What are verb concepts made of?

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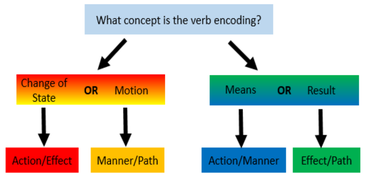
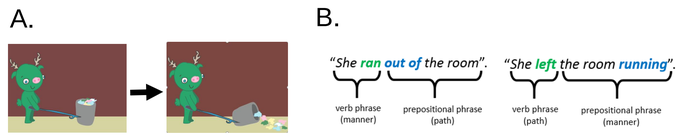
Introduction

Previous evidence has suggested that adults' lexicalization biases formed from change of state (action and effect) verbs can systematically affect their predictions of the meanings of motion (manner and path) verbs. However, it is unclear whether children are capable of altering their biases in a similar way and what the mechanisms behind this process might be. Here, we explored whether four- and five- year old English speaking children learn these biases by determining what dimensions are important as they encounter events, or by using a unifying conceptual framework to distinguish between means and results more broadly. We predicted that if verb meanings are conceptually grouped together under a broader framework, providing evidence for either action or effect for novel change of state event verbs would affect children's predictions of novel motion event verbs encoding manner or path.

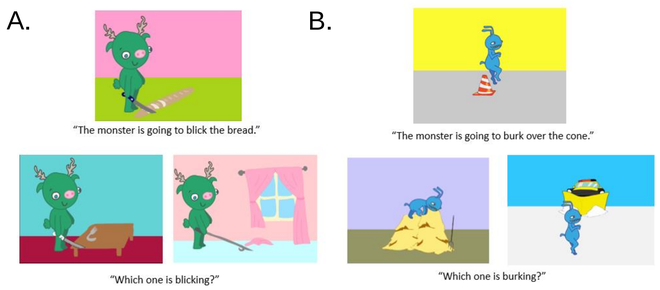




A. Change of state events are described in terms of action and effect. B. Motion events are described in terms of manner and path, which can be encoded in grammatically distinct ways.

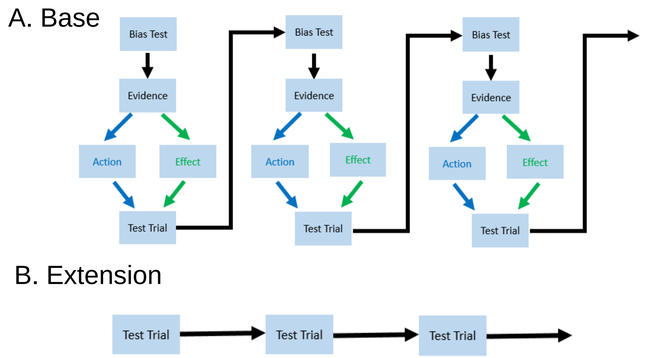
Methods

1. Stimuli



Novel verbs described a character performing a change of state or motion event. A. Change of state events consisted of an object-directed goal with a means (action) and outcome (effect). B. Motion events consisted of a movement that varied in its manner and path.

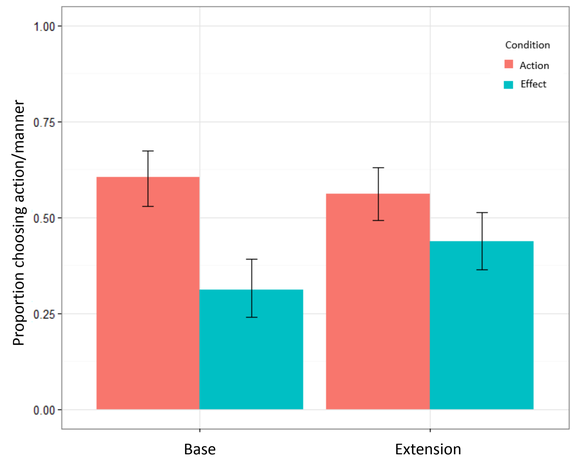
2. Procedure



The procedure consisted of 8 base and 8 extension trials. A. During base phase trials, participants were given a bias test, evidence, and test trial for verbs encoding action or effect. During extension phase trials, participants responded to a single bias test for novel verbs encoding manner or path.

Results

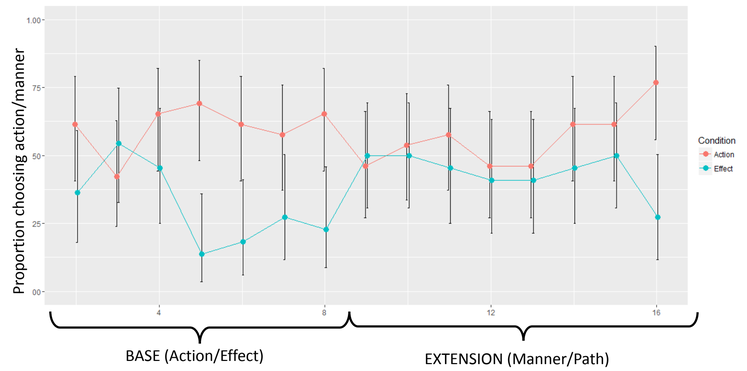
Action/Effect to Manner/Path Mapping



Participants in the action condition were more likely to interpret verbs in the base phase bias tests as encoding action than those in effect condition. This was significant with a linear mixed-effects model ($p < 0.0006$). Participants in the action condition were also more likely to interpret novel verbs in the extension phase as encoding manner than those in the effect condition ($p < 0.0013$)

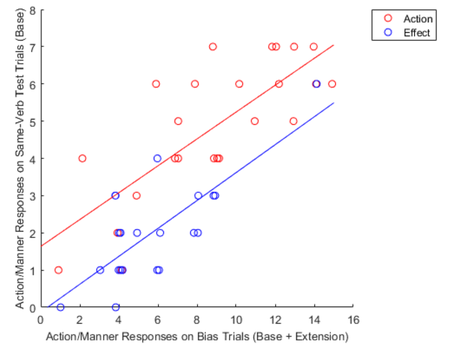
Comparing Base and Extension Trials

1. Strength of bias increases with trials



During the base phase, participants' responses gradually differentiated more between conditions with more trials. Responses between the two conditions during the extension phase did not show as clear of a pattern.

2. Training performance predicts bias test responses



There was a significant correlation between participants' proportion of responses choosing action or effect in the base phase and proportion of responses choosing manner or path in the extension; for both the action condition ($r = 0.7682$, $p < 0.0001$) and the effect condition ($r = 0.756$, $p < 0.0001$)

Conclusions

1. Lexicalization biases are flexible and can be updated on the basis of experience.

2. Lexicalization biases are abstract and reflect an underlying unified conceptual structure that distinguishes between means and result.

3. Biases reflect prior linguistic experiences.