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### HW #3: Vowels

#### Methodology:

First, I impressionistically transcribed all of the adult targets and all of the child productions. Then I used the automatic formant tracker in Praat to report F1 and F2 values at three points in each vowel: the first quarter, the midpoint, and the last quarter. I generally used the same settings for both of the adults (0-4000 Hz, 5 formants, window = 0.025 s) and for all of the children (0-6000 Hz, 5 formants, window = 0.025 s); these were based on examining a subset of the data files to estimate appropriate settings. I then plotted all of the vowels for each speaker, labelling each with the target and the transcribed production (which were the same for the adult speakers). These graphs thus encode the target, the production, and the formant values over time for each vowel. I checked each vowel plotted to see if the measured formants seemed at all reasonable, and then went back to Praat to look at and hand-measure any formants that seemed to have been mis-measured. Even this hand-measuring, however, did not resolve all of the problems.

#### Notes:

##### 1. Adult: e4f

- ◆ I had trouble getting few enough formants – Praat kept finding an F1 and an F2 very close together, where I only saw a single formant (e.g. skrt, shrp, shel, same, shep, sail); I ended up using what Praat thought was F3 for my F2 values.

##### 2. Adult: e5f

- ◆ I have the exact opposite problem with this speaker. The F2 values that Praat finds (especially for the vowels I hear as high and back, in soup and stks) seem to be way too high, but I don't actually see any band of energy that looks like it could be F2 at a lower level.

##### 3. Child: e2n00f

- ◆ I think Praat is tracking her third harmonic as F1, but I'm not sure how to get around this.

##### 4. Child: e2n04f

- ◆ As with adult e4f, many of the F2 values for this child seem very low compared to my perception of the vowel and the rest of her vowel space. This is especially true with her front vowels (in e.g. safe, same, sail, sstr), which I tended to hear as higher than the targets but still front. What dialect did these children speak? (or what dialect did their parents speak?) This child seems to have /e/ raising, which isn't uncommon in some adult dialects; if she were repeating the "word" rather than the "sounds," perhaps she should be considered "on target" after all . . .

##### 5. Child: e2n08f

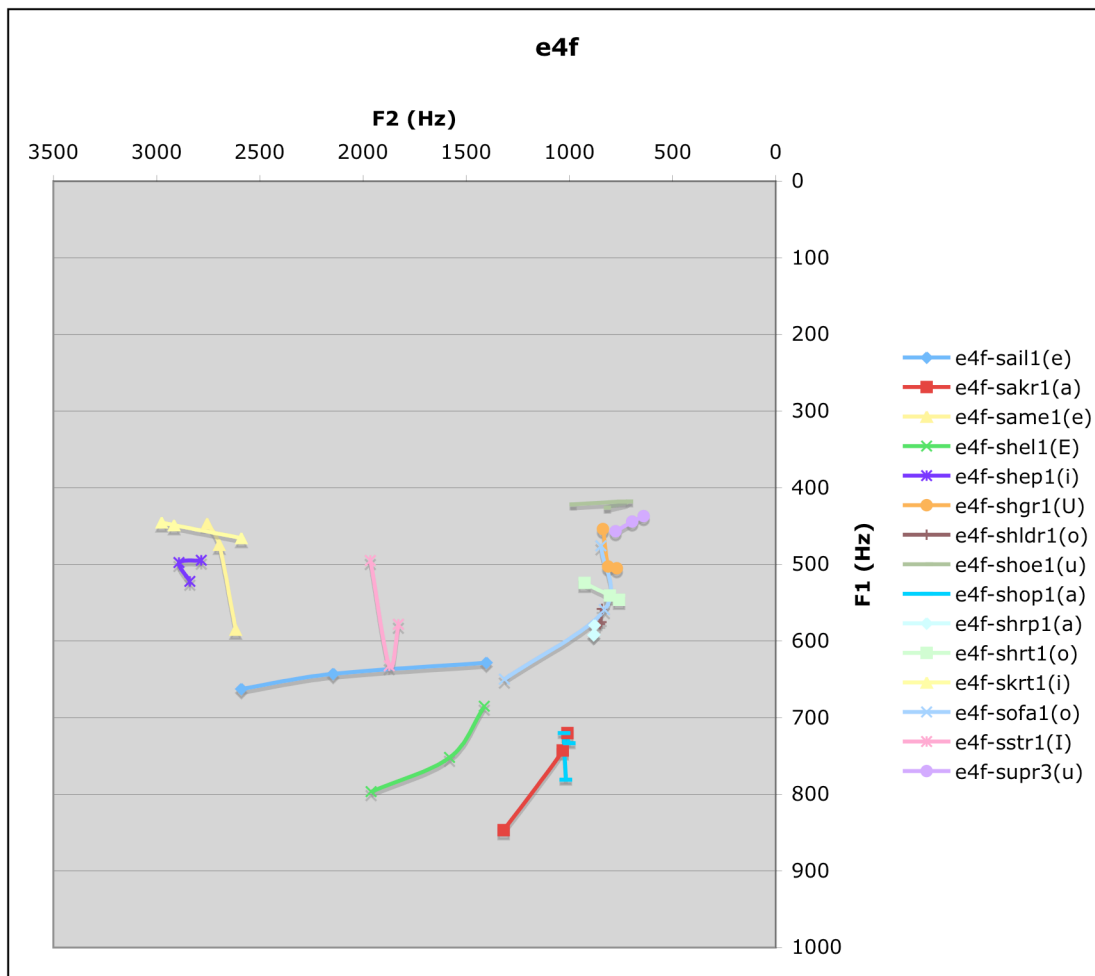
- ◆ The token of shel is too breathy for me to have any idea what's going on with the formant values.

### Summary:

I found the most consistency between target and perceived production with [I] and [E], with [u] also being produced fairly close to target most of the time. For [a], I found that a lot of the productions involved vowels that sounded more like diphthongs that either started or ended with [a] but involved another vowel either before or after the target. There weren't very many tokens of [i] and [e], and the productions seemed to vary by child. For example, e2n11f was almost always on target, and produced [i] for [i] and [e] for [e]; e2n04f on the other hand produced [I] and [U] for [i], and [E] and [i] for [e]. The target vowels [o] and [U] were particularly poorly produced, with a tendency to be fronted and/or raised, even by the otherwise very accurate e2n11f.

### Graphs:

Below are the graphs of the vowel space for each speaker. Each line represents one production, measured at the first quarter, midpoint, and third quarter of the vowel. Each line is labelled with the child, target word, target vowel (based on my perception of the adult target), and my perception of the child's actual production. For example, the yellow line in e2n03m, labelled as "e2n03m-shgr1a(U-i)" represents his vowel in the word "sugar," which was produced with a [U] by the adult (to my ears) and was produced with an [i] by the child (to my ears).



# e5f

