REPORT

Learning words: children disregard some pragmatic information that conflicts with mutual exclusivity

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Abstract

Children tend to infer that when a speaker uses a new label, the label refers to an unlabeled object rather than one they already know the label for. Does this inference reflect a default assumption that words are mutually exclusive? Or does it instead reflect the result of a pragmatic reasoning process about what the speaker intended? In two studies, we distinguish between these possibilities. Preschoolers watched as a speaker pointed toward (Study 1) or looked at (Study 2) a familiar object while requesting the referent for a new word (e.g. 'Can you give me the blicket?'). In both studies, despite the speaker's unambiguous behavioral cue indicating an intent to refer to a familiar object, children inferred that the novel label referred to an unfamiliar object. These results suggest that children expect words to be mutually exclusive even when a speaker provides some kinds of pragmatic evidence to the contrary.

Introduction

Between 18 months and 6 years of age, children acquire an astonishing number of words, by one estimate as many as 14,000 (Carey & Bartlett, 1978). Many of these words are learned indirectly, without explicit instruction from a parent or tutor (Akhtar, 2005a; L. Bloom, 1993; Schieffelin, 1985). How do children zero in on the correct meaning of a new word so quickly? One way they do so is by making use of the words they already know. For example, most 2.5-year-olds know the word *shoe*. When shown a shoe and an unfamiliar object, such as a wonton maker, and asked to select the *blicket*, children overwhelmingly choose the unfamiliar object – even though they have never heard the word *blicket* before (e.g. Au & Glusman, 1990; Carey & Bartlett, 1978; Golinkoff, Hirsh-Pasek, Bailey & Wenger, 1992; Markman & Wachtel, 1988; Merriman & Bowman, 1989). Although there is broad agreement that children learn much of their vocabulary indirectly, there is vigorous debate over how best to characterize the inferential reasoning process that enables them to do so. The studies reported here attempt to distinguish between two prominent and competing proposals for the indirect learning of count nouns: mutual exclusivity and the social-pragmatic account.

According to mutual exclusivity, children select the unfamiliar object because of a default assumption that each object belongs to just one category (Markman, 1989, 1992). Tests and discussions of this assumption focus most often on its logical conclusion, which is that each object has only one category label (Markman & Wachtel, 1988; Merriman & Bowman, 1989). Thus, in the above example, children select the wonton maker rather than the shoe because they assume that *blicket* refers to a category and that an object cannot be a member of both the blicket category and the shoe category. Of course, children do learn that more than one label can apply to an object. For example, even 2.5-year-olds agree that a dog dressed as a sailor can be called both a *dog* and a *sailor*, and that a cat can be called both a *cat* and an *animal* (Clark & Svaib, 1997; Deák & Maratsos, 1998; but see Macnamara, 1982). But, when learning new words (as opposed to applying known ones), assuming initially that each object has only one label may represent an efficient strategy for avoiding redundant hypotheses and for learning word-referent mappings indirectly (for a review, see Woodward & Markman, 1998).

An alternative explanation for indirect word learning comes from the social-pragmatic account. According to

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this account, children learn the meanings of words by exploiting pragmatic cues the speaker provides. In the indirect word learning situation, they select the unfamiliar object because they infer that the speaker used the word *blicket* to convey a particular intention (Bloom, 2000; Clark, 1988, 1990, 1997; Diesendruck & Markson, 2001; Gathercole, 1987, 1989). Specifically, children are thought to reason implicitly along the following lines: 'I know that a shoe is called a *shoe*. If the speaker meant to refer to the shoe, she would have asked me for the shoe. But she didn't; she used *blicket*. So she must intend to refer to something other than the shoe. A plausible candidate is the wonton maker. *Blicket* must refer to the wonton maker.' This reasoning process has as its basis two pragmatic principles that Clark (1988) has argued govern word use: conventionality and contrast. According to conventionality, 'for certain meanings, there is a conventional form that speakers [and addressees] expect to be used in the language community' (p. 319). And according to contrast, 'every two forms contrast in meaning' (p. 318). If a speaker uses a form other than the conventional one, that must indicate that the speaker has a different meaning in mind.

Importantly, according to the social-pragmatic account, the speaker could have used *blicket* to refer to the shoe, so long as *blicket* was meant to convey a meaning different from *shoe*. For example, the speaker could have used *blicket* to offer a different perspective on the shoe, such as a shift in register (*cop* vs. *policeman*) or taxonomic level (*dog* vs. *poodle*). In her review of the evidence, Clark (1997) concluded that children readily accept multiple labels for the same object, provided the speaker offers interpretable pragmatic cues that make the intended referent clear. For example, Clark and Grossman (1998) found that if a speaker specified an inclusion relationship between two novel words (e.g. 'a *ruk* is a kind of *dob*'), 2-year-olds learned that both words could apply to the same object.

Another type of pragmatic cue that would be expected to make the intended referent clear is behavioral. From a very early age, children are sensitive to overt pragmatic cues like pointing and gaze direction (for a review, see Carpenter, Nagell & Tomasello, 1998). By 14 months of age, infants can use another person's gaze direction to predict which of two objects that person will grasp, showing that they expect there to be a link between where a person looks and that person's goals (Phillips, Wellman & Spelke, 2002). By 18 months of age, infants can exploit another person's attentional direction to learn the referent for a novel word. In one study, Baldwin (1991) showed that when infants heard an adult label an object, they checked the adult's line of regard, and mapped the label onto the object that was the focus of

the adult's attention – even though it was different from the object that had been the focus of their own attention and even though it was concealed in a bucket at the time the label was uttered.

The explanation for indirect word learning offered by the social-pragmatic approach is very different from the one offered by mutual exclusivity. Whereas mutual exclusivity focuses on a default expectation children have about words (i.e. that the categories to which they refer are mutually exclusive), social-pragmatics emphasizes an expectation children have about people (i.e. that people convey their intentions in particular ways). One way to distinguish between the two explanations is to ask what children do when a speaker indicates, by pointing or looking, that she or he intends to refer to a familiar object with a new label. According to the social-pragmatic account outlined earlier, children should not have difficulty inferring that a new word applies to a familiar object, so long as the speaker provides interpretable pragmatic cues indicating that it is the intended referent (Clark, 1997). According to mutual exclusivity, in contrast, children may discount or ignore these behavioral pragmatic cues if an unfamiliar object is also available as a potential referent.

In two studies, we tested these competing predictions with preschoolers. We used a disambiguation procedure, similar to that used in other studies of indirect word learning (e.g. Markman & Wachtel, 1988). A researcher introduced a familiar object and a novel one, and then made a request using a novel label: 'Can you give me the *blicket*?' The critical difference between the present study and earlier studies was that we added a pragmatic cue often used in direct labeling situations: When making the request, the speaker pointed toward (Study 1) or looked at (Study 2) the familiar object. The predictions were straightforward: If children infer the referent of the new word by relying on cues to the speaker's communicative intent, they should select the familiar object because it is clearly the focus of the speaker's attention. In contrast, if they rely on an assumption about words – namely, that they are mutually exclusive – they should ignore the speaker's point or look and infer that the new word refers to the novel object.

Another group of children in each study participated in a pragmatic baseline condition whose purpose was to ensure that the speaker's point or look was an interpretable cue to referential intent. In this condition, the speaker introduced the same familiar–novel pair of objects, and pointed or looked at the familiar object while making a request. This time, however, the request did not involve a new word (e.g. 'Can you give it to me?'). As in the novel label condition, the social-pragmatic account predicts that children should select the familiar object

because it is the focus of the speaker's attention. Mutual exclusivity makes no prediction about how children will respond in the pragmatic baseline condition because a new word was not involved.

Study 1

Method

Participants

Twenty-four 3- and 4-year-olds (*mean*: 4 years, 1 month; *range*: 3;7–4;11) participated in a single 5-minute session at their preschool. Half of the children were boys. One additional child participated, but refused to make a selection on any trial.

Design

Children were randomly assigned to one of the two conditions: the novel label condition (mean age = 4;1) or the pragmatic baseline condition (mean age = 4;2). Each child participated in six trials.

Stimuli

Six pairs of objects were used in the study. One member of each pair was novel and the other was familiar. The novel objects were a device for braiding hair, a coaster, a pencil holder, a fish tackle piece, a honey dipper and a soda bottle vacuum top. The familiar objects were a plastic elephant, a penny, a crayon, a hot-rod car, a spoon and a key.

Procedure

Children were tested individually in a small room at their school. The researcher began each of the six trials by holding up the pair of objects assigned to that trial, one in each hand, and saying, 'Look at these!' He then drew equal attention to each object, commenting briefly on each in turn: 'Look at this! Isn't it interesting?' The objects were then placed on the table, slightly more than shoulder-length apart.

At this point, the researcher made a request using a novel name ('Can you give me the *blicket*?') or a neutral phrase ('Can you give it to me?'), depending on whether the child was in the novel label condition or the pragmatic baseline condition. The novel labels were selected randomly from the following list: *mido, dawnoo, blicket, gazzer, jeeter* and *mandoh*. In both conditions, as he was making the request, the researcher pointed unambiguously

Novel Label Condition

'Can you give me the *blicket*?' Speaker points to car (familiar object).

Child selects novel object.

Pragmatic Baseline Condition

'Can you give it to me?' Speaker points to crayon (familiar object).

Child selects familiar object.

Figure 1 *Example of sequence of events from Study 1.*

to the familiar object: He extended the index finger of his right hand toward the familiar object (regardless of whether the object was on the left or right), and placed it on the table about halfway between his body and the object. As his finger touched the table, he tapped the table twice to draw the child's attention to the pointing gesture. His finger remained extended toward the familiar object until the child made a selection (see Figure 1). Throughout the trial, the experimenter looked at the child. If the child was reluctant to make a choice or requested clarification, the researcher repositioned each object slightly and repeated the request and the point. After the child made a selection, the researcher said 'Thank you', and proceeded to the next trial.

Children in each condition were assigned to one of three trial orders. The order of object pairs within each trial order was random. For each child, the unfamiliar object appeared on the left three times and on the right three times, and it appeared on one side no more than twice in a row. In each condition, the unfamiliar object appeared on the left on the first trial for half of the children.

Sessions were videotaped and scored off-line.

Results and discussion

Children understood the speaker's pointing gesture as a cue to his referential intent, but they did not make use

Table 1 *Number of times (out of 6) children selected the familiar object (the object that was the focus of the speaker's attention)*

	Mean	SD
Study 1 (Pointing)		
Pragmatic baseline	6.00	0.00
Novel label	0.75	1.36
Study 2 (Gaze Direction)		
Pragmatic baseline	3.94	1.77
Novel label	1.50	2.13

of it when they were asked to select the referent of a new word. Table 1 shows the number of trials (out of six) that children chose the familiar object – the object to which the speaker was pointing. When the speaker pointed to the familiar object and asked, 'Can you give it to me?' children selected the familiar object 100% of the time. However, when the speaker pointed to the familiar object and asked, for example, 'Can you give me the *blicket*?' children selected the familiar object just 12.5% of the time, significantly less often than would be expected by chance of 50%, $t(11) = 5.75$, $p < .001$. Even though the familiar object was the focus of the speaker's attention in both conditions, children in the novel label condition were much less likely than those in the pragmatic baseline condition to select it, $t(22) = 13.40$, $p < .001$.

Considering children's selections on the first trial only, the same pattern of results emerged: Whereas all 12 of the children in the pragmatic baseline condition selected the familiar object on the first trial, only 2 of the 12 (17%) children in the word condition did so.

To check that children in both conditions noted the speaker's point before they selected an object, two coders, blind to condition, independently coded a video compilation of all of the sessions. For each trial, they indicated whether the child looked in the direction of the speaker's pointing gesture at any time during or after the point had been made and before the child made a selection. The two coders agreed on 87.5% of the trials. Using only those trials, children in the label condition looked on 97% of trials, and those in the pragmatic baseline condition looked on 100% of the trials. Thus, children in the two conditions were equally likely to notice the speaker's point, but those in the pragmatic baseline condition were more likely to make use of it.

These results are consistent with the predictions from mutual exclusivity: Pointing, a powerful behavioral pragmatic cue, may be ignored or discounted when it suggests that a new word applies to an already labeled object and when an unlabeled object is also available as a potential referent.

Study 2

In Study 2, we presented 3- and 4-year-old children with the same indirect word learning situation as in Study 1. This time, however, the speaker looked at (rather than pointed toward) the familiar object while making the requests.

Method

Participants

Thirty-two different 3- and 4-year-olds (*mean*: 3 years, 8 months; *range*: 2;11–4;9) participated in a single 5-minute session at their preschool or in the lab. Thirteen boys and 19 girls participated. The data from five additional children were excluded because their selections were exclusively to the right or left side (2), or because of experimenter error (3).

Design

Children were randomly assigned to the novel label condition or the pragmatic baseline condition (mean age in each = 3;8).

Stimuli

The objects were the same as those used in Study 1, except that the honey dipper was replaced by a lemon juicer.

Procedure

The procedure was the same as in Study 1 with two exceptions. First, instead of pointing toward the familiar object when making a request, the researcher made a pronounced shift in gaze direction (eye gaze and head orientation) toward the familiar object. The researcher then placed his or her hand palm-up between the two objects and continued to look at the familiar object until the child made a selection (see Figure 2). Additionally, instead of using 'Can you give it to me?' as the request in the pragmatic baseline condition, the speaker used an arbitrary fact that could apply to either of the objects. The six fact requests were: 'Can you give me the one I got yesterday?', 'Can you give me the one I keep in my house?', 'Can you give me the one my sister found?', 'Can you give me the one that fell on the floor this morning?', 'Can you give me the one I accidentally dropped in a fishtank?' and 'Can you give me the one my friend gave me?' As in Study 1, the social-pragmatic account predicts that children in the pragmatic baseline
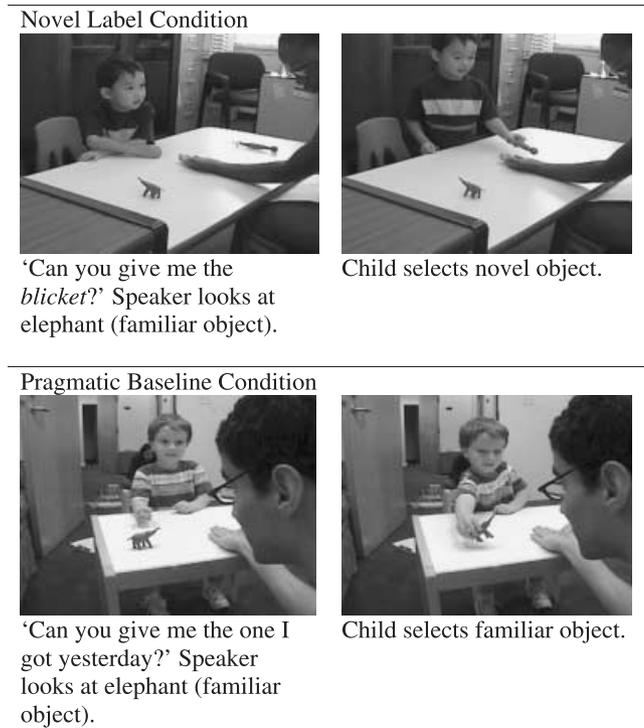
Novel Label Condition

'Can you give me the *blicket*?' Speaker looks at elephant (familiar object).

Child selects novel object.

Pragmatic Baseline Condition

'Can you give me the one I got yesterday?' Speaker looks at elephant (familiar object).

Child selects familiar object.

Figure 2   *Example of sequence of events from Study 2.*

condition should select the familiar object because it is the object of the speaker's attention. Mutual exclusivity makes no predictions in this condition because a new word was not involved (see Diesendruck & Markson, 2001).

Results and discussion

As Table 1 shows, the pattern of results was the same as in Study 1. When the speaker looked at the familiar object and asked, for example, 'Can you give me the one my sister found?' children selected the familiar object 66% of the time, more often than expected by chance, $t(15) = 2.12$, $p = .05$. In contrast, when the speaker looked at the familiar object and asked, for example, 'Can you give me the *blicket*?' children selected the familiar object just 25% of the time, significantly less often than would be expected by chance, $t(15) = 2.82$, $p < .05$. As in Study 1, children in the novel label condition were significantly less likely to select the familiar object than those in the pragmatic baseline condition, $t(30) = 3.52$, $p < .01$.

Considering children's selections on the first trial only, the same pattern of results emerged: Whereas 11 of the 16 (69%) children in the pragmatic baseline condition selected the familiar object on the first trial, only 4 of the

16 (25%) children in the label condition did so, $\chi^2(1, N = 32) = 6.15$, $p < .05$.

To check that children in both conditions noted the speaker's gaze before they selected an object, two coders, blind to condition, each independently coded the video from 15 of the sessions. (Two of the 32 participants' videos were unable to be coded for gaze because of an awkward camera angle.) Coders indicated whether the child looked at the speaker's face at any time during or after the speaker's gaze began to shift toward the familiar object and before the child made a selection. Children in the label condition looked to the speaker on 98% of trials, and those in the pragmatic baseline condition looked on 94% of the trials. For reliability, each coder also coded a random selection of four participants originally coded by the other coder. Agreement was 98%. As in Study 1, then, children in the two conditions were equally likely to notice the speaker's pragmatic signal, but those in the pragmatic baseline condition were more likely to make use of it.

General discussion

When presented with a familiar object and an unfamiliar one and asked to select the referent of a novel label, children selected the unfamiliar object even when the speaker pointed toward (Study 1) or looked at (Study 2) the familiar object. These results are consistent with the explanation of indirect word learning offered by mutual exclusivity: Children selected the unfamiliar object as the referent for the novel label because of a default assumption that each object belongs to only one category and therefore has only one label.

The preference for the unfamiliar object in the label conditions is especially striking given the results from the pragmatic baseline conditions, where a novel label was not involved. When the speaker in Study 1 made a neutral request ('Can you give it to me?') and pointed to a familiar object, children always selected that object. Similarly, when the speaker in Study 2 made a request involving an arbitrary fact (e.g. 'Can you give me the one my sister found?') and looked at a familiar object, children also tended to select that object. The preference for the familiar object was weaker in the pragmatic baseline condition of Study 2 than Study 1, suggesting that gaze direction may be a more subtle pragmatic cue than pointing. Alternatively, the different wording of the pragmatic baseline conditions in the two studies might have led children to respond differently. Whatever the source of this difference, both studies demonstrated that when a request did not involve a new word, children used the speaker's pointing or gaze to infer that the speaker meant to refer to the familiar object.

Children in the label conditions were not immune to the power of these behavioral pragmatic cues either: On the very first trial, for example, two children in Study 1 and one child in Study 2 noted the speaker's point or gaze, respectively, toward the familiar object and proceeded to search under the table at that location. Ultimately, however, these children went on to select the unfamiliar object: They were aware that gaze direction or pointing was a good cue to referential intent, but they were also apparently unwilling to believe that the familiar object was the intended referent of the novel label.

Markman, Wasow and Hansen (2003, Study 3) reported a related finding with much younger children. In that study, a speaker placed a single familiar object on a table and asked 15- to 17-month-olds for the *blicket*. Although the speaker in that study neither looked nor pointed at the familiar object when using the new word, the most pragmatically felicitous inference in this context would have been that the speaker intended to refer to the familiar object. Nonetheless, these infants often searched under the table and/or looked around the room, as if trying to find a possible referent. As in the studies reported here, the most likely explanation for this search behavior is that they did not expect an unfamiliar word to apply to an already labeled object. In a study of second label learning, Liittschwager and Markman (1994, Study 3) found that even when a speaker did look at and point toward a familiar object while providing a novel label, 16-month-olds failed to learn the novel label. Again, this suggests that under some circumstances, children may not make use of pragmatic information that conflicts with mutual exclusivity.

On a social-pragmatic account, what might have led children in our studies to ignore strong pragmatic cues that the speaker intended to use a new word to refer to a familiar object? The coding of where children looked during the speaker's point or gaze shift rules out the possibility that they failed to detect these pragmatic cues: Indeed, they nearly always noted the speaker's point or gaze, and those in the label conditions did so to the same extent as those in the pragmatic baseline conditions. But perhaps when pointing or gaze direction conflict directly with conventionality and contrast as cues to the speaker's intent, the latter simply win out. Our results cannot rule out this social-pragmatic explanation, but it seems unlikely. It requires that children prefer a complicated line of reasoning about intent (e.g. 'If the speaker had meant that, s/he would have said that') over directly observable cues to the speaker's intent (e.g. where the speaker is pointing or looking). Moreover, it is at odds with an important tenet of the social-pragmatic position – namely, that children readily accept multiple labels for a single object when they are provided with interpretable pragmatic cues (Bloom, 2000; Clark, 1997).

One might object that the pointing and gaze cues in our studies were unnatural because they were provided separately whereas they often co-occur in daily interactions. As a result, perhaps they were not interpreted as cues to the speaker's intent. Results from our pragmatic baseline conditions, however, make it clear that when a new word was not used, children readily interpreted a point or look as a sign of the speaker's intent. Still, perhaps in labeling situations, children do not know how to interpret a look without an accompanying point or a point without an accompanying look. This seems unlikely. Classic work by Baldwin (e.g. 1991, 1993) involving first label learning has shown that children as young as 18 months can use the direction of a speaker's gaze (even in the absence of a point) to determine the referent to which she intends to refer. We are not aware of any studies of first label learning that examine whether children can use a speaker's point in the absence of gaze to determine the speaker's intended referent, but we expect they could.

It is possible that if the speaker had instead used some other kinds of pragmatic cues, children would have selected the familiar object as the referent for the new word. For example, when parents are introducing second labels, they often provide some kind of bridging information to make the relationship between the known and new label explicit (e.g. 'a poodle is a kind of dog') (e.g. Callanan, 1985; Callanan & Sabbagh, 2004; Clark & Grossman, 1998). This possibility is actually consistent with the predictions from mutual exclusivity. Recall that mutual exclusivity is a violable default assumption, a best first guess about a new word's meaning. As with the many default assumptions proposed in perception and cognition (e.g. Pinker, 1997), it can be overridden given the right circumstances. The studies reported here have demonstrated that mutual exclusivity is robust even in the face of some forms of normally powerful pragmatic information. But there is certainly a range of other circumstances under which children would be expected to violate mutual exclusivity and to select the familiar object instead.

For example, if the speaker had grasped the penny and placed it in front of the child while requesting a *blicket*, or if the speaker had explained that a penny was a kind of *blicket*, children might have violated mutual exclusivity. In fact, although the results from the pragmatic baseline conditions showed that our pointing and gaze manipulations were unambiguous indications of referential intent, we expect that if the speaker had been even more explicit (e.g. using a touch-point and tapping on top of the familiar object; making an even more

explicit shift in head and body orientation; or perhaps using both pointing and gaze together), children would have violated mutual exclusivity and selected the familiar object rather than the unfamiliar one.

Given that mutual exclusivity can be overridden under some circumstances, does that make it an unlikely explanation for indirect word learning? We don't think so. Children learn words in many different contexts. Particularly in Western middle-class households, some word learning occurs as a result of direct instruction, but, as noted at the beginning of this paper, much of it occurs indirectly (Akhtar, 2005a; L. Bloom, 1993; Tomasello, 2003). Tomasello (2001) has argued that children are given a leg up on this problem by virtue of being born into a highly structured social world, and by being so sensitive to pragmatic information. The social world is indeed an important source of information in word learning, but there are times when it may lack structure, or where pragmatic information may be insufficient to allow children to infer the meaning of a new word.

For example, children must spend a good deal of time in overhearing contexts (Akhtar, 2005a, 2005b; Akhtar, Jipson & Callanan, 2001). Suppose a child overhears a new word but does not see where the speaker was looking at the moment the word was uttered. It would be useful if the child could make an inference about the new word's meaning even though there was little or no pragmatic support for that inference. Mutual exclusivity may also help overcome the potential ambiguity of some pragmatic cues. For example, a point or glance may not always be precise enough for a listener to locate a particular intended referent. In these cases, a default assumption like mutual exclusivity would serve a child well.

A number of social-pragmatic researchers have argued that proposed expectations about words, such as mutual exclusivity, actually reflect pragmatic reasoning processes (Bloom, 2000; Clark, 1997; Diesendruck & Markson, 2001; Nelson, 1988; Tomasello, 2001). The studies reported here suggest that it is unlikely that mutual exclusivity reduces to a pragmatic reasoning process: Preschoolers seem to expect words to be mutually exclusive even when a speaker provides some kinds of pragmatic evidence to the contrary.

Acknowledgements

References

Akhtar, N. (2005a). Is joint attention necessary for early language learning? In B.D. Homer & C. Tamis-LeMonda (Eds.), *The development of social cognition and communication* (pp. 165–179). Mahwah, NJ: Erlbaum.

Akhtar, N. (2005b). The robustness of learning through overhearing. *Developmental Science*, **8** (2), 199–209.

Akhtar, N., Jipson, J., & Callanan, M.A. (2001). Learning words through overhearing. *Child Development*, **72**, 416–430.

Au, T., & Glusman, M. (1990). The principle of mutual exclusivity in word learning: to honor or not to honor? *Child Development*, **61**, 1474–1490.

Baldwin, D.A. (1991). Infants' contribution to the achievement of joint reference. *Child Development*, **62**, 875–890.

Baldwin, D.A. (1993). Infants' ability to consult the speaker for clues to word reference. *Journal of Child Language*, **20**, 395–418.

Bloom, L. (1993). *The transition from infancy to language: Acquiring the power of expression*. Cambridge: Cambridge University Press.

Bloom, P. (2000). *How children learn the meanings of words*. Cambridge, MA: MIT Press.

Callanan, M.A. (1985). How parents name objects for young children: the role of input in the acquisition of category hierarchies. *Child Development*, **56**, 508–523.

Callanan, M.A., & Sabbagh, M.A. (2004). Multiple labels for objects in conversations with young children: parents' language and children's developing expectations about word meanings. *Developmental Psychology*, **40**, 746–763.

Carey, S., & Bartlett, E. (1978). Acquiring a single new word. *Papers and Reports on Child Language Development*, **15**, 17–29.

Carpenter, M., Nagell, K., & Tomasello, M. (1998). Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development*, **63** (4), Serial 255.

Clark, E.V. (1988). On the logic of contrast. *Journal of Child Language*, **15**, 317–335.

Clark, E.V. (1990). On the pragmatics of contrast. *Journal of Child Language*, **17**, 417–431.

Clark, E.V. (1997). Conceptual perspective and lexical choice in acquisition. *Cognition*, **64**, 1–37.

Clark, E.V., & Grossman, J.B. (1998). Pragmatic directions and children's word learning. *Journal of Child Language*, **25**, 1–18.

Clark, E.V., & Svaib, T.A. (1997). Speaker perspective and reference in young children. *First Language*, **17**, 57–74.

Deák, G.O., & Maratsos, M. (1998). On having complex

representations of things: preschoolers use multiple words for objects and people. *Developmental Psychology*, **34**, 224–240.

Diesendruck, G., & Markson, L. (2001). Children's avoidance of lexical overlap: a pragmatic account. *Developmental Psychology*, **37**, 630–641.

Gathercole, V.C. (1987). The contrastive hypothesis for the acquisition of word meanings: a reconsideration of the theory. *Journal of Child Language*, **14**, 493–531.

Gathercole, V.C. (1989). Contrast: a semantic constraint? *Journal of Child Language*, **16**, 685–702.

Golinkoff, R.M., Hirsh-Pasek, K., Bailey, L.M., & Wenger, N.R. (1992). Young children and adults use lexical principles to learn new nouns. *Developmental Psychology*, **28**, 99–108.

Liittschwager, J.C., & Markman, E.M. (1994). Sixteen-and 24-month-olds' use of mutual exclusivity as a default assumption in second-label learning. *Developmental Psychology*, **30**, 955–968.

Macnamara, J. (1982). *Names for things: A study of human learning*. Cambridge, MA: MIT Press.

Markman, E.M. (1989). *Categorization and naming in children: Problems of induction*. Cambridge, MA: MIT Press.

Markman, E.M. (1992). Constraints on word learning: speculations about their nature, origins, and domain specificity. In M.R. Gunnar & M. Maratsos (Eds.), *Modularity and constraints in language and cognition* (Vol. 25, pp. 59–101). Hillsdale, NJ: LEA.

Markman, E.M., & Wachtel, G.F. (1988). Children's use of mutual exclusivity to constrain the meanings of words. *Cognitive Psychology*, **20**, 121–157.

Markman, E.M., Wasow, J.L., & Hansen, M.B. (2003). Use of the mutual exclusivity assumption by young word learners. *Cognitive Psychology*, **47**, 241–275.

Merriman, W.E., & Bowman, L.L. (1989). The mutual exclusivity bias in children's word learning. *Monographs of the Society for Research in Child Development (Serial 220)*, **54** (Nos. 3–4).

Nelson, K. (1988). Constraints on word meaning? *Cognitive Development*, **3**, 221–246.

Phillips, A.T., Wellman, H.M., & Spelke, E.S. (2002). Infants' ability to connect gaze and emotional expression to intentional action. *Cognition*, **85**, 53–78.

Pinker, S. (1997). *How the mind works*. New York: W.W. Norton.

Schieffelin, B. (1985). The acquisition of Kaluli. In D.I. Slobin (Ed.), *The cross-linguistic study of language acquisition: Vol. 1. The data* (pp. 525–593). Hillsdale, NJ: Erlbaum.

Tomasello, M. (2001). Perceiving intentions and learning words in the second year of life. In M. Bowerman & S. Levinson (Eds.), *Language acquisition and conceptual development* (pp. 132–158). Cambridge: Cambridge University Press.

Tomasello, M. (2003). *Constructing a language: A usage-based theory of language acquisition*. Cambridge, MA: Harvard University Press.

Woodward, A.L., & Markman, E.M. (1998). Early word learning. In D. Kuhn & R. Siegler (Eds.), *Handbook of child psychology*: *Vol. 2. Cognition, perception, and language* (5th edn., pp. 371–420). New York: John Wiley and Sons.