

## Picture priming of logical form generalizes across nouns, but not across verbs

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Sentences containing two quantifiers, like *Every boy climbed a tree*, have two interpretations – one where there is a single tree that every boy climbed, and another where every individual boy climbed some tree, but no two boys necessarily climbed the same one. The systematicity of this ambiguity is well-captured by theories that posit two possible representations at the level of logical form with different scope relations between the quantifiers. But does this characterization merely describe the two meanings from a theorist's-eye view, or are these distinct logical forms invoked in the process of interpreting these sentences?

This question has recently been investigated in 4-year-olds (Viau, Lidz and Musolino, 2010) and adults (Raffray and Pickering, 2011) using a priming paradigm. Raffray and Pickering used a picture choice priming method with adults where ambiguous target trials follow unambiguous prime trials. Participants are told to pick the picture which matches the sentence they see. On prime trials, an ambiguous sentence (e.g. *Every boy climbed a tree*) is presented with two pictures, one of which matches one of the possible readings of the sentence (e.g. for a universal-wide reading, three boys each climbing a different tree; for an existential-wide reading, three boys climbing the same tree). The other does not match the lexical content of the sentence (e.g. each boy climbing a different ladder). Thus the context forces one interpretation of the ambiguous sentence. In the following target trial, a new sentence (e.g., *Every hiker climbed a hill*) is accompanied by two ambiguous pictures – one of three hikers climbing a single hill (an existential-wide reading), and another where each hiker climbs their own hill (the universal-wide reading).

Raffray and Pickering (2011) found that participants were more likely to choose a universal-wide target after having seen a universal-wide than an existential-wide prime. This priming only occurs when the particular combination of quantifier and thematic role is preserved across the prime and target. Thus priming is found from *Every kid climbed a tree* to *Every hiker climbed a hill*, but not from *A kid climbed every tree*. Note, however, that the verb remains the same across target and prime. If logical form priming depends on thematic roles, as Raffray and Pickering conclude, rather than more concrete representations of specific events, then priming should persist across different verbs with the same argument structure.

To test this prediction, we explored quantifier scope priming both within and across verbs (e.g., from *Every boy climbed a tree* to *Every shark attacked a surfer*). We counterbalanced the order of sentences, as well as the prime type of every item such that each prime sentence was accompanied by a universal-wide forced picture choice for half of the participants and an existential-wide picture choice for the other half. We replicate a significant priming effect across sentences with the same verb (see Table 1;  $N=132$ ;  $p<0.01$ ), but find no effect of prime type across different verbs ( $N=135$ ;  $p=n.s.$ ) and a significant interaction between the two conditions ( $p<.05$ ). We discuss three possible explanations and their relation to prior accounts of **syntactic** priming during comprehension: 1) priming occurs over abstract scope representations which are lexically mediated (Pickering & Ferreira, 2008); 2) priming occurs over concrete representations of events (which generalize to new event-participants but not new verbs); 3) verb overlap focuses participants on commonalities across adjacent trials and thus priming is attentionally mediated.

<b>Feiman, Aiello &amp; Snedeker</b>	<b>U-wide Prime</b>	<b>E-Wide Prime</b>
<i>Within Verb</i>	71.2%	66.2%
<i>Between Verb</i>	47.3%	47.5%
<b>Raffray &amp; Pickering</b>		
<i>Within Verb</i>	77%	69%

**Table 1:** The percentages of participants selecting a universal-wide picture after either a universal-wide or an existential-wide prime trial.