

Language-Specific Semantics and Categorization

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Abstract

Until the early 1990's, the predominant view was that human languages share a significant number of universal properties and that these properties are shaped by universal cognition. In the last few years, however, with evidence of extensive and significant differences across languages particularly in the semantic domain of space, the debate on language and cognition has been re-kindled and has become, once again, a central issue in psychology, linguistics and cognitive science. In this debate, studies on languages such as Korean and Mandarin-Chinese (that are very different from much researched languages like English) have provided crucial information about the extent to which language influences cognition in children and adults. In this workshop, we present three papers showing influence of language on cognition, specifically categorization, with data involving English, Korean, and Mandarin-Chinese. These three papers will be followed by a discussion paper.

Keywords: spatial cognition, categorization, typicality, category types, noun and verb.

Influence of Language-specific input on spatial categorization: Categories of containment (Choi)

Recent research on infant cognition has shown that preverbal infants (9-, 11-, and 14-month-olds), regardless of their language environments, can make a distinction between tight-fit and loose-fit containment relations. This distinction is systematically made in Korean (*kkita* 'fit tightly' vs. *nehta* 'put something loosely in a container'), but not in English (i.e. *in*). The questions are, whether this nonlinguistic sensitivity to differences in degree of fit is influenced by the language-specific input as infants learn their target language, and if yes, when the influence begins to take place. Using a preferential-looking method, Choi

examined children's nonlinguistic sensitivity to the distinction between Tight-in and Loose -in in English- and Korean-learners at different ages: 18, 24, 29, and 36 months. The children's productive vocabulary was also measured through language survey filled out by the mothers.

The preferential data showed a significant decrease in sensitivity in English learners to the differential feature (i. e. degree of fit) between the two relations from 18-/24-month-olds to 29-/36-month-olds. In contrast, 29-/36-month-old Korean learners maintained the distinction between the two relations. The decrease in sensitivity to the tight/loose feature in English learners corresponded with increase in vocabulary level and the production of the word 'in': E children who produced in or had high vocabulary level showed much less sensitivity to the difference between tight-in and loose-in than those who did not produce in or had low vocabulary level. Thus, there is an intimate relation between vocabulary learning and nonlinguistic sensitivities of the relevant domain.

How linguistic input shapes spatial categorization in infants and toddlers (Casasola)

This paper presents the author's recent findings on the effect of teaching a novel word on toddlers' spatial categorization. In this study, English-learning toddlers of 21 to 22 months were taught a novel spatial word for actions resulting in a tight-fit spatial relation, a relation that is lexically marked in Korean (i.e. *kkita*) but not in English. A second group of toddlers viewed the actions but were not provided with a novel word. Following this training session, toddlers' comprehension of the novel word was tested in a preferential-looking paradigm. Only toddlers who were

taught the novel spatial word looked significantly longer at the tight-fit events during the test trials that presented the novel word than during control trials that presented neutral linguistic stimuli. The results indicate that toddlers can map and generalize a novel word onto actions resulting in a tight-fit relation given limited experience with the novel word. The results provide insight into how young word learners begin to form language-specific semantic spatial categories.

A second experiment further documents the influence of linguistic input on infants' spatial categorization. Korean- and English-learning infants of 10 and 18 months were tested on their categorization of containment and tight-fit relations. At 10 months, infants from both language environments formed the same spatial categories (i.e., containment but not tight-fit). At 18 months, however, infants formed only the spatial category consistent with the semantic pattern of their language. Together, the two studies begin to delineate the role of linguistic experience in shaping how infants and toddlers organize spatial events into categories.

Removing the “Basic” and ”Typical” in Noun Categories: ERP and Behavioral Studies with English and Chinese speakers (Tardif, Simms, & Liu)

In response to a number of studies showing that English-speakers use more noun types and that Mandarin-speakers use more verb types when speaking (Tardif, Shatz, & Naigles, 1997; Tardif, in press). This study explores how object labels in Mandarin Chinese and English differ and examines the effects of these differences on categorization tasks. Basic-level labels (e.g., *qi4che1* ‘car’, *huo3che1* ‘train’, *zi4xing2che1* ‘bicycle’) in Chinese often include the superordinate category term (e.g., *che1* ‘vehicle’), whereas in English, basic-level labels do not. Study 1 examined how this difference might affect the use of superordinate and basic level terms by 40-English and 20 Mandarin-speaking adults, and found that Mandarin speakers are more likely than English speakers to replace basic level terms with superordinate level terms. Also, English speakers were more likely than Mandarin speakers

to replace basic level terms with other basic level terms from the same category. Study 2 examined typicality effects and basic-level effects in a timed typicality rating task with 27 English-speaking and 24 Mandarin-speaking adults with different types of categories. Across all category types, English speakers showed similar typicality effects for all category types, but Mandarin speakers showed typicality effects only for certain category types. These results were further replicated in Study 3, a yes-no category inclusion ERP task, with both English- and Mandarin-speakers showing significant N400 responses to out-of-category items, but only English-speakers showing N400 responses to atypical category members. The data across all three studies converge to suggest that in addition to the differences in noun and verb use, there may also be strong and significant differences in noun and verb category structures that lead to important differences in the processing of object and action concepts for speakers of these two languages.

Discussion (McDonough)

In each of the three presentations, we find that languages differ in the kinds of semantic distinctions are made in the domain of spatial relations (Choi and Casasola) and object labels (Tardif et al.). These findings urge us to reconsider assumptions we have held over the years about what infants need to know before acquiring language (linguistic precursors), the required flexibility they need to maintain during the acquisition process, and how language then quickly influences how infants structure their experiences in the world as evidenced not only in verbal but nonverbal tasks. These studies impress upon us that the transition from preverbal to verbal thought is a rich arena for researchers to test views on the relation between language and thought. In her discussion, Laraine McDonough will cover some common assumptions made about the preverbal infant mind, first language acquisition and how language influences cognition. Suggestions will be made to elicit discussion among the symposium panel and audience as to how these views can be updated, revised and/or completely changed to accommodate the data presented.