Priming children's interpretation of globally ambiguous sentences

Emily Atkinson, Natalie Bloss, Sofia Johnson, & Carolina Jones (University of Michigan)
eeatkins@umich.edu

A growing body of work has demonstrated that children, like adults, can be primed to produce sentences with a particular structure (e.g., [1-2]). These priming studies have focused on sentence structures with very similar meanings (e.g., active vs. passive, prepositional object vs. double object datives). It is unclear, however, whether a particular interpretation can be primed when a sentence is compatible with multiple meanings (i.e., it is globally ambiguous). For example, in the sentence in (1), the pipe cleaner could either be the instrument of pointing – i.e., the sheep uses it to point ([$_{VP}$ [$_{VP}$ points at the pig] [$_{PP}$ with the pipe cleaner]]) – or modify the description of the pig – i.e., the pig holds it ([$_{VP}$ points at [$_{NP}$ the pig with the pipe cleaner]]).

(1) The sheep points at the pig with the pipe cleaner.

Previous work demonstrated that children rely on verb biases to determine how to interpret these sentences [3]. Verbs fall into 3 classes: instrument-biased, modifier-biased, and equi-biased. The current study examines whether children's interpretation of sentences with equi-biased verbs can be primed by producing sentences with one of these interpretations.

Control (N=16) The classification of the 8 verbs used in the study (*scratch*, *throw*, *pinch*, *feel*, *drag*, *turn over*, *blow on*, & *point at*) as equi-biased was based on adult sentence continuations [3]. Thus, we first conducted a control experiment to uncover children's bias. Both experiments utilized a picture selection task that the child played with a puppet. In a particular trial (n=24; 8 targets, 16 fillers), the puppet would describe a picture and the child had to select the matching picture. For the target trials (Fig1), the puppet described the picture using an ambiguous sentence like (1) containing one of 8 equi-biased verbs. Despite this classification, children (mean age=5;2, range=4;1-6;4) selected the picture matching the instrument interpretation 82.12% of the time. Thus, this value will be used as the baseline in the main experiment.

Exp (N=32) Unlike in the control experiment, the child and the puppet took turns describing a picture and selecting the matching picture from two options. For the production portion of the task, an ambiguous sentence like (1) described the pictures, but the image itself disambiguated its meaning. When it was the child's turn to select the match, the choices depicted the two alternative interpretations of the target sentence (Fig1) and technically either answer was correct. Crucially, the child's production could serve as an interpretative prime; if they produced a sentence with a particular interpretation, they may be primed to select that same interpretation when encountering another ambiguous sentence of the same type. Children (mean age=5;7, range=4;5-6;7) were randomly assigned to either produce instrument or modifier interpretations. Each trial (n=8) consisted of a pair of picture selections. First, the puppet selected a picture based on the child's production, then the child selected based on the puppet's production. The modifier priming group was less likely to select the picture corresponding to the instrument interpretation than the instrument priming group (Fig2; β=1.25, p<0.001). Older children were significantly more likely to select the instrument interpretation (β=1.49, p<0.05), but there was no interaction between age and priming group. Compared to the baseline established in the control experiment, priming increased the selection of the picture with the matching interpretation for both priming groups (instrument: t=3.55, p<0.01; modifier: t=-2.19, p<0.05).

These results suggest that interpretation can be primed by the production of a sentence with a similar interpretation. Implications for priming and the role of production will be discussed. Also, an in-progress follow-up experiment aims to compare the priming effects arising from ambiguous primes to those following unambiguous primes (e.g., *The sheep points at the pig* [instrument: *by using* / modifier: *that has*] *the pipe cleaner*).

References [1] Huttenlocher, Vasilyeva, & Shimpi 2004. *JML*. [2] Savage et al. 2004. *Developmental Science*. [3] Snedeker & Trueswell 2004. *Cognitive Psychology*.

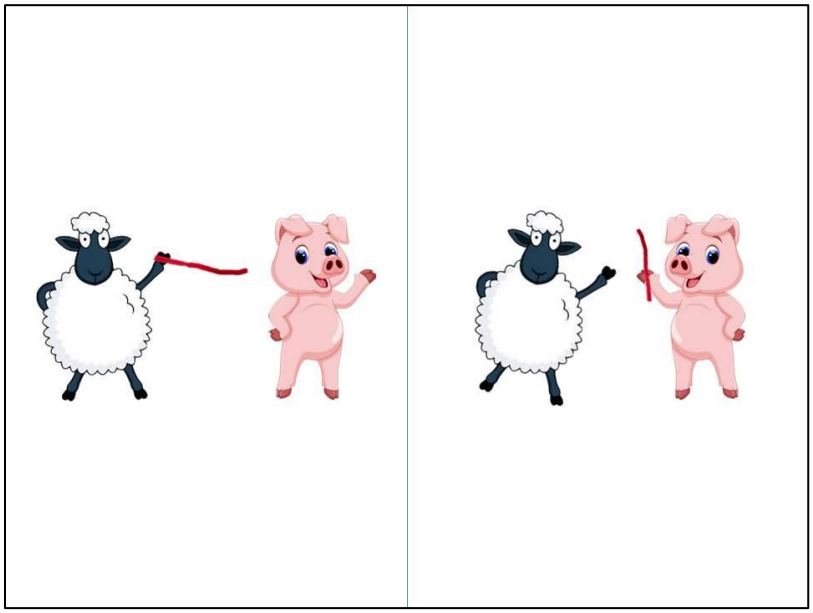

Figure 1. Example of a target trial. For this trial, the puppet said the sentence “The sheep points at the pig with the pipe cleaner” and the child selects either the instrument (left) or modifier (right) interpretation.

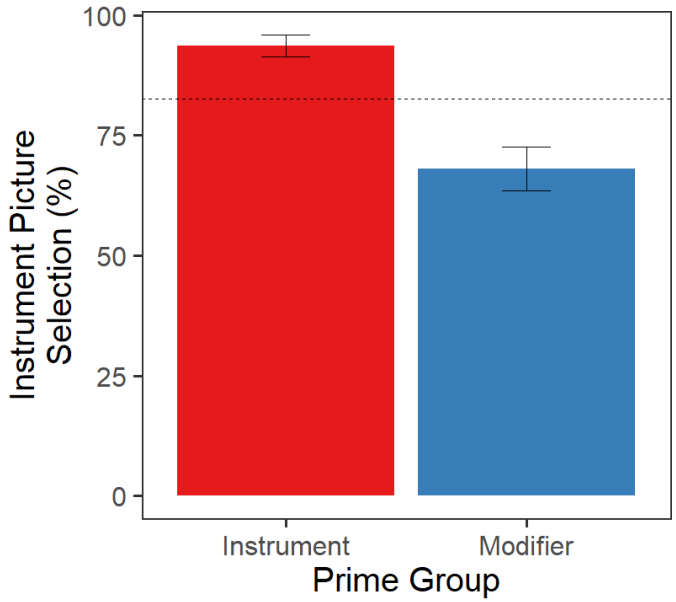

Figure 2. Percentage of trials in which the instrument interpretation was selected for each priming group (instrument vs. modifier interpretation). The horizontal line indicates the baseline rate of selecting the instrument picture discovered in the control experiment.