When glides are obstruents, or Turkish [j]

Stefano Canalis, Semra Özdemir, Utku Türk & Ümit Tunçer
Boğaziçi University

Traditionally, phonological features have been assigned three roles: capturing contrast, capturing natural classes, and providing information for the phonetic realization of segments. However, in the last few years growing evidence has revealed that the instantiation of identical feature specifications is not constant across languages, and speakers know fine phonetic details of their own language that are neither universal nor automatic (among many others, see Cohn 2011 for a summary). This casts doubt on the motivation for the latter task.

An alternative view (not far from the structuralist interpretation of phonological features – see e.g. Jakobson, Fant & Halle 1952) is that phonological features only account for contrast and natural classes. While their definition must ultimately include reference to phonetic properties, such properties are only relative and contextual; they do not refer to specific articulatory configurations or positive acoustic attributes, but only to phonetic differences among segments. One implication of this viewpoint is that the same feature may have rather different phonetic realizations cross-linguistically. This may be especially relevant for segments that are notorious for their varied behaviour cross-linguistically, such as the class of glides (see e.g. Padgett 2008, Levi 2004) – ''[p]erhaps the most problematic segment type for all theories of phonology'' (Hyman 1985: 77).

We aim to show that the Turkish phoneme typically realized as the front glide [j] supports the view that phonological features are only relative and contextual properties. Even if the phonetic implementation of this segment *prima facie* supports its classification as [+sonorant], five different pieces of evidence suggest that it is a [–sonorant] segment, i.e. the voiced palatal fricative /j/.

1. Word-final consonant clusters. Turkish allows several [+sonorant] consonant - [–sonorant] consonant clusters word-finally: *sarp* 'steep', *dört* 'four', *mülk* 'property', *renk* 'colour', *kamp* 'camp', *harf* 'letter, character', *vals* 'walz', *şans* 'chance', and so on (see Erguvanlı-Taylan 2015: 48-50 for additional details). However, compared to [l, r, n, m], the distribution of [j] in word-final clusters is much more restricted: it only occurs in a handful of lexical items, all of them loanwords; most obstruent consonants never occur after it. Furthermore, even the few attested clusters are unstable, as an epenthetic vowel is often inserted between the glide and the preceding vowel (for example, while the accusative form of *keyf* 'pleasure' is *keyf-i* [kejfi], implying an underlying root /kejf/, its bare form is most typically realized as [kejif]).

2. Distribution of approximants. The phonological inventory of Turkish suggests that its phonetic glides are realizations of underlying fricatives. First, not only is the glide /w/ not a phoneme in Turkish, but Turkish speakers consistently adapt [w] as [v] in loanwords. Second, at least one fricative has an approximant allophone: intervocalic /v/ is realized as a bilabial approximant [β̞] when the following and/or preceding vowel is round (Göksel & Kerslake 2005).

3. Turkish [h]-deletion. Syllable-final [h] is optionally deleted in Turkish when the following syllable starts with a sonorant consonant: /fihrist/ → [fiːrist] 'index', /tehlike/ → [teːʎike] 'danger'. Again, the odd man out is [j], as [h] cannot be deleted when the following syllable starts with this segment: /myhje/ → *[myːje] 'a place name' (Mielke 2001).

4. /e/ lowering. Göksel & Kerslake (2005) report that the allophones of Turkish /e/ are [e, æ, ɛ]. [ɛ] occurs word-finally and [æ] occurs before tauto-syllabic /l/, /m/, /n/, /r/, but not before [j]. Gopal and Nichols (2017) instrumentally confirm that [j] does not trigger lowering. We carried out a similar study with data from 9 Turkish speakers, and our results fully align with Göksel & Kerslake's (2005) description and Gopal & Nichols' (2017) results.

5. Phonetics. A preliminary phonetic survey suggests that Turkish [j] can have friction, at least in some environments. While it is realized as an approximant in most cases, we found that it is

optionally devoiced utterance-finally, with concomitant noise at high frequencies typical of fricatives (see Figure 1). We measured the harmonics-to-noise ratio of word-final glides produced by 8 Turkish speakers, either within or at the very end of a carrier sentence. In the former condition, the average HNR was 12.85 dB, but it dropped to 6.6 dB utterance-finally. It is true that other Turkish consonants optionally and partially devoice utterance-finally. However, glides do not pattern with sonorants in this case either. While /ɾ/ and /l/ may devoice (see e.g. Kornfilt 1997, Göksel & Kerslake 2005, Nichols 2016) utterance-finally, nasal consonants do not, whereas utterance-final [z] may be devoiced as well. Therefore, the feature [+continuant] defines the class of consonants undergoing optional utterance-final devoicing (as is well known, Turkish stops and affricates devoice word-finally and obligatory).

In each of the circumstances discussed above, [j] does not pattern with sonorant consonants. It could be argued that, since [j] is supposedly [–consonantal], we could express the group of segments in 1., 3. and 4. as the natural class [+sonorant, +consonantal]. But, even ignoring significant arguments against the use of the feature [consonantal] (see e.g. Hume & Odden 1996), this would not explain why [j], higher in the sonority scale than all the other consonants, cannot enter into complex clusters while liquids and nasals can. We conclude that the Turkish 'glide' is [+continuant], but not [+sonorant]: it is an underlying voiced palatal fricative. Concerning the apparent paradox of assuming an underlying /j/ that never surfaces as such, but is realized either as an approximant or as a voiceless segment, a phonetic motivation may be invoked. Frication and voicing are to some extent mutually exclusive (Johnson 2012: 156); the former requires a high volume velocity to produce turbulent noise, while the vibration of the vocal folds impedes airflow through the vocal tract.

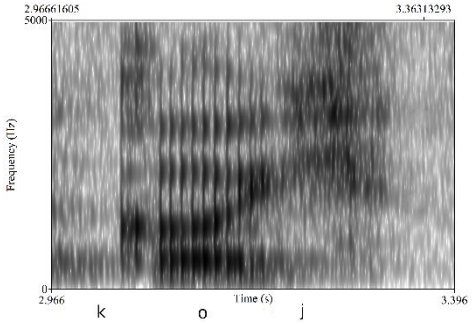

Figure 1: Spectrogram of a devoiced and fricativized Turkish 'glide' in *koy* 'bay'

References

Cohn, Abigail. 2011. Features, segments, and the sources of phonological primitives. In G. N. Clements and R. Ridouane (eds.), *Where do features come from?* Amsterdam, John Benjamins: 15-41

Erguvanlı-Taylan, Eser. 2015. *The phonology and morphology of Turkish*. Istanbul, Boğaziçi Üniversity Press.

Göksel, Aslı & Celia Kerslake. 2005. *Turkish: A comprehensive grammar*. New York, Routledge.

Gopal, Deephti & Stephen Nichols. 2017. Sonorant-conditioned mid vowel lowering in Turkish. Paper presented at the 14th OCP, Düsseldorf, 20 February 2017.

Hume, Elizabeth & David Odden. 1996. Reconsidering [Consonantal]. *Phonology* 13(3): 345-376.

Hyman, Larry. 1985. *A theory of phonological weight*. Dordrecht, Foris.

Jakobson, Roman, C. Gunnar M. Fant & Morris Halle. 1952. *Preliminaries to speech analysis: The distinctive features and their correlates*. Cambridge (MA), MIT Press.

Johnson, Keith. 2012. *Acoustic and auditory phonetics, 3rd ed*. Malden (MA), Wiley-Blackwell.

Kornfilt, Jaklin. 1997. *Turkish grammar*. London, Routledge.

Levi, Susannah V. 2004. *The representation of underlying glides: A cross-linguistic study*.

Mielke, Jeff. 2001. Explaining directional asymmetry in Turkish [h] deletion. *Working Papers in Linguistics* 55: 117-171.

Nichols, Stephen. 2016. An acoustic study of the Turkish rhotic. Poster presented at the 5th International Workshop on Phonetic, Phonological, Acquisitional, Sociolinguistic and Dialect-Geographic Aspects of Rhotics, Leeuwarden 18-20 May 2016.

Padgett, Jaye. 2008. Glides, vowels, and features. *Lingua* 118(12): 1937-1955.