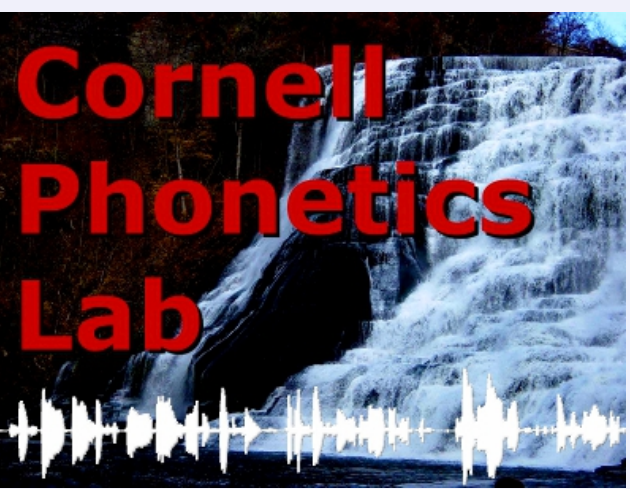


PHONETIC CONVERGENCE IN MULTIPLE FEATURES

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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:** Correlations among eight features across pairs of interlocutors: F1, F2, vowel duration, pitch, intensity, turn duration, pause duration within turns, and pause duration between speakers.

Hypotheses

Hypothesis 1: Correlation in convergence across features.

Hypothesis 2: Correlation in convergence across tasks.

Methodology

- Phonetic measurements from 8 pairs of female speakers of English, ages 18-22
- 4 high-liking pairs; 4 low-liking
- Task 1: trivia questions
- Task 2: undirected conversation

Correlation by Individual and by Task

Figure 1: Correlation for convergence in pairs with the same individual; $R = 0.33$, $p = 0.05$

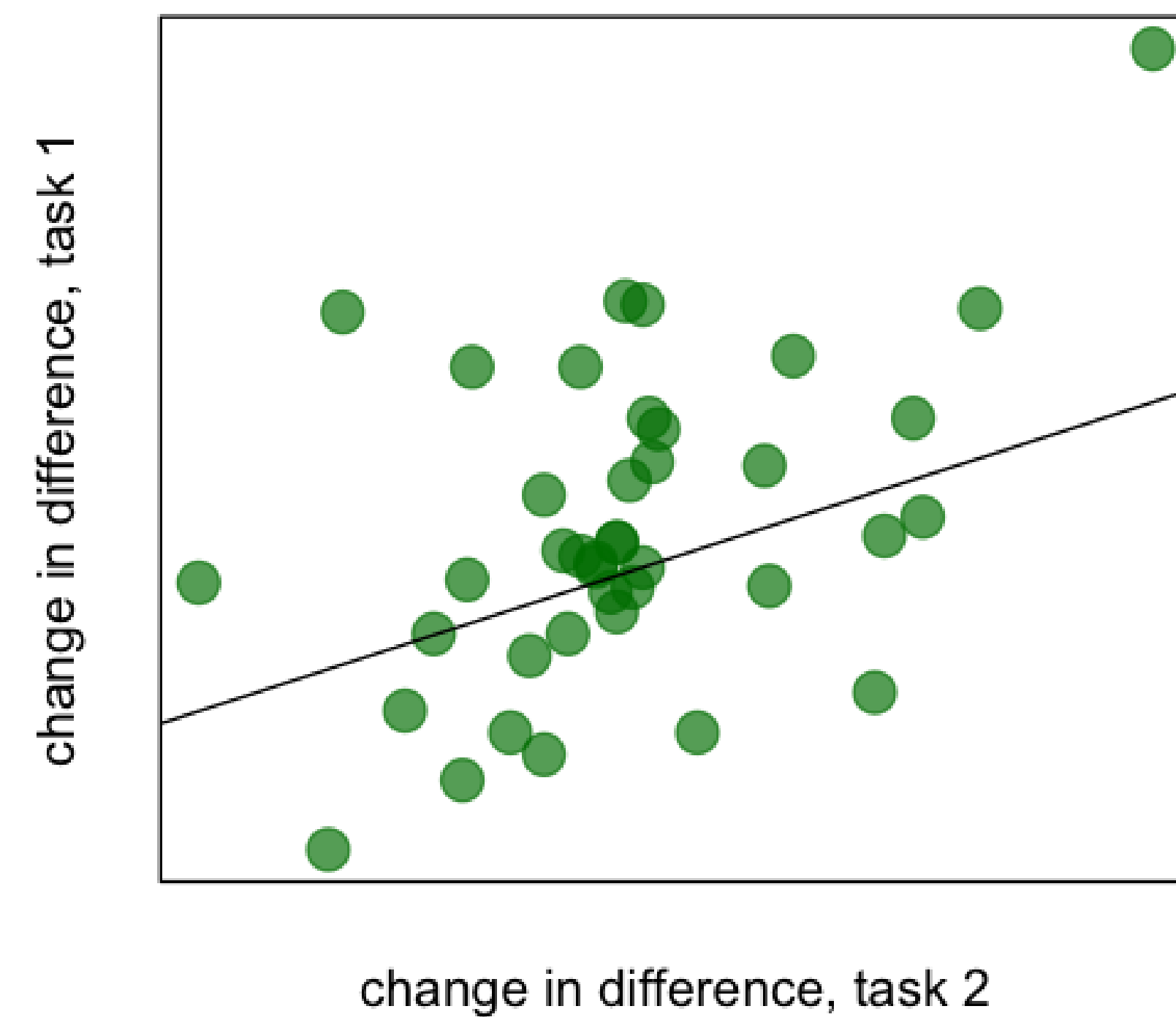
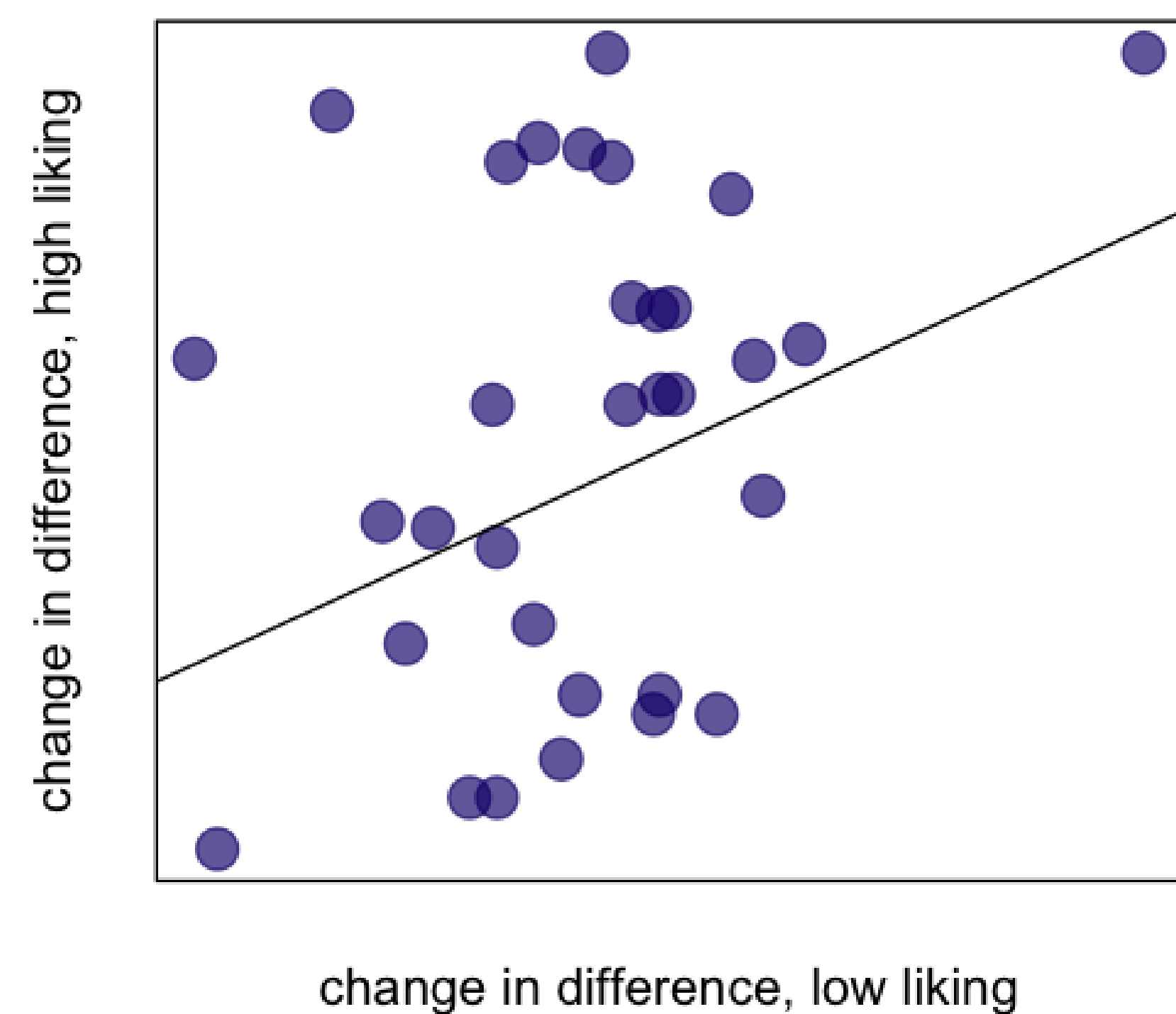


Figure 2: Correlations for convergence in different tasks; $R = 0.42$ for non-turn-taking features, $p = 0.041$. With turn-taking features, $R = -0.22$.

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Correlations by Feature

Little correlation convergence in different features for each pair; no trend for correlations to be positive or negative. Only three significant correlations, all with task-related or physiological explanations.

	F2	Vowel Duration	Intensity	F0	Turn Duration	Cross-Turn Pause Duration	In-Turn Pause Duration
F1	-0.17	-0.09	0.3	-0.14	-0.15	0.32	0.25
F2		0.19	-0.1	0.35*	0.26	0.1	-0.27
Vowel Duration			0.29	-0.09	0.05	-0.08	-0.07
Intensity				-0.16	-0.29	0.16	-0.02
F0					0.47***	0.03	-0.3
Turn Duration						0.27	-0.07
Cross-Turn Pause Duration							0.49***

Table 1: Correlations for difference in partners' means through all time periods

- Correlation between within-turn pause duration and turn switching pause duration is due to all speakers' decreasing pause duration over time.
- Correlation between partners' pitch and F2 is due to a change-independent correlation between F2 and pitch ($R = 0.061$, $p = 1.4E-06$).
- Correlation between partners' average pitch and turn duration is due to absolute correlation between pitch and turn duration: $R = 0.1$, $p = 8.8E-11$.

Conclusions

- Positive correlation between a pair's convergence in a feature in different tasks
- Positive correlation between convergence in pairs containing the same individual
- Lack of correlation between a pair's convergence in different features
- Perhaps resulting from different salience of features to different listeners

Future Directions

- **Additional Results:** Patterns of individual change correlated across tasks and between partners; trend of positive correlations between features.
- **Future Work:** Individual variation in convergence: recording each individual in several pairs and in different tasks. Clearer individual tendencies? Connected to ratings of partner cooperativeness/likeability?
- **Future Work:** Connections between individual tendency to converge in a feature and to use that feature as a cue for identifying sounds or speakers. Effects of altering or obscuring that cue as compared to others?

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