Nobody understands me but me: L2 speakers are idiosyncratically tuned to their own productions
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Many researchers implicitly assume that speech production and perception are tightly coupled, that is, that speakers produce sound patterns that reflect their mental representations of those patterns. Further, exemplar accounts imply that speakers may learn their own production patterns across repeated hearings. These assumptions predict that a given speaker will understand their own speech better than anyone else will. A different possibility is that production, while guided by perception, lags behind, predicting that speakers will not understand their own speech as well as they understand a more-skilled speaker. Prior research finds relationships between L1 speakers' productions and perceptual categorization (e.g. Beddor et al., 2018; Newman, 2003; Perkell et al., 2004). Surprisingly, though, neither prediction about *self*-comprehension has been tested. Here we test second-language (L2) speakers' recognition of self-produced words.

  Method. In the *naming phase*, participants named a series of 32 pictures (16 minimal pairs). A native speaker also named the pictures, with the L2 speaker present to control for token familiarity. Recordings were quickly edited. Then, in the *recognition phase*, each trial presented a recording (e.g., themselves saying "code") and four pictures (code, coat, ship, shape). Each set contained a minimal-pair word selected to be challenging to native Mandarin speakers (e.g. code vs. coat). Accuracy (Figures 1-2) and eye movements were measured. The recognition phase occurred in two blocks, one with all L2 recordings, the other with all L1 recordings. Order of speaker recorded and order of speaker heard were counterbalanced across participants.

  In **Experiment 1,** second-language speakers of English (L1 Mandarin; *n*=45/48) attempted to recognize their own productions, as well as those of a previously-unfamiliar native English speaker. They were roughly as accurate at recognizing their own speech (89%) as they were at recognizing a native speaker (90%, *p*=.36). In **Experiment 2** a new set of native English listeners (*n*=32/48, in progress) heard the original recordings of L2 and native speakers from Experiment 1. They were both more accurate on native speech (98%) and *less* accurate on L2 speech (81%) than participants in Experiment 1 (*p*<.0001). This finding is consistent with Experiment 1 speakers exhibiting accent features unfamiliar to L1 listeners.

  Findings indicate a **self-advantage**: you understand yourself better than someone else understands you. This is expected if perception and production are tightly coupled, as well as on an exemplar-based account where speakers learn their own productions. Still, since findings might reflect a more general advantage for a particular interlanguage (e.g. Bent & Bradlow, 2003), we contrasted the *interlanguage hypothesis* with the *self-specialization hypothesis* in **Experiment 3.** A new set of Mandarin listeners heard the recordings of Experiment 1 talker pairs (*n*=28/48). These new L2 listeners show weaker comprehension of earlier-recorded L2 speakers than those speakers showed for themselves (*p*=.001). This is more consistent with the *self-specialization hypothesis* and less consistent with the *interlanguage hypothesis*. Ongoing work should control for token familiarity by testing speakers who have both heard each other.

  While speakers comprehend themselves well, they still undershoot perfect accuracy. Exploration of error patterns (Figure 2) show **systematic perceptual biases when hearing one's own speech**: L2 speakers in Experiment 1 tended to hear themselves as devoicing coda consonants (e.g. hearing "co<u>d</u>e" as voiceless *coat* more than hearing "coat" as co<u>d</u>e; *p*=.001).

  Findings add nuance to accounts of L2 learning and accent adaptation in that L2 speakers with the same L1 show idiosyncratic consistencies. Findings of production lag challenge L2 speech production accounts that assume tight production-perception coupling.

References

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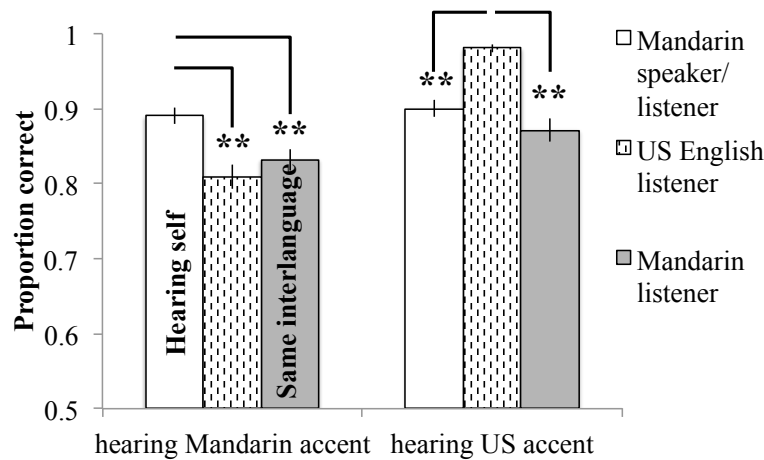
Figure 1. Overall accuracy in recognizing Mandarin-accented vs. US-accented English words. L2 speakers in Experiment 1 were more accurate at recognizing their own productions than listeners in Experiment 2 (native English) and Experiment 3 (native Mandarin) were at recognizing their productions. ** *p*<.005
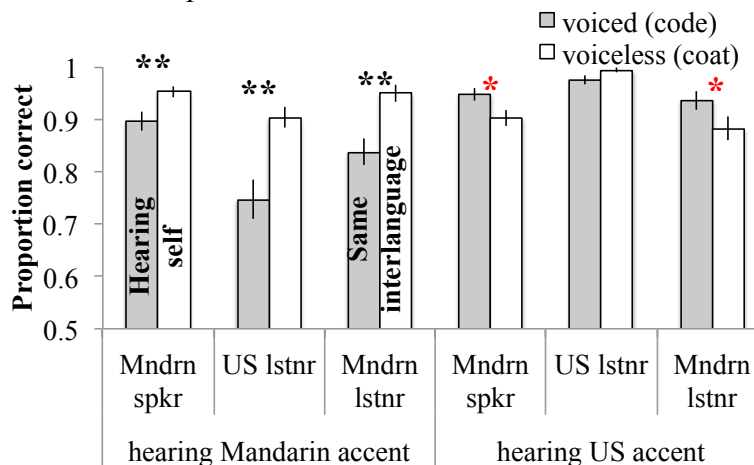

Figure 2. Perceived devoicing: despite good self-comprehension, L2 speakers in Experiment 1 still tended to hear their own productions of voiced codas as being voiceless, more than the opposite error (hearing voiceless codas as voiced).** *p*<.005, * *p*<.05 in opposite direction