Sonorant-conditioned mid vowel lowering in Turkish

In Turkish, realisations of the front mid vowels /e ø/ are conditioned by the following coda, with sonorants lowering preceding vowels, as in (1).

(1) /ben/   [bæn]   'I'   /dørt/   [dœrt]   'four'
     /erdem/ [ær.dæm] 'virtue'   /tørpy/   [tœr.py] 'file'
     /beʃ/   [beʃ]   'five'   /tʃøp/   [tʃøp]   'rubbish'

Reports in the descriptive literature (e.g. Göksel & Kerslake 2005) do not address the generality and categoricity of this pattern. Vowel lowering in closed syllables or before a rhotic coda is widely attested (e.g. French, Catalan /e/ (Bradley 2010), Swedish /ɛ/ and /ø/ (Riad 2014), Faroese /e/ (Árnason 1999), /o/ in various Swiss German varieties (Keel 1982, Janda & Joseph 2001, inter alia); however, the Turkish case presented here is distinct as it generalises to all [+sonorant] finals.

Our (ongoing) experimentation samples 7 female and 2 male Turkish speakers, all resident in the UK at the time of consultation. Two age ranges were represented: those clustered around 35 (range 31–38) and those clustered around 20. Speakers read a list of 190 items in isolation, and 35 sentences containing tokens of /e ø/ embedded in varied environments; F1, F2 (at the mid-point of the vowel) and duration were measured. Production data confirm that that speakers have two categorically distinct realisations of /e/ conditioned by the following coda (save a single speaker from far Eastern Turkey who shows some gradient lowering, especially before /r/, but no categoricity). /e/-realisations preceding a coda sonorant do not overlap with those in other environments. No speakers show predictable lowering of /o/; the state of /ø/ is more variable, however. For some speakers, /e/ is the only target of pre-sonorant lowering; for some others, a significant effect on /ø/ can be seen (e.g. (1)), though categoricity is less convincing. For the youngest speakers, /ø/ appears to be categorically lowered (Fig. 3). /ø/-lowering is most significant before coda /r/; this may partly be an effect of relative lexical frequency but might also indicate that pre-rhotic lowering is the phonetic precursor to this change.

Across all environments, the following (gradient) generalisation holds: F1(obstruent) < F1(open) < F1(sonorant), i.e. pre-obstruent /e/s are highest, pre-sonorant /e/s are lowest. This is distinct from the ordering that we see for /ø/ for our older group (Fig. 2), for which F1(open) << F1(obstruent, sonorant). For younger speakers (Fig. 3), it seems that the ordering for /ø/ is converging towards the ordering for /e/. Younger speakers seem to show categoricity in /ø/-lowering, tighter clustering in the obstruent–open–sonorant split in /e/ and much more overlap between lowered /e/ and /ɑ/.

We see two sets of apparent exceptions to the /e/-lowering rule. In a few very high-frequency items (determined as per the Turkish National Corpus, Aksan et al 2012), we see some optionality, entirely absent from any lower-frequency items not governed by other exceptions: *kendi* 'myself' [kæn.di]~[ken.di], *önemli* 'important' [ø.nem.li]~[ø.næm.li]. Second, independent of frequency, /e/ in word-initial sonorant-coda syllables resists lowering, but only in a word of sufficient size (trisyllabic or larger): [**el**.bi.se] 'dress', [**ʃem**.si.je] 'umbrella'. Affixation does not affect this exceptionality in either direction, suggesting that we do not have a straightforward case of positional faithfulness; exceptional items remain exceptional under affixation, and non-exceptional items remain non-exceptional.

This seems to be a clear and traceable change in progress. In the apparent initial system, the front mid vowels are *highest* in open syllables; in the final system, pre-obstruent vowels are highest and pre-sonorant vowels are lowest, with /e/ ahead of /ø/ for all speakers. Speakers at an 'intermediate' stage in the change show a small separation between the pre-*rhotic* context and other sonorant contexts, suggesting a possible rhotic precursor; younger speakers show unequal (in magnitude) but seemingly opposed pre-obstruent raising, which we propose may indicate an *avoidance* of the established lowering, due to anti-similarity between the pre-obstruent environment and the canonical targets of the process.
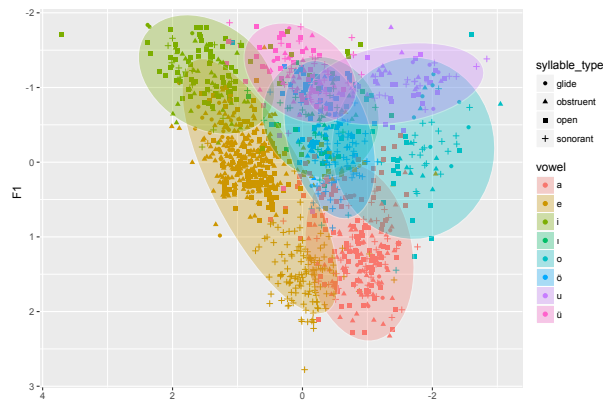
Figure 1: F1 and F2 plots for 5 participants aged 31-38 (mean 34), Lobanov-normalised, shown with 95% confidence ellipses. Note that /e/ clustering by coda type is visible.
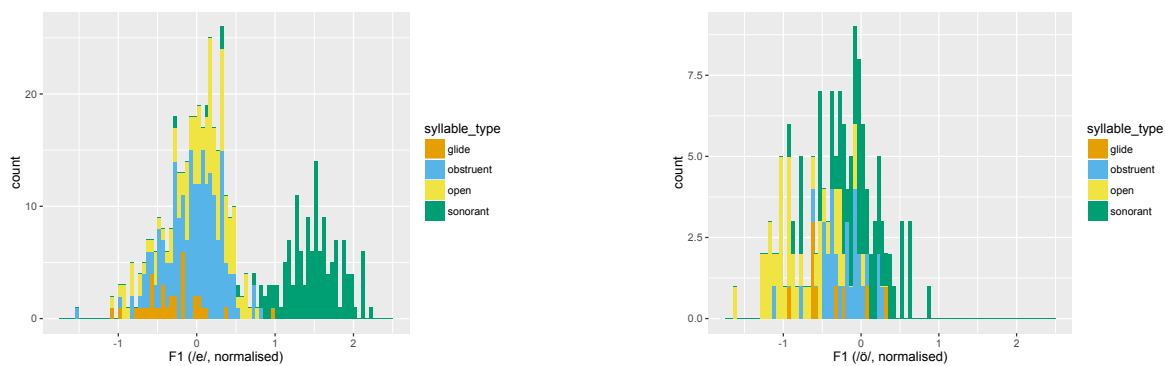

Figure 2: Histograms of normalised F1 for /e/, /ø/, for 5 participants aged 31–38.
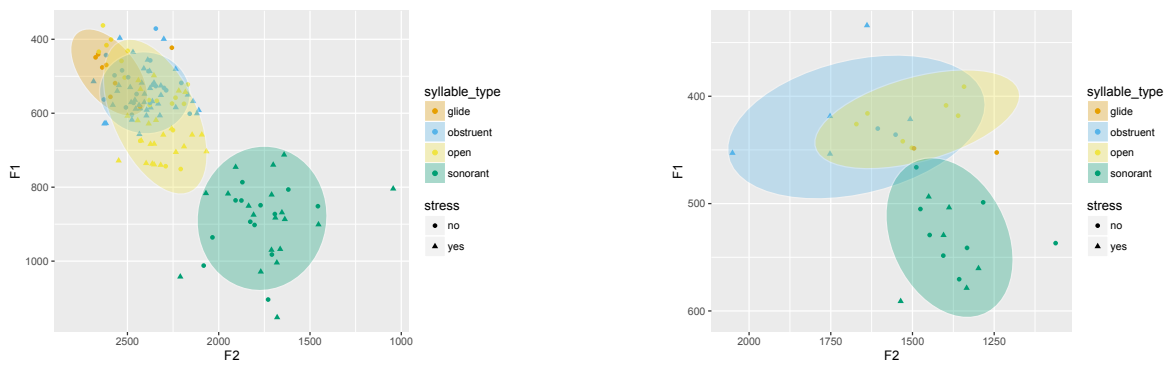

Figure 3: F1 and F2 (non-normalised) for /e/ (left), /ø/ (right), for one speaker aged 20. Note that the pattern in /ø/ appears to be converging with the well-established pattern in /e/.

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