

An Instrumental Study of Scottish Gaelic Preaspiration

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- 1) **The problem:** Current accounts of voiceless preaspirated stops in Scottish Gaelic present an oversimplified analysis of the phenomenon, insofar as they fail to consider a number of important phonological factors: vowel length, medial vs. final position, and place of articulation. No phonetic studies of SG preaspiration have systematically considered all these factors.
- 2) **In Scottish Gaelic:**
 - a) /p t̪ k/ vs. /p^h t^h k^h/. There is no voiced series.
 - b) Preaspiration in medial and final position, regular aspiration in initial position.
 - c) *cop* [k^ho^hp] 'foam' <> *gob* [kop] 'beak'
 - d) *bàta* [pa:^hta] 'boat' <> *fàdadh* /fa:tax/ 'kindling'

Figure 1. Dialect Distribution by Type (from Helgason 2002)

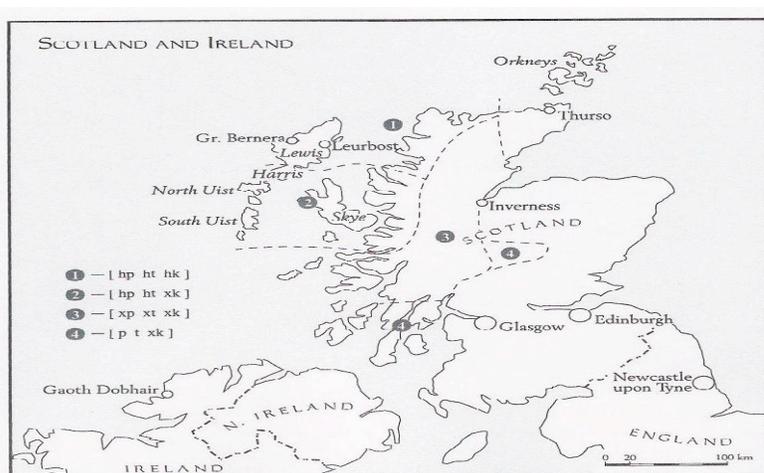
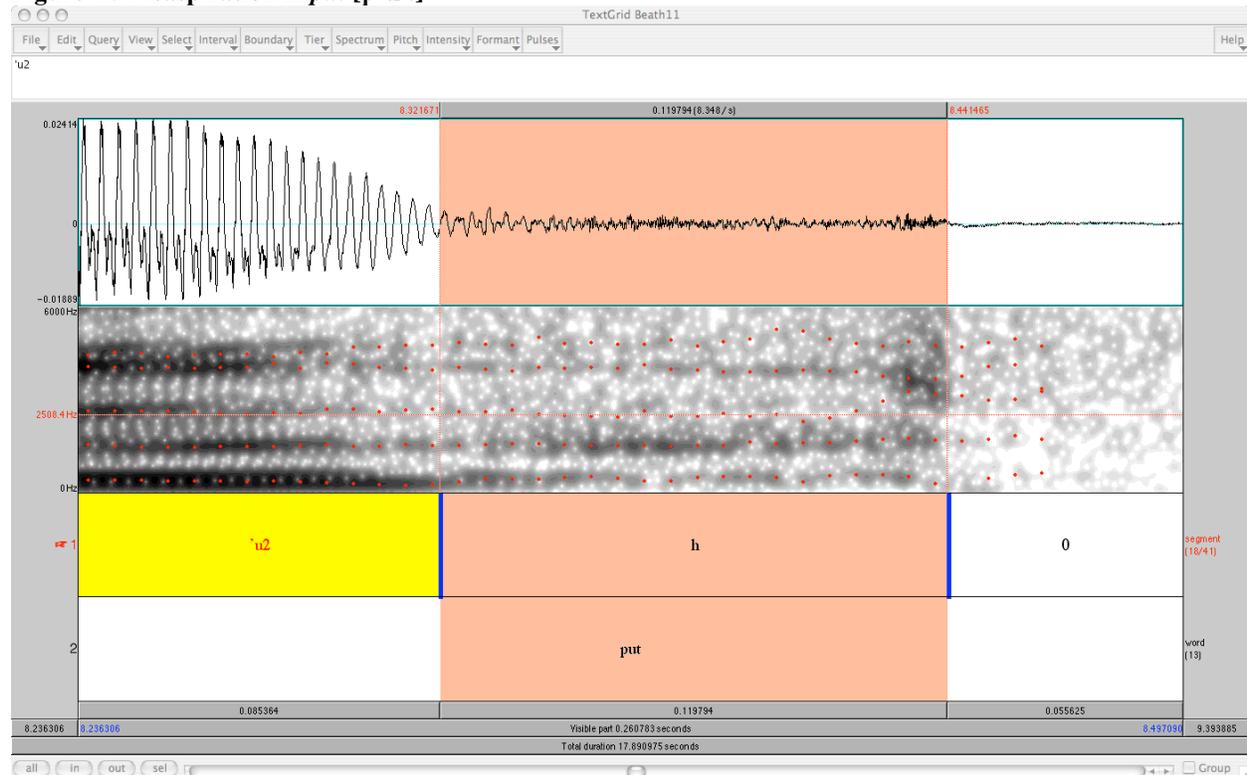


Table 1. Stimuli

	labial	dental	velar
t ^h V	put /p ^h u ^h t/ 'buoy'	tog /t ^h ok/ 'raise'	cop /k ^h o ^h p/ 'foam'
Vt ^h	cnap /k ^h na ^h p/ 'knob'	brot /pro ^h t/ 'soup'	breac /prea ^h k/ 'salmon'
Vt ^h V	copag /k ^h o ^h pak/ 'weed'	bata /ba ^h ta/ 'stick'	poca /p ^h o ^h ka/ 'bag'
t ^h V:	pòg /p ^h o:k/ 'kiss'	tùch /t ^h u:x/ 'make hoarse'	càbag /k ^h a:pak/ 'cheese'
V:t ^h	pàp /p ^h a: ^h p/ 'Pope'	bòt /po: ^h t/ 'boot'	bòc /po: ^h k/ 'puff'
V:t ^h V	ròpach /ro: ^h pax/ 'squalid'	bàta /pa: ^h ta/ 'boat'	pràcais /p ^h ra: ^h kɪʃ/ 'chit-chat'
tV	bac /pa ^h k/ 'hollow'	dad /tat/ 'jot'	gob /kop/ 'beak'
Vt	cab /k ^h ap/ 'gob'	ged /ket/ 'though'	cog /k ^h ok/ 'fight'
VtV	clabog /k ^h lapok/ 'bargain'	spadag /sp ^h atak/ 'quarter'	daga /taka/ 'pistol'
tV:	bò /po:/ 'cow'	dòcha /to:xa/ 'probably'	gèadh /ki:ax/ 'goose'
V:t	còb /k ^h o:p/ 'plenty'	clàd /k ^h la:t/ 'wool comb'	bròg /pro:k/ 'shoe'
V:tV	cùbaid /k ^h upitʃ/ 'pulpit'	fàdadh /fa:tax/ 'kindling'	brògan /pro:kan/ 'shoes'

Figure 2. Preaspiration in put [p^hu^ht]



3) Results

Via mixed-model ANOVA, Figs 3 and 4:

- a) Preaspiration length is greater after short vowels than long ($t = -7.38$, $df = 189$, $p < .0001$)
- b) Final position is more favorable to preaspiration than medial position ($t = 6.62$, $df = 189$, $p < .0001$)
- c) (Medial: avg. 112 ms VCV, 70 ms in V:CV; Final: 160 ms VC, but 100 ms in V:C)
- a) Confirming Ladefoged et al (1998), and contra Shuken (1980: 209), there is a significant effect for place of articulation. Preaspiration in labial consonants (89ms) is shorter than dentals (110ms) ($t = 3.6$, $p = .0004$), and that in dentals is shorter than in velars (138ms) ($t = 3.78$, $df = 189$, $p = .0002$); unlike Ladefoged et al. (1998), who report no significant difference between dental and velar stops.

4) Conclusions

Experimental findings show that all three factors considered (V length, position, POA) exert significant effects on the duration and frequency of preaspiration.

The frequent omission of preaspiration in certain environments (especially in labial stops, especially in medial position after long V's) suggests that a merger may be underway in the affected dialects (consider dialect region 4, Figure 1, where such a merger seems already to have occurred).

Preliminary results not reported here suggest that omission is more common among younger speakers, but the small number of participants prohibits a definitive statement to this effect.

- a) > Age-related variation: interesting area for further investigation
- b) > Variation by dialect also; both studies require a much larger sample size than that available for this study.

Figure 3. Duration of Preaspiration

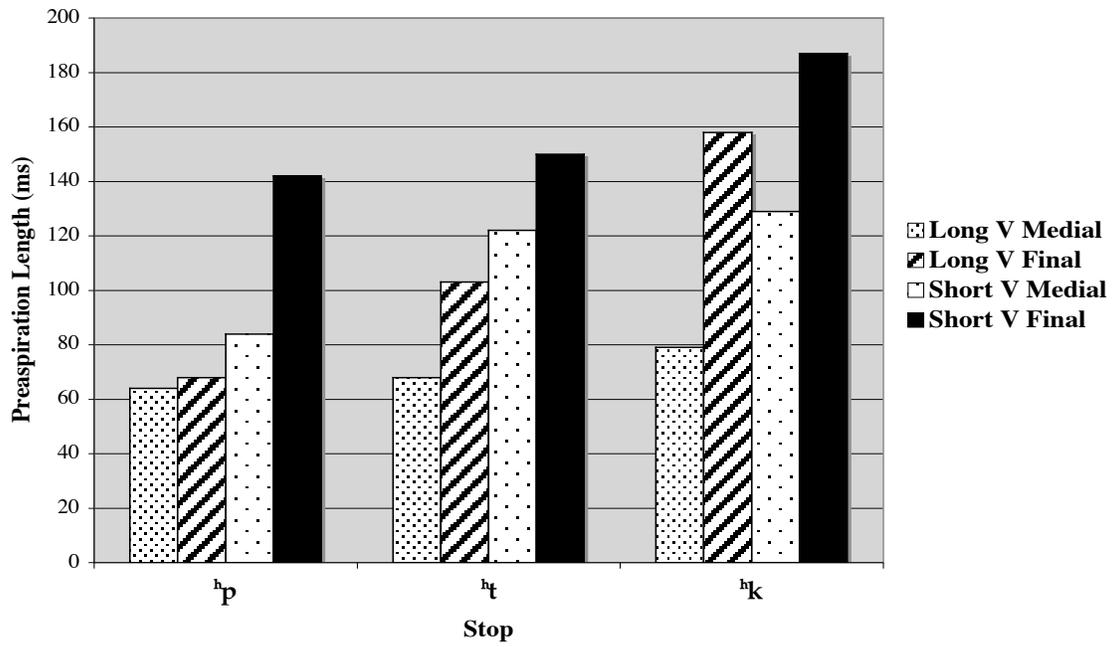
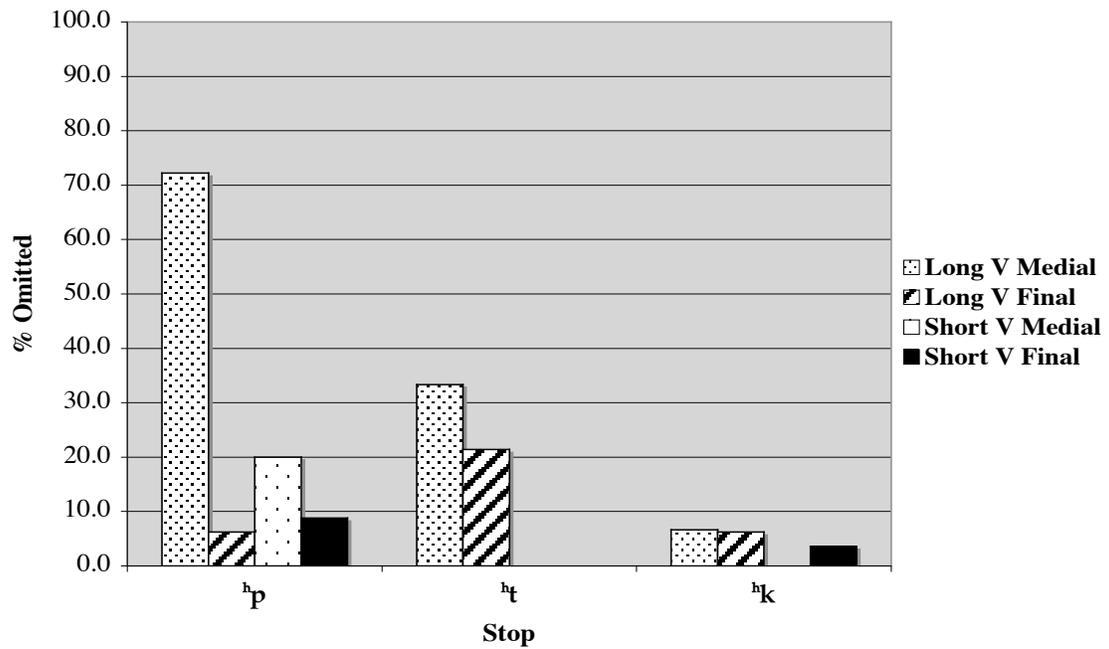


Figure 4: Omission of Preaspiration



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