

Do faces speak volumes? A methodological perspective on social biases in speech comprehension and evaluation across three age groups

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An unresolved issue in social perception concerns the effect of perceived ethnicity on speech processing. Bias-based accounts assume that listeners activate stereotypes in the case of a talker classification as nonnative (Rubin, 1992; Kang & Rubin, 2009), resulting in conscious misunderstanding and negative evaluation of speech. In contrast, expectation/exemplar-based accounts suggest that correct anticipation of a talker's accent facilitates processing (Babel & Russell, 2015; McGowan, 2015). Driven by theoretical and methodological differences in previous research, this study seeks to establish the extent to which effects of perceived ethnicity on speech processing depend on three sources of variability: experimental method, speech context, and age group. Life-long experiences with certain speakers and their language use shapes the distributional knowledge and can contribute to differences across age group. To this end, sentence recall (assessing speech intelligibility) and accent ratings from three white European non-university populations (72 teens, mean age 14.1; 50 younger adults, mean age 36; 50 older adults, mean age 77.6; all native speakers of German) were examined. Participants were primed with photographs of young Asian and white European women and asked to repeat utterances spoken in standard German, Korean-accented German, and a regional German variety, all embedded in speech-shaped noise. Each ethnicity was presented across all three levels of the accent factor (i.e. there were three photographs for each ethnicity). After the recall task, participants were asked to provide accent ratings for each speaker on a scale from 1-5 (5 = strong accent). A linear mixed effect logistic regression model for binary responses was fitted to the recall data, and a cumulative link mixed model was used for the accent ratings. Sentence recall accuracy increased in the foreign-accented speech for the Asian prime compared to the white European prime, in line with expectation/exemplar-based accounts. However, this matching expectation effect varied during the course of the experiment across the accents and groups (first vs. second half, see Figure 1) and was most pronounced in the group of teens in the foreign accent. In contrast, speech presented along Asian primes received the most negative accent ratings (see Figure 2) irrespective of the speech context, consistent with a bias-based view. The effect was stronger in the group of older adults than in the other groups. Younger adults showed weak or no effects of ethnicity in either task. Taken together, both methods show in part successful integration of social information, but the conclusions diverge. A disconnect between linguistic measures and a non-equivalence of sentence recall and indexical judgments like accent ratings became apparent. Clearly, they seem not to tap into the same underlying construct. The malleability of ethnicity effects shows the importance of a substantial scrutiny of the methodological disparities used by theoretical accounts. While the present findings show that each theory has its share, they also suggest that theoretical contradictions are a consequence of methodological choices that tap into distinct aspects of social information processing. Importantly, predictive abilities and strategies vary across the age groups, underlining the importance of the inclusion of underrepresented populations in future research.

References

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Figure 1: Proportion of correctly repeated words in each speech context and listener group, for the first and second half of the experiment. Black dots represent the overall means and the colored dots show the individual participant means. The violin plots depict probability density. Error bars represent 95% confidence intervals.

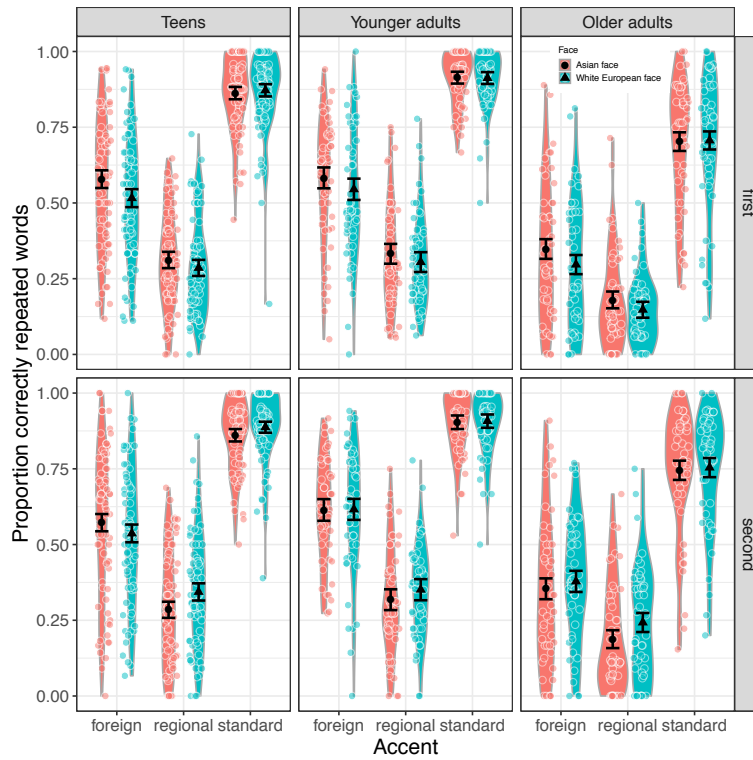


Figure 2: Estimated marginal means for ratings based on the clmm model. Error bars represent 95% confidence intervals.

