

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

The Role of Comparison and Contrast in Category Development

Permalink

<https://escholarship.org/uc/item/0944v7cm>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 29(29)

ISSN

1069-7977

Authors

Ankowski, Amber N.
Sandhofer, Catherine M.

Publication Date

2007

Peer reviewed

The Role of Comparison and Contrast in Category Development

Amber N. Ankowski (aankowski@ucla.edu)

Department of Psychology, University of California, Los Angeles
1285 Franz Hall, Los Angeles, CA 90095 USA

Catherine M. Sandhofer (sandhof@psych.ucla.edu)

Department of Psychology, University of California, Los Angeles
1285 Franz Hall, Los Angeles, CA 90095 USA

Keywords: Cognitive Development; Learning; Comparison

Introduction

How do comparison and contrast help children learn a new category? When children are acquiring a new category they must compare across the range of members within the category. For example, when learning the category of “bears,” a child may compare within-category examples of bears at the zoo and plush teddy bears to determine what comprises category membership. However, to truly understand the category a child must also contrast bear examples against other non-category members, like dogs or plush sheep, to determine category boundaries. The process of contrasting involves viewing two or more dissimilar items that do not share category membership, while comparison involves viewing multiple objects that are members of the same category.

Comparison and contrast have been frequently studied in the laboratory. Researchers agree that viewing multiple exemplars leads to better performance on a variety of tasks and using a variety of measures (e.g. Namy & Gentner, 2002; Waxman & Klibanoff, 2000). However the specific situations in which comparison and contrast are effective tools for category development is understudied.

The current studies seek to unify this disparate research by systematically varying stimuli features to determine which learning situations highlight the effectiveness of comparison or contrast. Because comparison provides information about *category membership* and contrast provides information about *category boundaries*, the usefulness of these processes are likely to be determined by features of the specific learning environment.

Study 1

Study 1 investigated the effect of comparison and contrast when stimuli did not vary in features irrelevant to the target category.

Methods

48 three-year-old children were randomly assigned to one of three between subjects conditions: Compare, Contrast and Compare-Contrast. Children in the Compare condition saw three objects from the target category. In the Contrast condition subjects saw one object from the target category with two objects from other categories. Subjects in the

Compare-Contrast condition saw two objects from the target category and one object from another category. In all conditions the experimenter labeled the objects twice. Subjects then saw three test objects and were asked to match to the target stimuli. Each subject made 24 object matches. All stimuli sets consisted of three same-sized wooden blocks and did not vary in any irrelevant dimension.

Results

Study 1 revealed that contrast was essential when stimuli did not vary in irrelevant ways. Children in the Comparison condition scored at chance, while children in the Contrast and Compare-Contrast conditions scored above chance.

Study 2

Study 2 investigated the effect of comparison and contrast when stimuli varied in one feature irrelevant to the target category.

Methods

Methods were the same as those used in Study 1 except stimuli sets varied in one irrelevant feature.

Results and Discussion

In Study 2 children in all conditions scored significantly above chance. With the addition of a single irrelevant feature variation, comparison and contrast were equally effective in enabling children to learn the novel concept. Together these studies indicate that features of stimuli presented have a significant effect on children’s ability to use comparison and contrast for category acquisition. Because the efficacy of comparison and contrast was significantly impacted by changes in the stimuli, this may suggest one reason why previous research has found dissimilar results regarding the relative effectiveness of comparison and contrast as learning tools.

References

- Namy, L.L., & Gentner, D. (2002). Making a silk purse out of two sow's ears: Young children's use of comparison in category learning. *Journal of Experimental Psychology*, *131*, 5-15.
- Waxman, S.R. & Klibanoff, R.S. (2000). The role of comparison in the extension of novel adjectives. *Developmental Psychology*, *36*, 571-581.