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Young children's developing sensitivity to discourse continuity as a cue for inferring reference

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ABSTRACT

Children encounter many opportunities for word learning where a novel word (e.g., “chinchilla”) coincides in time with the presence of its referent (e.g., a parent pointing at a fuzzy rodent). These two ingredients are not always paired simultaneously, but they sometimes still occur in succession within a discourse. We investigated children's ability to apply their knowledge of discourse structure to infer the referent of a novel word in the absence of social cues such as pointing and eye gaze. In Experiment 1A, we introduced 2- to 6-year-old children and adults to two novel toys and described each using two sentences. We embedded the introduction of a novel label (“Have you seen a toma before?”) between the two sentences about one of the toys, with no cues implying the label's referent other than its position in the discourse. Children older than 3 years and adults were more likely to attribute the label to the toy whose descriptions surrounded the naming event. In Experiment 1B, we tested whether participants made their selections based on temporal associations—choosing the toy that was described closest in time to the naming event—rather than inferences about discourse. Participants heard the novel label introduced after the two descriptions of a toy rather than embedded between them. Both children and adults responded close to chance in this experiment, indicating that temporal proximity alone did not guide their selections. Together, these results suggest that children can use discourse position to make inferences about reference in word learning situations.

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Introduction

Children can use many strategies to learn new words. In overtly pedagogical situations, adults employ cues such as pointing and other signals of joint attention to establish reference. These ostensive cues can help children to learn word meanings (Bakeman & Adamson, 1984; Csibra, 2010; Hollich, Hirsh-Pasek, & Golinkoff, 2000). Unambiguous ostensive cues, however, are not available at all times. For children to learn in more ambiguous situations, they must rely on other strategies to infer the meanings of novel words. Here we considered discourse structure—the order of utterances and how they relate to each other—as a cue. We focused particularly on discourse continuity, the idea that sentences in close succession are more likely to relate to the same topic. The current study measured children’s ability to use discourse continuity to make inferences about the referent of novel words in simple grounded contexts.

Children are exposed to information about discourse structure whenever they hear speech, and the simple linking of topics across sentences can provide a valuable source of information about the meanings of words. From an utterance such as

(1) I love chinchillas!

A child might not be able to infer what “chinchilla” means. But consider this same utterance as embedded in a short discourse:

(2) I got a new pet.
I love chinchillas!
They’re so soft.

The discourse structure in Example 2 might allow a child to make inferences that (a) a chinchilla is a kind of animal and (b) chinchillas are probably furry. This linking of information across a sequence of utterances requires that the child has some understanding of discourse structure. For inference (a), the child must assume that the statement in the second utterance is topically related to the first one; for inference (b), the child must assume that the pronoun in the third utterance co-refers to the noun in the second one.

Here we focus on inferences such as (a). We begin by discussing adults’ recognition of discourse structure cues and how these abilities may relate to children’s language processing. We then discuss links between these abilities and word learning. Our review of previous literature sets the stage for our experiment, which tests whether adults and children are able to make a simplified version of this inference using an assumption of discourse continuity to infer which object is referred to by a novel term.

Throughout this discussion, the perspective we take on word learning is that there are (at least) two problems that learners jointly solve (Frank, Goodman, & Tenenbaum, 2009; McMurray, Horst, & Samuelson, 2012): (a) the problem of in-the-moment referential ambiguity and (b) the longer term problem of finding the conceptual extension of a word (even when its referent is known). We refer to the first problem as the problem of determining reference, and we refer to the second problem as the generalization problem. Although Example 2 highlights the potential of discourse information for both problems, here we focus on the role of discourse in referent selection.¹

Discourse structure and referent selection

Discourse in adult speech is often structured around the introduction and subsequent discussion of particular topics (e.g., Ariel, 1990; Clark, 1996; Gundel, Hedberg, & Zacharski, 1993; Prince, 1992). The first mention of a new topic or entity tends to be used to establish reference; it is usually longer and more explicit than subsequent mentions. These later mentions (when the topic is “given”) presuppose

¹ A somewhat orthogonal concern about calling this type of example word learning has to do with children’s retention of the referents they select. Some recent work indicates that although young children can use in-the-moment information to make inferences about reference, mappings inferred in this way are not necessarily retained (Bion, Borovsky, & Fernald, 2012; Horst & Samuelson, 2008). Our current work does not address long-term word learning but instead focuses on investigating children’s in-the-moment inferences about reference.

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