The Domain Specific Relation between Vocabulary Size and Generalization: The Case Example of Color Word Learning

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Previous research has suggested that a critical number of category instances need to be experienced for generalization to occur. Perhaps surprisingly, some support for this idea comes from research on word learning. In the word learning literature, fast mapping refers to the ability to learn word-referent correspondences after only a brief exposure to the word, to extend it appropriately to other instances, and to retain this information for some time after exposure. Fast mapping is associated with greater ease in word learning, and consequently, a period of rapid vocabulary growth called the “Naming Boom” (Carey, 1978). Though the term fast mapping is specific to the word learning literature, it can also be thought of as the ability to generalize within a category.

Fast mapping appears to develop independently within specific domains. Consider the case of color words: in comparison to the acquisition of other word types, such as count nouns, the acquisition of color words is protracted and errorful (Bornstein, 1985). This present study examined color word learning as a case example of the domain specificity of fast mapping.

Factors that lead to fast mapping

Previous research has found that vocabulary size (50 to 100 words) is a powerful predictor of the first emergence of fast mapping and the Naming Boom (Bates, Bretherton, & Snyder, 1988). A similar relationship may exist within specific word domains, such as color words (Sandhofer & Smith, 1999). Thus it appears that a critical number of words must be learned, or instances experienced, before category generalization occurs.

This study examined whether experimentally manipulating the size of children’s color lexicon can lead to category generalization, i.e. the fast-mapping of color words. Children, with no existing color lexicon, were trained in two, four, or six color words. After completing eight training sessions, children were then tested in their ability to learn four untrained colors after a single labeling session (fast map).

Results

Children trained in two and four color words perform at chance on the test of fast mapping, whereas children trained in six color words perform significantly above chance.

These results suggest that when others factors, such as age and overall vocabulary size, are held constant fast mapping of color words emerges once children have acquired five or more color words. This case example of color suggests that the ability to fast-map is domain specific: fast-mapping emerges in a word domain once a critical vocabulary level has been reached in that particular domain.

These results inform the question of how many specific instances are needed for category generalization to occur within a specific domain. In the case of color words, this number appears to be five. However, the question remains whether five instances are needed to generalize for all domains, or if this number varies across domains – perhaps depending on category properties such as statistical density (see Kloos & Sloutsky, in press, for a discussion of these issues).

References


