INTRODUCTION

- Articulation changes continually over time, so to understand the development of coarticulation, dynamics need to be studied.
  - In /sV/ syllables with contrasting vowels, children under the age of ten have been found:
    - not to differentiate between tongue shapes at mid-/s/ ([5])
    - to have greater vowel-on-consonant effects at 30 ms before vowel onset (e.g. [2])
    - to have earlier onset of tongue movement towards the vowel ([1])
  - There is articular evidence that even teenagers differ from adults in some aspects of speech production ([3]).
  - In this study, we expected to observe age-related differences in tongue dynamics.

METHOD

- Six children (mean age 11.0; range 1.8); six adults.
- Scottish English speakers.
- Syllables /sa/ and /si/ in a carrier phrase.
- Six repetitions.
- QMU ultrasound system.
- Frame rate 100 Hz.
- Synchronised ultrasound and acoustic data.
- Cubic spline fitted to tongue contour at every ultrasound frame within /s/ (automatic; manual correction).
- xy values for tongue curves from nine equally spaced time points during /s/.
- Main measure: mean nearest neighbour distance between curves (e.g. [4]).
- Durations of /s/ measured.
- Linear mixed models in SPSS; speaker – random factor.

RESULTS AND DISCUSSION

1. Tongue travel during /s/.

- Greater before /i/ (p < 0.001).
- Greater in adults (p < 0.001).

2. Difference in tongue shape for /s/ across vowel contexts.

- In both groups, tongue moves over two times more in the context of /i/. In adults, /s/ is significantly longer before /i/, but not in children. Children do not seem to use duration to help themselves produce a larger tongue movement.

3. Within-speaker variability.

- Mean normalised WS distances:
  - in children 1.72 mm, in adults 1.25 mm.
  - Age N/S.
- This suggests that preadolescents can control for tongue placement across repetitions as well as adults can.

REFERENCES