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What constrains children's learning of novel shape terms?

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Abstract

In this study, 3-year-olds matched on vocabulary score were taught three new shape terms by one of three types of linguistic contrast: corrective, semantic, or referential. A 5-week training paradigm implemented four training sessions and four assessment sessions. Corrective contrast ("This is concave, it is not square," where *square* is the child's label for the target) produced more learning than did either semantic or referential contrast. In addition, regardless of group, more was learned about those targets that were classified more variably at pretest. Avoidance of lexical overlap (i.e., using more than one term for the same dimension) might make it more difficult for children to learn new dimensional adjectives, and a "shape bias" might make learning shape terms easier. However, children's expectations about the speaker's communicative intent interacted with the potential benefits of contrast in the semantic condition, and children in that group learned no more than did controls.

Keywords: Attention; Linguistic contrast; Mutual exclusivity; Pragmatic cues; Shape bias; Shape terms

Introduction

Preschoolers' rapid acquisition of new vocabulary is facilitated by their ability to engage in joint attention (e.g., Baldwin, 1991, 1993), their awareness of syntactic forms (e.g., Hall & Graham, 1999), understanding of the speaker's intent (e.g., Akhtar, Carpenter, & Tomasello, 1996),

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and belief that objects have only one name (the assumption of "mutual exclusivity" [e.g., Markman & Wachtel, 1988]). They also believe that new words map onto instances of a novel category for which they do not already know a name ("novel name–nameless category" or N3C principle [Mervis & Bertrand, 1994]). By 2 years of age, children can learn a novel noun after a single exposure by simple naming (e.g., "This is a dax"). However, dimensional adjectives are harder to learn because the meanings of these words need to be abstracted from the objects to which they are applied. Rice (1980) took more than 1000 trials to teach 3-year-olds three new color terms by telling them, "This is green." In the current article, we address the idea that avoidance of lexical overlap, as described within the mutual exclusivity framework, might make it harder for young children to learn new adjectives for dimensions such as shape, color, and texture. This is because extension errors, combined with a belief that terms are mutually exclusive, may prevent children from determining the referent of a new word within a specific context.

Dimensional adjectives have been taught using linguistic contrast (e.g., Au & Laframboise, 1990; Gottfried & Tonks, 1996) in the form, "This is Y, it is not X," where Y is a new word and X is a word from the same semantic domain as Y that the child knows. The contrastive context facilitates semantic classification. When the child hears, "This is a rhombus, it is not a square," knowing the meaning of *square* should facilitate semantic classification of the new word *rhombus* as a shape word. Au and Laframboise (1990) taught 3- to 5-year-olds new color terms with either semantic or corrective linguistic contrast. Semantic contrast uses one or two terms that are chosen at random from the set the child already knows for the domain, whereas corrective contrast uses the child's own label for a particular referent. Thus, the child would receive semantic contrast when told, "This is ochre, it is not red and it is not green," if *red* and *green* were known words but not ones the child had used to describe the target ochre object at pretest. If instead the child were told, "This is ochre, it is not yellow" (where *yellow* was the term used by the child to label the ochre target), this would be corrective contrast. After a single exposure to the contrastive information, children taught by corrective contrast had learned significantly more than had a control group taught by simple naming, but another group given semantic contrast had learned no more than controls. Gottfried and Tonks (1996) replicated these findings but varied the test objects on shape as well as color. Children interpreted the new terms as shape words when these were introduced in a simple naming context but interpreted them as color terms when they were introduced with corrective contrast. This suggests that children are predisposed to attend to the shape dimension in the context of new adjectives. Au and Markman (1987) also used semantic contrast to teach material and color terms, both with adults and with 3- and 4-year-olds, and found the method to be effective with adults but not with children.

Au and Laframboise (1990) argued that semantic contrast confuses the child because it introduces an "unmotivated denial" of terms that the child has not used. Alternatively, unmotivated denial may lead the child to search for the objects named by the speaker, diverting attention away from the target (O'Hanlon & Roberson, 2006). Akhtar (2002) showed that 2- and 3-year-olds are sensitive to pragmatic context and that these children more readily extended novel texture or shape terms on the basis of discourse context. The experimenter told children either "This is a smooth one" or "This is a round one." When a novel object of unusual texture and shape was labeled "a dacky one," children previously exposed to the shape context interpreted *dacky* as referring to shape, but children previ-