How categorical is perceptual assimilation in L2? Discrimination and identification along continua in 1-to-1 and 1-to-2 mappings

Fernanda Barrientos

Perception of vowels by L2 speakers with a smaller L1 inventory

- Perceptual Assimilation Model (PAM):
  - Naive L2 speakers will perceptually assimilate L2 categories to L1 categories, mapping two L2 sounds into either two (1-to-1) or one different perceptual categories (2-to-1).
  - Two-category assimilation (TC type): two non-native segments fall into two different L1 categories (1-to-1).

- Speech Learning Model (SLM):
  - L2 speakers may create new phonetic categories along their lifespan.

- Native Language Magnet:
  - Native speech categories warp the perceptual space.

Experimental approaches for perceptual category testing

- Categorical Perception (CP): A labelling task along a continuum between two perceptual categories should predict discrimination between adjacent tokens of that continuum (spike in discrimination at label changing point).
- CP is better attested when creating continua between stop consonants (with manipulated VOT) than with vowels.

Research questions

- Does CP occur in continua built between two vowel categories, both in native and nonnative speakers who have fewer vowel categories?
- Will the different types of perceptual assimilation in L2 speakers affect CP results?
- Can nonnative speakers learn CP after exposure to the language?

Methodology

- Subjects:
  - 7 native speakers of American English (NS)
  - 9 native speakers of Spanish with advanced knowledge of English and time spent living abroad in the United States (NNS-A)
  - 7 native speakers of Spanish with low/intermediate knowledge of English and no living abroad experience (NNS-B)

- Stimuli:
  - Tokens of 5-step acoustic continua (F1 and F2 orthogonal manipulation of real vowels with Prat 1 /a/ /a/ (SC type), /a/ /a/ (TC type) and /a/ /a/ (TC type). Endpoint values taken from recordings of a native speaker of American English (CVC words in carrier sentence).

Results 1: L2 labelling

- Different types of perceptual assimilation do not affect discrimination; however, labelling patterns are clearly different between NS and NNS.

Results 2: 1-step and 2-step discrimination

- Both 1-step and 2-step discrimination showed similar responses among groups, with the exception of /a/ /a/ continuum: the 2-step task triggered a peak only in NS. The 1-step task did not yield any above-chance results in any of the groups.

- /a/ /a/ continuum shows ceiling effect for all groups in the 2-step task. The 1-step task showed perfect CP-like discrimination in all groups, with a sensitivity peak in the boundary zone between tokens 3 and 4.

Results 3: L1 labelling

- NNS-B and NNS-A show very similar labelling patterns. All cases show a clear mapping of /a/ onto /a/ and /a/ is mapped mostly onto /a/ but also /a/.
- However, NNS-A showed a different pattern in the /a/ /a/ continuum, with a slight preference for an /a/ mapping of /a/. Nevertheless, this preference is not enough to support a remapping hypothesis (where /a/ is mapped onto the second closed native category in the perceptual space /a/).

Conclusions

- CP does not occur in vowel continua neither in NS nor NNS, as discrimination results seem to be bound to phonetic and not phonological factors. Labelling itself is a better method for assessing the presence of phoneme-like perceptual categories.
- Different types of perceptual assimilation do not affect discrimination; however, labelling patterns are clearly different between NS and NNS.
- Similar perceptual patterns in L2 labelling show that NNS-A do not learn native-like perception, and do not create L2 categories when perception is affected by SC type of perceptual assimilation.
- Discrimination among adjacent tokens of a vowel continuum trigger similar responses in all groups, regardless of their experience in the language. However, it is enhanced when Euclidian distance between categories is short and perceptual categories are already present (i.e. in NS).
- Labelling does not seem to have any relation with discrimination: while labelling patterns were different along a given continuum by group, discrimination results were in most cases exactly the same. Euclidian distances are better predictors of discrimination, but it has no effect in labelling.

References


http://bist.ly/fernandab
fernanda.barrientos@unimanchester.ac.uk