DIRECTIONALITY OF /s/-RETRACTION IMITATION

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Convergence as a path to sound change

Speakers produce and accumulate shifts that persist and gradually lead to change.

Trudgill 1981, i.a.
Convergence in action...

Queen Elizabeth II over time (1950s [5] vs. 1980s [8]) shifted her vowel production toward Standard Southern British [S].

(Harrington et al. 2000)
Convergence in action...

Two individuals exhibit medium-term shifts toward each other.

(Sonderegger et al. 2017)
Convergence in the laboratory

Speakers shift their VOT following exposure to increased, but not decreased VOT.

(Nielsen 2011)
Speakers converge toward increased nasalization, but diverge from decreased nasalization.

(Zellou et al. 2016)
/s/-retraction

When there’s an /r/ nearby... like ‘grocery’ or ‘strudel’.
“There was the time that he had me tie his right hand behind his back just in case it got cut off so that-

No, seriously! Um, so that he would be ambidextrous, and he would do that for a week”

https://youtu.be/_MSYzyQQiEU
/s/-retraction

Rarely in /spr/ or /skr/ clusters, like ‘scream’ or ‘sprinkle’.
“[ft]rain or gaze is maybe what he said.”

“Maybe [ft]ain or [kr]ape is what he said to me.”
Asymmetrical distribution

Baker et al. 2011
Asymmetrical distribution

Possible explanations:
- Phonological underspecification  Shapiro 1995
- Intervening bilabial closure in /spr/
The Present Study
Research questions:

1. Do individuals exhibit convergence to increased or decreased degrees of /s/-retraction?

2. Are similar shifts observed across the different clusters?

3. What can these patterns tell us about the asymmetrical distribution of /s/-retraction?
Methods

Silent reading → Pre-test reading → Listening → Post-test reading

Block 1 → Block 2 → Block 3 → Block 4
Methods

<table>
<thead>
<tr>
<th>sit</th>
<th>sing</th>
<th>sip</th>
</tr>
</thead>
<tbody>
<tr>
<td>spit</td>
<td>sting</td>
<td>skip</td>
</tr>
<tr>
<td>spritz</td>
<td>string</td>
<td>script</td>
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<tr>
<td>shit</td>
<td>shingle</td>
<td>ship</td>
</tr>
</tbody>
</table>

Onset digitally mixed from prevocalic equivalents.
Participants

- 73 undergraduate students
- Age: Min. 18, Max. 22, Mean 20
- Gender: 33 female, 37 male, 3 non-binary
- Race: 16 Asian, 5 black, 9 Latino, 34 white, 9 multiracial
- Environment: 7 rural, 44 suburban, 22 urban
Measurements

- Recordings were transcribed, FAVE-aligned, and all onsets were manually corrected.
- Centroid Frequency (CF) was extracted automatically.
- Retraction ratio was calculated for all /sCr/ sibilants.

\[
\frac{\text{CF of token} - \text{speaker mean CF of } /s/}{\text{speaker mean CF of } /ʃ/ - \text{speaker mean CF of } /s/}
\]
Analysis

LINEAR MIXED MODEL:

$RR \sim TRIAL + BLOCK \times (CLUSTER) \times GENDER$
RESULTS: INCREASED RETRACTION

Will individuals converge toward increased retraction?

This might suggest that cues of retraction are useful to the listener and would support a convergence-to-change model of sound change.
STR imitation
STR baselines

ordered by pre-exposure RR, red line indicates the model talker
STR imitation

ordered by pre-exposure RR, red line indicates the model talker
Just the "retractors", i.e., people above the model talker

STR imitation
SKR imitation

ordered by pre-exposure RR, red line indicates the model talker
Green star = converges in STR and SKR, red star = converges in STR only, red NO sign = STR retractor who did not converge in any cluster

SKR Imitation
SPR imitation

Green star = converges in STR and SPR, red star = converges in STR only, red NO sign = STR retractor who did not converge in any cluster
For all individuals whose STR baseline was above the model talker
For all individuals who's baseline was never above the model talker in any cluster
Increased conditions summary

1. No individuals increase their retraction to converge toward the model talker.

2. Retractors will decrease their retraction to converge toward the model talker.

3. Convergence is observed in /str/ and /skr/ clusters, but not /spr/ clusters.
RESULTS: DECREASED RETRACTION

Will individuals, including non-retractors, converge toward decreased retraction?

This might suggest that individuals avoid convergence in order to maintain a contrast between /s/ and /ʃ/ even though English does not maintain that contrast preconsonantally.
STR baselines, shifted model talker
STR imitation, shifted model talker
SKR imitation, shifted model talker
SPR imitation, shifted model talker
Decreased condition summary

1. No individuals exhibit convergence in either direction in any cluster.
General Discussion

1. Speakers do not appear to converge toward increased degrees of retraction, challenging a convergence model of sound change.

2. Retractors will converge toward slightly but not extremely decreased retraction, suggesting an effect of ‘in group’ alignment.

3. Convergence is observed in /str/ and /skr/ clusters, but not /spr/ clusters, complicating the nature of the asymmetrical distribution.
Next Steps

1. Examine hyper-increased retraction to ask if retractors will converge toward increased retraction, aligning in ‘in-group’ identity.

2. Search for other measurements of convergence besides retraction to ask if retraction is less salient for non-retractors.

3. Examine articulatory nature of convergence, asking if lip rounding may be prohibitory toward tongue backing convergence.

4. Continue to probe for possible uniting characteristics of the innovators.
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REFERENCES

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