Changing 4-6yo's means/outcome verb biases within and across domains

Melissa Kline, Annelot de Rechteren van Hemert & Jesse Snedeker

She ran into the room	Manner
She entered the room running	Path
She flattened the can with a hammer	Action
She hammered the can flat	Effect

- **Frequencies of verb type vary across languages** (Talmy 1985, Levin & Rappaport Hovav 2010)
- **Biases change with training** (Shafto, Havasi & Snedeker 2014)
- **Adult biases carry over between domains** (Geojo 2014)

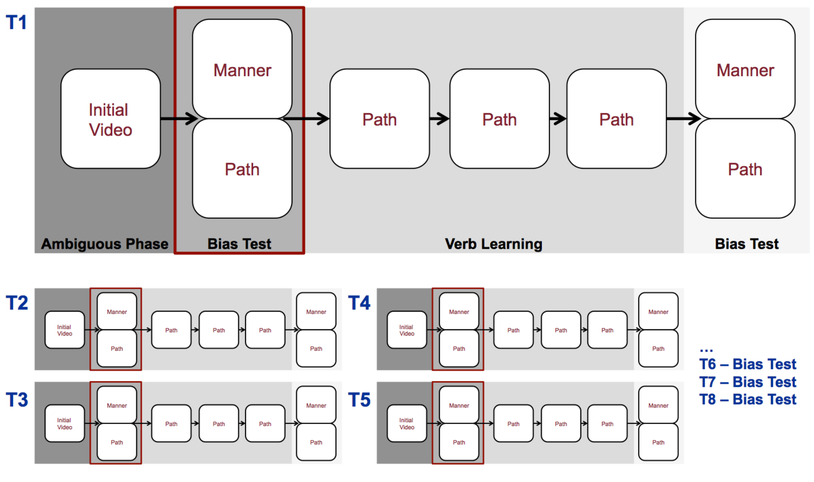
Suggests that verb semantics involves a more general representation of means vs. outcome (Levin & Rappaport Hovav 2010)**; young babies also care about this distinction in nonlinguistic contexts** (Csibra & Gergely 2007)

Do young children use 'umbrella' means/outcome representations to predict verb meaning?

Motion scene with manner (center) and path (right) meaning extensions. Adults accept *He's krading up the hill* for meanings like both 'ascend' and 'crabwalk'

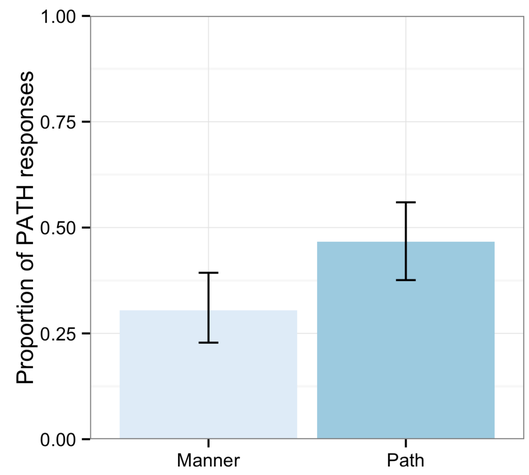
Method

4-6yo children learned 8 distinct novel verbs each in the sequence shown below (Path condition). Analysis focuses on the initial guesses for children make over the course of the training session



Experiment 1 – Manner/Path biases

After learning Manner verbs, children expected subsequent verbs (bias test, trials 2-8) to have manner extensions; after learning Path verbs they made more path guesses (n=34, replication, Shafto et al. Exp. 3 with new stimuli)



Experiment 2 – Action/Effect biases

Does training in one event domain lead to bias changes for verbs in another domain?

If early (domain-general) cognitive representations drive these biases, we should expect transfer.

If children (unlike adults) do not represent any similarities in event structure between Motion and Change-of-State domains we should see no transfer.

Paralleling Experiment 1, Experiment 2 uses Change-of-State events that can generalize along a dimension of action (center, e.g. 'combing') or effect (right, e.g. 'ripping').

References

Csibra, G., & Gergely, G. (2007). "Obsessed with goals": Functions and mechanisms of teleological interpretation of actions in humans. Acta Psychologica, 124(1), 60–78.

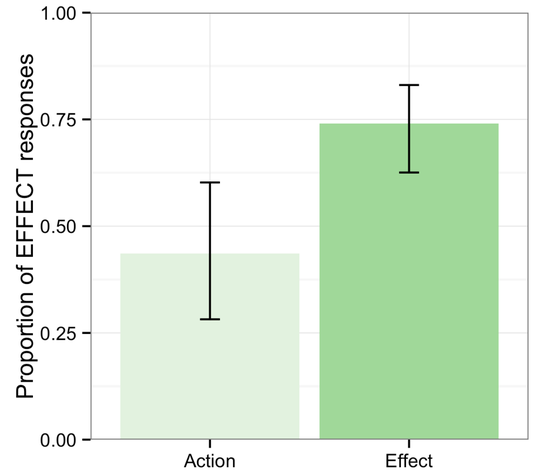
Geojo, A. (2014). Breaking and Entering: Verb Semantics and Event Structure (Doctoral dissertation). Harvard University.

Rappaport Hovav, M., & Levin, B. (2010). Reflections on manner/result complementarity. In E. Doron, M. Rappaport Hovav, & I. Sichel (Eds.), Syntax, Lexical Semantics, and Event Structure (pp. 21–38). Oxford, UK: Oxford University Press.

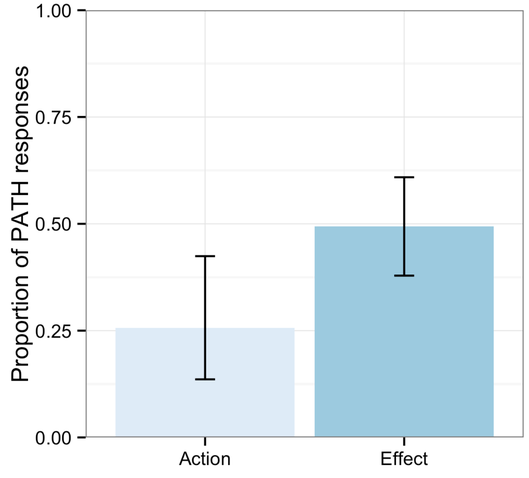
Shafto, C. L., Havasi, C., & Snedeker, J. (2014). On the plasticity of semantic generalizations: Children and adults modify their verb lexicalization biases in response to changing input. Developmental Psychology, 50(3), 794–808.

Experiment 2 – Action/Effect biases

Learning Action (manner) or effect Effect verbs altered children's verb meaning predictions in a new domain (trials 2-8). (n=15, ongoing)



- **After learning ACTION Change-of-state verbs (trials 1-8) children then guessed that novel verbs for Motion events were MANNER verbs (trials 9-16)**
- **After learning EFFECT Change-of-state verbs they were more likely to expect PATH motion verbs**



Conclusions

These findings provide initial evidence that the kinds of event representations used for verb meanings involve domain-general representations of means and outcome which may be related to early cognitive models of goal-directed action

Acknowledgments

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All project materials (Video stimuli, presentation software, anonymized data and analysis scripts are available at http://github.com/mekline/MannerPathPriming