

Acoustics and articulation of the subset scenario in Gaelic-English bilinguals: Supplementary Materials

Claire Nance and Sam Kirkham
Lancaster University

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1. Analysis of different vowel contexts in acoustics

The acoustic analysis showed a significant effect of vowel context on the F2–F1 measure. The values of lateral F2–F1 in the context of the three different vowels are plotted in Figure S1.

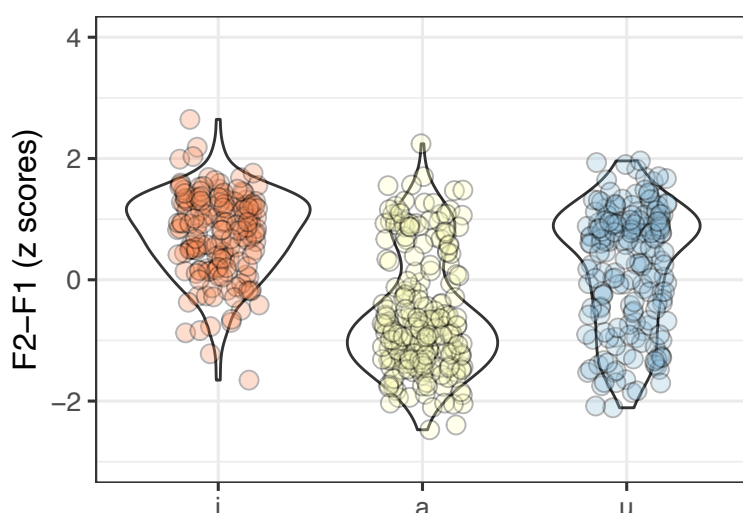


Figure S1: Values of F2–F1 in laterals preceding the three vowel contexts in this analysis.

Posthoc analysis indicates that laterals preceding /i/ and /u/ vowels have similar values, but laterals preceding /a/ have lower F2–F1 values. This result is shown in Table S1.

Post-hoc comparisons	$\hat{\beta}$	SE($\hat{\beta}$)	df	t	p(t)
i – a	1.04	0.17	41.4	6.11	<.001
i – u	0.28	0.17	41.4	1.63	.25
a – u	-0.76	0.16	41.7	-4.90	<.001

Table S1: Posthoc testing comparing different vowel contexts in acoustics.

2. Analysis of different vowel contexts in articulation

The articulatory analysis also showed a significant effect of vowel context. The values of tongue PC1 in different vowel contexts are shown in Figure S2.

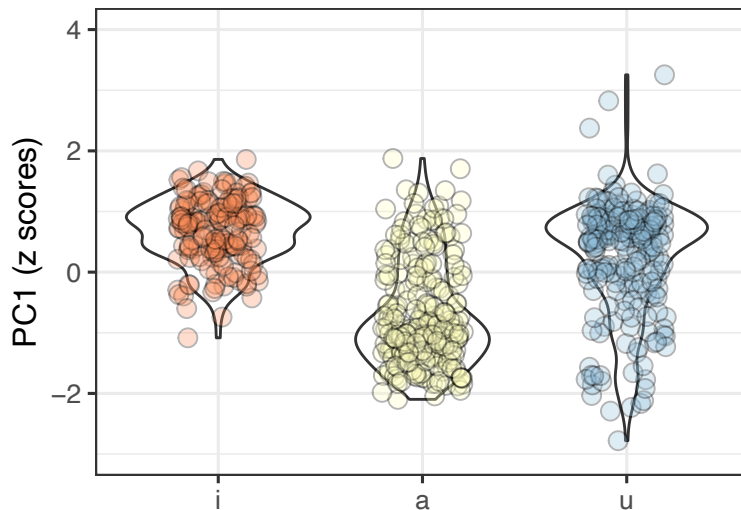


Figure S2: Values of PC1 in laterals preceding the three vowel contexts in this analysis.

Posthoc analysis indicates that laterals preceding /i/ and /u/ vowels have similar values, but laterals preceding /a/ have lower PC1 values. This result is shown in Table S2.

Post-hoc comparisons	$\hat{\beta}$	SE($\hat{\beta}$)	df	t	p(t)
i – a	1.33	0.19	41.7	5.93	<.001
i – u	0.19	0.20	41.7	0.95	.61
a – u	-0.95	0.18	41.4	-5.35	<.001

Table S2: Posthoc testing comparing different vowel contexts in articulation.

3. Analysis of PC2 values

The values of PC2 according to phoneme/language category and word position are shown in Figure S3. Statistical modelling of these data are in Table S3. The model shows a significant effect of vowel category, but no other significant differences.

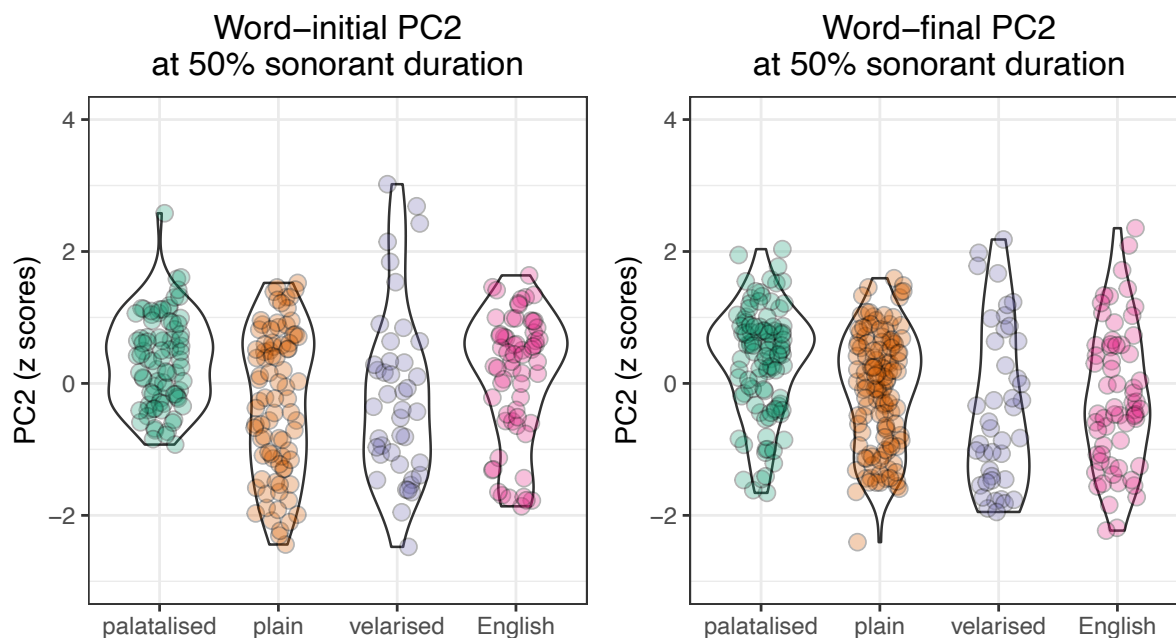


Figure S3: PC2 values according to phoneme/language category and word position.

Full model	$\hat{\beta}$	SE($\hat{\beta}$)	df	t	p(t)
Intercept	0.71	0.22	22.14	3.28	.003
Model comparisons			df	χ^2	p(χ^2)
Category			6	7.25	.30
Position			4	7.58	.11
Vowel			2	55.93	<.001
Position*Category			3	3.26	.35

Table S3: PC2 statistics. Full model AIC is 1190.09 compared to a null model AIC of 1226.04.

4. Analysis of PC3 values

The values of PC3 according to phoneme/language category and word position are shown in Figure S4. The statistical model of these data is in Table S4. The model shows a significant effect of word position, and Figure S4 indicates that values are generally lower in word-final position. Again, there is a significant difference for vowel context. There is also a significant interaction of word position and language/phoneme category. Figure S4 suggests that this interaction stems from differences in the velarised and English laterals in word-initial and word-final position.

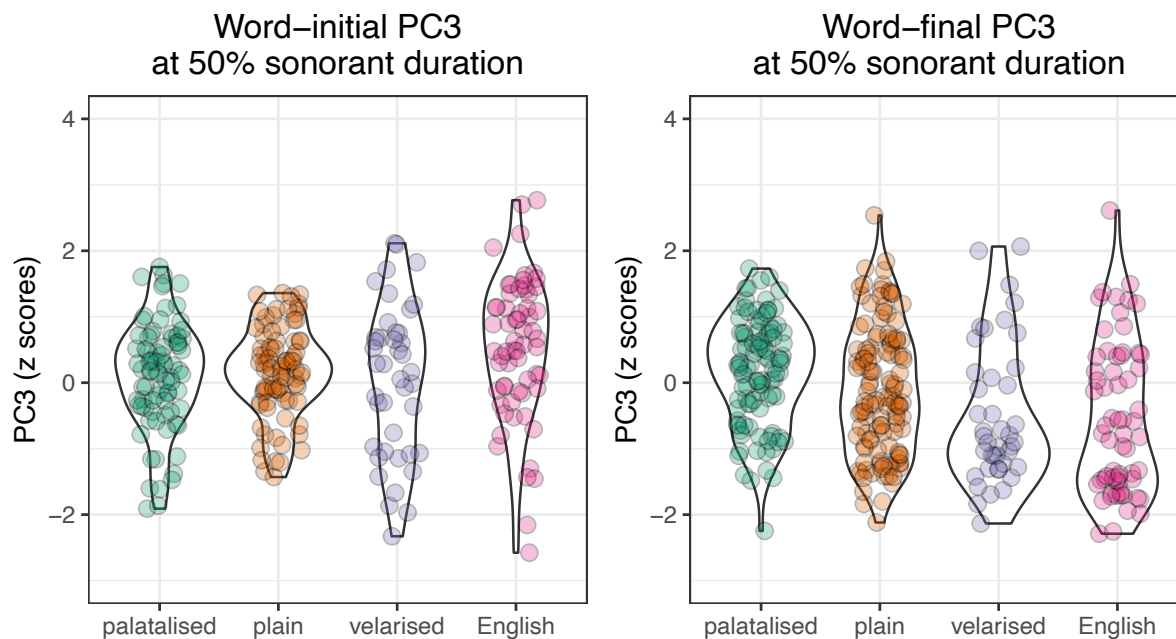


Figure S4: PC3 values according to phoneme/language category and word position.

Full model	$\hat{\beta}$	SE($\hat{\beta}$)	df	t	p(t)
Intercept	-0.02	0.20	26.96	-0.11	.91
Model comparisons			df	χ^2	p(χ^2)
Category			6	12.12	.06
Position			4	15.10	.004
Vowel			2	8.32	.02
Position*Category			3	9.94	.02

Table S4: PC3 statistics. Full model AIC is 1919.29 compared to a null model AIC of 1623.37.

5. Analysis of PC4 values

The values of PC4 according to phoneme/language category and word position are shown in Figure S5. The modelling of PC4 is in Table S5. The model shows a significant effect of language/phoneme category, and vowel position. Figure S5 indicates that the significant effect of language/phoneme category comes from large differences between the Gaelic laterals, especially in word-initial position.

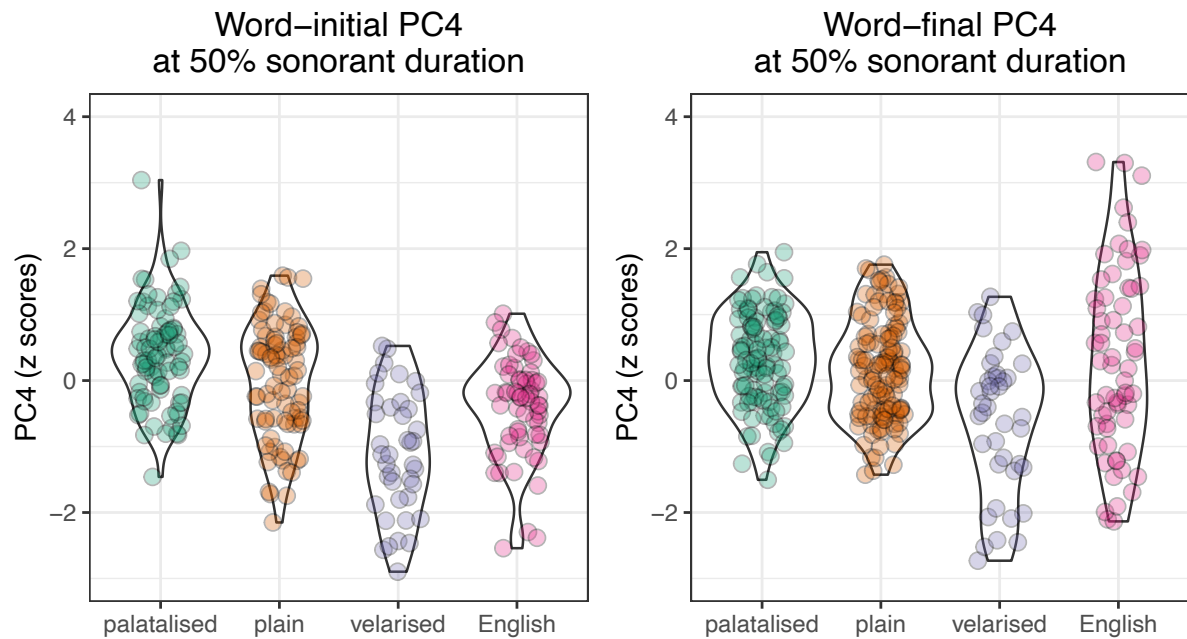


Figure S5: PC4 values according to phoneme/language category and word position.

Full model	$\hat{\beta}$	SE($\hat{\beta}$)	df	t	p(t)
Intercept	0.42	0.21	29.01	2.00	.05
Main effects			df	χ^2	p(χ^2)
Category			6	15.98	.01
Position			4	8.50	.07
Vowel			2	6.94	.03
Position*Category			3	4.21	.24

Table S5: PC4 statistics. Full model AIC is 1473.61 compared to a null model AIC of 1480.82.