Individual Tendencies for Phonetic Convergence

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Introduction

- **Convergence** is the phenomenon in which individuals' behavioral and linguistic characteristics become more similar to characteristics of their partners' behaviors and speech during interaction.
- Convergence is found in many features of speech and other behaviors, including e.g. vowel features, pitch, speech rate, and turn-taking behaviors.
- **Objective**: Identify correlations in convergence exhibited by the same pair across tasks and by pairs with the same individual; do individuals have consistent tendencies?

Hypotheses

Hypothesis 1: Correlation in convergence by a pair in different tasks.

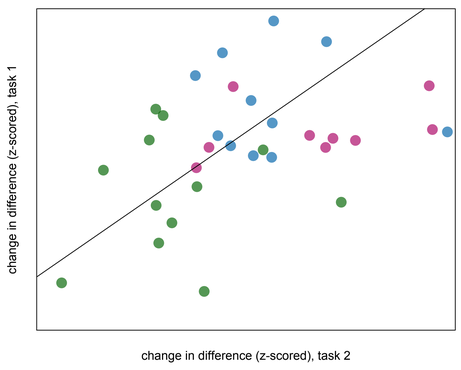
Hypothesis 2: Correlation in convergence by an individual in different pairs.

Methodology

- Phonetic measurements from 12 pairs of female speakers of English, ages 18-22
- 4 RAs; each interacted with 3 participants
- Task 1: trivia questions
- Task 2: undirected conversation

Correlation by the Same Pair in Different Tasks

Figure 1: Correlation in formants (F1 (pink): R = .074, p = .73; F2 (blue): R = .16, p = .45; F3 (green): R = .11, p = .61)



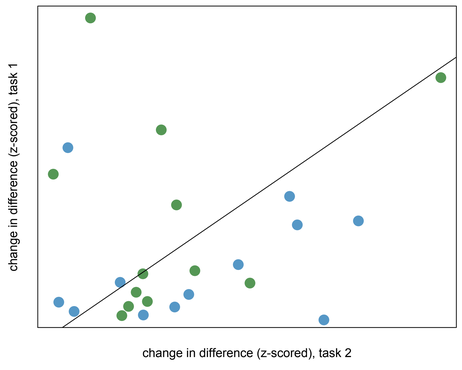


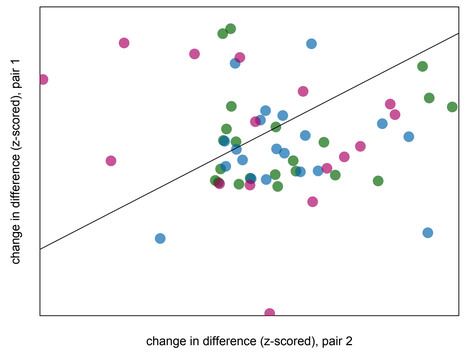
Figure 2: Correlations in a selection of other features (intensity (green):R = .22, p = .29; pause duration (blue): R = .18, p = .39)

Individual measures lacked significant correlation; patterns appeared in comparisons with multiple measures

- Among vowel formants (not influenced by task) R = .36, p < .001***
- Among prosodic features (intensity, pitch, phonation) R = -.23, p = .046*
- Among speech rate features (vowel, pause, and turn duration) R = -.11, p = .35

Correlations by Pairs Containing the Same Individual

Figure 1: Correlation in formants (F1 (pink): R = .042, p = .78; F2 (blue): R = -.31, p = .024; F3 (green): R = .003, p = .98)



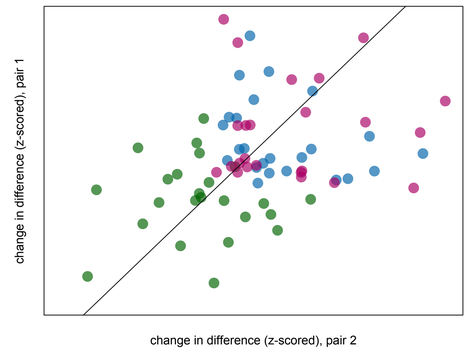


Figure 2: Correlations in a selection of other features (pause duration (green): R = .35, p = .0095**; pitch (blue): R = .32, p = .02*; phonation (pink): R = .42, p = .0012**)

In addition to some significant correlations for individual measures, there were also patterns that appeared in comparing measures:

- Among vowel formants (F1, F2, F3) R = .30, p < .001***
- Among prosodic features (intensity, pitch, phonation) R = .42, p < .001***
- Among speech rate features (vowel, pause, and turn duration) R = .13, p = .39

Conclusions

- Weak positive correlation between a pair's convergence in a feature in different tasks, obscured in characteristics strongly influenced by task (timing and prosodic measures)
- Positive correlation between convergence in pairs containing the same individual, apparent in vowel quality and prosodic changes
- Perhaps resulting from different salience of features to different listeners; the correlations were most apparent when comparing across measures as well as across pairs

Selected References

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