

Supplemental Material S1. Analysis results for error rate, duration, and spectral mean (m1).

Group means and standard deviations for error rate, duration median, and m1 median, by target and timepoint.

Group	F	V	%err (SD)	n	dur (SD)	m1on (SD)	m1mid (SD)	m1off (SD)
Adult (n = 10)	s	i	1.1 (3.5)	10	188 (14)	6129 (587)	6548 (390)	6091 (387)
	s	u	3.3 (7.5)	10	189 (14)	6042 (413)	6394 (327)	6033 (395)
	sh	i	0.0 (0.0)	10	193 (14)	4398 (178)	4361 (142)	4153 (189)
	sh	u	0.0 (0.0)	10	199 (17)	4249 (141)	4227 (176)	3935 (238)
TD6 (n = 8)	s	i	11.1 (13.3)	8	195 (29)	5450 (395)	6018 (365)	5763 (614)
	s	u	11.1 (13.3)	8	193 (38)	5520 (516)	5983 (381)	5616 (562)
	sh	i	5.6 (10.3)	8	203 (24)	4425 (416)	4406 (319)	4306 (274)
	sh	u	5.6 (11.9)	8	202 (23)	4131 (618)	4164 (441)	3864 (468)
TD9 (n = 9)	s	i	3.7 (5.6)	9	187 (17)	5764 (504)	6131 (463)	5935 (393)
	s	u	4.9 (14.8)	9	179 (20)	5521 (429)	5933 (479)	5544 (408)
	sh	i	0.0 (0.0)	9	188 (23)	4432 (429)	4572 (460)	4361 (477)
	sh	u	1.2 (3.7)	9	192 (29)	4282 (529)	4423 (640)	4177 (581)
SSD6 (n = 8)	s	i	56.9 (26.8)	6	193 (54)	5246 (407)	5832 (281)	5179 (568)
	s	u	63.9 (35.0)	4	205 (31)	4256 (1080)	5441 (108)	4863 (353)
	sh	i	20.8 (23.3)	7	194 (26)	4497 (555)	4826 (377)	4489 (251)
	sh	u	23.6 (28.1)	7	180 (20)	4190 (478)	4633 (350)	4177 (227)
SSD9 (n = 3)	s	i	25.9 (35.7)	3	177 (33)	5357 (585)	5786 (78)	5688 (349)
	s	u	29.6 (42.1)	2	175 (52)	5388 (5)	5941 (38)	5810 (297)
	sh	i	11.1 (19.2)	3	200 (30)	4234 (481)	4377 (405)	4116 (415)
	sh	u	0.0 (0.0)	3	188 (32)	4062 (280)	4189 (230)	3921 (208)

Error Rate

A 3 (Group: adults, TD6, TD9) × 2 (Fricative: /s/, /ʃ/) × 2 (Vowel: /i/, /u/) ANOVA on error rate revealed significant effects of Group ($F[2, 24] = 4.95, p = .016$) and Fricative ($F[1, 24] = 7.16, p = .013$). The Group effect indicated higher error rates in the TD6 group (8.3%) than in the adult group (1.1%) with a marginal difference with the TD9 group (2.5%; $p = .063$); the TD9 and adult groups did not differ. The Fricative effect indicated more errors for /s/ targets (5.6%) than for /ʃ/ targets (1.9%). No other effects were significant (all $F_s < 1, n.s.$).

A 2 (Group: TD6, SSD6) × 2 (Fricative: /s/, /ʃ/) × 2 (Vowel: /i/, /u/) ANOVA on error rate revealed significant effects of Group ($F[1, 14] = 22.00, p < .001$) and Fricative ($F[1, 14] = 8.79, p = .010$). The Group effect indicated higher error rates in the SSD6 group (41.3%) than in the TD6 group (8.3%). The Fricative effect indicated more errors for /s/ targets (35.8%) than for /ʃ/ targets (13.9%). A significant Group × Fricative interaction ($F[1, 14] = 4.89, p = .044$) revealed that the group difference was driven primarily by more errors on the /s/ targets in the

SSD6 group (60.4%) than in the TD6 group (11.1%); the groups did not differ significantly for /f/ (SSD6: 22.2% vs. 5.6%). In addition, although both groups showed numerically higher error rates for /s/ than for /f/, this difference was significant only for the SSD6 group (60.4% vs. 22.2%) and not for the TD6 group (11.1% vs. 5.6%). No other effects were significant (all F s < 1, n.s.).

With respect to individual comparisons, all SSD6 children except participant 320 produced more errors than the TD6 group for at least one target. For the SSD9 children, only participant 312 produced significantly more errors than the SSD9 group (for /s/ targets only). More detailed information is provided in Supplemental Material S3.

Duration

The 3 (Group) \times 2 (Fricative) \times 2 (Vowel) ANOVA on median duration revealed only a significant effect of Fricative ($F[1, 24] = 9.03, p = .006$) indicating longer duration for /f/ (196 msec) than for /s/ (188 msec). None of the effects involving Group were significant, nor were any other effects (all F s < 1, n.s., except Fricative \times Vowel, $F[1, 24] = 2.44, p = .131$).

Comparison of duration medians for the SSD6 children revealed only one significant difference, namely longer duration for *seeb* for SSD6 304 (285 ms) than for the TD6 group (195 ms) ($p = .022$). Three additional SSD6 children showed marginal differences from the TD6 group for one target, in all cases in the direction of shorter fricative duration than the TD6 group (*shoob* TD6 = 202 ms; SSD 104: 155 ms, SSD 300: 153 ms; *seeb* TD6 = 195 ms; SSD 319 = 136 ms).

None of the SSD9 children differed significantly from the TD9 group, although SSD 307 showed a trend for shorter fricative duration than for /s/ targets (*seeb* TD9 = 187; SSD 307 = 148; *soob* TD9 = 179; SSD 307 = 139). More detailed information is provided in Supplemental Material S3.

Spectral Mean (m1) (see Figure S1 below)

A 3 (Group) \times 2 (Fricative) \times 2 (Vowel) \times 3 (Timepoint) ANOVA of spectral mean medians, with the same participants included as in the Duration analysis, indicated several significant effects. A significant effect of Vowel ($F[1, 24] = 17.48, p < .001$) indicated higher m1 in the /i/ context (5188 Hz) than in the /u/ context (5012 Hz). A significant effect of Fricative ($F[1, 24] = 513.28, p < .001$) supported the (expected) higher m1 for /s/ (5930) than for /f/ (4271). A Group \times Fricative interaction ($F[2, 24] = 6.10, p = .007$) revealed that adults had higher m1 for /s/ (6206 Hz) than for both children's groups, which did not differ for /s/ m1 (TD6: 5725 Hz, TD9: 5805 Hz). Groups did not differ in spectral mean for /f/. Importantly, all groups showed a significant difference in the expected direction (m1 for /s/ > m1 for /f/). There was also an effect of Timepoint ($F[2, 48] = 27.92, p < .001$), indicating higher m1 at fricative midpoint (5272 Hz) than at onset (5040 Hz) and offset (4988 Hz); onset and offset did not differ. Timepoint also interacted significantly with Vowel ($F[2, 48] = 4.47, p = .017$), indicating that onset and offset m1 did not differ in the /i/ context (onset: 5100 Hz, offset: 5102 Hz) but did so

in the /u/ context (onset: 4957 Hz, offset: 4862 Hz); the Vowel effect (/i/ > /u/) was present at all Timepoints. Finally, Timepoint interacted with Fricative ($F[2, 48] = 26.73, p < .001$), indicating that onset and offset differed for /ʃ/ (onset: 4321 Hz, offset: 4131 Hz) but not for /s/ (onset: 5760 Hz, offset: 5844 Hz), and that onset differed from midpoint for /s/ (onset: 5760 Hz, midpoint: 6185 Hz) but not for /ʃ/ (onset: 4321 Hz, midpoint: 4359 Hz). Importantly, the Fricative effect (/s/ > /ʃ/) was present at all timepoints. No other effects were significant ($F_s < 1.5, p_s > .25$, except Group \times Fricative \times Vowel, $F[2, 24] = 1.57, p = .2284$).

No significant differences were observed for any child (SSD6 or SSD9) at any timepoint, with the exception of SSD6 300, whose median m1 at fricative onset for *soob* was lower (2700 Hz) than in the TD6 group (5520 Hz) ($p = .001$). Several children showed marginal effects but there was no apparent systematicity to these effects in terms of participant, target, or timepoint. More detailed information is provided in Supplemental Material S3.

Figure S1. Group data for spectral mean, by target and timepoint, for adults vs. TD6 vs. TD9 (left), TD6 vs. SSD6 (middle), and TD9 vs. SSD9 (right). Error bars represent standard error.

