Online Experiments for Language Scientists

Lecture 6: Perceptual learning

Kenny Smith

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Lev-Ari (2017)

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

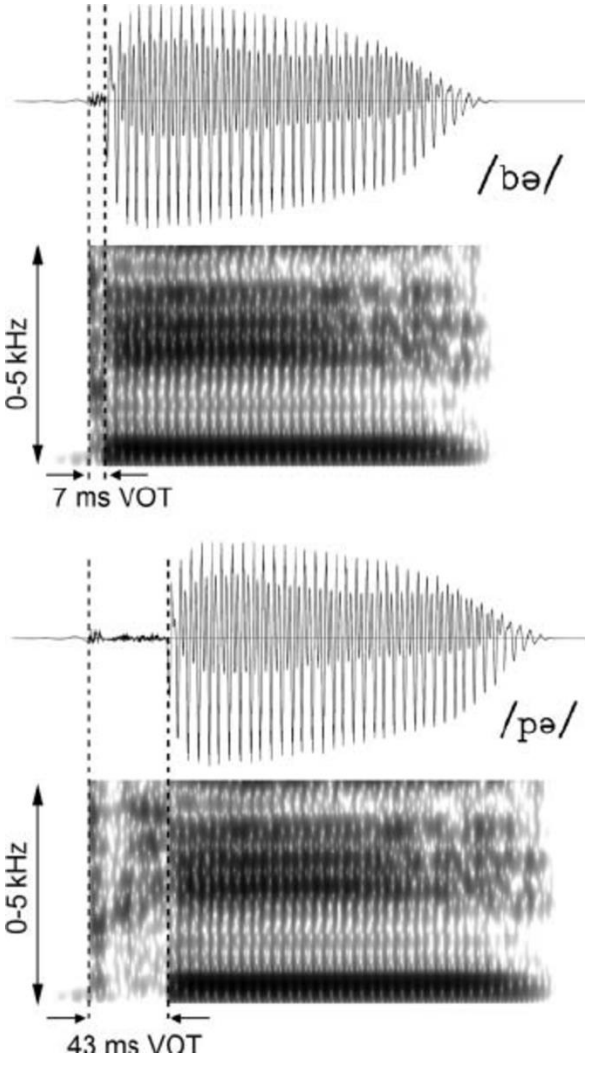
Perceptual learning experiment run on MTurk

- 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

Voice Onset Time and /d/-/t/

5ms

10ms

Voice Onset Time and /d/-/t/

5ms

10ms

15ms

Voice Onset Time and /d/-/t/

5ms

10ms

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Voice Onset Time and /d/-/t/

5ms 10ms 15ms 20ms 25ms

Voice Onset Time and /d/-/t/

5ms 10ms 15ms 20ms 25ms 30ms

Voice Onset Time and /d/-/t/

5ms 10ms 15ms 20ms 25ms 30ms 35ms

Voice Onset Time and /d/-/t/

5ms 10ms 15ms 20ms 25ms 30ms 35ms 50ms

Voice Onset Time and /d/-/t/

5ms 10ms 15ms 20ms 25ms 30ms 35ms 50ms 80ms

Manipulated audio presentation

Unmanipulated

Manipulated (VOT=24ms)

Unmanipulated

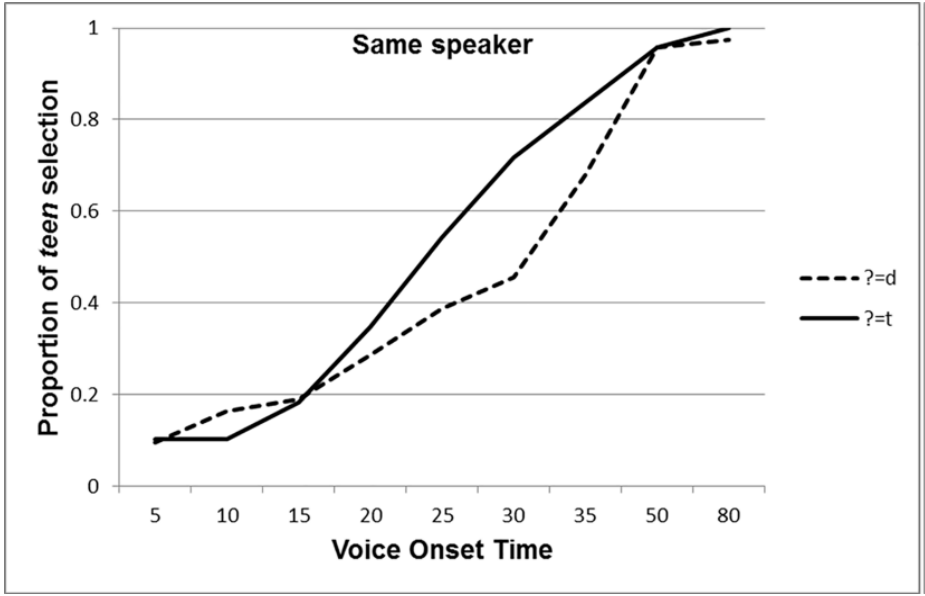
Manipulated (VOT=24ms)

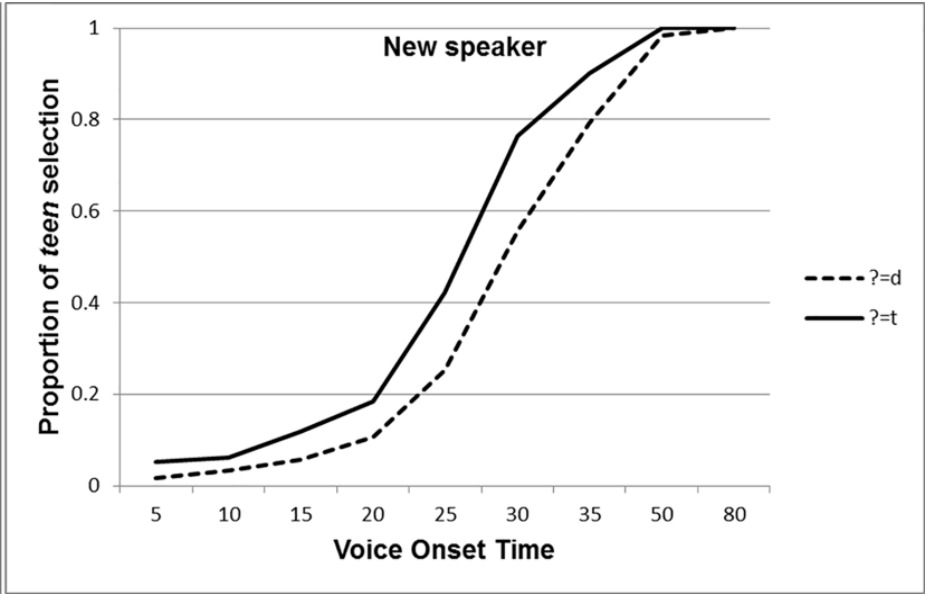
Demo using this week’s practical code

Sample size, study duration etc

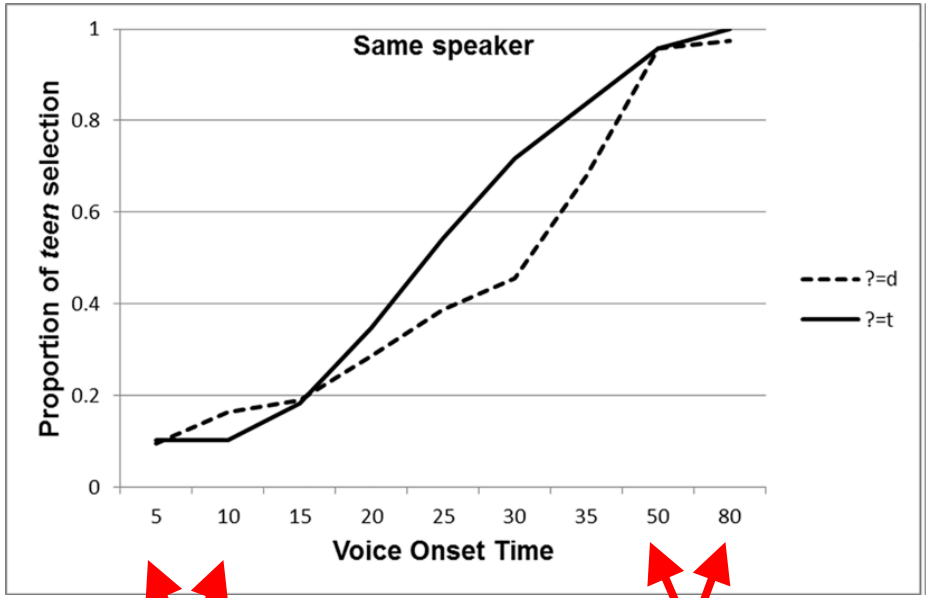
- US-based MTurk workers
- N=148 after 5 exclusions (spread over 4 conditions)
- 5-15 minutes, $1.20

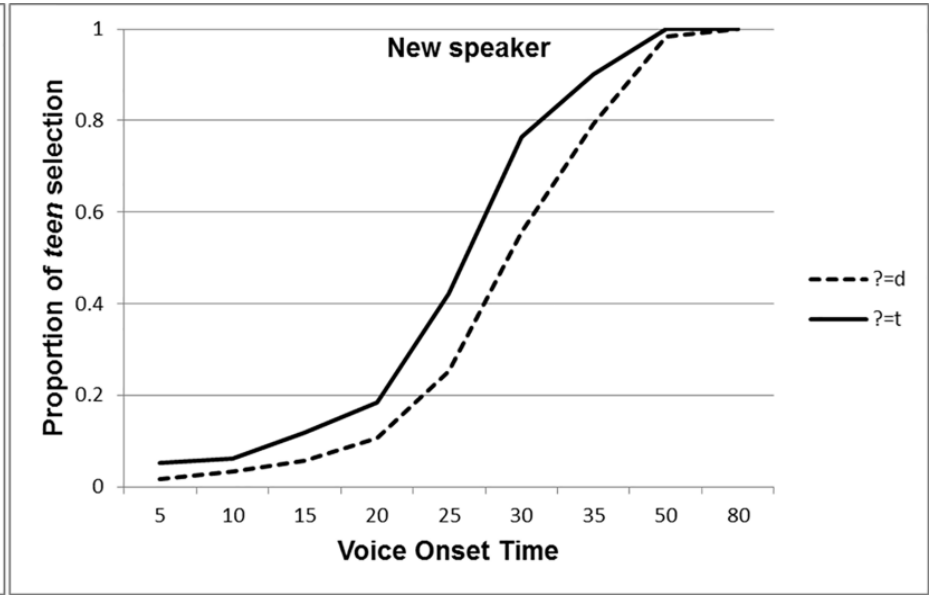
Perceptual learning





Perceptual learning



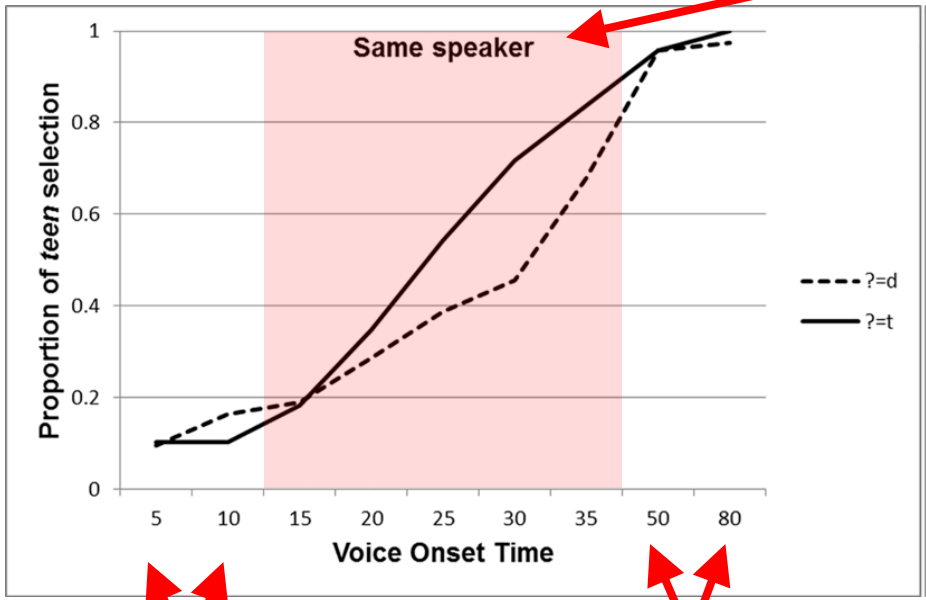


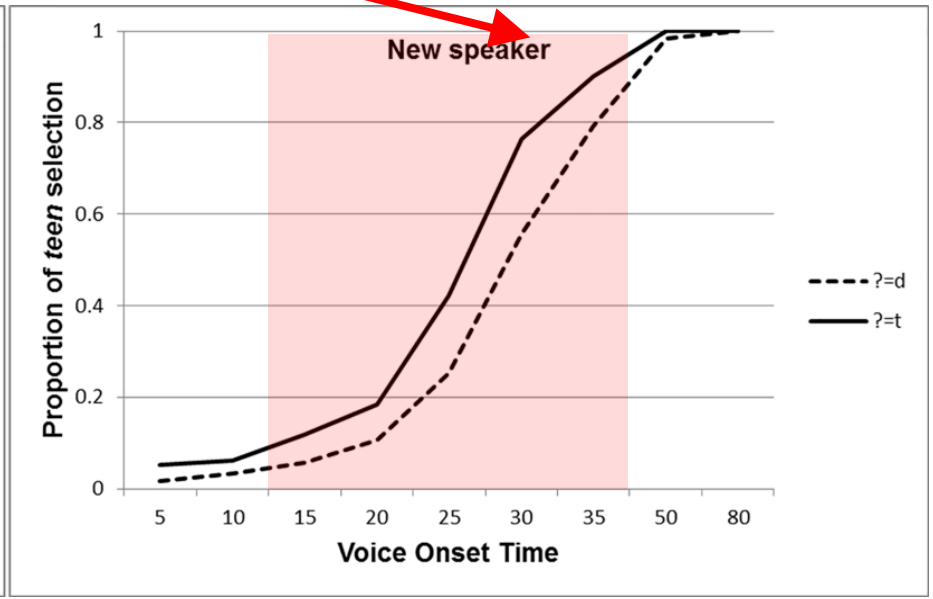
Good /d/

Good /t/

Perceptual learning

Ambiguous zone



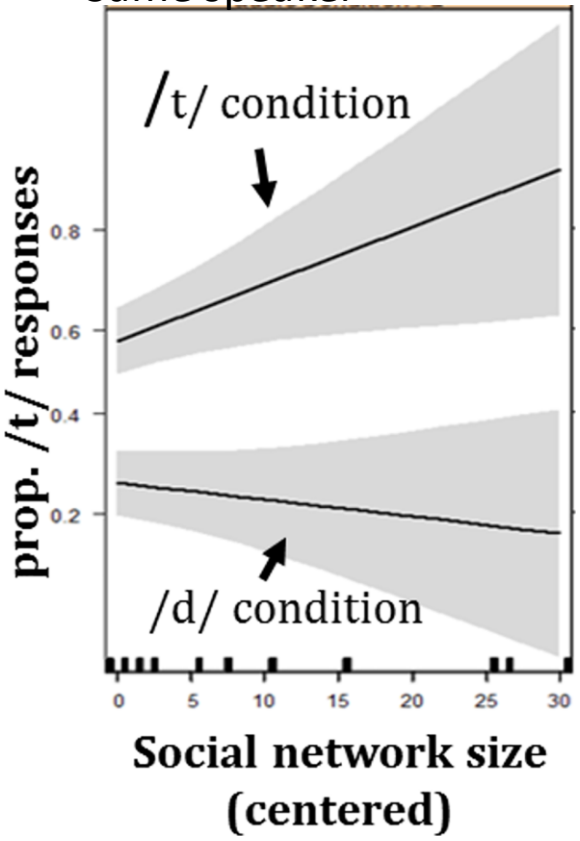


Good /d/

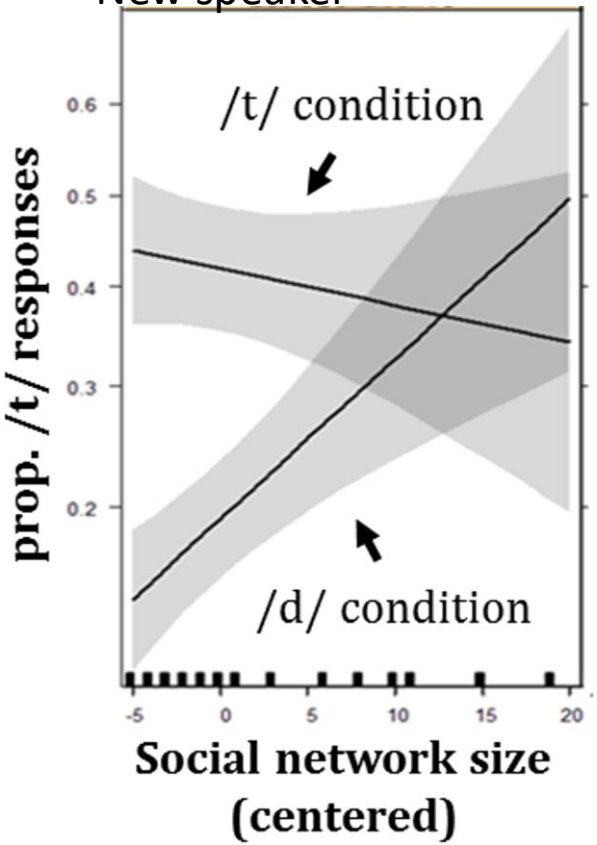
Good /t/

Social network effect on new speakers only?

Same speaker

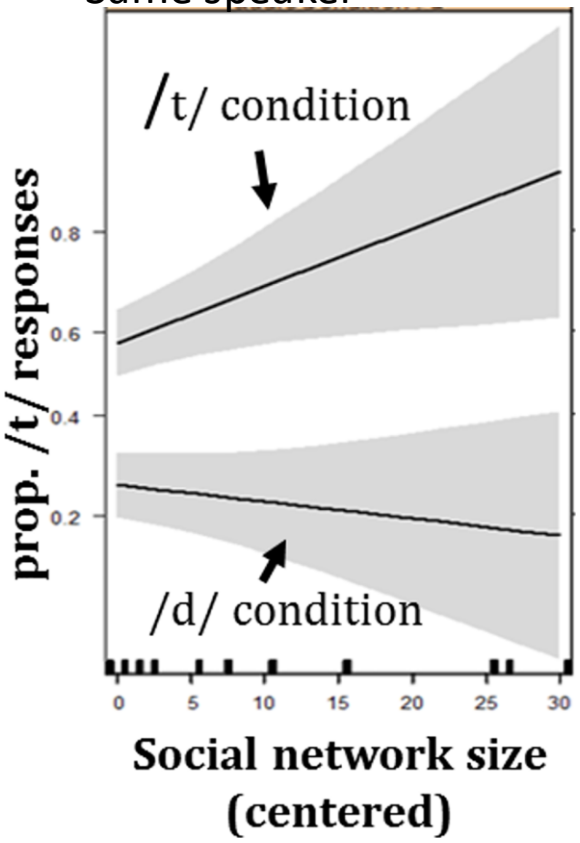


New speaker

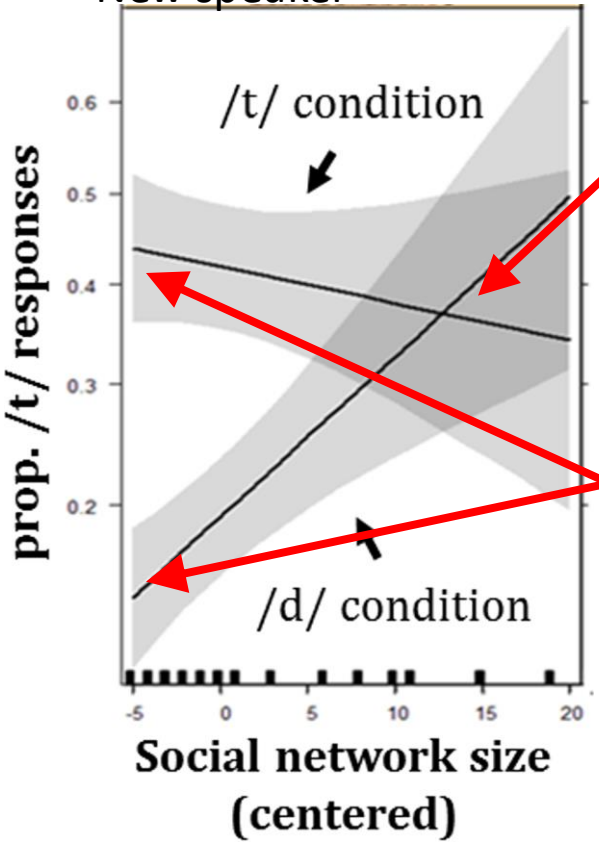


Social network effect on new speakers only?

Same speaker



New speaker

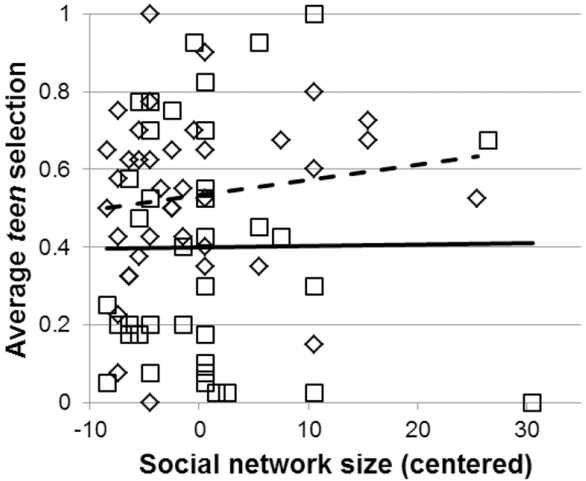


Big social network,
little effect of training

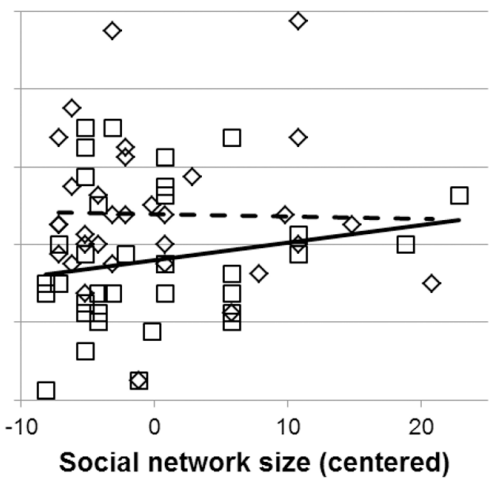
Small social network,
big effect of training

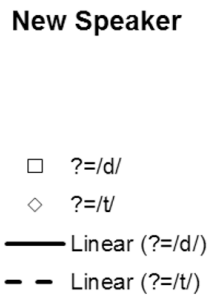
Raw data

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 (β=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?

Time for Q&A/discussion on this week’s reading

Next up

Thursday lab

- A perceptual learning experiment using Lev-Ari's audio stims (thanks Shiri!) and equivalent visual stims

Next week

- Priming and overspecification, recording participant audio