Three-year-olds' comprehension of contrastive and descriptive adjectives: Evidence for contrastive inference.

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Combining information from adjectives with the nouns they modify is essential for comprehension. Previous research suggests that preschoolers do not always integrate adjectives and nouns, and may instead over-rely on noun information when processing referring expressions [1; 2]. This disjointed processing has implications for pragmatics, apparently preventing under-fives from making contrastive inferences.

Two visual world experiments investigated how English-speaking three-year-olds (N=73, M_{age}=44 months) process size adjectives across syntactic (prenominal; postnominal) and pragmatic (descriptive; contrastive) contexts (Fig. 1). The first experiment used an established paradigm [3] and the second used a novel experimental design that allowed children time to demonstrate their abilities in adjective-noun integration and in contrastive inference. We asked:

1. Do 3-year-olds integrate adjectives and nouns to resolve reference by utterance end?
2. Do 3-year-olds show contrastive inference?
3. Do 3-year-olds process modified noun phrases more quickly when adjectives occur pre- or post-nominally?
4. Is there an association between 3-year-olds' contrastive inferencing ability and their language ability or speed of processing?

Using growth curve analysis [4] (and replicated with logistic regression), we show that preschoolers are able to integrate adjectives and nouns to resolve reference accurately by the end of the referring expression in a variety of pragmatic and syntactic contexts and in the presence of multiple distractors (RQ1). Crucially, by modelling the effect of pragmatic function (contrastive - where the prenominal adjective was informative, vs. descriptive - where it was not) on visual preference for the target object during the unfolding utterance, we reveal for the first time that when task demands are reduced (exp. 2), 3-year-olds show a stronger target preference during the adjective in the contrastive condition and greater distraction from the property competitor in the descriptive condition (Fig. 2; upper panel). Using both manifestations of contrastive inference, we conclude that young children can contrastively infer, given a slowed-down speed of presentation and visually enhanced size contrasts (RQ2; exp. 2). Against our hypothesis that participants would resolve reference more quickly when adjectives appear postnominally [5], we find no effect of syntactic frame (RQ3). Finally, correlational analyses reveal no association between preschoolers' contrastive inferencing ability and their semantic and syntactic abilities, or their speed of processing (RQ4).

Our findings provide novel evidence for a continuity in young children's pragmatic development. By analysing high-resolution online data in response to stimuli that require integration of an adjective with a noun, in younger children than have been tested before, we show that children can coordinate lexical, referential, and pragmatic information to interpret language in real time. We discuss mechanisms driving this coordination, and their relationship to task demands.

References
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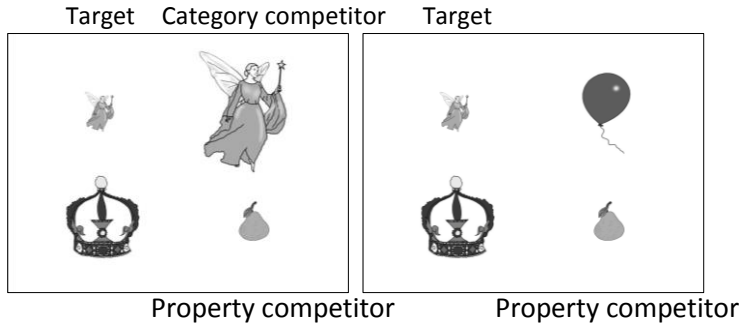
Figure 1. Pragmatic context was manipulated using contrastive (left panel) and descriptive (right panel) visual arrays, crossed with prenominal and postnominal syntactic frames presented auditorily, e.g., *Where's the little fairy? / Where's the fairy that's little?*
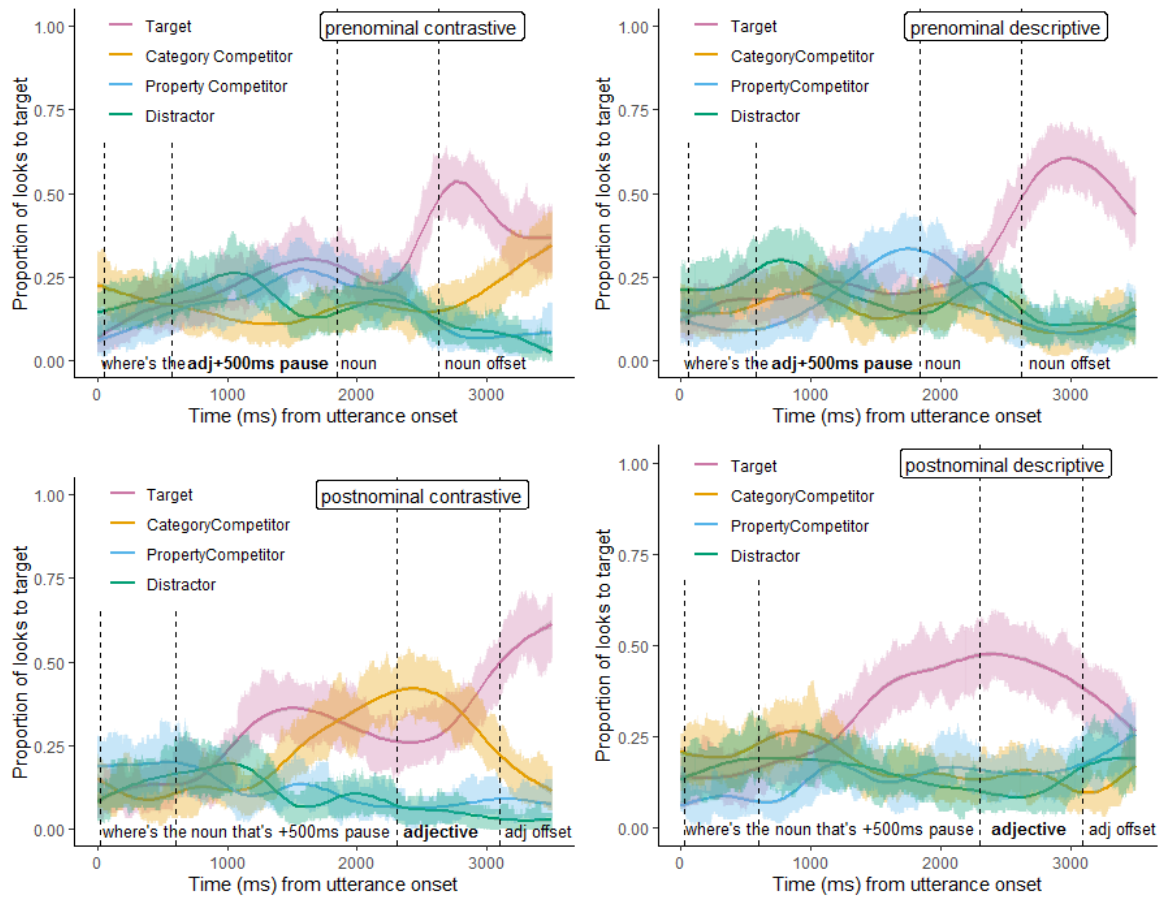

Figure 2. Proportion of looks to each interest area across syntactic and pragmatic conditions. Vertical dashed lines represent mean onset times. Bold text indicates disambiguation points.