Whose sound changes do we follow?
Selective attention to ingroups as a mechanism for sound change

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Workshop on Sound Change in Interacting Human Systems
In this talk we propose a socially selective attention mechanism which is operative in speech perception and processing.

The proposed mechanism clearly addresses the DIFFUSION and SPREAD of a change, but also speaks to EVALUATION and ACTUATION problems (Weinreich et al., 1968).
Face perceivers have an own-group bias: They are better at remembering faces from their own ingroups (Young et al., 2012; Van Bavel & Cunningham, 2012).

- This has been shown using a minimal group paradigm (Tajfel et al., 1971).

We propose that a similar effect is operative in speech perception.
Our proposal

Sound changes spread faster through ingroups because listeners attend more to phonetic detail in own-group voices.

- This complements our existing knowledge that not all input exerts an equal influence.
  - e.g., cross-linguistic variation in perceptual cue weighting (Francis & Nusbaum, 2002; Iverson et al., 2003).
As a simple first test of this hypothesis we test the effects of group membership on voice memory.
Forty voices (20 female) producing 15 single monosyllabic words.

All speakers were native speakers of North American English.

Twenty voices of equal gender distribution were assigned to each personality color (RED, GREEN).
Procedure

1. Group membership assignment
2. Bracelets
3. Typing words
4. Surprise voice memory test
1. Group Membership Assignment

We closely follow Bernstein et al. (2007) in this aspect of the design.

- Participants completed an abbreviated version of the Big 5 Personality test (John & Srivastava, 1999).
- Participants were assigned to either a RED or GREEN personality type.
- All participants received the same personality description.
  - We provide this at the end for those who are interested.
2. Bracelets

- Each participant reported their personality color to the experimenter.
- To foster in-group feelings, she said she was also that personality color.
- The experimenter then provided the participant with a bracelet of the appropriate color to wear for the remainder of the task.
3. Typing Words

- Participants were presented with 20 voices (10 female) and asked to transcribe the words as they were produced.
- Each voice produced the same 15 words in a random order.
- Half of the voices were presented with a **GREEN BACKGROUND** and half were presented with a **RED BACKGROUND**.
- Participants were informed that these colors reflected the personality colors of the talkers.
4. Surprise Memory Test

Participants were presented with voices and asked whether each voice was NEW or OLD

- 40 voices (20 female): 20 new, 20 old
- Same word list (different random order) as the typing task.
- Participants were assigned to one of Two Conditions:
  - Personality color present at test
  - No color present at test
63 listeners completed the experiment

- No colour at test: 18 GREEN PERSONALITY, 15 RED PERSONALITY
- Color at test: 15 GREEN PERSONALITY, 15 RED PERSONALITY

Self-identified native speakers of North American English recruited from the UBC community.

- No reported speech, language, or hearing disorders.
- Compensated $10CAN.
We analyze responses in the surprise memory test using a hierarchical model.

- **Dependent variables:** listeners’ ability to correctly identify each voice as NEW or OLD

- **Independent variables:** VOICE STATUS (new voice/old voice), GROUP MEMBERSHIP (ingroup/outgroup), MEMBERSHIP AT TEST (color/no color)
Model Results

- Effects of Membership at Test prompted separate models for the two conditions.
- No color at Test: no additional effects
- Color at Test: effects of Voice Status and Group Membership
Voice Status

Group Membership Labeled at Test?

Proportion of Voices Correctly Identified

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<thead>
<tr>
<th>Voice Status</th>
<th>Colors</th>
<th>No Colors</th>
</tr>
</thead>
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<tr>
<td>New Voice</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Old Voice</td>
<td>0.6</td>
<td>0.6</td>
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</table>
Ingroup vs Outgroup

Proportion of Voices Correctly Identified

Group Membership Labeled at Test?

Group Membership
Outgroup
Ingroup

Colors
No Colors

0.5
0.6
Interpretation

When group membership is presented at test, listeners are
- better at identifying old voices as old
- better at correctly identifying ingroup voices as new or old
Like face processing, voice processing is subject to own-group biases.

What does this mean for sound change?
Garrett and Johnson’s (2013: 41) actuation model relies on exemplar storage and a bias factor.

“Speakers who seek to identify with the group may be more likely to notice phonetic variation among group members and thus include it in as a group indexical property, even though that same variation exists in the population as a whole. Prospective group members may thus notice variants when they are produced by the target group even though they disregard those same variants when produced by other speakers.”

Our memory effects could be the key here: the architecture of the exemplar space may give preference to some exemplars (ingroup) over others (outgroup). See also Sumner et al. (2014).
Spread and diffusion of patterns

As such we provide a mechanism for the kinds of changes reported, for example, in Labov, Rosenfelder, and Fruehwald (2013).

Philadelphians may be shifting towards more northern dialect patterns because they see themselves as ingroup with northerners and not southerners. These shifts could occur due to a shift in distribution of phonetic representations.
We assert that such a selective attention mechanism can explain the spread of sound change. We also suggest that this socially selective attention mechanism can also speak to actuation.

When is phonetic variation noticed?
Janda and Joseph’s (2001) “Big Bang” model posits that the initial stages of a sound change are rooted in minute phonetic variation, and that later spread is a separate phenomenon not reliant on phonetic factors.

Our memory effects could operate at either point – as a bias in which phonetic variation is noticed by speakers, or when sound changes are spread.
Children’s acquisition of peer group language patterns (Chambers, 1992; Payne, 1980; Trudgill, 1981; Kerswill & Williams, 2000; Floccia et al., 2012; at least in western societies, see Sharma, 2011) can be explained by our socially selective attention mechanism.
Our group membership assignment was highly artificial.

In the real world group membership is redundantly encoded based on speech and accent, affiliation, and a number of social categories. We also have more experience with our ingroups.

Given this, we would expect the effects of group membership on speech processing to be greater in the real world.
We selectively attend to voices based on group membership, paying more attention to those in our ingroups.
Thank you.

Thank you for listening!
Thanks to the organizers of this workshop.

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This personality measure has been found to be very good at predicting future success both socially and monetarily. The measure itself is often used by businesses and organizations as a means of identifying strong candidates for competitive positions. Further, psychologists who study relationships often use this personality inventory to identify future success in relationships.