Two-Year-Olds’ Appreciation of the Shared Nature of Novel Object Labels

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Two-year-olds’ appreciation of the shared nature of object labels versus object preferences was examined in 2 studies. A total of 128 24- to 27-month-olds played a finding game with an experimenter during which they were taught a piece of information about a target object in a nonostensive learning context. In Experiment 1, children were presented with a cue signaling the referent of a novel label. In Experiment 2, children were presented with a cue signaling the experimenter’s preference for a particular object. Results indicate children appreciate that knowledge of an object’s label is shared between 2 different individuals, but object preferences are not.

Consider the following situation: A young child is seated in front of her toy box and hears an adult utter a word that she has never heard before, the word top. How does the child figure out what that new word means? First, she needs to determine that the intended referent of the word is a top, rather than one of the many other toys in the box. Once the child has settled on the appropriate referent of the new word, she needs to determine how to generalize that word to other appropriate referents. That is, she has to decide what other objects can also be called tops. Finally, to successfully use words to communicate, she has to assume that other members of her language community will understand what she means when she uses the word top. In other words, she needs to understand that the knowledge of object labels is shared or conventional among speakers and listeners. In this article, we report two experiments that examined 2-year-olds’ understanding of the shared nature of novel object labels versus another type of referential information, namely, object preferences.

Given the complexity involved in learning a simple label like top, one might expect children to acquire new words slowly and with a great deal of effort. Yet word
learning is one of the most rapid and seemingly effortless accomplishments of childhood. In fact, it has been estimated that young children learn approximately five to six new words a day between 18 months and 6 years of age (Anglin, 1993; Carey, 1978, 1982). To explain this remarkable feat, researchers have examined the diverse set of abilities that young children recruit to learn new words (see Akhtar & Tomasello, 2000; Baldwin & Moses, 2001; Bloom, 2000; Hollich, Hirsh-Pasek, & Golinkoff, 2000; Sabbagh & Baldwin, in press; Woodward & Markman, 1998, for reviews). In recent years, there has been growing acknowledgment of the critical role that young children’s social understanding or theory of mind plays in their acquisition of new words (e.g., Akhtar & Tomasello, 2000; Baldwin & Moses, 2001; Bloom, 2000). This perspective emphasizes the fundamentally social and communicative nature of word learning and focuses on how young children’s understanding of other’s intentions and mental states guides their word learning.

Evidence for links between social understanding and word learning comes from a number of lines of research (see Akhtar & Tomasello, 2000; Baldwin & Moses, 2001; Bloom, 2000, for reviews). One line of research indicates that children’s sensitivity to cues produced by speakers signaling their referential goals and intentions can assist children in identifying the intended referent of a novel word. For example, studies have suggested that young children’s tendency to link a novel label with an object can be directed by a speaker’s gaze direction (e.g., Baldwin, 1993a, 1993b; Moore, Angelopoulos, & Bennett, 1999), a speaker’s affective or behavioral cues (e.g., Tomasello & Barton, 1994; Tomasello, Strosberg, & Akhtar, 1996), and the relative novelty of objects or actions in the discourse context (e.g., Akhtar, Carpenter, & Tomasello, 1996; Akhtar & Tomasello, 1995). Studies have also suggested that the role of intentional cues in word learning extends beyond the acquisition of object names to action words (Poulin-Dubois & Forbes, 2002; Tomasello & Akhtar, 1995).

Another line of research examined how young children’s assessment of another’s knowledge state impacts their word learning. In a recent set of studies, Sabbagh and Baldwin (2001) found that 4-year-olds will avoid mapping a new word onto an unfamiliar object if a speaker provides signs of ignorance in a word learning context. That is, preschoolers resist making a link between a new word and a target object if they think that an ignorant speaker may not know the conventional name of an object. Birch and Bloom (2002) demonstrated that preschoolers were sensitive to a speaker’s knowledge state when learning proper names. They found that children assumed that a novel proper name referred to an individual familiar to the speaker versus an individual unfamiliar to the speaker. Taken together, these studies demonstrate that preschoolers will monitor another’s epistemic state when making links between novel words and novel objects.
The current studies explored another potential link between social understanding and word learning by examining young children’s expectations regarding the shared nature of object labels versus other types of referential information. As noted earlier, a key aspect of word learning involves the understanding that words have communicative value because speakers and listeners can assume that knowledge of the correct label for an object is shared by other speakers in their linguistic community. The notion that young word learners must develop the appreciation that language is a conventional communicative system was first articulated by Eve Clark (1983, 1993). Clark proposed that word learning is guided by a number of pragmatic principles, including a Principle of Conventionality, which states that, “For certain meanings, there is a form that speakers expect to be used in the language community” (Clark, 1993, p. 67).

Researchers have begun to provide evidence documenting the development of children’s understanding of the conventionality of language during the infancy and preschool years. Clark (1983, 1992, 1993) indicated that young word learners’ spontaneous self-repairs to previously incorrect word choices and their tendency to ask adults for the names of objects indicates an early awareness of conventionality and a quest to learn the conventional forms of language. Recent studies have suggested that there is a developmental progression in the types of symbols that infants believe convey object reference in a conventional manner during the 2nd year of life. Although younger infants are willing to accept gestures and nonlinguistic sounds (e.g., a whistle) as referring to objects, older infants tend to accept only words (e.g., Namy, 2001; Namy & Waxman, 1998; Woodward & Hoyne, 1999). Only one study has examined young children’s appreciation that novel words may be conventional. Diesendruck and Markson (2001) presented 3-year-old children with two novel objects and labeled one object with a novel name (e.g., “Look this is a fep.”) or a novel fact (e.g., “I keep this in the kitchen.”). A puppet, who was either present or not present during the naming of the first object, then requested the child to retrieve the referent of a new novel name (e.g., “Can you give me the jop?”) or the referent of a novel fact (e.g., “Can you give me the one that goes inside a fish tank?”). When asked for the referent of a novel word, children selected the second object as the referent of the second novel name more often than would be expected by chance, regardless of whether the puppet was present during the initial naming phase. In contrast, when asked for the referent of a novel fact, children chose randomly between the two objects when the puppet had been absent but chose the second object when the puppet had been present. These findings indicate that 3-year-olds presumed that individuals would share knowledge of the correct referent of a novel label, even if they had not been provided with explicit evidence that this was the case. In contrast, 3-year-olds assumed that individuals would share knowledge of novel factual information about an object only when this had been
clearly demonstrated. These findings indicate that by 3 years of age, children appreciate that the knowledge of an object’s label is conventional and is shared, whereas knowledge of factual information is not.

Although there is emerging evidence that young children possess at least a basic understanding of the conventionality of language, there are many unresolved issues that can be clarified only through research on word learning during the infancy and toddler years. In particular, there has been little systematic investigation of whether children under 3 years of age presuppose that knowledge of the label of a novel object is shared by other speakers within a linguistic community. In these studies, we first examined whether 2-year-olds appreciated that the knowledge of the correct referent of a new word taught in a nonostensive context by one speaker would be shared by a second speaker who was not present when the new word was learned. We then contrasted the naming of objects with another type of referential act, namely the communication of a speaker’s preference, to examine whether 2-year-olds understand that different types of information vary in their ability to be generalized across speakers. This contrast allowed us to examine whether toddlers will differentiate between the shared nature of object names versus other types of referential information. Before one can attribute an understanding of the conventionality of language, one must demonstrate that children extend words differently than they extend other types of information. That is, words should be assumed to be shared between people although other types of information, such as preferences, should be specific to individuals.

EXPERIMENT 1

The goal of Experiment 1 was to examine 2-year-olds’ appreciation that object labels acquired in a nonostensive context are conventional. In this study, 24- to 27-month-olds played a finding game similar to that used by Tomasello and Barton (1994). In the original version of this paradigm, an adult announces her intention to find an object (e.g., “Let’s find the gazzer.”) and then “finds” with obvious glee a target object that is hidden. In one condition, the target object is found immediately, although in other conditions other objects are found and rejected before the target object is found. At no time does the adult ever directly pair the novel label with the novel object nor does the child have any preknowledge of the specific object that the adult is about to find. Studies using this paradigm have suggested that to acquire a word in this context, children have to monitor the adult’s intentions to determine which object is the intended referent of the novel word (Tomasello & Barton, 1994; Tomasello et al., 1996).

In this experiment, children were tested in one of four groups. In the same speaker group, one speaker provided a novel label before finding a target object (“Where’s the mido?”) and then asked for the referent in the subsequent compre-
hension and generalization tasks (“Show me the *mido*.”). In the different speaker group, one speaker provided the novel label while a second speaker, who was not present during the finding game, requested the referent of the novel label in the comprehension and generalization tasks. In the two control groups, a novel label was not provided during the finding game. In the same speaker control group, the same individual who played the finding game also asked for the referent of the novel label in the comprehension and generalization tasks. In the different speaker control group, one speaker played the finding game while a second speaker requested the referent of the novel label in the comprehension and generalization tasks. The control groups were included to ensure that object salience or object preference could not account for the performance of participants in the experimental groups. That is, a comparison of children’s performance in the experimental and control groups allowed us to examine whether children were not simply choosing the first object the experimenter found or were choosing a particular object because of a preference for that object.

If 2-year-olds can map a novel label onto a target object in this nonostensive context, more children in the same speaker group should correctly choose the target object as the referent of the novel label in the comprehension and generalization tasks than in the same speaker control group. Furthermore, if 2-year-olds appreciate that the meanings of novel labels acquired indirectly are shared across individuals, then children in both the same speaker and different speaker groups should consistently map the novel label onto the correct referent, when compared to children in the control groups.

Method

Participants

Eighty-eight toddlers age 24 to 27 months \(M = 2.13\) years, \(SD = .07\) participated in this study. All toddlers were from homes in which English was the primary language spoken. Eleven additional children were tested but removed from the final sample for the following reasons: experimenter error \((n = 2)\) and excessive fussiness \((n = 9)\). Children were randomly assigned to one of the four following groups:

1Note that in our study the novel object was always found immediately after the novel label was provided. We elected to use only this variant of the finding game procedure as previous studies had found no difference between conditions in which the object was found immediately after the language model was provided or following the rejection of other objects (Tomasello & Barton, 1994; Tomasello et al. 1996). Thus, we felt confident that previous studies had demonstrated that children were relying on intentional cues to learn words in this paradigm. Moreover, the goals of our studies were to examine whether 2-year-olds could use referential cues provided in a nonostensive context to learn novel words or map preferences to specific objects and to examine whether 2-year-olds appreciated that word meanings were shared between individuals while object preferences were not.
groups: same speaker-word \((n = 22, 13 \text{ boys and 9 girls}, M \text{ age} = 2.12 \text{ years}, SD = .05)\), different speaker-word \((n = 22, 13 \text{ boys and 9 girls}, M \text{ age} = 2.15 \text{ years}, SD = .07)\), same speaker-control \((n = 22, 11 \text{ boys and 11 girls}, M \text{ age} = 2.12 \text{ years}, SD = .08)\), and different speaker-control \((n = 22, 11 \text{ boys and 11 girls}, M \text{ age} = 2.15 \text{ years}, SD = .09)\). At the end of the testing session, participants received a Child Scientist certificate and a small prize as a token of appreciation.

**Stimuli**

Eight unfamiliar objects and seven familiar objects were used in this study. The unfamiliar objects consisted of two exemplars of each of the following objects: an oddly shaped rattle, a hand drum, a noisemaker, and castanets (see Figure 1 for a sample object set). The two exemplars of each object type differed from one another only in color. Prior to beginning the experiment, the researcher asked the parent whether his or her child was familiar with the name of any of the objects. If a child knew any of the objects, an alternate unfamiliar object (an oddly shaped whistle) was available. The familiar objects served as distracter objects and included a miniature toy puppy, two toy cars, two dinosaurs, a pony, and a slinky.

The finding game apparatus consisted of four white metal boxes mounted to a piece of Plexiglas. The 5.5 in. \(\times\) 4 in. \(\times\) 2.5 in. (14 cm \(\times\) 10.2 cm \(\times\) 6.5 cm) boxes were glued 6 in. (15.3 cm) apart on the 8 in. \(\times\) 40.5 in. (20.3 in. \(\times\) 129 cm) Plexiglas sheet. A stopwatch was used throughout the session to time the period children played with the objects throughout and after the finding game, as well as to time the period that the experimenter was out of the room before children completed the

![FIGURE 1 Sample object set.](image)
comprehension and generalization tasks. A cafeteria tray was used during the comprehension and generalization tasks. A video camera mounted on a tripod was used to tape sessions for coding purposes.

**Procedure**

The session began with a brief warm-up period during which the parent completed the consent form and the experimenter showed the parent the unfamiliar objects to ensure that the child did not know the name of any of the objects. None of the children had a label for any of the objects, thus no replacements were made. At this time, parents were also instructed not to talk during the experiment, until the elicited production task where the parent was asked to help the experimenter encourage the child to produce a label for the target object. A second experimenter was also present during this warm-up period.

Children were told that they were going to play a game with the experimenter and were taken into the testing room with their parents. Participants were seated on either a booster seat or on their parent’s lap at a rectangular table directly across from the experimenter. The session consisted of three phases: script training, the finding game, and novel label testing. The finding game used in this experiment was adapted from that used in previous word learning studies conducted by Tomasello and his colleagues (e.g., Tomasello & Barton, 1994; Tomasello et al., 1996).

**Script training.** Out of view of the child, the experimenter placed one of the unfamiliar objects from the first set in each of the boxes and then closed the lids. The experimenter then placed the apparatus on the table in front of her so the child could see all of the boxes. She opened the box farthest to her right and said, “Let’s see what’s in here.” She then removed the object (e.g., the rattle), demonstrated what it did (e.g., shook it), and then passed it to the child. Children were allowed to play with the object for 10 sec. The experimenter then requested that the child place the object back in the box (e.g., “Okay, now you put it back.”). The experimenter repeated this script training for the remaining three objects. After the last object had been introduced to the child, the researcher removed the apparatus from the table and gave the toddler one of the distracter toys to play with (e.g., a toy car) while she set up for the finding game.

**Finding game.** The finding game consisted of four rounds and proceeded in the same manner for children in both the same speaker-word and different speaker-word groups. In the first round, the experimenter placed the target object (e.g., the noisemaker) in the first box on her right-hand side. The remaining three nontarget objects were placed in the other boxes in a random order and the lids were closed. She then retrieved the distracter toy and placed the apparatus back on
the table in front of her. While maintaining eye contact with the child, the experimenter said, “Where’s the *mido*? Let’s find the *mido*. Let’s find the *mido*.” She then proceeded to open the first box, held up the target object (e.g., the noisemaker), smiled and said, “Oh!” while demonstrating what it did (e.g., spun it). She then passed the object to the child to play with for 5 sec. After that time elapsed, the experimenter retrieved the object and returned it to the box. She then looked the child in the eye and said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here.” She opened the second box, held up the nontarget object (e.g., the hand drum), smiled and said, “Oh!” She again demonstrated what the object did and then gave the object to the child to play with for 5 sec. She proceeded to find the remaining nontarget objects in the third and fourth boxes in the same manner as in the previous trial. Note that each time the experimenter “found” an object, her affective and verbal response remained exactly the same, regardless of whether or not it was a target or nontarget object. All that differed was whether the experimenter provided a novel label before finding one of the objects. The first round was completed when the experimenter placed the last object back in the final box. The experimenter removed the apparatus from the table and gave the child another distracter toy to play with (e.g., a toy dinosaur). At this time, the experimenter shifted all of the objects down one box to the left. After all of the objects were switched, the next round of the finding game began.

This procedure was repeated for three additional rounds of the finding game. In the second round, the target object (e.g., the noisemaker) was in the second box and the nontarget object that was in the last box in the first round (e.g., the rattle) was placed in the first box. The objects were shifted such that across all four rounds, each object was “found” in each location. Although the objects were shifted with each round, the experimenter always looked in the boxes in the same order. That is, for each round the experimenter always opened the first box on her right-hand side first and then the second box on her right-hand side second and so on. For children in either the same speaker-control group or the different speaker-control group, the finding game followed the same procedure, however the experimenter did not provide a novel label before finding any of the objects. Thus, the participant did not hear the novel word at all during the finding game.

At the end of the fourth round, the researcher removed all of the objects from the boxes and placed them on the table in front of the child in a random order. The child was then allowed to play with all objects for 15 sec. After this play period elapsed, the experimenter removed the objects from the children’s view by placing them in a bucket and gave them the remaining distracter toy (e.g., the slinky) to play with for 30 sec. She then told the child that she needed to go and check on her friend. For children in the same speaker-word and same speaker-control groups, the experimenter said that she would come back to play with them some more. For children in the different speaker-word or the different speaker-control groups, she told them that her friend was going to come in and play with them some more. The
experimenter then left the room. While the experimenter was out of the room, children played with the slinky.

**Novel label testing.** There were three tasks used to test children’s novel label mapping: a comprehension task, a generalization task, and an elicited production task. In both the same speaker-word and the same speaker-control groups, the same experimenter who was present during the finding game reentered the room after 30 sec. She retrieved the distracter toy from the child and looked into the bucket where all of the objects were and said, “Oh, look at all of these.” She then placed the four unfamiliar objects in a random order on a tray on the table in front of her. While maintaining eye contact with the child, she asked for the referent of the novel label (e.g., “Show me the mido.”). She then slid the tray in front of the child so that the child could either point to or touch the target object. After a choice was made, the experimenter put all of the nontarget objects back into the bucket and proceeded to the novel label generalization task.

For the novel label generalization task, the experimenter placed the second set of unfamiliar objects in a random order on the cafeteria tray. This set of objects differed only in color from those used in the finding game. The experimenter then placed the tray on the table and asked the child for the referent of the novel label. After a choice was made, the experimenter proceeded to the elicited production task. She held up the target object from the first set of four objects and asked the child to name the object (e.g., “What’s this? What’s this called?”). If the child did not respond, the experimenter repeated the question. If the child continued not to respond, the researcher prompted the parent and the parent asked the child to name the object. The experimenter put the target object away and then held up a nontarget object from the first set of objects and asked the child to name that object in the same manner as described previously. This task was used to ensure that children appreciated that the novel label was specific to the target object.

The comprehension, generalization, elicited production, and nontarget elicited production tasks were all conducted in the same manner described previously for children in the different speaker-word and the different speaker-control groups but by a different experimenter. That is, the second experimenter who was present during the warm-up phase entered the room 30 sec after the first experimenter left and administered the tasks.

**Scoring and Reliability**

The object chosen in response to the comprehension and generalization questions was coded as either correct or incorrect. That is, if children chose the target object in the comprehension and generalization tasks, they received a score of 1 for each task. If children did not choose the target object, they received a score of 0 for that task. If children produced the novel label in response to the elicited production
question they were given a score of 1 for production. If they did not produce the correct label they received score of 0.

To establish interrater reliability, 20% of the data \((n = 16, 4 \text{ per condition})\) was randomly selected and was coded a second time from the videotapes by a coder blind to the experimental hypotheses. Cohen’s Kappa was used to establish the level of agreement between the experimenter and the coder, as this measure includes both a measure of agreement and a correction for chance-level agreement (Sattler, 2002). Two Kappas were calculated to establish the level of agreement on the object that children selected in the comprehension task and in the generalization task. The two raters were found to be in perfect agreement on the comprehension task \((\kappa = 1)\) and the generalization task \((\kappa = 1)\).

### Results

To examine possible group differences on the comprehension and generalization tasks, we first conducted a series of chi-square analyses.\(^2\) The number of children in each group who chose the target and nontarget objects in the comprehension task and in the generalization task and labeled the objects in the elicited production task are reported in Table 1.

| Variable              | Same Speaker | Different Speaker |
|-----------------------|--------------|-------------------|
|                       | Word | Control | Word | Control |
| Comprehension task    |      |         |      |         |
| Target                | 14   | 6       | 15   | 6       |
| Nontarget             | 8    | 16      | 7    | 16      |
| Generalization task   |      |         |      |         |
| Target                | 12   | 4       | 13   | 6       |
| Nontarget             | 10   | 18      | 9    | 16      |
| Total comprehension   |      |         |      |         |
| Target                | 10   | 3       | 12   | 4       |
| Nontarget             | 12   | 19      | 10   | 18      |
| Elicited production task | |         |      |         |
| Target labeled        | 6    | 0       | 6    | 2       |
| Nontarget labeled     | 0    | 0       | 1    | 0       |

Note. \(N = 22\) in each group.

\(^2\)Note that overall four-way chi-square analyses indicted a significant difference between groups on comprehension, generalization, and total comprehension, \(\chi^2(3, N = 88) = 11.33, p = .01, \chi^2(3, N = 88) = 11.14, p = .01, \chi^2(3, N = 88) = 10.72, p = .01,\) respectively. However, to more precisely test the hypothesis of interest, separate chi-squares were conducted and are reported throughout this article.
task are presented in Table 1. Because very few children produced a word on the elicited production task in any of the conditions, we did not use this variable in any of the analyses. As expected, significantly more children in the same speaker-word group than in the same speaker-control group correctly identified the target object as the referent of the novel label in the comprehension task, $\chi^2(1, N = 44) = 5.87, p = .015$. Similarly, significantly more children in the different speaker-word group than in the different speaker-control group correctly chose the target object on the comprehension task, $\chi^2(1, N = 44) = 7.38, p = .007$. Therefore, more children in both the word groups correctly chose the target object in the novel label comprehension task than in the respective control groups.

Next, chi-square analyses were completed to examine differences between the same speaker-word and different speaker-word groups on performance on the comprehension task. The number of children in the same speaker-word group who correctly identified the target did not differ significantly from the number of children in the different speaker-word group on the comprehension task, $\chi^2(1, N = 44) = .10, n.s$. Thus, in both word groups, the majority of the children chose the target object as the referent of the novel label in the comprehension task, indicating that children in both groups established correct word-to-object mappings.

In the next set of analyses, group differences on the generalization task were examined using a series of chi-square analyses. The first analysis indicated that significantly more children in the same speaker-word group than in the same speaker-control group chose the target object, $\chi^2(1, N = 44) = 6.29, p = .012$. Similarly, significantly more children in the different speaker-word group than in the different speaker-control group chose the target object, $\chi^2(1, N = 44) = 4.54, p = .03$. Finally, a comparison of the same speaker-word and different speaker-word groups revealed no significant differences on performance on the generalization task, $\chi^2(1, N = 44) = 0.09, n.s$. Thus, the majority of the children in both the same speaker-word and different speaker-word groups were able to make correct word-object mappings in the generalization task. This indicates that, regardless of whether the speaker requesting the referent of the novel label was present during the finding game, children generalized the novel label to the appropriate object.

In the final set of chi-square analyses, a composite measure, total comprehension, was used to further explore group differences. Children were given a score of 1 on the total comprehension measure if they correctly chose the target object on both the comprehension task and the generalization task. Thus, this was a conservative measure of children’s ability to correctly link the target object category with the novel label. The number of children scoring 0 and 1 on the total comprehension measure is presented in Table 1. Consistent with the aforementioned analyses, significantly more children in the same speaker-word group correctly chose the target object on both the comprehension and generalization tasks than in the same speaker-control groups, $\chi^2(1, N = 44) = 5.35, p = .02$. Similarly, significantly more children in the different speaker-word group correctly chose the target object on both the comprehen-
sion and generalization tasks than in the different speaker-control group, \(\chi^2(1, N = 44) = 6.29, p = .01\). The chi-square analysis comparing the total comprehension for toddlers in the same speaker-word and different speaker-word groups was not significant, \(\chi^2(1, N = 44) = .36, n.s.\) Consistent with the hypotheses, the number of participants who correctly selected the referent of the novel label in both the comprehension and generalization tasks in the same speaker-word and different speaker-word groups did not differ but was greater than the number of children showing total comprehension in the respective control groups.

Next, binomial probabilities \((p = .25, q = .75)\) were used to investigate whether the number of children selecting the target object within each condition on each measure differed significantly from what would be expected by chance alone. The number of children in both the same speaker-word group and the different speaker-word group who chose the target object on the comprehension task was greater than that expected by chance, \(p = .001\) and \(p = .00002\), respectively. In contrast, the number of children in both the same speaker-control group and different speaker-control group who chose the target object on the comprehension task was not greater than expected by chance, \(p = .18\) and \(p = .18\), respectively. The number of children in both the same speaker-word group and the different speaker-word group who chose the target object on the generalization task also was greater than that expected by chance, \(p = .002\) and \(p = .0006\), respectively. In contrast, the number of children in both the same speaker-control group and different speaker-control group who chose the target object on the generalization task was at chance levels, \(p = .16\) and \(p = .18\), respectively. For the total comprehension measure, the number of children in both the same speaker-word group and the different speaker-word group who chose the target object was greater than that expected by chance, \(p = .02\) and \(p = .002\), respectively. In contrast, the number of children in both the same speaker-control group and different speaker-control group who chose the target object on both the comprehension task and the generalization task was not greater than expected by chance, \(p = .1\) and \(p = .16\), respectively. Thus, as predicted, children in the same speaker-word group and different speaker-word group selected the target object in the comprehension task and the generalization task at a rate higher than what would be expected by chance alone. These findings indicate that children in the same speaker-word and different speaker-word groups displayed meaningful word learning behavior while children in the control groups did not.

In the final set of analyses, we used parametric analyses to examine group differences in word learning. For each child, we summed the number of target object choices across the comprehension and generalization tasks. We then used a one-way analysis of variance (ANOVA) to examine whether there were significant differences between groups. This analysis revealed a significant main effect of group, \(F(3, 87) = 5.85, p = .001\). Planned comparisons revealed that children in the same speaker-word group \((M = 1.82, SD = .85)\) and different speaker-word group \((M = 1.27, SD = .88)\) did not differ significantly in the number of target object
choices, \( t(42) = .35, n.s. \) In contrast, children in the same speaker-word group chose significantly more target objects than children in the same speaker-control group \( (M = .45, SD = .74), t(42) = 3.02, p = .004 \). Similarly, children in the different speaker-word group chose significantly more target objects than children in the different speaker-control group \( (M = .55, SD = .8), t(42) = 2.86, p = .007 \). Thus, these findings indicate that children in both the same speaker-word group and the different speaker-word group selected the target object more often when children’s performance on the comprehension task and generalization task was combined than children in the control groups.

Discussion

The goal of Experiment 1 was to explore 24- to 27-month-olds’ appreciation that the meanings of novel object labels learned in nonostensive contexts are conventional. The results of this experiment yielded two main findings. First, the results provide additional evidence that 2-year-olds can learn the word-referent links in a nonostensive word learning context and, second, they reveal that 2-year-olds show evidence of understanding that the knowledge of an object’s label is shared across individuals.

The finding that 24- to 27-month-olds were able to map the novel word to the target object indicates that they used cues signaling a speaker’s referential goals to identify the correct referent of a new word. Moreover, the findings from the generalization task indicate that children were able to generalize the new word beyond the initial exemplar to another member of the same object category. These findings are consistent with the results of previous studies conducted by Tomasello and colleagues (e.g., Tomasello & Barton, 1994; Tomasello et al., 1996).

The finding that 24- to 27-month-olds were able to generalize the novel label learned in a nonostensive context to a second speaker suggests that they possess an understanding that knowledge of the name of a given object is conventional. That is, even when the different speaker was not present during the finding game, children were able to correctly identify the referent of the novel label. This suggests that 2-year-olds understand that individuals will share a common understanding of the correct referent for a novel label even in nonostensive word learning contexts. It is possible, however, that children in this study were merely generalizing the information learned to another individual. That is, 2-year-olds may possess the propensity to generalize any information learned as a default strategy without possessing the conceptual understanding of the conventional nature of the linguistic system. Thus, Experiment 1 may not have been a sufficiently stringent test of children’s understanding of the conventionality of object labels. In Experiment 2, we addressed this possibility by examining whether children would generalize object preferences across speakers.
EXPERIMENT 2

In Experiment 2, 24- to 27-month-olds’ appreciation that certain information, such as an individual’s object preferences, should not be extended to a second individual was examined. The procedure of Experiment 2 was similar to that of Experiment 1 with one exception: rather than providing a novel label during the finding game, the experimenter provided children with a cue to her preferences for a target object (e.g., “Let’s find the one I like.”). As in Experiment 1, there were two experimental groups: the same speaker-preference group and the different speaker-preference group. In the same speaker-preference group, the same speaker introduced her preferences before finding the target object and asked for the referent of her preference in the subsequent comprehension and generalization tasks (“Show me the one I like.”). In the different speaker-preference group, one speaker introduced her preferences for the target object while a second speaker requested the referent of her preference (“Show me the one I like.”) in the comprehension and generalization tasks. Unlike Experiment 1, the two control groups were not included in this study because the findings of Experiment 1 suggest that neither object preferences nor salience issues were affecting the results.

If 24- to 27-month-olds possess the understanding that preferences are individual specific, it was expected that children in the same speaker-preference group would choose the object that the first experimenter said she liked. In contrast, children in the different speaker-preference group should respond at chance levels if they understand that preferences may not be commonly shared among individuals. That is, they should appreciate that simply because one experimenter liked a particular object, a second experimenter will not necessarily like the same object. A comparison with the results of Experiment 1 allowed us to assess whether 2-year-olds possess the understanding that although labels are conventional and are shared by members of the same linguistic community, object preferences are not.

Method

Participants

Forty children age 24 to 27 months ($M = 2.11$ years, $SD = .07$) participated in this study. Participants were recruited in the same manner as in the first experiment and were from homes in which English was the primary language spoken. Children were randomly assigned to one of the following two groups: same speaker-preference ($n = 20$, 11 boys and 9 girls, $M$ age = 2.12 years, $SD = .07$) and different speaker-preference ($n = 20$, 11 boys and 9 girls, $M$ age = 2.10 years, $SD = .07$). At the end of the testing session, participants received a Child Scientist certificate and a small prize as a token of appreciation. None of these children had participated in Experiment 1.
Materials and Stimuli

The unfamiliar objects, distracter objects, and finding game apparatus used in this experiment were identical to those used in Experiment 1.

Procedure

The procedure was similar to that of Experiment 1, with the following three exceptions: (a) rather than providing a novel label during the finding game, the experimenter indicated that she wanted to find the object she liked; (b) in the comprehension and generalization tasks, the experimenter asked for the one she liked; and (c) because a novel label was not provided, there were no elicited production tasks.

The script training and finding game proceeded in the same manner as in Experiment 1. However, as stated previously, instead of providing a novel label during the finding game, before finding the target object in every round the experimenter said, “Where’s the one I like? Let’s find the one I like. Let’s find the one I really like.” Before finding the nontarget objects, the experimenter merely said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here.” The comprehension and generalization tasks proceeded in the same manner as in Experiment 1, however instead of asking for the referent of the novel label, the experimenter (either the same speaker or the different speaker) asked for the referent of her preference (e.g., “Show me the one I like. Give me the one that I like.”).

Scoring

The method of scoring was identical to that used in Experiment 1. As in Experiment 1, 20% of the data (n = 8, 4 per condition) was coded a second time from the videotapes. Two Kappas were calculated to establish the level of agreement between the experimenter and the coder on the objects that children chose on the comprehension and generalization tasks. The two raters were found to be in perfect agreement on both the comprehension task (κ = 1) and the generalization task (κ = 1).

Results

As in Experiment 1, chi-square analyses were conducted to examine group differences between the same speaker-preference and different speaker-preference groups on the comprehension and generalization tasks. The number of children who correctly chose the target object in the comprehension and generalization tasks is presented in Table 2. As was expected, significantly more children in the same speaker-preference group than in the different speaker-preference group chose the target object on the comprehension task, \( \chi^2(1, N = 40) = 8.64, p = .003 \). Similarly, significantly more children in the same speaker-preference group than
in the different speaker-preference group chose the target object on the generalization task, $\chi^2(1, N = 40) = 3.96, p = .05$.

As in Experiment 1, additional analyses were completed using the composite measure: total comprehension. Recall that total comprehension assessed whether children performed correctly in both the comprehension task and the generalization task. The number of children scoring 0 and 1 on the total comprehension is presented in Table 2. As predicted, the number of children showing total comprehension in the same speaker-preference group differed significantly from the number of children in the different speaker-preference group, $\chi^2(1, N = 40) = 4.44, p = .04$. This indicates that more children in the same speaker-preference group identified the correct object that the experimenter liked in both the comprehension and generalization tasks than did the children in the different speaker group. Thus, these results indicate that, as predicted, children in the different speaker-preference group did not choose the same object that the first speaker liked as the object the second speaker liked.

In the next set of analyses, we used binomial probabilities ($p = .25, q = .75$) to investigate whether the number of children selecting the target object within each condition differed significantly from what would be expected by chance. On the comprehension task, the number of children in the same speaker-preference group who chose the target object was greater than that expected by chance, $p = .0008$. In contrast, the number of children in the different speaker-preference group who chose the target object on the comprehension task was at chance levels, $p = .134$. On the generalization task, the number of children in the same speaker-preference group who chose the target object was greater than that expected by chance, $p = .01$. In contrast, the number of children in the different speaker-preference group who chose the target object on the generalization task was not greater than ex-

| Variable                     | Same Speaker-Preference | Different Speaker-Preference |
|------------------------------|-------------------------|------------------------------|
| Comprehension task           |                         |                              |
| Target                       | 12                      | 3                            |
| Nontarget                    | 8                       | 17                           |
| Generalization task          |                         |                              |
| Target                       | 10                      | 4                            |
| Nontarget                    | 10                      | 16                           |
| Total comprehension          |                         |                              |
| Target                       | 4                       | 0                            |
| Nontarget                    | 16                      | 20                           |

Note. $n = 20.$
pected by chance, $p = .19$. For total comprehension, the number of children in the same speaker-preference group who chose the target object was not greater than that expected by chance, $p = .19$. However, the number of children in different speaker-preference group that chose a nontarget object was greater than that expected by chance, $p = .003$. Thus, these results, with the exception of the total comprehension measure, indicate that children in the same speaker-preference group encoded the speaker’s preference and correctly selected the target object in the comprehension task and the generalization task.

As in Experiment 1, we then used parametric analyses to examine group differences in target object selection. For each child, we summed the number of target object choices across the comprehension and generalization tasks. We then used a one-way ANOVA to examine whether there were significant differences between the two groups. This analysis revealed a significant main effect of group, $F(1, 39) = 20.65, p = .001$. Planned comparisons revealed that children in the same speaker-preference group ($M = 1.10$, $SD = .55$) chose significantly more target objects than children in the different speaker-preference group ($M = .35$, $SD = .49$), $t(38) = 4.54, p = .001$. Thus, these findings indicate that children in the same speaker-preference selected the target object as the referent of the speaker’s preference significantly more often than children in the different speaker-preference group.

**Cross-Experiment Comparisons**

Given that Experiments 1 and 2 shared the same general procedure, stimuli, participant characteristics, and experimenter, we conducted cross-experiment comparisons to examine whether children extended novel words differently than speaker preferences. First, using a $4 \times 2$ chi-square analysis, we compared the number of children who selected or did not select the target object in the comprehension task across the following four groups: same speaker-word group (Experiment 1), different speaker-word group (Experiment 1), same speaker-preference group (Experiment 2) and different speaker-preference group (Experiment 2). The number of children selecting the target object in the comprehension task varied significantly different across the four groups, $\chi^2(3, N = 84) = 14.99, p = .002$. As expected, the majority of children in the same speaker-word group (64%), the different speaker-word group (68%), and the same speaker-preference group (60%) selected the target object as the referent of either the novel label or the speaker’s preference. In contrast, few children in the different speaker-preference group (15%) chose the target object as the referent of the second speaker’s preference.

Second, we used a one-way ANOVA to examine group differences in target object selection summed across the comprehension and generalization tasks. This analysis revealed a significant main effect of group, $F(3, 83) = 6.99, p = .001$. Planned comparisons revealed that children in the same speaker-word group did
not differ significantly in their choices of target objects from children in the same-speaker preference group or the different speaker-word group, $t(40) = .36$, *n.s.*, and $t(42) = .35$, *n.s.*, respectively. In contrast, children in same speaker-word group, the different speaker-word group, and the same-speaker preference group all chose significantly more target objects than children in the different speaker-preference group, $t(40) = 3.82$, *p* = .001, $t(40) = 4.13$, *p* = .001, and $t(40) = 4.54$, *p* = .001, respectively. These results indicate that children extended words differently than they extended preferences. Consistent with the analyses described earlier, children chose the target object as the referent of the novel word in the both the same-speaker and different speaker groups. In contrast, children correctly chose the target object as the referent of the speaker’s preference in the same speaker group but not in the different speaker group.

**Discussion**

The goals of Experiment 2 were to explore 24- to 27-month-olds’ ability to encode a speaker’s preferences for a target object, as well as their appreciation of the individual specificity of object preferences. Two main findings emerged from this experiment: (a) 2-year-olds are able to encode a speaker’s preferences for a target object and (b) 2-year-olds understand that a second speaker may not share the same preference for a particular object as the first speaker.

As predicted, children in the same speaker-preference group consistently gave the experimenter the unfamiliar object that she “liked” in the comprehension and generalization tasks, indicating that they used referential cues to encode her preference for a specific unfamiliar object. In contrast, children in the different speaker-preference group did not give the second speaker the same object that the first speaker “liked” more often than any of the other objects in the comprehension and generalization tasks. This finding indicates that 24- to 27-month-olds possess the understanding that each individual holds their own preferences and that preferences may vary across individuals. These findings are consistent with research demonstrating that by 18 months of age, infants are able to monitor the desires of another person and understand that the desires and intentions of another individual may be different from their own and from a second person (Poulin-Dubois, 1999; Repacholi & Gopnik, 1997).

**GENERAL DISCUSSION**

These studies were designed to examine 2-year-old children’s appreciation of the conventionality of object labels versus preferences in a nonostensive learning context. In two experiments, children age 24 to 27 months played a finding game with an experimenter during which they were taught a piece of information about a tar-
get object in a nonostensive context. In Experiment 1, the experimenter provided a referential cue as to the correct referent of a new word (e.g., “Let’s find the *mido*.”). In Experiment 2, the experimenter provided a referential cue expressing her preferences for a target object (e.g., “Let’s find the one I *like*.”). In both experiments, children were subsequently asked for the referent of the novel label (Experiment 1) or the referent of the experimenter’s preference (Experiment 2). Children were also asked whether the novel label or the experimenter’s preferences could be generalized to another member of the same object category as the target object. The comprehension and generalization tasks were administered either by the same experimenter who played the finding game with the participants (same speaker groups) or by a second experimenter who was not present during the finding game (different speaker groups).

The results of these studies yielded two insights into the nature of 24-month-olds’ word learning abilities. First, the present findings provide incremental evidence that 2-year-olds can rely on referential cues provided in a nonostensive context to learn the referent of a new word. In Experiment 1, 2-year-olds used referential cues provided by a speaker to make correct word-object mappings and to generalize the novel label to a second object that was a member of the same object category as the target object. These findings are consistent with a large body of existing research indicating that 2-year-olds are adept at using numerous cues to make correct word-referent mappings (e.g., Akhtar et al., 1996; Akhtar & Tomasello, 1996; Baldwin, 1993a, 1993b; Tomasello & Barton, 1994; Tomasello et al., 1996). These findings add to this body of evidence by demonstrating that children can use cues to accomplish two fundamental tasks of word learning, namely, identifying the intended referent of a novel word and generalizing the novel label to other appropriate referents.

Second, these studies indicate that that 24- to 27-month-olds appreciate that the knowledge of the referent of an object label learned in a nonostensive word learning situation is shared between two individuals. Furthermore, they also possess the appreciation that preferences are specific and not necessarily shared between two individuals. Thus, by 2 years of age children possess an understanding that while object labels are conventional and *can* be generalized to another individual, an individual’s preferences are not conventional and *cannot* be generalized to another person.

When considered in conjunction with other recent empirical work, the results of these studies add to our understanding of the children’s appreciation of conventionality during late infancy and early childhood. Studies have revealed a developmental progression in the types of symbols that infants believe convey reference in a conventional manner during the 2nd year of life (e.g., Woodward & Hoyne, 1999). For example, Namy demonstrated that infants age 17 and 18 months will accept gestures, nonverbal sounds, and pictures to represent object categories but 26-month-olds will not (Namy, 2001; Namy & Waxman, 1998). These findings indicate that 2-year-olds understand the shared nature of the names of novel objects
and the individual specificity of preferences. By 3 years of age, children’s understanding of conventionality is even more developed. For example, children are able to distinguish between the conventional shared nature of object labels and the nonconventional nature of factual information (Diesendruck & Markson, 2001). Furthermore, Diesendruck (2002) recently found that 3-year-olds understand that conventionality is language specific. In this study, children who were told that a speaker was monolingual adhered to the principle of conventionality and presumed that a second novel label referred to a different object that had not been previously labeled. However, children who were told that a second speaker was bilingual did not consistently map the second label onto the second object. Thus, children understood that the second label could have been the conventional term for the already labeled object but in a different language. Thus, by 3 years of age children possess an intricate understanding of the types of information (labels vs. facts) and circumstances (monolingual vs. bilingual) that are conventional.

In summary, the current research examined 2-year-olds’ appreciation of the conventional nature of an object label learned in a nonostensive context. The findings of this study are twofold: (a) 2-year-olds can learn the correct referent of a new word in a nonostensive context using referential cues provided by a speaker and (b) they appreciate that although the knowledge of object labels acquired in a nonostensive context are conventional, one’s preferences are not. Thus, the current research contributes to the existing word learning literature by indicating that by 2 years of age, children possess an appreciation of one of the basic rules governing language use. That is, 2-year-olds understand that words are conventional tools used by members of the same linguistic community to communicate.

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