How dialectal variability affects early word form recognition – Testing mono- and bi-varietal children via an app

Lotta Kiefer, Katharina Zahner-Ritter, Katharina Hölzl, Sarah Warchhold, Bettina Braun

Background & Objective

Word form recognition

- While infants start recognizing familiar words within their first year of life, words with an unfamiliar (regional or foreign) accent are only recognized towards their second year of life [1-3]
- The ability to recognize words despite speaker-specific influences such as dialectal variation increases with age, suggesting that children's lexical representations become more flexible and less specific [4]

Influences of a bi-varietal input

- Bi-varietal input might lead to more flexible lexical representations [5]
- Braun et al. compared looking times towards Standard German words vs. non-words in 12–18-month-old mono-varietal vs. bi-varietal German children [6]
  - Familiarity preference in mono-varietal vs. novelty preference in bi-varietal children
  - Novelty preference also for older (18–24 months) mono-varietal group
    - → More mature linguistic processing in bi-varietal children?

Overall research question

Does bi-varietal input influence the flexibility of lexical representations in children?

Specific research question

Is there a difference in word form recognition and respective looking patterns for dialectal (Swabian) words vs. non-words between mono- and bi-varietal children?

Hypotheses

Bi-varietal children show novelty preference

Mono-varietal children show no preference, word form recognition for dialectal words increases with age

Methods

Participants

- So far 17 children, 12–24 months old
- Bi-varietal group: n = 5 (ø age 17.0 months, 3 f, 2 m)
- Mono-varietal group: n = 12 (ø age 16.8 months, 7 f, 5 m)

Procedure

- Familiar Word Paradigm
- Via free iPad app (see QR-Code)
- → Data collection from home
- Total of 8 trials (4 word lists, 4 non-word lists, **Figure 1**(c))

Dialect classification

- Perception of parental dialect strength on 4-point Likert scale by independent raters via speech sample (see **Figure 1**(a))
- Dialectal self-assessment questionnaire

Materials

- Stimuli: 18 Swabian (southwestern German dialect) words, each paired with a non-word
- 8 experimental lists consisting of 12 words, 8 experimental lists consisting of 12 non-words (example in **Table 1**)

Figure 1. Experimental steps in the app, including (a) the production phase, (b) the calibration phase, and (c) two example trials separated by an attention getter.

Visit our app

Word	IPA (Standard)	IPA (Swabian)
Fuß “foot”	[fuːs]	[fʊəs]
Non-Word	**IPA (Standard)**	**IPA (Swabian)**
stuch	[ʃtuːx]	[ʃtʊəx]

Table 1. Example of a Swabian word and non-word.

Analysis & Results

- Significant effect of age: Children >18mo show larger difference in looking times than children ≤18mo **for dialectal stimuli**
- **Bi-varietal children:** No effect of word type on looking times
- **Mono-varietal children:** Significant familiarity preference

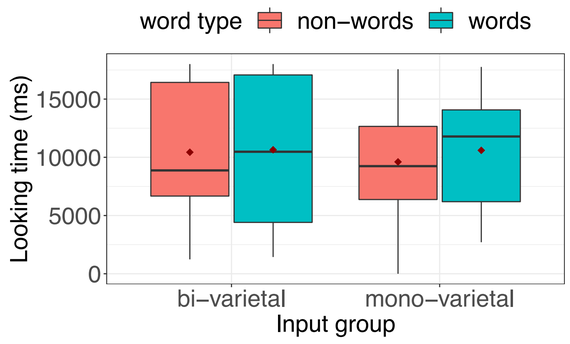

Figure 2. Looking times by condition for dialectal stimuli.

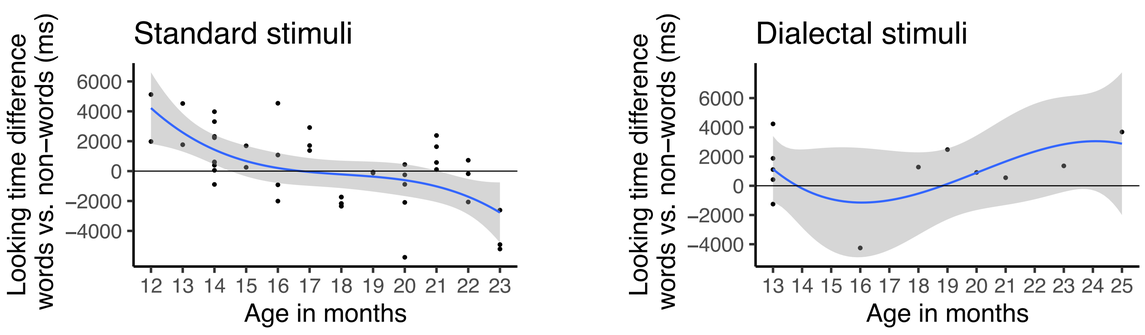

Figure 3. Relationship between looking time difference to words and non-words and age for standard stimuli from [6] (left) and dialectal stimuli in this study (right) in mono-varietal children. Positive values indicate familiarity preference.

Discussion

Bi-varietal children show no evidence for novelty or familiarity preference, but small number of participants

Mono-varietal children show familiarity preference

- might be familiar with dialectal words through environment
- representations might be robust enough to withstand variation
- lexical representations seem to change with increasing age, leading to better recognition of dialectal word forms

Remote testing enables recruitment of participants in rural areas (especially important for bi-varietal group), but difficult to control for interfering factors (e.g., background noise)

Future directions

- Testing more children in the same setting via app
- Replication with stimuli of unknown variety and further experimental methods (e.g., intermodal preferential looking) to gain insights into potential characteristics of lexical representations in bi-varietal children:
  - single storage, double storage, underspecification

References

[1] **Best**, C. T., Tyler, M. D., Gooding, T. N., Orlando, C. B., and Quann, C. A., "Development of phonological constancy: Toddlers' perception of native- and Jamaican-accented words," Psychological Science, vol. 20, pp. 539-542, 2009. [2] **van Heugten**, M. and Johnson, E. K., "Learning to contend with accents in infancy: Benefits of brief speaker exposure," Journal of Experimental Psychology, vol. 143, pp. 340-350, 2014. [3] **van Heugten**, M., Paquette-Smith, M., Krieger, D. R., and Johnson, E. K., "Infants' recognition of foreign-accented words: Flexible yet precise signal-to- word mapping strategies," Journal of Memory and Language, pp. 51-60, 2018. [4] **Schmale**, R., Cristià, A., Seidl A. and Johnson E.K., “Developmental Changes in Infants’ Ability to Cope with Dialect Variation in Word Recognition,” Infancy, vol. 15, pp. 650–662, 2010. [5] **van der Feest**, S. V. H. and Johnson, E. K., "Input-driven differences in toddlers' perception of a disappearing phonological contrast," Language Acquisition, vol. 23, pp. 89-89, 2016. [6] **Braun**, B., Czeke, N., Rimpler, J., Zinn, C., Probst, J., Goldlücke, B., et al., "Remote testing of the familiar word effect with non-dialectal and dialectal German-learning 1–2-year-olds," Frontiers in Psychology, vol. 12, 2021. 714363.

Corresponding author: bettina.braun@uni-konstanz.de