

Online Experiments for Language Scientists, UoB

Lecture 3: Perceptual learning

Kenny Smith

kenny.smith@ed.ac.uk

Lev-Ari (2017)

Lev-Ari, S. (2017). Talking to fewer people leads to having more malleable linguistic representations. *PLoS ONE*, 12, e0183593.

Perceptual learning experiment run on MTurk

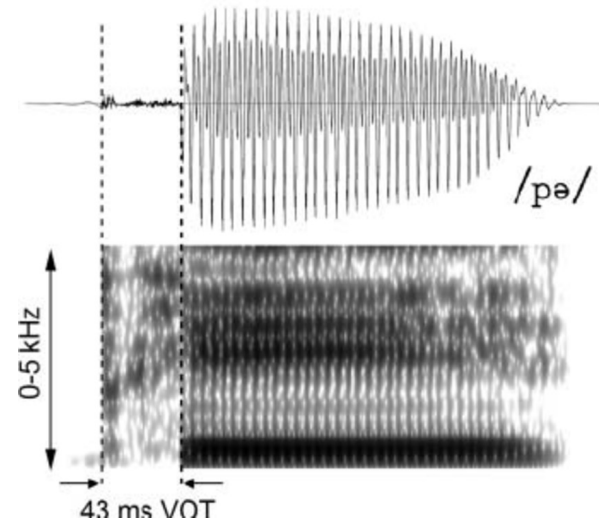
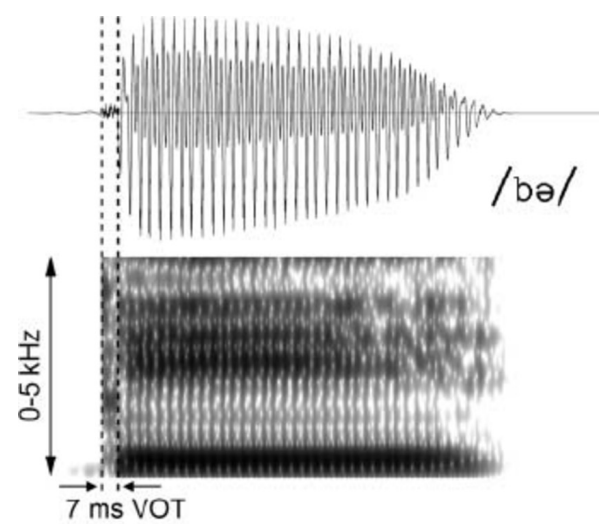
- Do people with smaller social networks have more malleable linguistic representations (as assessed through a perceptual learning experiment)?



Shiri Lev-Ari
(Royal Holloway,
University of
London)

Voice Onset Time

Image from Neef, N. et al. (2012). Reduced Speech Perceptual Acuity for Stop Consonants in Individuals Who Stutter.
Journal of Speech, Language, and Hearing Research, 55, 276-89.



Voice Onset Time and /d/-/t/



5ms



10ms



15ms



20ms



25ms



30ms



35ms



50ms



80ms

Manipulated audio presentation



Unmanipulated



Manipulated (VOT=24ms)



Unmanipulated



Manipulated (VOT=24ms)

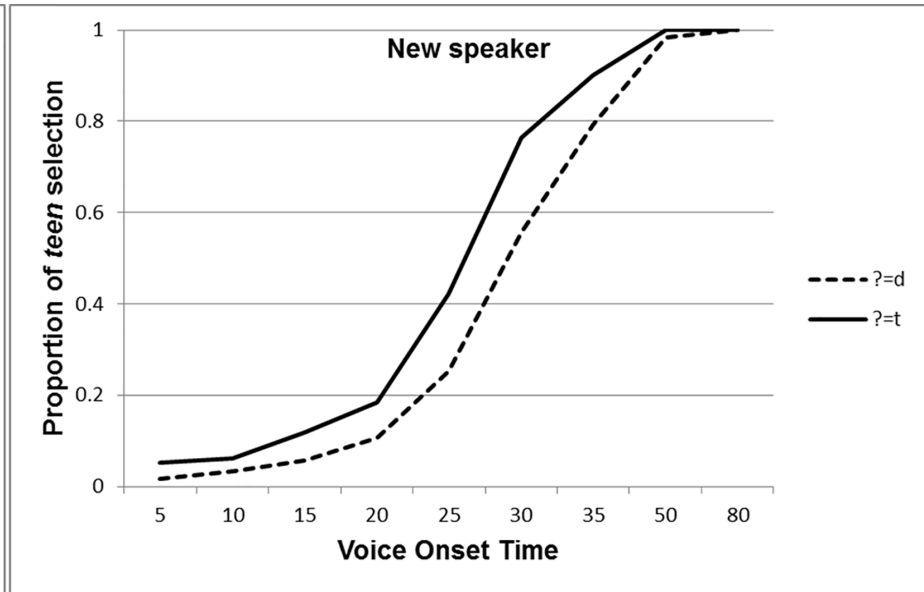
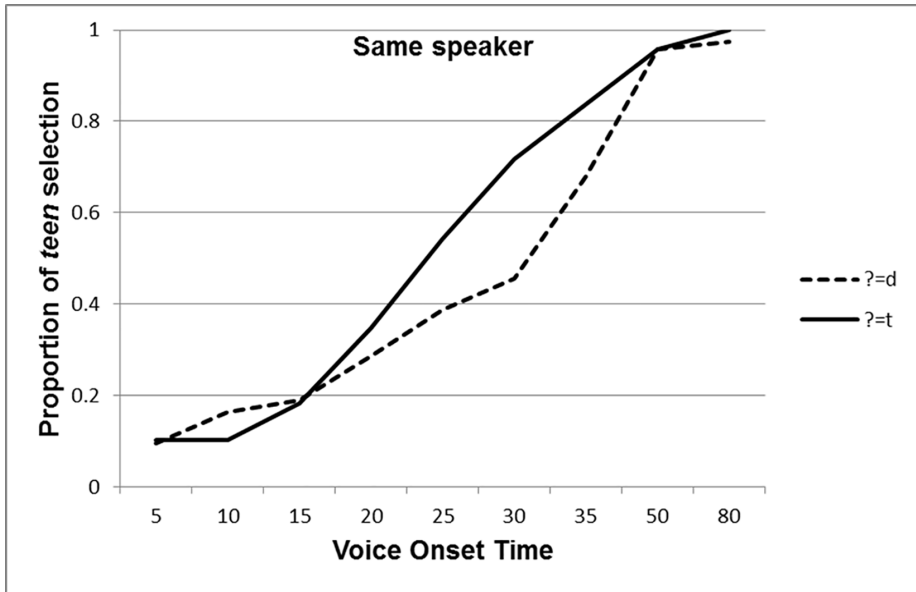


Demo using our code

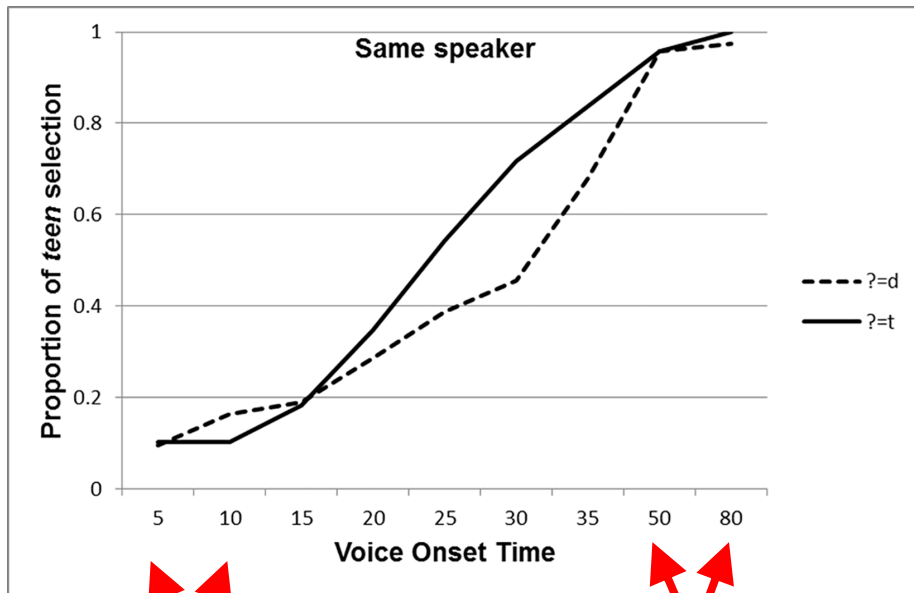
Sample size, study duration etc

- US-based MTurk workers
- N=148 after 5 exclusions (spread over 4 conditions)
- 5-15 minutes, \$1.20

Perceptual learning

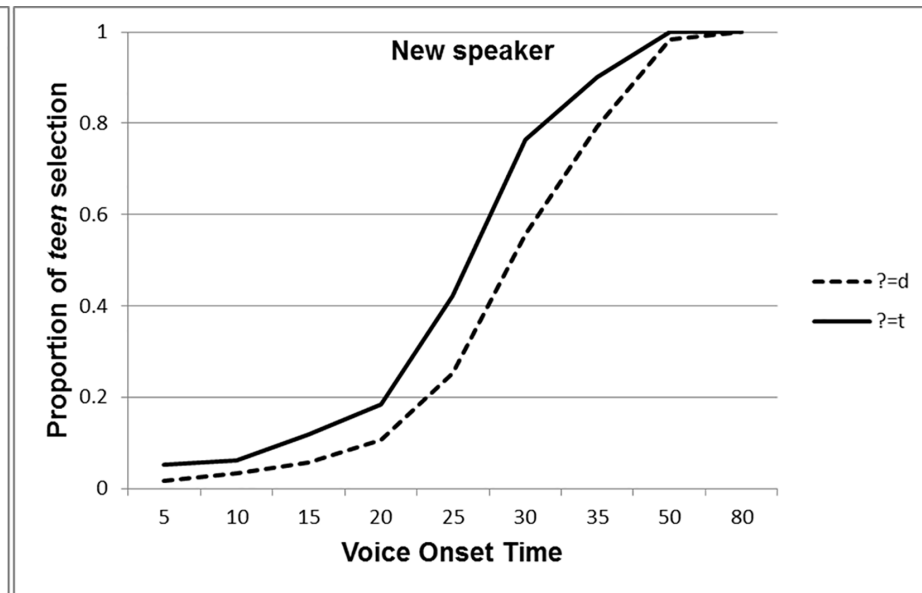


Perceptual learning



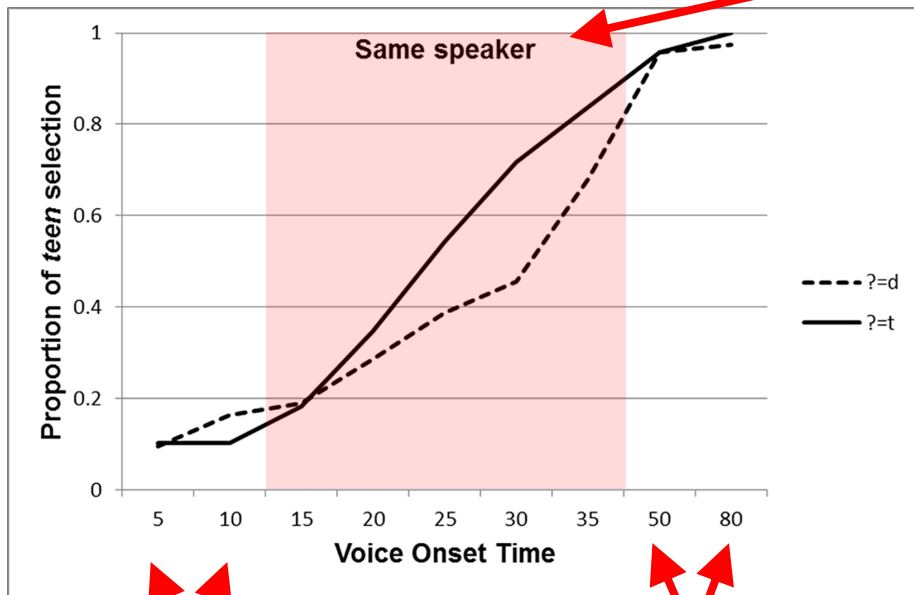
Good /d/

Good /t/



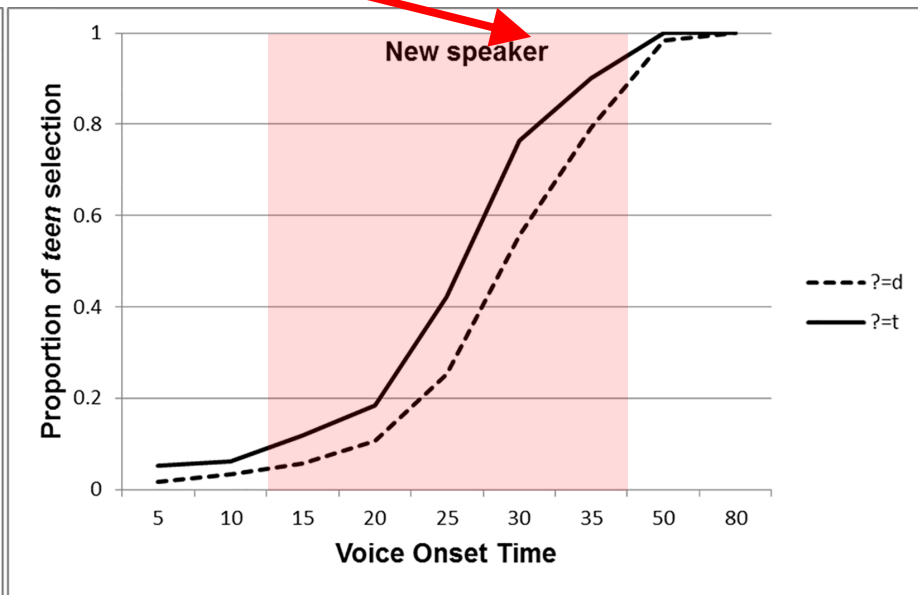
Perceptual learning

Ambiguous zone

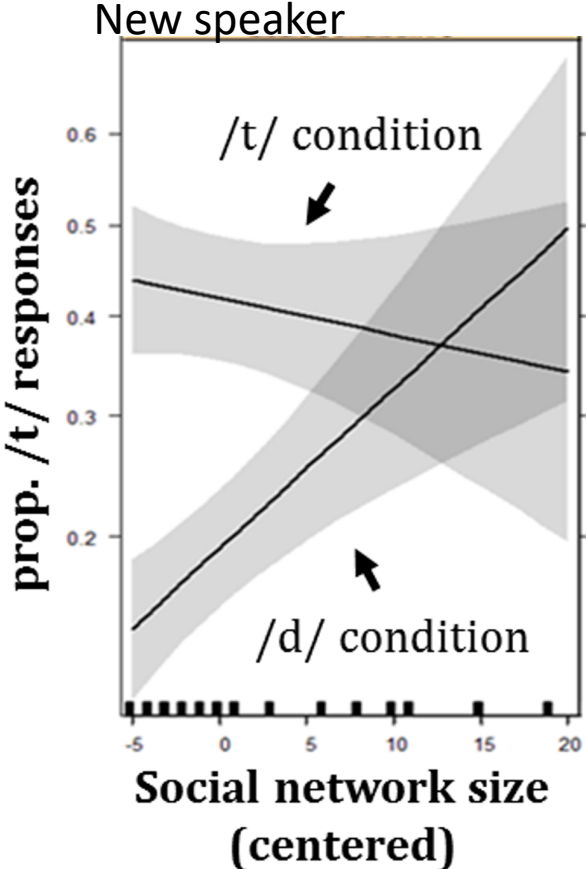
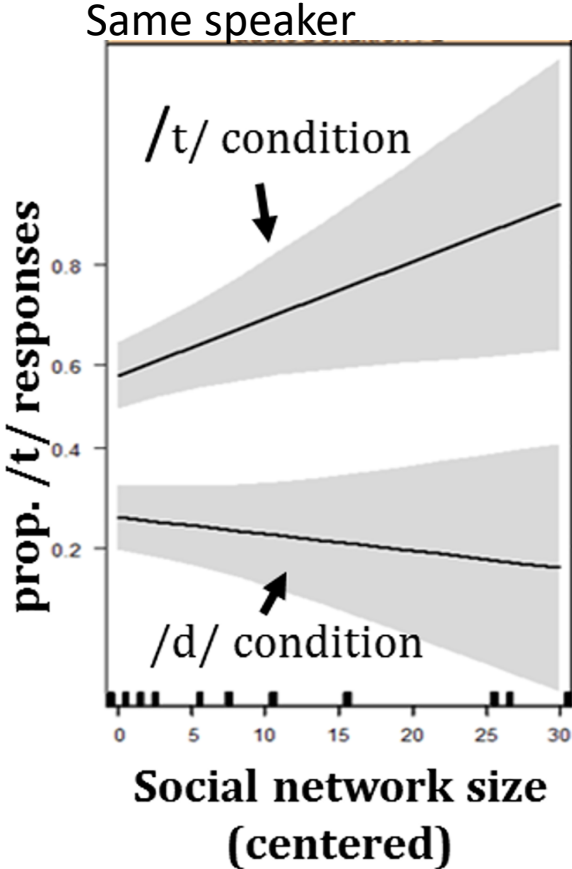


Good /d/

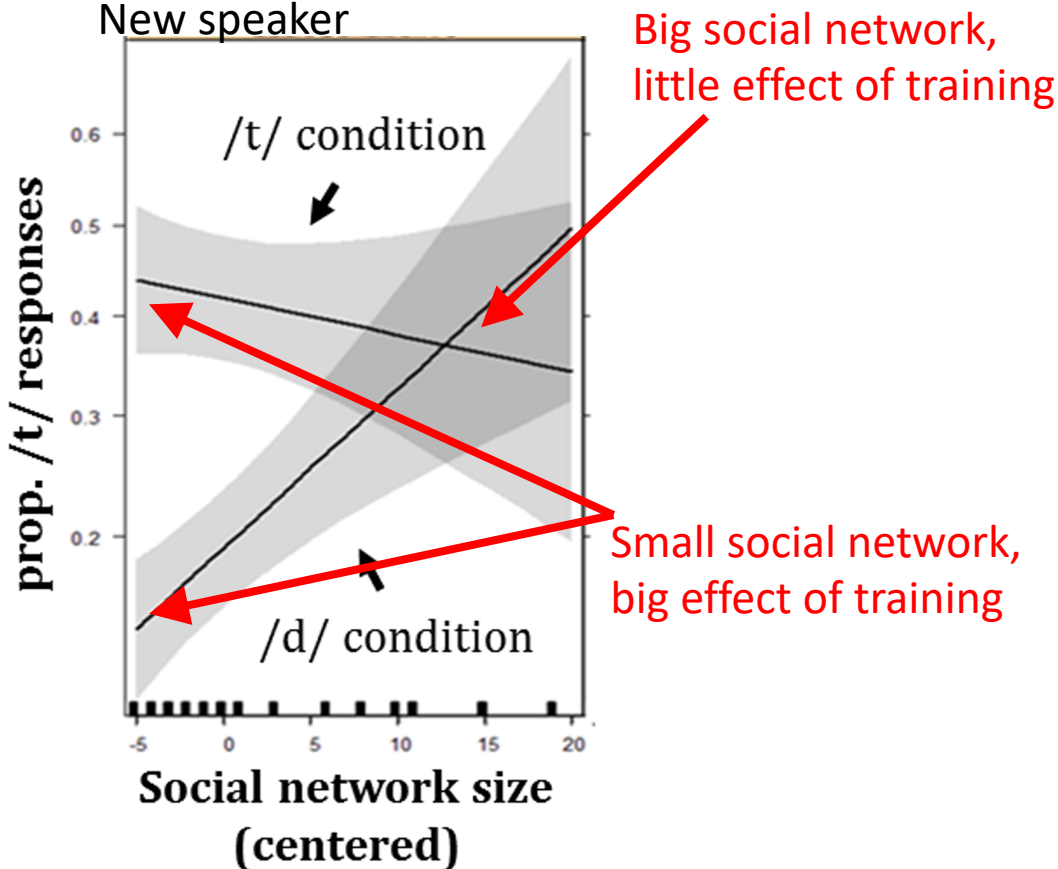
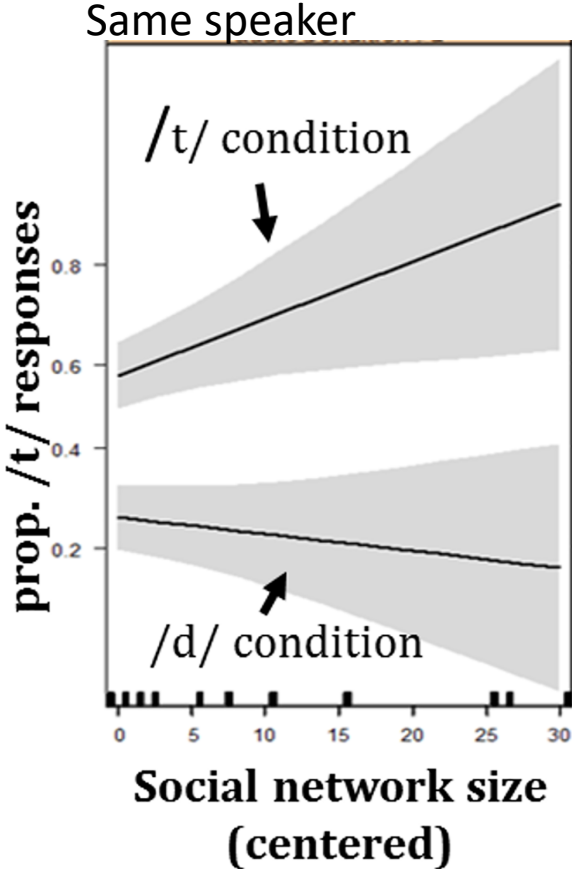
Good /t/



Social network effect on new speakers only?

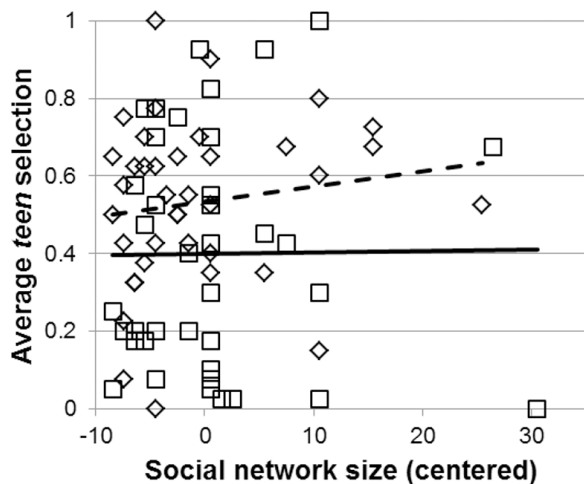


Social network effect on new speakers only?

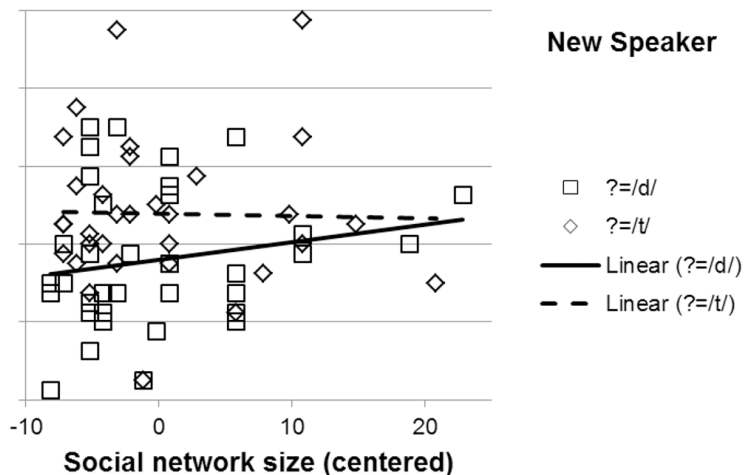


Raw data

Same speaker



New speaker



Alternative analyses

From supplementary materials

“1. Analyses that do not exclude the participants whose Social Network Size was 4 and 8 standard deviations from the mean show very different results from those reported in the paper. Comparing results with and without a particular participant or observation is in fact the test for undue influence, often called Cook’s Distance [1]. Analyses whose results depend on including a specific data point or individual are considered unreliable.

2. Analyzing the data with the untrimmed estimates of Social Network Size leads to the same pattern of results as in the analysis reported in the paper, but the triple interaction does not reach conventional level of significance ($\beta=0.13263$, $SE=0.07405$, $z=1.791$, $p=0.073$).”

Lev-Ari's conclusions

Individuals with smaller social networks have more malleable linguistic representations

- More influenced by manipulated-/d/ training
- Potential role for such individuals in propagating linguistic change?

Demo using our code