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Producing accented words without self-listening improves word memory

Background

- Production advantage in memory studies (MacLeod et al., 2010)
- Production advantage with foreign accented speech (Grohe & Weber, 2016)
- **Imitation study:** Greater production effect with English words produced by native speakers than with Dutch accented words (Cho & Feldman, 2013)

Research Questions

1. How stable is the production advantage without any acoustic differences between an auditory prompt and a participant's self-production?
2. What is the role of accent familiarity if both the familiar and unfamiliar accent deviate from the standard pronunciation?

→ Memory study, varying **training modality** (self-production *without imitation* vs. listening) and **accent familiarity** (familiar vs. unfamiliar)

Material and Procedure

Material

- 88 German compound words (56 critical words + 32 fillers)
- Critical words:

Familiar accent	Unfamiliar accent
canonical pronunciation: "st" = /st/ Zahnbür/st/e – 'tooth brush'	canonical pronunciation: "st" = /ft/ Blumen/ft/rauß
Swabian: /st/ → /ft/ Zahnbür/ft/e	Northern German: /ft/ → /st/ Blumen/st/rauß

Procedure

Study-test paradigm

1. Study phase

- Familiar accent block, unfamiliar accent block
- Half of the words are read aloud with the instructed accent by one participant, half by the other participant (alternating)



2. Memory tasks

- Old/new recognition task
- Free recall task

Experiment I: with self-listening

- 40 native speakers of German (Swabian dialect)
- 19-31 years, mean age=24.4

Results

Old/new recognition task: d-primed (Hit rates: see Figure 1)

- Greater d-prime of self-produced words than listened-to words ($\chi^2=23.3$; $p<.001$)
- Greater d-prime of familiar accent than unfamiliar accent ($\chi^2=4.1$; $p=.04$)
- No interaction

Free recall

- Self-produced better recalled than listened-to words ($\chi^2=11.0$; $p<.001$)

Experiment II: no self-listening

white noise over headphones during self-production

- 40 native speakers of German (Swabian dialect)
- 19-30 years, mean age=24.2

Results

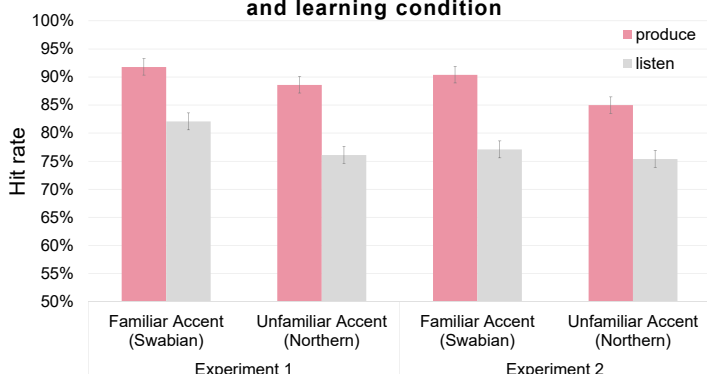
Old/new recognition task: d-primed (Hit rates: see Figure 1)

- Greater d-prime of self-produced words than listened-to words ($\chi^2=17.7$; $p<.001$)
- Tendency for greater d-prime of familiar accent than unfamiliar accent ($\chi^2=2.3$; $p=.1$)
- No interaction

Free recall

- Self-produced better recalled than listened-to words ($\chi^2=20.6$; $p<.001$)

Figure 1. Hit rates by accent and learning condition



Conclusions

- Self-production alone (even without self-listening) improves word memory
- Accent familiarity improves word memory
- Stable accent learning with production when there is no acoustic prompt to imitate (and no risk of acoustic differences between prompt and self-productions)

References

- Cho, K. W., & Feldman, L. B. (2013). Production and accent affect memory. *The Mental Lexicon*, 8(3), 295–319.
- Grohe, A.-K., & Weber, A. (2016). Learning to comprehend foreign-accented speech by means of production and listening training. *Language Learning*.
- MacLeod, C. M., Gopie, N., Hourihan, K. L., Neary, K. R., & Ozubko, J. D. (2010). The production effect: delineation of a phenomenon. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36(3), 671.