Structural concomitants of final vs. non-final stress reveal how two separate stress systems evolved in Turkish: Evidence from a database study

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Word-level accentual prominence in Turkish has long been a controversial issue especially due to its complex interaction with morphosyntax and the lexicon. However, there is much agreement that Turkish hosts two co-existing accentual patterns, one deriving the canonical "final stress" (FS) and the other the "non-final stress" (NFS) although theories differ greatly in the precise mechanisms that dock prominence on these positions (cf. Kabak & Vogel 2001, Inkelas & Orgun 2003). There is also lack of agreement as to whether word-level accentual phenomena in Turkish can be better handled within a pitch-accent or a stress-accent system. Nevertheless, while FS has unequivocally been associated with a default, weight *insensitive*, right edge-oriented stress assignment system (e.g., *kitáp* 'book', *kitap-lár* 'books', *kitap-lar-dán* 'from books', etc.), NFS has been considered to radiate properties of "exceptional stress" although NFS is known to interact with other properties such as morphological structure (e.g., some morphemes are 'pre-stressing', e.g., *kitáp-la* 'with a book'), weight sensitivity (a sub-set of words are subject to the so-called "Sezer Stress Rule" (SSR) that docks stress on the heavy antepenult when the penult is light, otherwise on the antepenult, e.g., *péncere* 'window', *galáksi* 'galaxy'), and lexical class (e.g., place names are typically subject to SSR, e.g., *Istánbul*). Previous work has even gone so far to suggest that NFS and FS may fall out from two separate accentual systems, with different phonetic realizations (Levi 2005), shunting the distinction to the stress vs. pitch accent dichotomy (e.g., Kamali 2011, Güneş 2015), or to the "footbased" vs. "footless" lower-level prosodies (Özçelik 2014). Little attention however has been paid to the question as to what led to the emergence of the two distinct systems, and how NFS has managed to coexist with FS despite the overwhelming pressure from the latter.

Here we ask whether the two systems may correlate with distinct phonological concomitants in terms of segmental and syllable structure in the lexicon. Our hypothesis is that if FS and NFS are linked to static patterns that are reliably distinct, this may be indicative of a principled separation of the two systems and thus provide us with cues for their evolution and coexistence. Expanding on Çakır (2000), who provided an extensive investigation of some phonological characteristics of NFS words in the lexicon, we compare the phonological structure of the two systems on the basis of a large database of FS and NFS words taken from the Turkish Electronic Living Lexicon, which were carefully reduced to approximately 10,000 morphologically simplex forms and annotated for syllable structure, vowel quality and quantity, and sonority.

Largely in accordance with Çakır (2000), our analyses showed that approximately 1 out of 10 simplex words in the database bears NFS, indicating the extent of the exceptions to FS in the lexicon. Strikingly, both NFS and FS words show weight sensitivity in stress placement, which has hitherto been postulated only for the SSR that accounts for 73% of the words with NFS in our database. Closer inspection of word final syllables reveals that 62% words with NFS end in a light syllable while 72% of FS words end in a heavy syllable, creating a structural asymmetry between NFS and FS words at the right edge. Another overwhelmingly salient segmental correlate of FS is the presence of a long vowel within a word: About 96% of words with a long vowel, irrespective of its position, are finally stressed (e.g., [tidʒa:rét] 'commerce'). At first sight, this may be puzzling since a great majority of words with long vowels are loans, and there is a significant correlation between loans and NFS in our database.

We argue that such significantly distinct patterns in the lexicon may shed light on the co-evolution of what appears to be two distinct stress systems on the surface. The fact that Turkish simplex words are replete with heavy final syllables can be linked to phonological factors such as the bimoraic minimality condition. Closer inspection of inflectional and

derivational suffixes reveals that the same pattern is very likely to recur in morphologically complex words (at least at the same magnitude) since we find that close to 70% of 230 monosyllabic derivational and inflectional suffixes constitute also heavy syllables. We suggest that this salient structural asymmetry at the right edge facilitated the arguably top-down and intonationally-driven native accentual system to accommodate loans with NFS, eventually leading to a complete reanalysis of prominence assignment in Turkish.

In particular, we argue that, despite constituting the majority pattern, heavy final syllables in native words lacked the necessary condition to allow weight sensitivity to become an active part of the phonological grammar since syllable weight was only incidental to the canonical, top-down, final prominence. The influx of loans with NFS from European languages, however, increased the variance in the prominence patterns across the board, leading to a restructuring of the accentual system as the language user had to look for potential structural cues in order to regularize the system. We suggest that an association between the constraints ensuring weight sensitivity and extrametricality could be established to predict NFS in these words since (i) the majority of them had a light final syllable, and (ii) this contrasted with the majority pattern in the native system, thereby yielding the necessary negative evidence to boost up the strength of these two hitherto "inactive" constraints. We show that this reanalysis has indeed led to an overgeneralization of NFS in some cases: Despite having final prominence in the donor language (French), some loans with light final syllables bear NFS in Turkish (e.g., *dépo* 'depot', *máyo* 'swimsuit'). Consequently, prominence in NFS words was interpreted to have moved from the right edge due to valid structural reasons, gradually giving NFS and FS the appearance of two different mutations of the same set of principles.

As for words with long vowels, closer inspection suggests that (i) they largely originate from Arabic and Persian, and (ii) they are very likely to end in a heavy syllable (78.81%) when they bear final stress. Thus, their almost categorical conformity to the FS pattern in our database finds an explanation on the basis of the word accentual system of the donor languages (e.g., Persian also has word-final prominence) as well as the phonotactics of the right edge of the borrowed stems (e.g., Arabic words were most probably borrowed without the inflectional vowel at the end). Altogether, these properties have conformed not only to the native accentual pattern but also to weight sensitivity.

As such, we argue that a combination of weight sensitivity and distinct phonotactic patterns has been the impetus behind the evolution of what appears to be two different accentual systems, which eventually led to the crossover of intonationally-driven final boundary tone to stress at the level of the word in Turkish. We will discuss some potential ways in which these diachronic scenarios could be implemented in stochastic phonological grammars such as the Noisy Harmonic Grammar.

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