Refining Turkish stress as a multifaceted phenomenon

Barry Kabak
University of Würzburg

1. Objectives

- Much has been said about stress assignment in Turkish, albeit with dubious characterizations of its nature and dynamics in the realm of prosodic typology and psycholinguistics.
- Unpacking the notion “accent” at the level of the word in light of psycholinguistic, cross-linguistic and diachronic evidence and refine various observations that have been made so far in the literature concerning the nature of word stress in Turkish.
- Psycholinguistic approach towards phonology: Phonology is phonetics plus memory. It deals with the organization of sounds, rhythms and melodies to explore the abstract form of sounds and constructions as stored in the mental lexicon, and how these forms facilitate articulation and processing.
- Property-driven approach to phonological typology: to characterize the same vs. different ways in which phonological properties are employed, rather than to classify languages into types (e.g., Hyman, 2009; Hyman, 2012, see also Plank, 2001).

Claims

- Word stress in Turkish, regular final or non-final, has a psycholinguistic reality. It is inert but pervasive, bearing both a lexical and delimitative function, tacked to a relatively poor pitch-based intonational inventory.
- It is futile to assume that Turkish is a pitch-accent language because arguments for pitch-accent require the presence of both accented and accentless words in the lexicon. Likewise, it is unsafe to claim that both pitch-accent and stress-accent co-exist in the same grammar to account for different location of accentual prominence within the word.
- Due to morphosyntactic complexity of words in Turkish, accentual phenomena are ultimately intertwined with wordhood and phrasehood, whereby the induction of canonical right-edge stress in language acquisition must be word-based and paradigmatic.
- Word formation and grammaticalization have been the impetus behind the morphophonologization of regular final accentual prominence diachronically, ultimately surrounding words with non-final stress.
- Non-final and final stress are an integral property of wordhood in Turkish, and must be seen as part of the same accentual system for both language acquisition and processing.

2. Turkish stress at the phonology-morphosyntax interface

> Initial, final, or no stress?

Scholarly debate on Turkish prosody began as early as the beginning of the 1900s (e.g., Lees’ excursus on Turkish stress in his 1961 book). It is generally assumed that two patterns co-exist:

<table>
<thead>
<tr>
<th>NON-FINAL (LEXICAL) STRESS-ACCENT</th>
<th>FINAL (REGULAR/FIXED/NON-LEXICAL) STRESS-ACCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Non-final stress 1</td>
<td>(1) Stemms with lexical accents:</td>
</tr>
<tr>
<td>a. sinéma</td>
<td>“cinema” (note: final accent for some speakers)</td>
</tr>
<tr>
<td>b. bébéx</td>
<td>“bébé” (cf. bébé “baby”)</td>
</tr>
<tr>
<td>c. bébéx-te</td>
<td>“in bébé” (cf. bébéx-te “in the baby”)</td>
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<tr>
<td>2. Bound morphemes with accentual specifications:</td>
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<tr>
<td>a. çocuk-ca</td>
<td>“childish” (cf. çocuk-luk “childhood”)</td>
</tr>
<tr>
<td>b. çocuk-la</td>
<td>“child=with” (cf. çocuk-la “in the child”)</td>
</tr>
<tr>
<td>c. öğren-töer-sum</td>
<td>“I am learning” (cf. öğren-di-m “I learnt”)</td>
</tr>
<tr>
<td>3. Adverbs generally have stress on their initial syllable (doğru ‘true’ vs. doğru ‘straight’ adv., e.g., Erdal 2009).</td>
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<tr>
<td>4. Regular final stress</td>
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<tr>
<td>a. tan</td>
<td>“know”</td>
</tr>
<tr>
<td>b. tan-dik</td>
<td>“acquaintance”</td>
</tr>
<tr>
<td>c. tan-dik-lar</td>
<td>“acquaintances”</td>
</tr>
<tr>
<td>d. tan-dik-lar-rım</td>
<td>“my acquaintances”</td>
</tr>
<tr>
<td>e. tan-dik-lar-rım-ız</td>
<td>“our acquaintances”</td>
</tr>
<tr>
<td>f. tan-dik-lar-rım-ız-dan</td>
<td>“from our acquaintances” (from Sezer, 1983)</td>
</tr>
<tr>
<td>5. Stem bears a lexical accent:</td>
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<tr>
<td>İstanbul-lu-la-yap-árak</td>
<td>“by being someone from Istanbul”</td>
</tr>
<tr>
<td>6. Leftmost suffix bears a lexical accent:</td>
<td></td>
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<tr>
<td>a. pre-accenting:</td>
<td></td>
</tr>
<tr>
<td>b. localy accented:</td>
<td></td>
</tr>
<tr>
<td>7. How to represent regular final stress?</td>
<td></td>
</tr>
<tr>
<td>i. “Prosodic Phonology” approach:</td>
<td></td>
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<tr>
<td>ii. “Top-down” Intonational approach:</td>
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<tr>
<td>1 How to represent non-final stress is also controversial. It is assumed to be predictable (akin to the Latin Stress Rule) in a sub-set of words (e.g., Sezer, 1983). See Inkelas (1999) for a metrical, Inkelas &amp; Orgun (2003) for a cophonology approach; Kabak &amp; Vogel (2011) for counter-arguments. I will not go into this issue in this talk.</td>
<td></td>
</tr>
<tr>
<td>2 Some of these so-called pre-accenting suffixes are arguably clitics.</td>
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</tbody>
</table>
Utterance-level prosody or word-level prosody?

- It has also been observed that “word-level stress” can be modulated by phrasal/utterance-level tonal phenomena (e.g., Göksel & Güneş, 2013).

- Morphosyntactic complexity of Turkish words:
  
  (7) Alman-lay-tr-a-ma-dik-lar-siz-dan-mi-sinz?
  
  German-der-vbl-caus-abl-neg-noml-pl-poss.pl-que-2pl
  
  “Are you one of those whom we could not Germanize?”

- Therefore, sentence-level prosody can be seen inside the “word”, yielding alternating stress (e.g., Sebütekin, 1984; Göksel & Güneş, 2013).

- It has been observed that stress location of stress when two lexically accented morpheme elements in
  
  (3) Default final vs. lexically marked accent
  
  In Turkish, compound nouns and genitive possessive noun phrases (GNPs) behave differently (Underhill 1976: 94-6). In
  
  (n)In
  
  compounds, modifiers come before the first member (Kabak 2004).
  
  For example, the Prosodic Hierarchy, Nespor & Vogel, 1986, providing support for models where word and sentence (phrase) structure mechanisms are not ordered (e.g. Ackema & Neeleman, 2004; Culicover & Jackendoff, 2005).

3. Acoustic correlates of “stress” in Turkish


- Words with final prominence exhibit a “moderate” rise in /f/ between the first and second syllable in disyllabic words. Words with initial prominence show a fall (Levi 2005, See Figure 2).

4. Theorizing phonetic evidence: A typology full of (con)fusion

- Levi (2005) argues that Turkish is a pitch-accent language (cf. Underhill 1966) on the basis of the fact that it primarily uses pitch for both final and non-final stress (no difference, however, between the two). The other argument she has is CULMINATIVITY, which is however also found in both stress-accent and tone languages (Hyman, 2009, 2012).

- Accented syllables are realized with a H**+L pitch accent. When the accent is in final position, the pitch accent is trimmed to H* with no fall.

- Figure 2: Waveform, spectrumgram, and pitch tracks for banmak vs. hanmak, taken from Levi (2005: 80-81).

- No salient /f/ excursion is observed in word-final prominence, suggesting that /f/ is not a robust cue in that position (Konrot, 1981; Pycha, 2006; Güneş, 2015).

- Not clear what exactly the contribution of other cues such as intensity, vowel quality (2-f) and vowel duration are:
  
  - Pycha (2006): The differences in /f/, intensity, duration, and vowel quality were all shown to be significant. Since the average differences in intensity and duration between stressed and unstressed syllables were below levels that are perceptually noticeable, /f/ is considered to be the most reliable cue.
  
  - Zora et al. (2016): The first perception study so far with manipulation of duration, /f/, intensity and spectral emphasis separately. Duration indeed constitutes an acoustic cue for word stress perception although its lexical status is debatable (Komflipt 1997, Kabak 2004)

Questions

i. What is the nature of accentual prominence at the word level in Turkish, psycholinguistically and cross-linguistically?

ii. What are the ramifications of Turkish word-level accent for grammar and beyond?

iii. Can answers to these questions shed light on the prosodic typology of Turkish accentual system?
- Günes (2015): non-final stress is pitch-accent whereas final-stress is stress-accent since the final syllable does not make exhibit $\theta$ excursion (property of stress-accent).
- Kamali (2011), Günes (2015): In the nuclear position, words with canonical final accent retain a plateau throughout with no noteworthy tonal marking on the final syllable (Fig. 3) while lexically accented words, via association with $H^{+}L$, show an early fall starting from the lexical accent until the postnuclear onset. The plateau pattern for words with canonical final stress was also found for words uttered in isolation, as well as those uttered in narrow and broad focus (e.g., Günes 2013, 2015).
- In the pre-nuclear position, items carry a right edge tone, H-, regardless of whether they are lexically accented or not (hence H- cannot be an indication of a final accent).

![Figure 3](image)

Figure 3: All-new context with a lexically accented (left) and a “regular” (right) word in the nuclear position, affirmative sentence (from Kamali 2013)

- “[F]inal stress seems to be an epiphenomenon at the word level. The perception of finality is possibly a perceptual elsewhere condition, where in fact there is no tonal marking of the relevant syllable.” (Kamali, 2011: 109, see also Günes 2015).
- “Finally stressed” words in Turkish are accentless words, which are also attested in Japanese (Pierrehumbert & Beckman, 1988) and varieties of Basque (Hualde et al., 2002).
- Other cues for stress such as intensity, duration and glottal parameters were not investigated in non-nuclear positions in Levi’s work (or not investigated at all in Kamali, 2011), where pitch is known to become irrelevant for stress (cf. Sluiter & van Heuven, 1996a, b, see also Kochanski et al., 2005). For example, Gordon (2004) finds that, although useful, $\theta$ is subordinate to duration and intensity as a marker of word-level stress in Chickasaw. However, at the phrase level, $\theta$ is the most salient signal of pitch accents (see also Kochanski et al., 2005).

- So, the phonetic evidence is limited and misinterpreted.
- There is no doubt that word-final stress arises as a default hence does not need to be stored in the lexicon, but “accentlessness” or “pitch-accent” comes with some typological and empirical consequences:

**Consequences/ Predictions of a pitch-accent account**
1. If Turkish is a pitch accent language, there must be both accented and accentless words in the lexicon (e.g., Kamali 2011). Then, the so-called accentless words should behave like accentless words from a typological viewpoint.
2. Since accentless words presumably have no word-level stress, language users should treat such words as such in speech perception and processing. Likewise, if word-final stress is epiphenomenal due to some sort of perceptual illusion, we should not see any relevance of it for the phonological system and its penumbra.
3. If pitch-accent and stress-accent co-exist in the same grammar, their distinction must stem from factors other than the concomitants of lexical marking vs. phonological default.

5. Empirical and typological issues with the pitch accent account 4

**Accentless words Indonesian**
- Indonesian has penultimate stress (except if it has a schwa, then final), but these are descriptions by non-native linguists who probably imposed their L1 stress preferences. The same has been claimed for some Hungarian scholars’ descriptions of Turkish stress as having initial stress (see Lees, 1961: 71-75).
- Halim (1974): No word stress (‘word-accent’, in his terminology) but sentence-based accent. The exact position of the accents depends on the position of the relevant words in the sentence: before an internal sentence boundary, the accent falls on the final syllable of the word preceding the boundary, whereas sentence-final accents fall on the penultimate syllable of the last word of the sentence.
- van Zanten & van Heuven, 1998: In word recognition gating experiments, Indonesian listeners fare no better when presented with a stressed syllable than when presented with an unstressed syllable. No consistent syllable that is judged by Indonesian listeners to sound more felicitous when associated with prominence except for those with Toba Batak background, which has contrastive stress—(van Zanten et al., 2003).
- “In our view, the rule that drives prominence patterns in the influential Javanese variety of Indonesian is phrasal. Possibly the only phonological rule that is relevant

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4 Pitch-accent is not a coherent category; not possible to come up with an explicit definition (Hyman 2009, 2012). Recent work suggests that even in languages that allegedly have no word stress, there is metrical structure (Ko, 2013 for Seoul Korean; Duanmu, 2004 for Beijing Mandarin).
for accent location in Indonesian states that it must occur somewhere at the right edge of a phrase” (van Zanten et al., 2003: 172).

Korean

- Stress in Korean (Seoul) is controversial. Word-level stress is believed to be insignificant by most. Those who argue for it do not even agree where it surfaces.
- Jun (1995): Korean stress is not a word-level but a phrase-level stress. The location of the stressed syllable depends on its position in an accentual phrase, like in Indonesian. Stress falls on either the first or the second syllable of the phrase depending on the number of syllables in the phrase, syllable weight, and the position of the phrase in the sentence.

- True cases of accentlessness at the word level: Unstable, variable, modulated by position (and other things). Characteristically, Turkish stress is not like that.

6. Psycholinguistic and neurolinguistic aspects of Turkish stress

6.1. Stress deafness

- Recent experimental research has shown that differences in the way stress is employed in the listeners’ L1 may determine their ability to store stress information in the target language (see Altmann, 2006; Peperkamp and Dupoux, 2002 for non-native stress perception typologies).
- French speakers, who have no lexically contrastive stress in their L1, cannot reliably encode contrastive stress and therefore fail on tasks that rely on long-term memory representations of stress while they can distinguish stress on the basis of acoustic information. “Stress deafness” is therefore argued to stem from processing stress at an abstract phonological level, instead of at the psychoacoustic level (e.g., Dupoux, et al., 1997; Dupoux, et al., 2001; Dupoux, et al., 2008; Peperkamp & Dupoux, 2002; Peperkamp et al., 2010).
- Turkish speakers were also reported to have problems with identifying stressed syllables of English pseudowords (Altmann, 2006).  

Figure 6: Discriminability scores (d-prime) for English stress identification (Altmann 2006)

✓ At first sight, these findings corrobore Kamali’s assumption. However, Turkish results do not pattern with Japanese (pitch-accent) and Korean (no contrastive pitch at the word level–Jun, 1998), but with Arabic and French. Altmann (2006) considers the clustering to mirror fixed word stress (penultimate in Arabic, final in French and Turkish) vs. no stress (Japanese, Korean, Chinese), or lexical stress (English, Spanish). Classifying Turkish as a pitch-accent language or as a language that has accentless words cannot explain this crosslinguistic patterning.

6.2. Neurolinguistic correlates of final vs. non-final stress

- Domahs, Genç, Knust, Wiese & Kabak (2012): Do Turkish speakers distinguish between violations of the default stress and violations of the non-default stress patterns?
- Deviations from lexically specified accents should yield a lexical violation effect since stress in these words is processed via the lexicon.
- Deviations from regular stress, however, should yield stress violation effects observed in other languages. But, if there is no word-final stress, speakers should not regard deviations from accentless words as stress violations.
- Studies using ERPs found a late positive component (P300b), which surfaces whenever metrical violations lead to changes of foot structure (Knaus et al., 2007; Domahs et al., 2008; Knaus & Domahs, 2009).

Detecting stress violations:

- 2 word types: penultimate stress, final stress
- 3 stress patterns: antepenultimate, penultimate, final

Penult: fiyasko fiyasko fiyasko
Final: baklava baklava baklava

Behavioral data:

Oна с́ле́й Fiyaskо dёsin “Tell him/her say FIASCO”

- Accuracy rates during EEG session:
  - Turkish participants had some difficulties in judging incorrect conditions accurately, indicating problems to perceive deviant stress patterns.

Table 1: Accuracy rates in detecting stress violations

<table>
<thead>
<tr>
<th></th>
<th>Fiyasko</th>
<th>tiyatro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canonical final stress</td>
<td>72 (8)</td>
<td>82 (7.1)</td>
</tr>
<tr>
<td>Penultimate stress</td>
<td>77 (6.9)</td>
<td>100 (7.2)</td>
</tr>
<tr>
<td>Final stress</td>
<td>96 (7.3)</td>
<td>52 (7)</td>
</tr>
</tbody>
</table>

1 Highly proficient L2 English speakers heard licit English nonce words with different stress locations produced by an American English speaker and were asked to click on the stressed syllable in pseudo-transcriptions with syllable boundaries clearly marked on the computer screen (e.g., nice.boo, shou.bel.las, mid.doo.val.oy, etc.).
✓ Turkish participants had difficulties to process that *final* stress can be a violation (→ regularization?),
✓ Words with canonical final stress when produced with incorrect stress were however accurately detected. This behavior could not be captured if such words were accentless.

**ERP data:**

Figure 5: Grand averages of event-related potentials (ERPs) obtained for words with canonical final stress (LEFT, e.g., *baklava*) and canonical penultimate stress (RIGHT, e.g., *tiyatro*). The correct condition (solid line) is plotted against the incorrect conditions (adopted from Domahs et al., 2012).

- Deviations from final stress (i.e., violations with antepenultimate and penultimate stress, e.g., *baklava, *baklava) evoked a significant positivity. Deviations from non-final stress with final stress (e.g., *tiyatro), however, evoked a negativity effect between 500 and 750 ms, but no positivity effect at all.
- Violations with final stress produce higher costs in the lexical processing of such words. The N400-type effect reflects that participants notice a lexical deviation, suggesting that non-final stress is lexical a la Kabak and Vogel (2001). This is particularly remarkable because the words were also presented orthographically.
- In German, a stress language, a finally stressed word with a deviant stress pattern, yields a P-300 type, a metrical structure violation component.footnote

**Zora et al. (2016):** Largely confirm these findings with words and pseudowords presented in a multi-deviant odd-ball paradigm in an EEG study:

Real word: beBEK, beBEK... BeBEK

Pseudoword: deDEK, deDEK... DeDEK

- They find differences between words and pseudowords: While eliciting a frontally maximal mismatch negativity (MMN) in real words, f0 manipulations elicited a frontal positivity, interpreted as a P3a response, in pseudowords. This f0-related positivity in pseudowords was considered to be a P3a response, an indication of involuntary allocation of attention to salient pitch changes. In contrast, MMN shows lexical access and the recognition of a lexical difference (e.g., between *Bebek* ‘a place name in Istanbul’ and *bebek* ‘baby’).

7. Functionality: Dynamic vs. inert stress, delimitative stress

7.1. English

✓ Stress has a phonetic effect on segmental phonology (flapping in General American English; vowel reduction in unstressed syllables)
✓ Morphology also dictates certain stress properties. For example, *al derivatives are known to come from verbs with non-initial stress (e.g., *arrive-al vs. *enter-al).
✓ Stress interacts with morphology (a-prefixing), word-formation (explicative inflection; *enteral) and even phrase formation (*sweet and sour).
✓ Stress correlates with word-class distinctions (roughly, verbs have final, nouns have initial stress tendency: PUSH up vs. push UP. Record vs. rCORD).
✓ A-prefixing in Appalachian English is sensitive to stress. A-prefixing is illicit with verbs carrying non-initial stress (e.g., *a-talking vs. *a-remembering). Even native speakers of General American English, who do not have a-prefixing in their variety, have been shown to respect this stress constraint in an acceptability task (Kabak & Meemann 2013).
✓ The influence of stress (and its penumbra) on word segmentation has been widely demonstrated (e.g., Cutler and Norris 1988, see Cutler for a review).
✓ Harris and Perfetti (2016): Misspellings are more likely to be detected in a stressed syllable than in an unstressed syllable if the misspelled word was highly predictable from context.

7.2. Turkish

- Very limited contrastive function: Only a handful of minimal pairs (e.g., *Bebek vs. *bebek). Note that, in the absence of vowel reduction, this is also the case for English.
- No salient effect on segmental quality; no interaction with vowel harmony or any other segmental process.
- No clear use for word class distinction except for some adjective vs. adverb pairs, where the latter receives initial stress (Erdal 1999). Verbal roots never have irregular stress but that is epiphenomenal because they are unlikely loans in Turkish (Kabak & Plank 2012).
- No interaction with word or phrase formation.
- No consistent pattern in the use of stress in Turkish poetry. Although Börekçi (1995), citing Miran (1966), suggests that many different types of verses were used in (historical varieties) of Turkish, including accentual verse, accentual-syllabic verse, as well as Arabic verse (venmi-aruzu), it is not clear whether the fixed number of stresses per line is due to fixed morphosyntactic structures that get repeated every other line.
- More research is necessary here. In a recent project, we are investigating alignment between stressed syllables and musical prominence in Turkish makam music (Kabak & Domene Moren, in prog.).

Delimitative function: Kabak et al. (2010); Ommen (2016) (see below)

- Stress is dynamic in English, whereas it is inert in Turkish.
- Even Russian, a truly word-stress and even a truly lexical-stress language at that, displays no influence of metrical structure on morphophonology: No weight sensitivity; no clearly agreed foot structure; vowel reduction patterns are not
straightforwardly accounted for by a particular type of foot structure; no foot-based reduplication, etc. (Lavitskaya & Kabak, 2014; Lavitskaya, 2015).

Absence of constraints and processes that refer to stress or metrical structure should then not be an argument against stress-accent at the level of the word.

7.3. Delimitative function of Turkish stress

- Sound and rhythmic alternations that typically characterize phonological wordhood in individual languages provide pervasive cues for word segmentation (e.g., Cutler and Norris, 1988; Peña et al., 2002).
- Edge-demarcation function of stress in a given language should then signal the language user the existence of word onsets or offsets relative to the position of the stressed syllable in the speech string (e.g., Vroomen et al., 1998 for Finnish).

Figure 7: Edge-demarcation by stress signals word boundaries

- Kabak, Maniwa & Kazanina (2010): 5-syllable CVCVCVCVCV auditory sequence with a trisyllabic non-word pre-target string and a non-word disyllabic target (Figure 8) placed in different positions in the sequence. Items were synthesized based on the voice of a German male speaker using a diphone-based speech synthesizer.

Figure 8: Stress and harmony manipulations in Kabak et al. (2010)

Figure 9: Mean response times for French and Turkish speakers (Kabak et al. 2010)

- Stress information in French and Turkish can facilitate speech segmentation by cueing word boundaries despite the fact that it does not promote (arguably, it even demotes) word onsets.
- Final stress has a demarcative function in Turkish and serves as a reliable cue. If the majority of words were accentless, showing no f0 rise in the nuclear position, edge-demarcation function would not be so salient.
- van Ommen (2016) extended the task in Kabak et al. (2010) to other languages, namely Hungarian (fixed, peripheral, left), Polish (fixed, penultimate, right), Dutch (variable, penultimate, right) and Turkish (variable, peripheral, right), replicated the Turkish results and showed that the use of stress in segmentation is language-specific and not due to universal effects (Fig. 10, left).

- She additionally shows a facilitative effect for Turkish speakers when the target word conformed the native final stress pattern, i.e., they responded faster to targets with the final-stress pattern as opposed to those with initial stress (Fig. 10, right).

Figure 10: Effect of stress pattern on context (Left) and on target per language (from van Ommen, 2016: 59-60)
8. Emergent final stress: Processing, language acquisition and diachrony

8.1. Evidence from optimal prosodic units in segmentation

- van Ommen (2016): also investigated how continuous speech is parsed by listeners to see whether the segmentations show any particular stress pattern that is comparable to those patterns in their native lexicon. She used five-syllabic strings of open syllables (phonotactically legal, vowel-harmony conformed), where 2 stressed syllables were distributed in different positions (e.g., SSwww, wwwSS, wwSSw, etc.). The Turkish and Dutch participants were told that they will hear sentences in an unknown language, and were asked to type out the words they hear in each sentence (e.g., felisife—fe lisi fefi \(\rightarrow\) S [w] [w] [w]).

- There is a wealth of interesting patterns in van Ommen’s data, which index different competing forces that guide segmentation: (i) Turkish speakers preferred to type out longer words than Dutch listeners and showed a dispreference for monosyllables (ii) The most likely position for boundaries was after the second or third syllable in both languages (iii) In both languages, when the sequence had a stress clash, the most agreed segmentation was to divide the word at the site of the clash (e.g., wwwSSw).

✓ Optimal prosodic structure of Turkish words is the one where stress is rightmost (See Table 2)

<table>
<thead>
<tr>
<th>Dutch segmentation</th>
<th>Turkish segmentation</th>
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<tbody>
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<td>[w] [w] [w] [w] [w]</td>
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Table 2: Dutch and Turkish segmentation preferences by frequency/expected frequency on three most divergent experimental conditions (adapted from van Ommen, 2016: 107, 113)

- Van Ommen (2016) in a corpus study also shows that it is difficult to infer a word stress system and the relation of word stress to the boundary from continuous speech by just relying on the knowledge of prominence patterns and phrase boundaries. So, mere knowledge of syllables, prominence pattern and phrase boundaries is not sufficient to learn the stress system of a language. She suggests that more information, such as first words, is necessary.

- Here, I suggest that understanding the properties of WORD is essential. Mobility of stress to the right-edge is the cue. But, this mobility is intertwined with the morphological complexity of words in Turkish.

- In languages like Turkish and Korean, word-level segmental phenomena are highly syllable-based (see Kabak 2014). Essentially, the lack of rule application (of such process) across words (such as vowel harmony) suggest that they must strive to achieve phonological unity within a domain that we can call a Phonological Word.

- Stress and harmony are an indispensable components of words and signals wordhood. Vowel harmony is the binder, stress is the ender.

- Agglutinative morphology, which results in the vacillation of word size, must be a strong cue for the canonical right-edge orientation of stress.

- In fact, this prosodic cue has been assumed to be reason behind precocious acquisition of inflectional morphology in Turkish.

- Akus-Koç & Slobin (1985) show that Turkish 2 year-olds exhibit an exaggerated tendency of putting stress on each morpheme to mark morpheme boundaries, sometimes with pauses between morphemes, especially in long strings.

- Operating Principles (Slobin 1973): Precocious acquisition due to acoustic cues that draw attention to the ends. Turkish and other sequential agglutinative morphologies may be acquired early because their morphemes are prosodically like words—i.e., syllabic and stressed (Newport & Meier 1985).

- Word-like morphemes, which had final stress, were indeed the impetus behind the emergence of non-final stress. Diachronically, in order for stress to be lexicalized, it has to be stuck inside the word (through prosodic adjoined).

8.2. Evidence from the genesis of lexically-specified accents in edgemosost systems

- Kabak & Revithiadou (2009b): The genesis of lexically pre-specified accents in edgemost accent systems derive from edge-most accents. Conflicting directionality in stress assignment at both the word and the compound level and morphologization is responsible for their emergence, which can proliferate through the subsequent application of fusion and morphological reanalysis.

- For example, in Turkish, Basque, and Moghol, accented suffixes (i.e., those that bear specified accents) are always polysyllabic (Hualde & Bilbao 1993: 66–67), and they originate from the fusion of two reanalyzed grammatical morpheme complexes. Hence, they are never monosyllabic.

  a. Development of local accents in Rightmost systems with Leftmost compound stress (e.g., Turkish, Basque, Moghol)

  \[
  v_0v_j \rightarrow s_j \rightarrow v_{j+1} + v_3
  \]

- For example, in Turkish, aspectual/temporal markers such as -\(\acute{\text{i}}\)yor, -\(\acute{\text{i}}\)ver, -\(\acute{\text{E}}\)r\(\acute{\text{k}}\) (Banguegül, 1986; Korkmaz, 2003; Johanson, 1998b: 113-114), and the negative potentiality marker -\(\acute{\text{r}}\)\(\acute{\text{i}}\)Em\(\acute{\text{E}}\) (Korkmaz, 2003: 815) are analyzable into compositional structures.

✓ Accentlessness cannot explain the evolution of morphemes that come with an accent prespecification in Turkish.
8.3 Evidence from the “monosyllable-first” pattern

- Turkish has a large number of co-compounds. If these constructions contain a monosyllabic word, it is always the first one in the sequence.

- Prefixal emphatic reduplication

- Why monosyllabic words come first can be explained by an avoidance of stress clash at the word level:

\[ [\sigma - \sigma] \quad * [\sigma \sigma - \sigma] \]

- Word level accentual properties determine the linear ordering of words, not sentence-level.

8.4 Evidence from compounds and phrase-medial words

8.4.1 Compound stress

- In compounds and compound-like constructions, leftmost constituent is promoted (hence its stressed syllable). Analogous to lexically accented stems and suffixes, the leftmost accent wins in Turkish. When the leftmost constituent is a “regular” word, the primary stress of the compound is on the last syllable of the first word.

(12) Representation of compounds vs. phrases:

8 Turkish compounds are argued to form a recursive PrWd (Kabak & Revithiadou, 2009a), where in most cases leftmost member wins. There are also compounds with rightmost stress (e.g., *bolğu+suyur {information=count-Aor} ‘computer’)

- The degree of perceived stress in the second member yields the difference between the compound and the phrase. While the primary word stress is still perceived on the second word in phrases, it is substantially reduced, if not eliminated, on the second word in the compounds (Kabak & Vogel, 2001, see also Underhill, 1976).

- In fact, Levi’s (2002b) measurements corroborate Kabak & Vogel’s 2001 account in (10) for all speakers as far as compounds are concerned (Figure 11).

8 Even when one assumes that compounds form Phonological Phrases, final stress on the leftmost word of the phrase cannot be explained if words are accentless.

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Refining Turkish stress as a multifaceted phenomenon

- The trap on the road is blocking the sign completely.

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Figure 11: Left: a regular (coban)+lexically accented word (salıttası), Right: lexically accented (Lîvînîya)+lexically accented word (lokânîtasi) taken from Levi 2002b: 13-14.
• They further show that the ip-final syllable is still marked by a H tone when the syllable is not stressed (as would be the case in a word with non-final stress, e.g., lokânta). These results suggest that word-final stress and boundary tone are distinct.

Figure 11: Left: tuzak, Right: tuzak, taken from Ipek and Jun 2014: 395).

Conclusions

• Stress in Turkish, lexical or regular, has a psycholinguistic reality. Finally stressed words do not behave like accentless words and there is no unequivocal evidence that the language has a pitch-accent system.

• Turkic represents a canonical stress language, with primary function to mark off word boundaries and to signal wordhood. Deviations from this canon due to morphophonological weakening and subsequent grammaticalization have caused lexical marking of stress (Hyman 2012, see also Kabv and Revhitnadiou, 2009b).

• Emergent metrical patterns in speech segmentation, word order in co-compounding and compound stress speak in favor of the existence of word-level stress in non-lexically accented words in Turkish. Lexically accented morphemes that give way to non-final stress also result from once word-final stressed that gets fused into the word due to grammaticalization.

• Turkish has a different and arguably a very poor inventory of utterance level pitch events, like French (Turo et al., 2012; Braun, Galts & Kabak, 2014) and Japanese (Asano & Braun, 2012).

• Indeed, there is growing experimental evidence indicating that Turkish does not employ prosodic correlates of information structural units in the way that languages such as English and German (so-called “intonation” languages) do. For instance, syntactically isolated parentheticals are prosodically realized identically to syntactically integrated constituents such as subjects and objects (Güneş 2003, 2016).

• Furthermore, nuclei of IPs in different information structural conditions (narrow focus, all new focus, double foci) bear identical properties, a flat contour (e.g., Ipek 2011).

• Relatively low functional load of stress contrasts at the word-level and their low density, as well as the poverty of utterance-level pitch events in Turkish may explain low sensitivity to stress as observed in the form of stress-deafness.

• Word-level and utterance-level accentual phenomena co-exist. The mapping between these different components is systematic, but it does not privilege any one over the other.

• “Intonation does not exist in a vacuum, rather it has a specific place in the overall design of grammar, one that makes it quite different from the tones and metrical structure which are present at the output of the lexical phonology and with which it may co-occur” (Hyman, 2012: 350).

References


