Phonetic convergence effects during choral speech

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Introduction

- In spoken interactions, the acoustic/phonetic characteristics of a speaker's voice tend to become more similar to those of their conversation partner (phonetic convergence).
- We aimed to investigate this using choral speech- the act of speaking in synchrony with another speaker.
- **Research question:** Does choral speech lead to phonetic convergence effects in pitch production?

General methods

- **Task:** Read sentences on screen, either:
  - Alone (solo reading baseline, SR)
  - In synchrony with another person (choral speech, CS)
- **Stimuli**: recordings of Harvard/IEEE sentences
- **Experiment 1:** 10 female participants per condition:
  - **High** F0 condition: synchronise with voice with a higher F0 than average (265Hz)
  - **Low** F0 condition: synchronise with voice with a lower F0 than average (175Hz)
- **Experiment 2:** 10 female participants:
  - **Extra low** F0 condition: synchronise with voice with an even lower F0 (140Hz)
- **Experiment 3:** 10 female participants per condition:
  - **Audio only CS** condition: High condition from Expt 1.
  - **Visual only CS** condition: Synchronise with silent videos of person speaking the sentences.
  - **Visual+audio CS** condition: Synchronise with videos of person speaking the sentences with audio.
- **Measures:**
  - **F0 change:** change in F0 from SR (baseline) to CS.
  - **F0 distance:** absolute distance from participant F0 to accompanist F0.
- **Analysis:** Linear-mixed modelling analysis, with likelihood ratio tests to compare models (e.g. with and without interactions).

Experiment 1

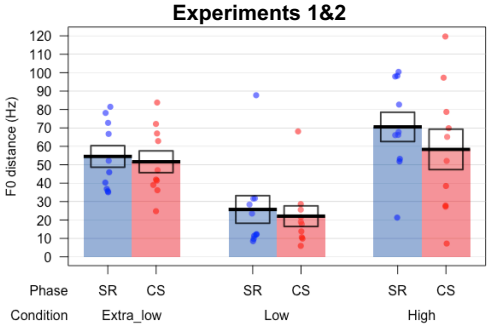
- Significant effect of condition on F0 change values: F0 change was positive in the high condition, and negative in the low condition.
- Significant interaction between phase (SR vs CS) and condition (high vs low) on F0 distance: convergence was greater in high versus low condition.
- F0 distance at baseline greater in high than low condition- could this explain greater convergence in high condition?

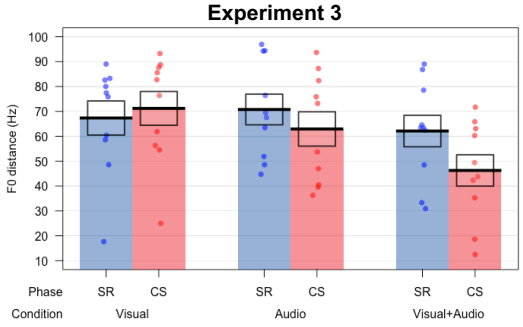
Experiment 2

- Same pattern of results seen for new extra low condition with even lower accompanist F0- reduced convergence compared to Expt 1 high condition, despite equivalent F0 distance at baseline.

Experiment 3

- Significant interaction between phase and condition on F0 distance:
  - Convergence was greater in audio compared to visual condition.
  - Convergence was reduced in audio compared to visual+audio condition.





Summary and conclusions

- Findings demonstrate F0 convergence during choral speech.
- These convergent changes were:
  - Greater when upward shifts in F0 were required.
  - Specific to choral speech conditions involving another voice (not seen for silent visual choral speech).
  - Enhanced by provision of visual cues in addition to voice.

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