common motor programs, have similar shapes, and can be identified from an average shape of members of the kind. While it has proven difficult to provide an independent definition of the degree of shape similarity shared by the individuals in a given basic-level kind (for discussion, see Fodor, 1983; Gleitman, Gleitman, Landau, & Wanner, 1987; Markman, 1989), the basic-level construct has provided a useful summary description of the psychologically salient kind in a variety of psychological tests (Rosch et al., 1976).

Is the developmentally privileged kind a basic-level kind? In two ways, the basic-level kind does appear to be the preferred interpretation of an ostensively defined word applied to an unfamiliar object. First, the individuals in the developmentally privileged object kinds, like those in basic-level kinds, appear to share an intermediate level of shape similarity. For example, Horton and Markman (1980) showed children between 4 and 7 years of age drawings of several unfamiliar objects and labeled each with the same novel count noun (e.g., "This is a danker"). Some children saw objects from a kind in which members shared a common general shape (e.g., salamander-like animals); others saw objects from a kind in which the members did not (e.g., ungulate-like animals, including pig-like, cow-like, and other perceptually distinct kinds of animal). Children found it easier to identify new individuals of the kind in which the members shared a common shape (new salamander-like animals) than the kind in which no common shape was shared (new ungulate-like animals). However, the degree of perceptual similarity among individuals in the developmentally privileged kind is not the highest degree imaginable. Taylor and Gelman (1988, 1989) presented evidence that suggests that children interpret a count noun applied ostensively to an unfamiliar object as referring to a kind that includes individuals from distinct subordinate-level kinds (with perceptually distinct appearances) within a basic-level kind. In other words, the level of perceptual similarity associated with the developmentally privileged kind, like the level associated with the basic-level kind, is (in some admittedly unclear sense) intermediate. (For further discussion of the "shape bias" in word learning, see Baldwin, 1989; Landau, Smith, & Jones, 1988; Soja et al., 1991.)

Second, the individuals in the developmentally privileged object kinds, like those in basic-level kinds, are discrete *whole* objects rather than parts of objects. That is, the individuals are members of a kind like DOG, rather than a kind like PAW or TAIL. For example, Markman and Wachtel (1988, Experiment 2) showed that 3-year-old children assume that a count noun applied to an unfamiliar salient part of an unfamiliar object (the trachea attached to a lung) refers to

the kind of object as a whole (LUNG). When the unfamiliar salient part belongs to an object for which the basic-level count noun is already known (the claw on a hammer), children are more likely to assume the word refers to the kind for the salient part (CLAW) (see also Shipley & Spelke, 1988).

Yet to conclude from the preceding evidence that the developmentally privileged object kind is a basic-level kind would be premature. The individuals in basic-level kinds have another property that has not been noticed previously in the developmental literature (see Macnamara, 1986). To understand this property, consider that one of the semantic principles associated with all object kinds is a principle of identity. This principle specifies the range of situations over which the identity of individuals in the kind is traced. The principle of identity associated with individuals in basic-level kinds like PERSON or DOG specifies that their identity should be traced across a certain range of situations (i.e., across the range of personhood or doghood). However, many kinds individuate their members in terms of types of situations that are more restricted than those associated with basic-level kinds. Ostension does not indicate whether the individuals in a kind are those that belong to a basic-level kind such as PERSON, or to a context-restricted kind, such as PASSENGER; to a basic-level kind such as DOG, or to a life-phase-restricted kind, such as PUPPY. Notice that the individuals in these pairs of kinds (persons and passengers, or dogs and puppies) coincide in certain situations (i.e., when persons are riding in vehicles, or when dogs are young). The problem for the learner is to select *which* individuals should be taken as members of the kind, given only an ostensive definition.

The distinction between basic-level kinds and situation-restricted kinds is important because it is directly related to individuation, and therefore to quantification. Gupta (1980) offered the following example, which we modify slightly. In certain situations, such as riding on an airplane, a man could be seen as a member either of the kind, PERSON, or of the kind, PASSENGER. After the plane lands, the man ceases to be a passenger, though he continues to be a person. However, if he makes a round trip on the airplane, the airline will count him (in their annual records) as *two* passengers, though he is only *one* person. Thus the decision to treat the man as either a PERSON or a PASSENGER directly affects quantification. We count differently under basic-level kinds and situation-restricted kinds.

The preceding example underscores the need to understand whether the individuals that fall in the developmentally privileged kind are individuals like persons (individuals whose identity is traced across an extensive range of situations) or individuals like passengers (individuals whose identity is tied to more restricted situations). Although it has often been claimed that children make a basic-level kind assumption in word learning, no work has noted that this claim also embodies a claim about the tracing of identity of individuals across a certain set of situations. As a result, no research has actually tested whether the developmentally privileged kind is a basic-level kind, with respect to this property. If the kinds that have been identified in the psychological literature as basic level (e.g., PERSON) are, in fact, developmentally privileged, then children should prefer them to situation-restricted kinds (e.g., PASSENGER) in a word-learning task involving unfamiliar objects. In the following experiments, we test whether children make this assumption about word meaning.

In Experiment 1, we examined whether children interpret count nouns as picking out individuals in basic-level kinds (e.g., PERSON or DOG) or situation-restricted kinds (e.g., PASSENGER or PUPPY). We taught one group of children a novel word modeled as a count noun for an unfamiliar stuffed animal depicted in a specific context (riding in a car), and another for an unfamiliar stuffed animal depicted in a specific life-phase (while young). Children then took part in tasks designed to reveal their interpretation of the words. The central goal of these tasks was to determine whether children extended the count noun to include other members of the basic-level kind, or whether they restricted the count noun to animals in the specific context (e.g., riding in a car) or life-phase (e.g., while young) of the target. We predicted that children's assumption would be to construe the individuals as members of basic-level kinds, not situation-restricted kinds.

A secondary issue concerned the hierarchical level of children's interpretation. In addition to varying in their situation (context or life-phase) with respect to the target, the

stimulus animals also varied in subtype, marked by color of garments. (See Taylor & Gelman, 1989, Experiment 3, for evidence that garment type may sometimes be construed by young preschoolers as a subtype distinction.) This manipulation allowed us to determine whether children would extend a novel word across subtypes within the basic level. We predicted that children's assumption would be to construe the individuals as being members of basic-level kinds, not members of a particular subtype (see Taylor & Gelman, 1988, 1989). We also include out-of-kind distractor animals in the test sets to enable us to distinguish a basic-level kind interpretation from a more superordinate-level kind interpretation.

A further motivation for the experiment was to examine the circumstances under which children would make something other than a basic-level kind interpretation. We explored the role of two factors, introductory cue and target familiarity. To examine the role of introductory cue, we provided some children with simple ostensive definitions (e.g., "This is a murvil"); we provided others with ostension plus information directly implying a situation-restricted interpretation (e.g., "This is a murvil because it is riding in a car"; "This is a murvil because it is very young"). We predicted that the use of such information would decrease children's tendency to make basic-level kind interpretations compared to the use of simple ostension, and lead them instead to make situation-restricted interpretations.

We also examined the role of the familiarity of the target object (i.e., whether or not children previously knew the basic-level count noun for the object). Recent studies have demonstrated that children tend to avoid assuming that two words will have the same meaning (see Clark, 1987, for theoretical discussion; for experimental evidence see Hall, 1991; Markman & Wachtel, 1988; Merriman & Bowman, 1989; Taylor & Gelman, 1988). In this experiment, some children learned the word for an unfamiliar target (e.g., a creature); others learned it for a familiar target (e.g., a bear). We predicted that children would be more likely to adopt an interpretation other than a basic-level kind (a situation-restricted kind or a subtype) if the target was familiar than if it was unfamiliar.

Experiment 1

Method

Subjects

Forty-three 3½-year-olds took part. Three children could not complete the task and were dropped from the study. The remaining 40 children ranged in age from 3-6 to 4-0, with a mean age of 3-9. There were 20 girls. Children were from predominantly white middle- and upper-middle-class backgrounds. They were tested in a quiet corner of their preschool classroom or in an adjacent room during normal school hours. Ten children were assigned randomly to each of four conditions. The mean age (and standard deviation), in months, in each condition was as follows: Unfamiliar–Ostension, 45.6 (2.0); Familiar–Ostension, 44.7 (2.4); Unfamiliar–Information, 45.3 (1.8); Familiar–Information, 45.5 (1.7).

Design

We used a 2 × 2 × 2 mixed design, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as between-subjects factors, and trial type (Context, Life-Phase) as a within-subjects factor.

Stimuli

Context portion.—We used two sets of six toys. The *unfamiliar* set had four focal animals from a single basic-level kind (creatures with blue hair, large teeth, red tongues, and one green eye), an unfamiliar distractor (a round creature with yellow and blue fur), and a familiar distractor (a yellow rabbit). The *familiar* set included four focal animals from a single basic-level kind (bears), an unfamiliar distractor (a round creature with yellow and blue fur), and a familiar distractor (a yellow rabbit). Note that the distractors were the same for the unfamiliar and familiar sets.

For the four members of the focal kinds (the one-eyed creatures and the bears), we crossed the color of their garments (white hats and white bow ties vs. plaid hats and plaid bow ties) with their context (sitting in the back of orange plastic cars vs. sitting on the ground). Thus in both familiar and unfamiliar sets, there were two animals of the focal kind sitting in cars, and two animals of the focal kind sitting on the ground (plus two distractors sitting on the ground).[1] All ani-

[1] The cars looked a bit like trucks, but we referred to them as "cars" in the task, and children accepted this label without difficulty.

mals were approximately 2 inches tall. Figure 1 shows the two sets of context stimuli.

Life-phase portion.—Again, the *unfamiliar* set consisted of four focal animals from a single basic-level kind (pink and blue furry creatures, with yellow horns, fangs, and a large green nose), an unfamiliar distractor (a blue creature with long antennae), and a familiar distractor (a dinosaur). The *familiar* set included four focal animals from a single basic-level kind (monkeys), an unfamiliar distractor (a blue creature with long antennae), and a familiar distractor (a dinosaur).

For the four members of the focal kinds (the horned creatures and the monkeys), we crossed color of garment (blue hats and blue bow ties vs. paisley hats and paisley bow ties) with life-phase ("very young" or approximately 2 inches tall vs. "grown up" or approximately 5 inches tall). Thus for both unfamiliar and familiar sets, there were two "very young" animals of the focal kind and two "grown up" animals of the focal kind (plus two distractors that were larger than the "young" focal animals). Figure 2 shows the two sets of life-phase stimuli.

As further props, we used two washcloths, one white, one blue, and an additional empty orange plastic car (for use in the context portion).

Familiarity of the Object Kinds

Eight preschool children (who did not participate in the experiment proper but who came from the same population as those who did) took part in a pretest to assess the familiarity of the object kinds. We were interested in whether children could offer a suitable (basic-level) count noun for each kind of object we used. The experimenter told children they would see a set of toys. He said that if they knew what kind of thing

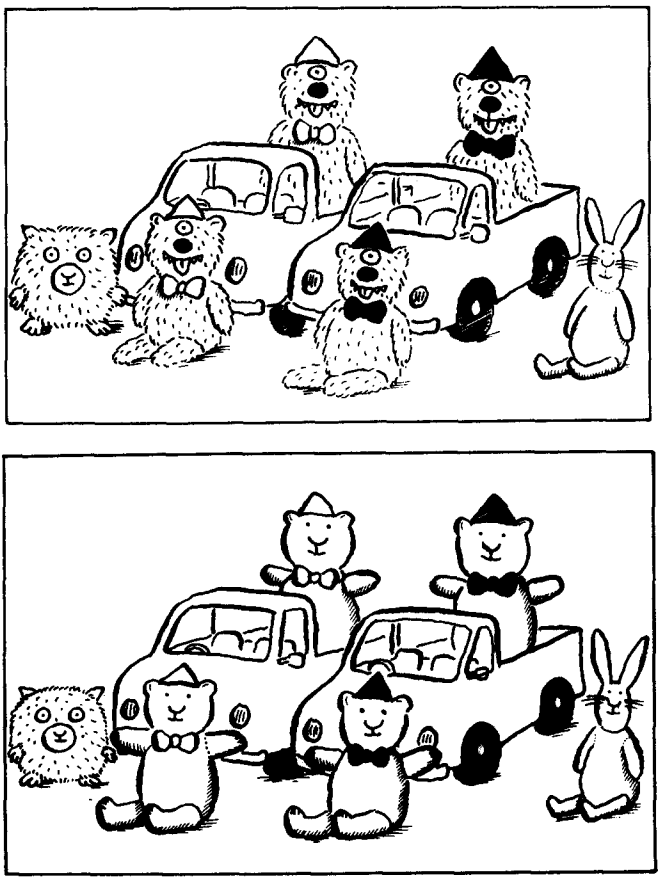

FIG. 1.—Unfamiliar (top) and familiar (bottom) stimuli used in context portion of Experiment 1. In the experiment itself, hats and ties were either white or plaid.

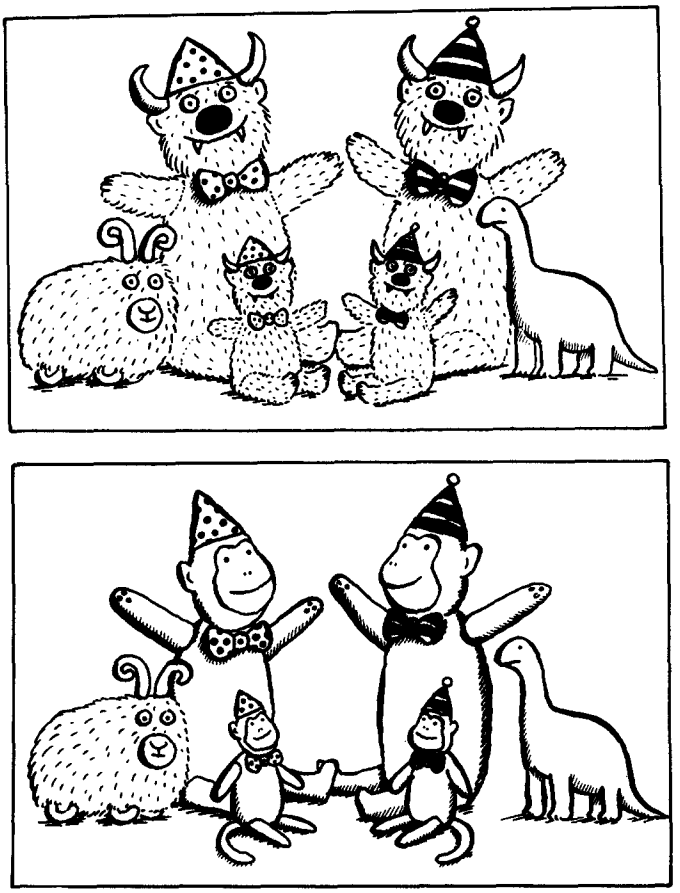

FIG. 2.—Unfamiliar (top) and familiar (bottom) stimuli used in life-phase portion of Experiment 1. In the experiment itself, hats and ties were either blue or paisley.

a toy was, they should say what it was, but if they didn't know the name, they should say they didn't know (and that it was acceptable not to know).

Each child saw one member of each kind used in the study. For the familiar focal stimuli (the bear and the monkey) and the familiar distractors (the dinosaur and the rabbit), all eight children provided appropriate count nouns (i.e., "bear," "monkey," "dinosaur," and "rabbit" or "bunny"). These findings support the claim that the intended familiar stimuli were familiar to the children.

For the two unfamiliar focal stimuli, one of the eight children offered the count noun "monster"; no other child provided any label (i.e., they all said they didn't know what they were). For the unfamiliar distractors, children offered a few count nouns, but there was no consensus among them. For one of the unfamiliar distractors, one child offered "dog," one provided "clown," and one said "mouse." For the other, one child offered "bee," and another suggested "caterpillar." The pretest thus also provided assurance that the intended unfamiliar toys were essentially unfamiliar, in the sense of unfamiliarity used here.

Procedure

The experiment had two parts, a context portion and a life-phase portion.

Context portion.—Children first saw all four members of the focal kind (one-eyed creatures or bears). The experimenter asked, "Which of these are riding in a car?" and "Which of these are out of a car?" Children had to answer correctly before the experimenter continued; all children did so.

Three of the four focal kind members were then moved to the experimenter's side,

leaving the target animal (a one-eyed creature or a bear riding in a car) in front of the child. Pointing to the target, the experimenter said, for example, "This is a murvil" (Ostension conditions) or "This is a murvil because it is riding in a car" (Information conditions). The experimenter then asked the child to repeat the word (Ostension conditions) or both the word and information (Information conditions). All children did as requested. The experimenter repeated the introductory cue at least four more times while children played with the animal, which remained in the car at all times. The experimenter then brought back the three other focal kind members. These four animals now were arranged so that the target animal sitting in a car and the animal of the same garment color sitting outside a car were closest to the child. The two animals of different garment color (one in a car, one outside) were placed directly behind these animals. In addition, a distractor animal was placed on each side of the focal kind set. The child participated in three tasks, in the following order:

1. *Toy selection task.*—The experimenter asked the child to perform a series of 12 actions, each involving one of the six animals. Six of these actions were designated as *test* trials, and on these the experimenter asked the child to perform an action in response to a request that included the new count noun (e.g., "Can you tickle a murvil?"). The remainder were *filler* trials, included to reduce the likelihood that children would select an animal simply out of an interest in handling it. On filler trials, the experimenter told the child which object to handle (e.g., "Can you pat *this* on the head?"). Each of the six objects served on one filler trial. Pairs of filler trials were interspersed semirandomly among the test trials, under the constraint that no more than two test trials occur in succession. Children performed a total of nine different kinds of action—six for the test trials, plus three for the filler trials (one per pair). All actions were familiar to children. They consisted of: pat on head, tickle, touch nose, wash with blue cloth, wash with white cloth, cover with blue cloth, cover with white cloth, point to, and wave to.

To decrease children's tendency to focus exclusively on any one animal, the experimenter replaced the animal chosen on any test trial in the following manner. If the animal had been in the row closest to the child, then the experimenter moved it to the second row. If it had been in the second row away from the child, then it remained in the second row. If it had been one of the flanking distractors, it remained on the flank. The movement of any animal involved a distance of only several inches, so all six animals were within the child's easy grasp on all trials (see Taylor & Gelman, 1988, for use of a similar technique). Following filler trials, toys were replaced where they had been previously located, because on those trials the experimenter, not the child, had selected the toy.

2. *Yes-no task.*—The experimenter pointed to each of the six toys and asked, for example, "Is this a murvil?" For all "yes" answers, the experimenter asked for a justification; he said, for example, "Why is this a murvil?"

3. *Posttest task.*—There were two versions of the posttest. Children received the version that matched their pattern of answers on the yes-no task. If children gave a *situation-restricted* (or a *conservative*) pattern of answers on the yes-no task (i.e., said "yes" only to the two toys in the context of the target, or only to the target itself), then we asked them two questions in the posttest. First, the experimenter pointed to one of the focal kind animals sitting in a car (always the target, if the child had made a conservative interpretation) and asked, for example, "Can you make this *not* be a murvil?" Second, he pointed to one of the focal kind animals sitting outside the cars and asked, for example, "Can you make this *be* a murvil?" (Another car, identical to the two used in the task, had been brought out for this purpose.) If children gave a *situation-independent* pattern of answers on the yes-no task (i.e., said "yes" to at least one toy from within, and one toy from outside, the context of the target), then we asked only the first question described above; we did not ask the second question because these children had already agreed that one or both of the toys outside the cars *were*, for example, "murvils."

Life-phase portion.—Children first saw all four members of the focal kind (horned creatures or monkeys). As a preliminary question, the experimenter asked, "When you grow up, are *you* going to get bigger or smaller?" All children answered correctly (i.e., they said "bigger"). The experimenter then pointed to the four toys and asked, "Which of these are very young?" and "Which of these are grown up?" Children had to answer correctly before the experi-

menter continued. All children pointed to the small creatures in response to the first question, and to the large creatures in response to the second. This performance is consistent with recent findings that children of this age know that life-phase and size are correlated for a wide range of animals (Rosengren, Gelman, Kalish, & McCormick, 1991). The questions were formulated using adjectives to describe the life-phases because children were to be taught count nouns in the experiment. These questions were meant to encourage children to treat the size differences as differences in life-phase rather than, for example, as differences between two subordinate-level kinds of animal (e.g., STANDARD POODLE and TOY POODLE).

Three of the four focal kind members were then moved to the experimenter's side, leaving the target animal (a small—"very young"—horned creature or monkey) in front of the child. Pointing to the target, the experimenter said, for example, "This is a kepid" (Ostension conditions) or "This is a kepid because it is very young" (Information conditions). The procedure then continued as in the context portion. Children took part in a *toy selection task* and then a *yes-no task*, exactly as in the context portion. There was, however, no *posttest task* for the life-phase portion, because it was not possible to have children change these animals by making them grow larger or smaller.

In all conditions, exactly half the children received the context portion before the life-phase portion. For each subject in one condition, the order of the trials in the toy selection task was determined randomly; these random orders then were copied in all conditions. The same order was used for any child's context and life-phase portions. The order in which the yes-no questions were asked was determined randomly for each child. For each child, two nonsense words were selected randomly from "murvil," "shennet," "dilkin," and "kepid." We also counterbalanced the choice of toy that served as a target on both the context and the life-phase portions; the toy of each garment color was used half the time.

Results and Discussion

Our interest first lay in examining the role of target familiarity and introductory cue in children's tendency to make a basic-level kind interpretation, that is, in their tendency to extend the novel count nouns to objects of the focal kind (1) across situations (context or life-phases) and (2) across subtype distinctions. We then examined children's justifications, and, finally, their posttest task answers.

Extending the Count Noun across Situations

Toy selection task.—We examined the proportion of test trials on which children selected either of the two focal toys outside the situation (context or life-phase) of the target. (No child selected either of the distractor toys on any test trial.) We obtained this proportion by adding the proportions of selections of the toys marked "Different Context (Life-Phase)" and "Both Different" in Table 1. The combined proportion reflects the extent to which children generalized beyond the situation of the target in extending the novel word.

We entered these scores into an ANOVA, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as between-subjects factors, and trial type (Context, Life-Phase) as a within-subjects factor. There was a significant effect of introductory cue, $F(1, 36) = 13.28$, $p < .001$, indicating a higher proportion of different-situation selections in the Ostension conditions ($M = .43$, SD = .17) than in the Information conditions ($M = .26$, SD = .21). The significant effect of target familiarity, $F(1, 36) = 22.20$, $p < .001$, revealed a higher proportion of different-situation selections in the Unfamiliar ($M = .45$, SD = .10) than in the Familiar ($M = .23$, SD = .23) conditions. The introductory cue × target familiarity interaction was also significant, $F(1, 36) = 5.76$, $p < .05$. Tests of simple effects established that the effect of target familiarity was significant in the Information ($p < .001$) but not in the Ostension ($p > .10$) conditions.

We next classified children according to the pattern of their selections across all test trials in the toy selection task. We classified children as having made a *situation-independent* interpretation if their six toy selections included at least one from outside the situation of the target. They were credited with a *situation-restricted* interpretation if their six toy selections all fell within the situation of the target, including at least one that was not of the target itself. If children selected only the target on all six test trials, we attributed to them a *conservative* interpretation.

The numbers resulting from this classi-

TABLE 1

PROPORTION OF TOY SELECTIONS (and Standard Deviation) IN TOY SELECTION TASK IN EXPERIMENT 1

	CONTEXT PORTION				
	Target Toy	Different Garment Color	Different Context	Both Different	Distractor
Ostension:					
Unfamiliar	.27 (.09)	.23 (.16)	.27 (.09)	.23 (.18)	.00 (.00)
Familiar	.52 (.33)	.05 (.11)	.40 (.29)	.03 (.11)	.00 (.00)
Information:					
Unfamiliar	.28 (.18)	.20 (.19)	.37 (.26)	.15 (.17)	.00 (.00)
Familiar	.62 (.27)	.30 (.30)	.07 (.12)	.02 (.05)	.00 (.00)

	LIFE-PHASE PORTION				
	Target Toy	Different Garment Color	Different Life-Phase	Both Different	Distractor
Ostension:					
Unfamiliar	.28 (.16)	.25 (.26)	.33 (.16)	.13 (.11)	.00 (.00)
Familiar	.60 (.32)	.08 (.21)	.28 (.27)	.03 (.07)	.00 (.00)
Information:					
Unfamiliar	.42 (.21)	.25 (.12)	.18 (.18)	.15 (.12)	.00 (.00)
Familiar	.67 (.26)	.23 (.24)	.08 (.21)	.02 (.05)	.00 (.00)

fication appear in the first, second, and fifth columns of Table 2. We used Fisher's exact tests to examine the relation between making or not making a situation-independent interpretation and seeing an unfamiliar or a familiar target. The results mirrored the significant interaction we obtained in the ANOVA. The relation was not significant in the Ostension conditions, in either the context or the life-phase portion. In contrast, in the Information conditions, significantly more children made situation-independent interpretations if the target was unfamiliar than if it was familiar, p's $< .05$.

Yes-no task.—We classified children as having made a *situation-independent* interpretation if they said "yes" to at least one toy from within, and one toy from outside, the situation of the target. We classified them as having made a *situation-restricted* interpretation if they said "yes" only to the two toys within the situation of the target. We assigned children a *conservative* interpretation if they said "yes" only to the target toy. The numbers that we obtained from this coding appear in parentheses in columns 1, 2, and 5 of Table 2. We again conducted Fisher's exact tests to examine the relation between making or not making a situation-independent interpretation and seeing either an unfamiliar or a familiar target. The results replicated the significant findings from the previous classification in all instances.

In sum, the results showed that children were more likely to interpret a novel count noun as applying across situations (1) if the target object was unfamiliar than if it was familiar, and (2) if the word was introduced with ostension than if it was introduced with information implying a situation-restricted interpretation. Strikingly, the effect of target familiarity was greater in the Information conditions than in the Ostension conditions. Despite the fact that the information called for a situation-restricted interpretation, children were more likely to rely on it if the object was familiar than if it was unfamiliar. Children thus appeared to assume that a word applied to an *unfamiliar* object applies to individuals across situations; children were to some extent oblivious to information that was in conflict with this assumption.

Extending the Count Noun across Subtypes

Toy selection task.—We examined the proportion of test trials on which children selected either toy of the focal kind outside the subtype of the target. (Recall that no child selected either of the distractor toys on any test trial.) We obtained this proportion

TABLE 2

CLASSIFICATION OF CHILDREN BY PATTERN OF TOY SELECTIONS IN TOY SELECTION TASK (and Pattern of Answers on Yes-No Task) IN EXPERIMENT 1

	SITUATION		SUBTYPE		
	Independent	Restricted	Independent	Restricted	CONS.
Context portion:					
Ostension:					
Unfamiliar	10 (10)	0 (0)	10 (10)	0 (0)	0 (0)
Familiar	9 (9)	1 (0)	3 (2) * (*)	7 (7)	0 (1)
Information:					
Unfamiliar	9 (9)	1 (1)	9 (9)	1 (1)	0 (0)
Familiar	4 (3) * (*)	6 (6)	6 (6)	4 (3)	0 (1)
Life-Phase portion:					
Ostension:					
Unfamiliar	10 (10)	0 (0)	8 (9)	2 (1)	0 (0)
Familiar	7 (9)	3 (0)	3 (4) * (*)	7 (5)	0 (1)
Information:					
Unfamiliar	8 (8)	2 (2)	10 (10)	0 (0)	0 (0)
Familiar	2 (3) * (*)	8 (4)	6 (5) * (*)	4 (2)	0 (3)

NOTE.—N = 10 per condition. Cons. = conservative pattern.
* Indicated relation is significant, $p < .05$ by Fisher's exact test.

by adding the proportions of selections of the toys marked "Different Garment Color" and "Both Different" in Table 1. This proportion reflects the extent to which children generalized across subtypes in extending the novel word.

We entered these scores into an ANOVA, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as between-subjects factors, and trial type (Context, Life-Phase) as a within-subjects factor. There was a significant effect of target familiarity, $F(1, 36) = 13.28$, $p < .001$, indicating a higher proportion of different-subtype selections in the Unfamiliar ($M = .40$, SD = .13) than in the Familiar ($M = .19$, SD = .23) conditions. The introductory cue × target familiarity interaction was also significant, $F(1, 36) = 4.17$, $p = .05$. Tests of simple effects established that the effect of target familiarity was significant in the Ostension ($p < .001$) but not in the Information ($p > .25$) conditions.

We next classified children according to the pattern of their selections across all test trials in the toy selection task. We classified children as having made a *subtype-independent* interpretation if their six toy selections included one or more from outside the subtype of the target. They were credited with a *subtype-restricted* interpretation if their six toy selections all fell within the subtype of the target, including at least one that was not of the target itself. If children selected only the target on all six test trials, we classified them as having made a *conservative* interpretation.

The results of this coding appear in the third, fourth, and fifth columns of Table 2. We examined the relation between making or not making a subtype-independent interpretation and seeing either an unfamiliar or a familiar target, using Fisher's exact tests. The results for the context portion were consistent with our finding of a significant interaction in the ANOVA; that is, more children made a subtype-independent interpretation in the Unfamiliar– than in the Familiar–Ostension condition, $p < .05$; the relation was not significant in the Information conditions. However, for the life-phase portion, more children made subtype-independent interpretations in the Unfamiliar than in the Familiar condition in *both* Ostension and Information conditions, p's $< .05$.

Yes-no task.—We classified children as having made a *subtype-independent* interpretation if they said "yes" to at least one toy from within, and one toy from outside, the subtype of the target. We classified them as having made a *subtype-restricted* interpretation if they said "yes" only to both toys

within the subtype of the target. We credited them with a *conservative* interpretation if they said "yes" only to the target animal. The numbers that emerged from this coding appear in parentheses in columns 3, 4, and 5 of Table 2. Using Fisher's exact test, we again explored the relation between making or not making a subtype-independent interpretation and being in an Unfamiliar or a Familiar condition; we obtained the same significant effects as we did from the previous classification.

In sum, children were more likely to extend the count noun across subtypes if the target was unfamiliar than if it was familiar. Moreover, this effect of target familiarity was greater in the Ostension conditions than in the Information conditions. The finding from the Ostension conditions extends to 3½-year-olds a finding that Taylor and Gelman (1988, 1989) previously obtained with 2-year-olds.

Justifications from Yes-No Task

We asked each of the 40 children for two sets of justifications (one set for the context portion, one for the life-phase portion), yielding 80 sets. We used these justification sets to gain further insight into children's interpretations of the new words. The justification sets were coded as *basic-level-kind-relevant, subtype-relevant, situation-relevant,* or *other.* Basic-level-kind-relevant justification sets alluded to the objects' appearance or kind, irrespective of situation or subtype (e.g., "because it's brown and furry"). Subtype-relevant justification sets made direct reference to the animals' garments (e.g., "because it's got a white hat"). Situation-relevant justification sets alluded to the context or life-phase of the objects (e.g., "because it's riding in a car"). The *other* category included ambiguous answers (e.g., "because it's a murvil"; "because it is") and failures to respond. The experimenter coded all justification sets; a second coder, blind to the hypotheses, coded one-half of the sets; agreement was 90%.

Seventy-six (95%) of the sets fell into one of the first three categories. We compared (1) whether children gave a basic-level-kind-relevant, a subtype-relevant, or a situation-relevant justification set, with (2) whether children gave a basic-level-kind pattern of answers (i.e., a pattern that was both situation-independent and subtype-independent), a subtype-restricted pattern, or a situation-restricted pattern on the yes-no task.

The correspondence between justifications and yes-no answers was considerable. Of the 76 justification sets, 53 (70%) were consistent with the pattern of selections on the yes-no task. However, there was a difference in the correspondence in the Ostension (89%) and the Information (65%) conditions. The lower rate of correspondence in the Information conditions reflects the fact that in these conditions (particularly in the Unfamiliar–Information condition), children tended to give basic-level-kind patterns of answers on the yes-no task, but gave situation-relevant justifications. For example, one child said "yes" to all four members of the basic-level kind on the yes-no task. However, when asked to justify his selections, he said that the two animals in the car were murvils "because they were riding in cars," and that the two animals outside the car were murvils "because they were not riding in cars." We think that these findings reflect the fact that, in the Information conditions, children often interpreted the word as referring to a basic-level kind; however, when they were asked for justifications after the task, they recalled the information the experimenter had originally provided and felt compelled to refer to it.

Posttest Task

The posttest task provided us with further evidence about children's interpretation of the new word in the context portion. Children's performance on the posttest was scored as either *consistent* or *not consistent* with a situation-restricted interpretation. To be consistent with a situation-restricted interpretation, children had to take the animal out of the car in response to the first question; and if they were asked the second question, they had to put the animal into the (newly introduced) car in response to it. To be not consistent with a situation-restricted interpretation, children had to answer the posttest question(s) without making any reference to the car.

We were interested in the correspondence between (1) whether children responded to the posttest question(s) in a manner consistent or not consistent with a situation-restricted interpretation, and (2) whether they had given a situation-restricted (or conservative) or a situation-independent pattern of answers on the yes-no task.

First consider the children who made a situation-restricted (or conservative) interpretation on the yes-no task, that is, said

"yes" only to the two animals riding in a car (or only to the target animal riding in a car). One child did so in the Familiar–Ostension condition, one did so in the Unfamiliar–Information condition, and seven did so in the Familiar–Information condition. The child in the Familiar–Ostension condition answered the posttest question in a manner that was *not consistent* with a situation-restricted interpretation, but the child in the Unfamiliar—Information condition and all seven children in the Familiar–Information condition responded to the posttest questions in a manner *consistent* with a situation-restricted interpretation. These findings offer further evidence that the interpretations these children made were indeed situation-restricted kinds.

Now consider children who made a situation-independent interpretation on the yes-no task, that is, said "yes" to animals of the focal kind both in and out of cars. Among the 31 children who made a situation-independent interpretation, most (27) gave answers that were *not consistent* with a situation-restricted interpretation. Some of these simply said "I don't know." Other answers were more explicit, but still ignored the car; these answers ranged from the cute (e.g., "I'd use my magic wand," "I'd get a wand and wave it") to the gruesome ("I'd chop him up," "I'd shoot him"). Only four children answered the question in a manner *consistent* with a situation-restricted interpretation; all were in the Information conditions. We suggest that these children *had* made a basic-level kind interpretation of the word, but when asked for explicit answers to the posttest question, recalled the information and decided to refer to it.

In summary, the results of Experiment 1 provided evidence that 3½-year-olds interpret a count noun applied ostensively to an unfamiliar object as referring to a basic-level kind, and not to a situation-restricted kind or to a subtype. The experiment also documented the role of target familiarity (knowledge of a basic-level count noun) and information in the tendency to make a situation-restricted kind interpretation. But although the results of Experiment 1 were clear, several concerns led us to conduct a follow-up experiment.

The first was the issue of children's familiarity with the restricted meanings that we intended to convey. In the context portion of Experiment 1, the intended restricted kinds were BEAR-PASSENGER or ONE-EYED-CREATURE-PASSENGER. Other evidence suggests that 3-year-olds do not know the count noun "passenger" (Hall, in press–a), making it unlikely that they knew words for either of the more specific meanings. For the life-phase portion, the intended restricted meanings were BABY-MONKEY or BABY-HORNED-CREATURE. Three-year-olds likely do know the word "baby," but they also know that specific kinds of animal have specific names (e.g., baby dogs get called "puppies"; baby cats get called "kittens"), and it is unlikely that they could have known words for either of the *specific* life-phase meanings used in the experiment. The horned creature was unfamiliar, and it is not clear what the English count noun would be for the kind BABY-MONKEY; perhaps "juvenile." Moreover, even in the event that children were affected by knowledge of the words "passenger" or "baby," this knowledge should have affected them to the same degree in the Unfamiliar and Familiar conditions, leaving our observed familiarity effects unexplained. However, to rule out the possibility that children's interpretations were affected by familiarity with the intended restricted meanings, in Experiment 2 we used a situation-restricted meaning that is *not* encoded by a single English count noun. We taught children a word for an animal sitting in a shallow box. Unlike the context "riding in a car," which may call to mind the count noun "passenger," the context "sitting in a box" does not suggest any single English count noun.

A second question concerned children's interpretation of the relation between garment color and meaning in Experiment 1. In the first experiment, we used garment color (i.e., the color of hats and bow ties) as a subtype distinction within the basic-level kinds. It is possible that children construed this as a subordinate-level kind distinction (especially given that the hats and ties were *sewn* onto the toys, making them appear to be an inherent rather than a changeable feature). Taylor and Gelman (1989, Experiment 3) have made such an observation. However, it is also possible that garment color was construed as a situational property, not as a subtype marker. If this was the case, then children who selected animals wearing only one color of garment may have been making another type of situation-restricted interpretation (e.g., PLAID-GARMENT-WEARER). Of course, this would not run counter to our hypothesis, given that children tended *not*

to make subtype interpretations in the Unfamiliar–Ostension condition. (They did so more often in the Familiar–Ostension conditions.) Nonetheless, in Experiment 2, we examined children's performance when the distinctions within the focal kind more closely resembled subordinate-level kind distinctions found within natural hierarchies. To do this, we used toys that differed in fur color within a basic-level kind. Fur or skin color often is used to mark subordinate-level kinds in natural hierarchies (e.g., red vs. silver foxes, brown vs. black bears).

Finally, because we were concerned about details involving the introduction and manipulation of the toys, we changed the procedure in four ways. First, we introduced all six toys at once, to decrease children's tendency to focus only on the four focal kind members from within the basic-level kind. Second, we interspersed the distractors among the focal toys in the array, again to draw attention away from the four focal kind members as a group. Third, movement of toys after a test selection did not always involve moving the toy to the row farther away from the child; sometimes, the movement was to a different position in the first row. We hoped that this change would block the possibility that the child viewed the toy movement as an indication that the chosen toy should *not* be selected a second time. Fourth, we altered the posttest procedure slightly. The fact that we brought out a new car exclusively for the second question of the posttest in Experiment 1 may have led children to think that it should be used somehow in responding to the questions. In Experiment 2, we did not introduce any new prop in the posttest.

Experiment 2

Method

Subjects

Forty-five children participated, none of whom had taken part in Experiment 1. Five children were dropped from the study because they failed to complete the task. The remaining 40 children ranged in age from 3-6 to 4-2, with a mean age of 3-10. There were 26 girls. Children were from a predominantly white population, ranging in socioeconomic status backgrounds. Exactly half the children were tested in nursery schools, in a quiet corner of their classroom or in an adjacent room, during normal school hours. The remaining children were tested in a testing room in a developmental laboratory. To recruit the latter children, we first obtained parents' names, primarily through health-care workers, hospital prenatal clinics, and newspaper advertisements. Parents received no remuneration for bringing children to the laboratory but were paid for their journey to and from it. The number of children tested in schools and in the laboratory was approximately the same in all conditions. Ten children were assigned randomly to each of four conditions. The mean age (and standard deviation), in months, in each condition was as follows: Unfamiliar–Ostension, 45.2 (2.4); Familiar–Ostension, 45.8 (1.9); Unfamiliar–Information, 46.3 (2.5); Familiar–Information, 46.1 (2.4).

Design

We used a 2 × 2 between-subjects design, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as factors.

Stimuli

We used two sets of six toys. The *unfamiliar* set included four focal animals from a single basic-level kind (round furry creatures with large yellow noses), an unfamiliar distractor (a blue creature with long antennae), and a familiar distractor (a grey cat). The *familiar* set consisted of four focal animals from a single basic-level kind (rabbits), an unfamiliar distractor (a blue creature with long antennae), and a familiar distractor (a grey cat).

For the four members of the focal kinds (the yellow-nosed creatures and the rabbits), we crossed their fur color (blue vs. pink) with their context (sitting in a shallow cardboard box vs. sitting on the ground). Thus for both unfamiliar and familiar stimulus sets, there were two animals of the focal kind sitting in boxes, and two animals of the focal kind sitting on the ground (plus two distractors sitting on the ground). All animals were approximately 3 inches tall. Figure 3 shows the two sets of stimuli.

As in Experiment 1, we also used a white washcloth and a blue washcloth.

Familiarity of the Object Kinds

Eight preschool children (who did not participate in the experiment proper but who came from the same population as those who did) took part in a pretest to assess object kind familiarity. The procedure was the same as in Experiment 1. For the two familiar stimuli—the rabbit and the cat—all children provided appropriate count nouns (i.e., "rabbit" or "bunny" and "cat"; one child la-

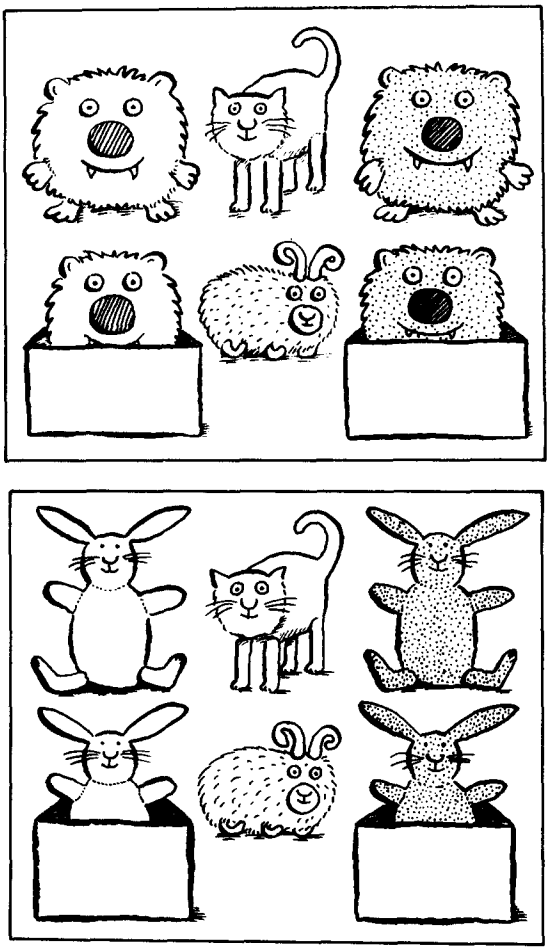

FIG. 3.—Unfamiliar (top) and familiar (bottom) stimuli used in Experiment 2. In the experiment itself, fur color was either pink or green.

beled the cat with the basic-level count noun "squirrel"). These findings support the idea that the intended familiar stimuli were familiar to the children.

For the two unfamiliar stimuli—the focal kind member and the distractor—children offered few count nouns. For the focal creature, one child offered the count noun "monster"; another offered "bat." No other child provided a label (i.e., they all said they didn't know what it was). For the distractor, one child offered "snail," and one provided "bug." The pretest thus also provided assurance that the intended unfamiliar toys were essentially unfamiliar, in the sense of unfamiliarity used here.

Procedure

This was exactly like the context portion of Experiment 1, with the following changes: (1) all six animals were presented together initially, rather than the focal kind members first; (2) the array of animals had the distractors mixed in with the focal kind members, rather than on the flank; (3) animals were moved following all test selections, but sometimes to another position in the front row and sometimes to a position in the rear row (determined randomly); and (4) during the posttest, no new props were introduced; if children wished to make use of a box in answering the second question, they were left to use one of the two boxes already on the table.

In addition, in the Information conditions, instead of saying, for example, "This is a murvil because it is riding in a car," the experimenter now said, "This is a murvil because it is sitting in a box."

RESULTS AND DISCUSSION

Again, we first examined the role of introductory cue and familiarity in children's tendency to make a basic-level kind interpretation, that is, to extend the novel count noun to members of the focal kind (1) across situations (i.e., contexts), and (2) across subtypes. Then we turned to an examination of children's justifications, and, finally, we considered the results of the posttest.

Extending the Count Noun across Contexts

Toy selection task.—We examined the proportion of test trials on which children selected either animal of the focal kind outside the context of the target, as in Experiment 1, by adding the proportions of selections of the animals marked "Different Context" and "Both Different" in Table 3. (In this experiment, one child selected the unfamiliar distractor toy on one test trial; all other children made all test selections from among the focal kind members.)

We entered these scores into an ANOVA, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as between-subjects factors. The results were consistent with those of Experiment 1. There was a significant effect of introductory cue, $F(1, 36) = 14.57$, $p < .001$, indicating a higher proportion of different-situation selections in the Ostension conditions ($M = .52$, SD = .21) than in the Information conditions ($M = .27$, SD = .25). The significant effect of target familiarity, $F(1, 36) = 7.84$, $p < .01$, revealed a higher proportion of different-situation selections in the Unfamiliar ($M = .48$, SD = .22) than in the Familiar ($M = .30$, SD = .27) conditions. The introductory cue × target familiarity interaction approached, but failed to reach, significance, $F(1, 36) = 3.17$, $p = .08$. Motivated by our findings in Experiment 1, we followed it up with tests of simple effects. These tests established that the effect of target familiarity was significant in the Information ($p < .01$) but not in the Ostension ($p > .25$) conditions.

We next classified children according to the pattern of their selections across all test trials in the toy selection task. We used the same criteria as in Experiment 1 for attributing *situation-independent*, *situation-restricted*, or *conservative* interpretations to children. The numbers appear in columns 1, 2, and 5 of Table 4. As in Experiment 1, we examined the relation between making or not making a situation-independent interpretation and seeing an unfamiliar or a familiar target, using Fisher's exact tests. The results supported the findings from the simple effects tests described above. The relation was not significant in the Ostension conditions. In contrast, in the Information conditions, significantly more children made a situation-independent interpretation if the target was unfamiliar than if it was familiar, $p < .05$.

Yes-no task.—Again, we relied on the same criteria as in Experiment 1 for assigning a child to a *situation-independent*, *situation-restricted*, or *conservative* interpretation. The numbers that emerged from this coding appear in parentheses in columns 1, 2, and 5 of Table 4. We again explored the relation between making or not making a situation-independent interpretation and being in an Unfamiliar or a Familiar condition, using Fisher's exact tests. The results replicated exactly the significant findings from the previous classification.

In sum, the results replicated Experiment 1 very closely. We found that target familiarity and introductory cue exerted the same effects on interpretation of the novel count noun as they did in Experiment 1. We also found evidence that the effect of target familiarity was greater in the Information conditions than in the Ostension conditions.

TABLE 3

PROPORTION OF TOY SELECTIONS (and Standard Deviation) IN TOY SELECTION TASK IN EXPERIMENT 2

	Target Toy	Different Fur Color	Different Context	Both Different	Distractor
Ostension:					
Unfamiliar	.27 (.14)	.17 (.21)	.30 (.17)	.25 (.18)	.02 (.05)
Familiar	.45 (.18)	.07 (.09)	.43 (.21)	.05 (.11)	.00 (.00)
Information:					
Unfamiliar	.35 (.17)	.23 (.18)	.12 (.16)	.30 (.15)	.00 (.00)
Familiar	.52 (.21)	.37 (.11)	.07 (.12)	.05 (.11)	.00 (.00)

TABLE 4

CLASSIFICATION OF CHILDREN BY PATTERN OF TOY SELECTIONS IN TOY SELECTION TASK (and Pattern of Answers in Yes-No Task) IN EXPERIMENT 2

	SITUATION		SUBTYPE		
	Independent	Restricted	Independent	Restricted	CONS.
Ostension:					
Unfamiliar	10 (10)	0 (0)	9 (9)	1 (1)	0 (0)
Familiar	9 (9)	0 (0)	4 (4) * (*)	5 (5)	1 (1)
Information:					
Unfamiliar	9 (9)	1 (1)	10 (10)	0 (0)	0 (0)
Familiar	3 (4) * (*)	7 (6)	10 (10)	0 (0)	0 (0)

NOTE.—N = 10 per condition. Cons. = conservative pattern.
* Indicated relation is significant, $p < .05$ by Fisher's exact test.

The experiment thus offers a clear confirmation of the finding that 3-year-old children tend to assume that a word applied to an unfamiliar object also applies to individuals of the same kind across situations, even if the children hear information that suggests the contrary.

Extending the Count Noun across Subtypes

Toy selection task.—We examined the proportion of test trials on which children selected either toy of the focal kind outside the subtype of the target, as in Experiment 1, by adding the proportions of selections of the toys marked "Different Fur Color" and "Both Different" in Table 3. (Recall that only one child selected the unfamiliar distractor on one trial.)

We entered these scores into an ANOVA, with introductory cue (Ostension, Information) and target familiarity (Unfamiliar, Familiar) as between-subjects factors. As in Experiment 1, there was a significant effect of target familiarity, $F(1, 36) = 12.58$, $p < .01$, indicating a higher proportion of different-subtype selections in the Unfamiliar conditions ($M = .48$, SD = .21) than in the Familiar conditions ($M = .27$, SD = .22). Unlike what we found in Experiment 1, introductory cue now had a significant effect, $F(1, 36) = 12.58$, $p < .001$; there was a higher proportion of different-subtype selections in the Information ($M = .48$, SD = .18) than in the Ostension ($M = .27$, SD = .24) conditions. Also unlike what we found in Experiment 1, the introductory cue × target familiarity interaction was *not* significant, $F(1, 36) = 2.44$, $p > .10$.

We next classified children according to the pattern of their selections across all test trials in the toy selection task. Again, we relied on the same criteria as in Experiment 1 for assigning children to a *subtype-independent, subtype-restricted,* or *conservative* interpretation. The third, fourth, and fifth columns of Table 4 show these numbers. As in Experiment 1, we examined the relation between making or not making a subtype-independent interpretation and seeing either an unfamiliar or a familiar target, using Fisher's exact test. The results were similar to those from the context portion of Experiment 1. In the Ostension conditions, significantly more children made a subtype-independent interpretation if the target was unfamiliar than if it was familiar, $p < .05$. In contrast, in the Information conditions, the relation was not significant.

Yes-no task.—The same criteria as in Experiment 1 were used to assign children to a *subtype-independent, subtype-restricted,* or *conservative* interpretation. The numbers that emerged from this coding appear in parentheses in columns, 3, 4, and 5 of Table 4. We again examined the relation between making or not making a subtype-independent interpretation and seeing an unfamiliar or a familiar target; the results, by Fisher's exact test, were the same as those described for the previous classification.

In sum, although we closely replicated the pattern of tendencies to extend the count noun across *situations,* we found some differences (in the ANOVAs) in the pattern of tendencies to extend the word across *subtypes.* Recall the previous findings suggesting that 2-year-old children are more likely to make a subtype-independent inter-

pretation in an Unfamiliar– than in a Familiar–Ostension condition (Taylor & Gelman, 1988, 1989). We obtained this finding in both our experiments. However, we had no prediction about the role of introductory cue (which had to do with the situation, not the subtype), or about the role of the interaction between target familiarity and introductory cue; thus we have no account to offer of the differences we observed between our Experiments 1 and 2 in terms of these factors.

Justifications from Yes-No Task

We asked each of the 40 children for one set of justifications, yielding 40 sets. Again, the justification sets provide further details about children's interpretation of the novel word. We coded them as *basic-level-kind-relevant, subtype-relevant, situation-relevant,* or *other,* analogously to what was done in Experiment 1. The experimenter coded all justification sets. A second coder, blind to the hypotheses, then coded them; agreement was 95%.

Thirty-three (83%) of the sets fell into one of the first three categories. Again, we compared (1) whether children gave a basic-level-kind-relevant, a subtype-relevant, or a situation-relevant justification set, with (2) whether children gave a basic-level kind pattern of answers (i.e., a pattern that was both situation-independent and subtype-independent), a subtype-restricted pattern, or a situation-restricted pattern on the yes-no task.

As in Experiment 1, the correspondence between yes-no answers and justification sets was impressive. Of the 33 sets, 24 (73%) were consistent with the pattern of selections on the yes-no task.[2] As in Experiment 1, there was a difference in this correspondence across the Ostension (92%) and the Information (60%) conditions. The lower rate of correspondence in the Information conditions again reflects the fact that in these conditions (especially in the Unfamiliar–Information condition) children tended to give basic-level-kind patterns of answers on the yes-no task, but gave situation-relevant justifications. We interpret this mismatch as we did in Experiment 1, as reflecting the fact that children *did* construe the word as referring to a basic-level kind; however, when asked for a justification after the task, these children recalled the information the experimenter had originally provided, and they felt compelled to use it.

Posttest Task

We conducted the same posttest as in Experiment 1 and coded children's answers in an analogous manner, as either *consistent* or *not consistent* with a situation-restricted interpretation. Again, we were interested in the correspondence between children's performance on the posttest task and the pattern of answers they gave on the yes-no task.

First consider the children who made a situation-restricted (or conservative) interpretation on the yes-no task, that is, said "yes" only to both animals sitting in a box (or only to the target animal sitting in a box). One child did so in the Familiar–Ostension condition, one did so in the Unfamiliar–Information condition, and six did so in the Familiar-Information condition. The child in the Familiar–Ostension and the child in the Unfamiliar–Information condition gave answers that were *not consistent* with a situation-restricted interpretation; in fact, both failed to answer the questions (i.e., said "I don't know"). However, all six children in the Familiar–Information condition responded to the posttest questions in a manner *consistent* with a restricted interpretation. As in Experiment 1, these findings offer additional evidence that these interpretations were, for the most part, situation-restricted kinds.

Now consider children who made a situation-independent interpretation on the yes-no task, that is, said "yes" to animals of the focal kind both in and out of boxes. Again, we asked these children *only* the first posttest question, because they had said "yes" to the animal(s) of the focal kind outside the box(es). Among the 32 children who made such an interpretation, most (26) children gave answers that were *not consistent* with a restricted interpretation; some simply said

[2] One child in the Familiar–Ostension condition gave a basic-level kind pattern of answers on the yes-no task (i.e., he said "yes" to all four rabbits). However, when asked for justifications, he pointed to one of the rabbits and said, "See, it has two murvils." He then pointed to each of the rabbit's ears. This finding shows that the child had made a salient part interpretation (i.e., RABBIT EAR), not a basic-level kind interpretation (i.e., RABBIT). This is consistent with the findings of Markman and Wachtel (1988; Experiment 2), and consistent with our general hypotheses. We did predict that target familiarity would promote fewer basic-level kind interpretations, but we had expected the most salient alternatives would be a subtype or a situation-restricted kind, not a part kind.

"I don't know"; other answers again ranged from cute (e.g., "Make some magic," "With a magic wand") to violent (e.g., "Take its nose off," "Cut its ears off"). Only six answered the question in a manner *consistent* with a restricted interpretation; five of these were in the Information conditions. We interpret these answers as we did in Experiment 1, as reflecting the fact that children had made a basic-level kind interpretation of the word during the yes-no task, but when explicitly asked to justify their performance, felt compelled to refer to the information that they had been given earlier.

In summary, the results of Experiment 2 clearly replicated the major findings from Experiment 1. We again found that the interpretation of a count noun applied ostensively to an unfamiliar object tended to be a basic-level kind, and not a kind including individuals tied to a specific context or subtype. The experiment also again showed that familiarity (knowledge of a basic-level count noun) and information affected the tendency to make a situation-independent interpretation of a novel count noun. Furthermore, the fact that Experiment 2 replicated Experiment 1 suggests that the findings of Experiment 1 were not due to (1) familiarity with a count noun for the situation-restricted meaning, (2) the fact that subtype was marked by garment color rather than something more inherent, like fur color, or (3) certain procedural details having to do with the presentation and manipulation of the stimuli.

General Discussion

In two experiments, our central finding was that 3½-year-old children assumed that a novel count noun applied ostensively to a solid unfamiliar object referred to a basic-level kind (e.g., PERSON, DOG) rather than to a kind that individuates its members by type of situation (e.g., PASSENGER, PUPPY). We suggest that this finding reflects an implicit assumption children make about the individuals in the developmentally privileged kind, namely, that their identity is traced across an extensive range of situations rather than across a more restricted set of situations (contexts or life-phases). Children must make this assumption because the individuals in basic-level kinds and those in situation-restricted kinds are coextensive over certain ranges of situations (e.g., when dogs are young, when persons are riding in vehicles), and so ostensive definition, unaided, does not distinguish between them.

We found that two factors weakened children's tendency to make a situation-independent kind interpretation: familiarity of the target object (i.e., previous knowledge of a basic-level count noun for the kind), and information calling for a situation-restricted interpretation. Children were more likely to make a situation-independent kind interpretation if the target was unfamiliar than if it was familiar, and if they learned the word through ostension than if they learned it with information implying a situation-restricted interpretation. Even if children heard explicit information calling for a situation-restricted interpretation, they were more likely to overlook the information if the target was unfamiliar than if it was familiar. The observed familiarity effects are consistent with several recent studies showing that children have a greater tendency to interpret a word as referring to a (basic-level) object kind if the target object is unfamiliar than familiar (e.g., Hall, 1991; Hall et al., in press; Markman & Wachtel, 1988; Taylor & Gelman, 1988).

Consistent with previous results, we also found that children tended to interpret a count noun applied to an unfamiliar object as picking out basic-level individuals rather than individuals within a given subtype. We suggest that the finding reflects another facet of the implicit assumption children make about the individuals in the developmentally privileged kind: that is, these individuals share an intermediate level of perceptual similarity. In both experiments, we also discovered that target familiarity affected children's tendency to make a subtype-independent interpretation. This finding replicated a finding that Taylor and Gelman (1988, 1989) obtained with 2-year-olds.

The results from these experiments thus add to recent results that suggest that the basic-level kind is the privileged interpretation of a word applied ostensively to an unfamiliar solid object (e.g., Hall, 1991; Hall et al., in press; Landau et al., 1988; Markman & Wachtel, 1988; Soja et al., 1991; Taylor & Gelman, 1988). Once the basic-level object kind term is acquired, children are more willing to entertain other interpretations of new words. Among the possibilities are a property (Hall et al., in press), a material kind (Markman & Wachtel, 1988; Prasada, 1993), the individual itself (Hall, 1991), and, as these experiments show, a subordinate-

level kind (see also Taylor & Gelman, 1988, 1989), or a situation-restricted kind.

The distinction between basic-level kinds and situation-restricted kinds is important because it is directly related to quantification. As noted in the introduction, quantification (counting) with basic-level kind members (e.g., persons) is different than quantification with kind members that are tied to specific situations (e.g., passengers) (Gupta, 1980). There are many occasions in which counting is done over situation-restricted individuals. Aside from airlines (which count passengers), restaurants count diners, universities count students, and hospitals count patients; all of these are situation-restricted individuals. Children ultimately must learn about quantifying over situation-restricted individuals. However, the results of the present experiments suggest that for young children, the privileged way of quantifying is over individuals that are not tied to restricted situations (for other discussion of what constitutes a countable entity for young children, see Shipley & Shepperson, 1990).

The preceding point about quantificational differences between basic-level kinds and situation-restricted kinds serves to highlight the distinction between basic-level (DOG) and subordinate-level (POODLE) kinds on the one hand, and basic-level (DOG) and situation-restricted kinds (PUPPY) on the other. If an individual in a subordinate-level kind (a poodle) coincides with an individual in a basic-level kind (a dog) in one situation, then it coincides in *all* situations. For example, the situations in which a certain pet (say Fifi) could be construed as a poodle are the same as those in which she could be construed as a dog. In contrast, basic-level and situation-restricted kinds have members that do *not* coincide in all situations (though they may overlap). For example, the situations in which Fifi could be construed as a puppy are *not* all the same as those in which she could be taken as a dog; Fifi could *not* be construed as a puppy when she grows up, although she could still be construed as a dog. The basic-level versus situation-restricted kind distinction thus does not reduce to the basic-level versus subordinate-level kind distinction.

To our knowledge, this is the first experimental demonstration of learners' preference for basic-level over situation-restricted kinds in a word-learning task (for discussion of other issues related to identity and object kinds, see Keil, 1989; Saltz & Medow, 1971). Several important issues remain unaddressed. First, we have examined only animate kinds. We believe that our focus on animate (rather than inanimate) kinds in these experiments provides a fair test of our hypothesis, because in English, situation-restricted count nouns occur frequently for animate kinds (especially PERSON). There are, however, situation-restricted count nouns that refer to artifact kinds (e.g., a jalopy is an old car); more research will be needed to test the hypothesis that children interpret words applied to inanimate objects as basic-level kind terms, not situation-restricted ones.

Second, our test stimuli did not allow us to examine whether the situation-restricted interpretations were restrictions within the basic level (e.g., BEAR-PASSENGER) or within a more superordinate level (e.g., ANIMAL-PASSENGER). Our procedure limited us to considering restrictions within the basic level. This is because we did not present distractor toys (from outside the basic-level kind) situated in the context or life-phase of the target. In pilot testing, we found that using a larger number of toys in the test arrays made it difficult to administer a toy-selection task. However, recent results from experiments using a different procedure are beginning to describe the level of abstraction of the situation-restricted interpretation (Hall, in press–b). Furthermore, the fact that virtually no children selected either of the distractor stimuli in our studies may have reflected children's familiarity with the relevant superordinate kind, ANIMAL. "Animal" is presumably a familiar count noun for 3½-year-olds, and there is good evidence that children avoid interpreting two words as having the same meaning (Clark, 1987). It will be important in future research to select objects from *unfamiliar* superordinate-level kinds.

Third, our 3½-year-old subjects were quite advanced learners. Thus, we are unable to make any claims about the origins of this interpretative assumption. However, we *do* know that children well below 2 years of age expect that words applied to solid objects will refer to kinds of objects (Markow & Waxman, 1992; Waxman & Hall, 1993; Waxman & Heim, 1991). Moreover, we know that even 4-month-old babies expect that objects will persist and maintain identity across situations (Baillargeon, 1987). Thus, it is possible that the basic-level kind assumption as discussed here guides word learning from the outset.

It should be possible to test younger word learners to see whether they construe solid objects as individuals in basic-level kinds (e.g., PERSON) or context-restricted kinds (e.g., PASSENGER). This should be possible because such a test does not depend upon children's having knowledge about how objects change through situations, only, for example, knowledge about objects within and outside cars. Such knowledge should be available to children as soon as they know about the objects (assuming very young children do not parse the world differently than adults, thinking that a creature in a car is part of the car). In contrast, it may be more difficult to test whether very young children construe a word as referring to a basic-level kind (e.g., DOG) rather than a life-phase-restricted kind (e.g., PUPPY), because children may lack sufficient knowledge about the specific kind of creature. We know that 3-year-olds expect size differences to be correlated with life-phase differences for a wide range of animal kinds (Rosengren et al., 1991). However, we know less about children under 3. Very young children may not think that dogs and puppies are members of the same basic-level kind (despite the shape similarity between puppies and dogs) because children may be unaware that puppies grow up to be adult dogs. Thus, it is conceivable that very young children might interpret the word "puppy," if applied to a young dog, as referring to dogs only when they are young, not because the children make a situation-restricted interpretation, but because PUPPY is a ("child") basic-level kind (see Mervis, 1987).

The preceding point leads us to a point about what we are *not* claiming in this paper. We do *not* claim that children interpret a word applied to a novel object as picking out those objects across their life span. However, we do claim that children interpret a word as referring to a basic-level kind, and not a kind whose members are tied to more specific situations. (And we accept that the "child" basic-level kind may differ from the "adult" basic-level kind; Mervis, 1987.) For many kinds (e.g., DOG, CAT, HORSE, and others whose perceptual form is roughly the same across the life span), our claim amounts to a claim about identity being traced across the life span. For many kinds, however, our claim amounts to a claim about identity being traced only through restricted life phases. For example, caterpillars grow up to be butterflies. CATERPILLAR and BUTTERFLY are distinct basic-level kinds, referred to in English by separate basic-level count nouns, "caterpillar" and "butterfly." We do *not* expect that children interpret a word applied to a caterpillar (assuming it to be an unfamiliar object) as meaning CATERPILLAR-OR-BUTTERFLY. We *do* expect that they interpret it as meaning CATERPILLAR. Interpreting a word as meaning CATERPILLAR implies a commitment to tracing individuals' identity across situations, but the situations are tied to the basic-level kind, CATERPILLAR. Even after people learn about the life-phase link between caterpillars and butterflies, we expect that their primary construal of a caterpillar is still as a member of the basic-level kind, CATERPILLAR. We also expect, however, that knowledge of the life-phase link enables them to make statements about identity across life phases through a kind at a higher level of abstraction, such as INSECT, as in "This caterpillar [in reference to one photo] and that butterfly [in reference to a second photo, taken at a later time] are the same *insect*"; see Macnamara (1986).

Through the two experiments reported here, we have attempted to elucidate the default interpretation children assign to a novel word applied ostensively to an unfamiliar solid object. We have presented evidence that this interpretation is a basic-level kind. While we have *not* been concerned with explaining previously identified properties of basic-level kinds (and we have acknowledged that a satisfactory explanation of these properties is lacking), we have been concerned with pointing out an unnoticed property of these kinds. This property is that, like all object kinds, basic-level kinds include individuals whose identity is traced across a certain set of situations. Our argument has been that these situations are more extensive than those that are associated with many situation-restricted kinds. Three-and-a-half-year-old children's interpretations of ostensively defined count nouns applied to unfamiliar objects accord with this property, providing new insight into the developmentally privileged word meaning.

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