

The effect of phonotactic regularities on infant word learning

Melanie Khu, Danit Nitka, Kyle E. Chambers*, & Kristine H. Onishi

McGill University & *Gustavus Adolphus College

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introduction

Languages display regularities in the positioning and sequencing of sounds.

treat
NOT
treat

Infants detect^{1,2} these phonotactic regularities and use them during word segmentation^{3,4} and word learning^{5,6}.

Laboratory experiments demonstrate that phonotactic regularities⁷ and other language properties^{8,9,10} can be acquired by statistical learning mechanisms.

However, these mechanisms may not be recruited for natural language learning.


To examine this issue, one can explore the extent to which the output from statistical learning is used by established language processes such as word learning¹¹.

our question

Do newly acquired phonotactic regularities influence an infant's subsequent mapping of a novel word form to a novel object?

procedure

1 *phonotactic learning phase*
hear language with consonant-position regularities

beesh tush
seesh teed
chud sum
tum cheesh

17 months

2 *word learning phase*
pair novel object with novel label

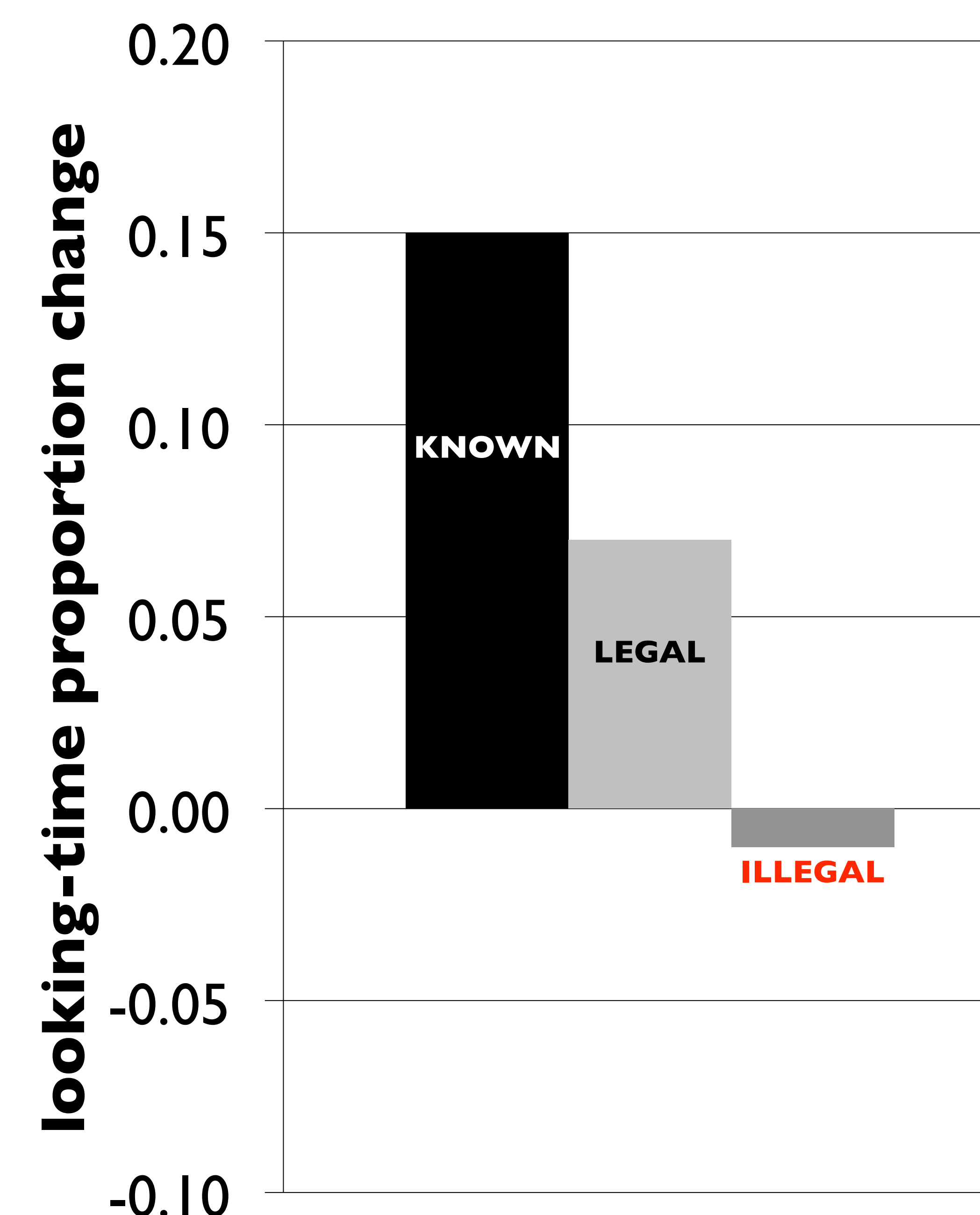


3 *preferential looking test*
ask to identify known and newly-learned objects



results

We compared infants' looking time proportion to the target object before and after hearing the target word in the preferential looking test.



For known objects and newly-learned objects with a legal-label, infants increased looking to the target object after hearing the target word.

conclusions

Phonotactic learning influences other language processes, including word recognition¹² and word learning.

Not only can infants learn novel linguistic regularities from auditory exposure but the output from this learning is used by the language processing system.

references

- Friederici, A. D., & Wessels, J. M. (1993). Phonotactic knowledge of word boundaries and its use in infant speech perception. *Perception & Psychophysics*, 54, 287-295.
- Jusczyk, P.W., Friederici, A. D., Wessels, J. M., Svenkerud, V.Y., & Jusczyk, A. M. (1993). Infants' sensitivity to the sound patterns of native language words. *Journal of Memory and Language*, 32, 402-420.
- Mattys, S. L., Jusczyk, P.W., Luce, P.A., & Morgan, J. L. (1999). Phonotactic and prosodic effects on word segmentation in infants. *Cognitive Psychology*, 38, 465-494.
- Mattys, S. L. & Jusczyk, P.W. (2001). Phonotactic cues for segmentation of fluent speech by infants. *Cognition*, 78, 91-121.
- Storkel, H. L. (2001). Learning new words: Phonotactic probability in language development. *Journal of Speech, Language, and Hearing Research*, 44, 1321-1337.
- Storkel, H. L. (2003). Learning new words II: Phonotactic probability in verb learning. *Journal of Speech, Language, and Hearing Research*, 46, 1312-1323.
- Chambers, K. E., Onishi, K. H., & Fisher, C. (2003). Infants learn phonotactic regularities from brief auditory experience. *Cognition*, 87, B69-B77.
- Saffran, J. R., Aslin, R. N., & Newport, E. L. (1996). Statistical learning by 8-month-old infants. *Science*, 274, 1926-1928.
- Gomez, R. L. & Gerken, L. (1999). Artificial grammar learning by 1-year-olds leads to specific and abstract knowledge. *Cognition*, 70, 109-135.
- Maye, J., Werker, J. F., & Gerken, L. (2002). Infant sensitivity to distributional information can affect phonetic discrimination. *Cognition*, 82, B101-B111.
- Graf Estes, K., Alibali, M.W., Evans, J.L., & Saffran, J.R. (2007). Can infants map meaning to newly segmented words? Statistical segmentation and word learning. *Psychological Science*, 18, 254-260.
- Chambers, K. E., Onishi, K. H., Wu, Y., Lomibao, J. (2007, March). Statistical learning and word recognition: Nonwords and words mingle. In K. E. Chambers & K. H. Onishi (Chairs), From artificial language learning to normal language processing. Symposium held at the Biennial Meeting of the Society for Research in Child Development, Boston, MA, US.