

# Redefining the Prosodic Hierarchy\*

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## SUMMARY

It is commonly assumed that the Foot is a universal constituent of the Prosodic Hierarchy (see e.g. Selkirk 1995, Vogel 2009). This is despite the fact that (i) some languages, such as Turkish, show no phonetic evidence of foot structure, and (ii) the first utterances of many children have been found to contain no evidence of the Foot. In this paper, I argue, contra previous approaches, that the presence/absence of the Foot is parametric; whereas some languages, such as English, require every prosodic word (PWd) to have at least one foot, other languages, such as Turkish, are footless.

I propose a unified analysis of Turkish stress. I argue that the so-called regular (word-final) “stress” in Turkish is intonational prominence, falling on the last syllable of the Prosodic Word (PWd), and does not involve foot structure. Exceptional stress (mostly pre-stressing suffixes), on the other hand, does involve foot structure (trochaic). A single grammar is proposed to capture the two types of stress. It is argued that the Turkish grammar does not assign foot structure, but if certain morphemes are already footed in the input/underlying representation (UR), they are footed in the output/surface representation (SR), too, because of faithfulness to this information, thereby resulting in exceptional stress. The entire Turkish grammar is trochaic under this approach, but trochaicity is satisfied vacuously for regularly stressed morphemes, for the grammar cannot assign foot structure and these morphemes are underlyingly footless.

## 1 INTRODUCTION

It is commonly assumed that the Foot is an essential constituent of the Prosodic Hierarchy (see e.g. Selkirk 1995; Vogel 2009). This is despite the fact that children’s first utterances do not contain any evidence of foot structure. Children first go through the Sub-minimal Word stage where their utterances are monosyllabic (Jakobson 1941/68), and critically monomoraic, and these have, thus, been considered to pose a problem for the Prosodic Hierarchy (see e.g. Fikkert 1994, Demuth 1995, Goad 1997, to appear). If the Foot came as part of the Prosodic Hierarchy, and thus UG, and if children receive positive evidence containing foot structure from the beginning of the acquisition process, it is a mystery why they do not start with the unmarked form of prosodic words (PWds), words composed of binary feet. If, however, the presence/absence of the Foot was parametric, children could, then, start with footless utterances first, and can then construct the Foot based on positive evidence, that is, if the

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target language has foot structure, such as English. This would solve the problem posed by language acquisition research, but would require the existence of footless languages.

Contra much previous research (see e.g. Selkirk 1995, Vogel 2009), it is argued in this paper that the Foot is not a universal constituent of the Prosodic Hierarchy; rather, some languages, such as Turkish, are footless.<sup>1</sup> That is, the presence/absence of the Foot is parametric. Several types of evidence are presented in support of this proposal. A comparison of regular (word-final) and exceptional stress in Turkish reveals, for example, that regular “stress” is intonational prominence falling on the last syllable of prosodic words in the absence of foot structure. Exceptional stress, on the other hand, is argued to be the result of certain morphemes coming into the computation already footed in the lexicon, and being footed on the surface, too, because of faithfulness to this information. The grammar, then, assigns the other properties of this foot, such as Binariness and Foot Type, which are vacuously satisfied for regular morphemes, as they are not footed, and as the grammar has no mechanism that assigns feet or stress. The result is a unified analysis of regular and exceptional stress in Turkish.

The remainder of this paper is organized in the following way: Section 2 introduces the Turkish data that usually appear in the literature. Section 3 presents the current account (based on Özçelik 2009, to appear), and shows how it captures these data. Section 4 presents several types of evidence supporting this account. Section 5 presents additional evidence for this account from higher-level prosodic structure. Section 6, then, concludes the paper.

## 2 TURKISH “STRESS”

### 2.1 REGULAR STRESS

Primary stress in Turkish falls on the final syllable of words (e.g. Lees 1961, Lewis 1967, Underhill 1976, Sezer 1983, van der Hulst & van de Weijer 1991, Inkelas 1994, 1999, Hayes 1995, Inkelas & Orgun 1995, 1998, Kabak & Vogel 2001). This is illustrated in (1), where stress moves to the right each time a new suffix is added, irrespective of the length of the word or the rhyme profile of the syllables involved:

- (1)
- |         |           |             |                 |                    |
|---------|-----------|-------------|-----------------|--------------------|
| a.      | b.        | c.          | d.              | e.                 |
| tabák   | tabak-lár | tabak-larím | tabak-lar-im-dá | tabak-lar-im-da-kí |
| plate   | plate-Pl  | plate-Pl-my | plate-Pl-my-on  | plate-Pl-my-on-one |
| ‘plate’ | ‘plates’  | ‘my plates’ | ‘on my plates’  | ‘one on my plates’ |

### 2.2 EXCEPTIONAL STRESS

When stress is non-final in Turkish, it is considered to be exceptional (see e.g. Kaisse 1985, 1986, van der Hulst & van de Weijer 1991, Inkelas & Orgun 1995, 1998, Kabak & Vogel 2001). There are two main types of exceptional stress in Turkish. One involves *roots*, which

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<sup>1</sup> A version of this proposal was presented at NELS 40 (Özçelik 2009), and will appear in the *Proceedings of NELS 40*. The most significant difference between the two proposals is that the current one uses parameters instead of constraints, and presents additional evidence from higher-level prosody.

are pre-specified for stress. The other involves a set of *suffixes*. The focus in this paper, as with most previous research, is on the latter.

### 2.2.1 PRE-STRESSING SUFFIXES

There are two types of exceptional affixal stress in Turkish. One involves the so-called *pre-stressing* suffixes (the most widely researched type of exceptional stress in Turkish). The syllable immediately preceding these suffixes gets stressed (again irrespective of its rhymal profile), or on certain accounts (e.g. Kabak & Vogel 2001), stress placement on or following these suffixes is prevented. This is shown in (2); in each case, exceptional suffixes are underlined:

- (2) a. dinle-dí      b. dinle-dí-de      c. dinlé-me-di      d. dinlé-me-di-de  
     listen-PAST    listen-PAST-too    listen-NEG-PAST    listen-NEG-PAST-also  
     ‘He listened.’    ‘He listened, too.’    ‘He didn’t listen.’    ‘He didn’t listen, either.’

### 2.2.2 STRESSED SUFFIXES

The other type of exceptional affix involves a smaller set of *stressed* suffixes. These are always stressed on their first syllable, regardless of this syllable’s rhyme shape (compare (3a) and (3b-c)) and irrespective of what follows (see (3d)). All of them are bisyllabic, i.e. no monosyllabic stressed exceptional suffix exists (see also Inkelas & Orgun 2003), which has important consequences for our analysis, as we will see in the next section.

- (3) a. gel-ince      b. gel-erek      c. gel-iyor      d. gel-iyor-du-lar  
     come-when      come-by      come-PRES.CONT.      come-P.C-PAST-PI  
     “when he/she comes”    “by coming”    “He/she is coming.”    “They were coming.”

Several researchers have attempted to account for the facts in (2) and (3), mostly, as mentioned, focusing on pre-stressing suffixes (see e.g. van der Hulst & van de Weijer 1991, Inkelas & Orgun 1998, Inkelas 1999, Kabak & Vogel 2001). None of these studies consider secondary stress (which arises when there is more than one exceptional stress attracting suffix, see (2d), see also Revithiadou et al. 2006). Further, the fact that different phonetic cues are associated with regular vs. exceptional stress has not been accounted for: Whereas exceptional stress is cued by both a sharp F0 rise and greater intensity, final prominence involves, at best, only a slight rise in F0 (Konrot 1981, 1987, Levi 2005, Pycha 2006). In addition, puzzling questions such as why monosyllabic exceptional suffixes are always pre-stressing (i.e. never stressed like those in (3)), and why stressed exceptional suffixes are always bisyllabic and are always stressed on their initial syllable (see (3)) have typically been left unanswered. The current account strives to answer all of these questions.

## 3 OVERVIEW OF THE CURRENT ACCOUNT

On the current account, one single grammar is offered for the two types of exceptional stress, as well as for regular final stress. I propose that the exceptional stress pattern in Turkish indicates that Turkish is a trochaic language (see also Inkelas & Orgun 1998, Inkelas 1999), given that these suffixes are mostly *pre-stressing*, and never *post-stressing* (see (2)), and, if ever stressed, as in (3), they are always bisyllabic and stressed on the first syllable, never on the second. I argue, on the other hand, that the so-called final “stress” in Turkish is not stress at all, but rather is intonational prominence associated with the end of a PWD; thus, formally,

it is a boundary tone (see Pierrehumbert 1980, Pierrehumbert & Beckman 1988, Gussenhoven 2004). This is supported by the fact that regular vs. exceptional stress in Turkish have different phonetic cues (see above).

The two systems (final vs. exceptional stress) do not, however, belong, on the current account, to different cophonologies (e.g. Inkelas & Orgun 1998) nor are exceptional affixes morphemes that are targeted by lexically indexed constraints (e.g. Pater 2000). In fact, I argue that one single grammar can capture both exceptional and regular final stress: I propose that Turkish is a trochaic but footless language, and thus, in the absence of feet, Trochaicity is vacuously satisfied. As a result, given a mechanism that assigns final prominence, more often than not, stress (or rather intonational prominence) will fall on the final syllable of the prosodic word, resulting in so-called regular stress. On the other hand, certain syllables (e.g. exceptional suffixes) come into the computation as footed in the input, and have to be parsed in the output, too because of faithfulness to this information, resulting in exceptional stress. Crucially, it is not the location of a stressed syllable that is pre-specified in the UR, but, rather, edges of feet, for exceptionally stressed morphemes.

This, then, is the only difference between regular and exceptional suffixes: While both are subject to the same grammar, the latter differ in that they are already footed in the input.

To summarize so far, on the current account, though the Turkish exceptional stress system is argued to be trochaic, final prominence is not a result of (trochaic) stress; rather, it is because of the effect of an intonational prominence rule, which places prominence on the final syllable of a PWD in the absence of a foot:

(4) Final Prominence: Place a boundary tone at the end of a PWD.

This rule will, then, capture all cases of regular stress/prominence in Turkish.

Pre-stressing and stressed suffixes, on the other hand, differ from regular suffixes in that they come into the computation already footed in the input, as shown in (5)

(5) a. Inputs (URs) for pre-stressing suffixes:

i. (me) <sub>Ft</sub>	ii. (de) <sub>Ft</sub>	iii. (ken) <sub>Ft</sub>	iv. (mi) <sub>Ft</sub>
NEG	too	while	question.particle

b. Inputs (URs) for stressed suffixes:

i. (ince) <sub>Ft</sub>	ii. (erek) <sub>Ft</sub>	iii. (iyor) <sub>Ft</sub>
when	by	PRES-CONT

Given these inputs, along with a rule like (6), these suffixes will be footed in the output as they are in the input. That the rule refers to the right rather than left edge of a foot is important here in capturing the pre-stressing behaviour of monosyllabic exceptional suffixes (more on this later).

(6) Align the right edge of a foot in the UR with the right edge of a foot in the SR.

This rule ensures that a foot edge in the input will correspond to a foot edge in the output of the grammar. No additional machinery is needed. In the spirit of earlier accounts of exceptional stress that specify a stressed *syllable* in the input and require that this correspond to a stressed syllable in the output (e.g. Alderete 1997, 2001 on Cupeño), the current account

specifies *foot edges* in the input (through (5)), and requires them to correspond to foot edges in the output (through (6)).<sup>2</sup> Concerning the argument ‘foot’ versus ‘syllable’, however, it is not clear how earlier pre-specification accounts would be able to pre-specify a syllable in ways to make it stress the preceding syllable in Turkish (or the following syllable in languages with post-stressing suffixes such as Erkeč and Standard Bulgarian, see e.g. Avgustinova 1997, Halpern 1995, Baerman 2004), for stress cannot be prespecified on a non-existing syllable, or rather, on an adjacent syllable in a different morpheme (see Özçelik 2009, 2011, to appear for more on this).

Let us return to the data in (2) and (3). As these data reveal, when an exceptional suffix is monosyllabic, as in (2), it is always *pre-stressing*, never stressed or post-stressing. When an exceptional suffix is bisyllabic, on the other hand, it is always stressed on its first syllable, never on the second.<sup>3</sup> As mentioned, these data are suggestive of an analysis where Turkish stress is trochaic. That is, the parameter determining foot shape in Turkish is set to *Trochaic* (left-headed) and not to *Iambic* (right-headed):

(7) Foot shape: Trochaic | Iambic

Given (6) and (7), we can now capture the behaviour of *bisyllabic* exceptional suffixes in (3). It follows from (6) that, despite the fact that the Turkish grammar does not assign foot structure, these suffixes will be footed, not through e.g. a parsing rule (such as PARSE- $\sigma$  that parses syllables into feet), but via faithfulness to the information specified in the UR. Further, given (7), the foot will be left-headed. This is exemplified in (8a) below (repeated from (3a)), through a comparison with a regularly stressed suffix in (8b) (repeated from (1b)):

(8) a. UR:	/gel-(ince)/	b. /tabak-lar/
Trochaic:	gel(ince)	tabaklar
SR:	[gel(ince)]	[tabaklar]

For *monosyllabic* exceptional suffixes, on the other hand, their pre-stressing behavior can be accounted for by the proposal that feet must be binarity in Turkish, as in the vast majority of languages. That is, Foot Binarity (Ft-Bin) is set to *Yes* in Turkish:

(9) Foot Binarity: Yes | No

If Ft-Bin were set to *No*, these suffixes would also surface as stressed. That Ft-Bin is set to *Yes*, together with the condition that states that the right edge of an input foot must correspond to the right edge of an output foot (i.e. (6)), captures their pre-stressing behaviour. Examine (10) (repeated from (2c)).

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<sup>2</sup> I believe (6) to be universal, with the directionality condition (Left vs. Right) being parametric, which can more generally capture exceptional stress crosslinguistically, but its application is revealed only in languages where underlying foot edges are present. That is, all cases of exceptional stress in the world’s languages, whether stressed, pre-stressing, or post-stressing, can likely be accounted for in this way, i.e. without specifying the location of a stressed syllable in the UR, but instead, by specifying underlying foot edges and using a rule like (6) to ensure that this information is faithfully realized in surface forms.

<sup>3</sup> There are some additional patterns that are revealed through the interaction of different exceptional suffixes illustrated in Özçelik (2009, to appear). We will only deal with the basic data here that appeared in previous literature. See Özçelik (to appear) for a more detailed analysis (see also Note 6).

- (10) UR: /dinle-(me)-di/  
 Align-Right: dinle(me)di  
 Ft-Bin: din(leme)di  
 Trochaic: din(léme)di  
 SR: [din(léme)di]

Finally, since when more than one exceptional suffix is available in a word, it is the stress of the leftmost one that surfaces as primary (Inkelas & Orgun 1998, Inkelas 1999, Kabak & Vogel 2001), End-Rule must be set to *Left* in Turkish:<sup>4</sup>

- (11) End-Rule: Left | Right

Given this, we can now capture data like (2d), too, repeated here as (12a) (see also (12b)). When there is more than one foot available, the head of the leftmost foot bears primary stress:

- (12) a. din(léme)(dide)    b. an(láma)dı(làrmı)

On the other hand, as mentioned earlier and assuming the parametric status of the Foot, the Turkish grammar itself cannot assign any foot structure, as is evident from the behaviour of regular final “stress”. Therefore, in the absence of input feet, words are not footed on the surface. This suggests, on a parametric view of the Foot, that the relevant parameter, which I will call the Footed parameter here, is set to *No* in Turkish:

- (13) Footed: Yes | No

In sum, then, it is only when an input foot is available (as in (5)) that the Turkish grammar can assign binary weight-insensitive trochees.

#### 4 EVIDENCE FOR THE CURRENT ACCOUNT

As stated above, I analyze Turkish final stress as intonational prominence falling on the last syllable of the PWD. In addition to its descriptive and explanatory advantages (see above), there are two types of independent motivation for this, which can be categorized under inclusionary and exclusionary criteria as follows.

##### 4.1 INCLUSIONARY CRITERIA

Inclusionary criteria include, first of all, the fact that the acoustic cues for the two types of prominence (final vs. exceptional) are not the same; as mentioned above, whereas exceptional stress seems to be true foot-based stress in that it is cued by both a sharp F0 rise and greater intensity (Konrot 1987, Levi 2005, Pycha 2006), final prominence is, at best, marked only a slight rise in F0 (Levi 2005, Pycha 2006). For some speakers, there is no rise at all; there is

<sup>4</sup> Most previous research does not deal with the issue of secondary stress in Turkish. The issue is not critical for the purpose of the current proposal. That main stress falls on the leftmost foot can be captured through Leftmost-Wins, too, as was done by Inkelas & Orgun (1998) instead of End-Rule-Left, if secondary stress is to be ignored. It should be noted, however, that secondary stress cannot be captured through certain accounts such as that of Kabak & Vogel (2001), where no stress is expected after the first pre-stressing suffix (see Özçelik 2011, to appear for more on this).

instead only a plateau (Levi 2005). In fact, some studies report no robust phonetic correlates whatsoever for final “stress” (see e.g. Konrot 1981, 1987). All of this seems to suggest that final stress in Turkish is nothing more than a slight optional pitch rise, which, unlike non-final (exceptional) stress, is not accompanied by intensity. Languages that mark prominence only by a pitch rise are classified, by several researchers, as pitch-accent languages, and not as stress-accent. The latter use duration and intensity, in addition to F0 (see e.g. Beckman 1986, Ladd 1996, Hualde et al. 2002 for more information on the categorization of languages into stress-accent vs. pitch-accent). In addition, metrical prominence in stress-accent languages is obligatory; every word must have at least one stressed syllable, whereas optionality of the type observed in Turkish regular “stress” is permitted in pitch-accent languages (Hualde et al. 2002, Hyman 2006). Finally, the fact that non-final (exceptional) stress is not accompanied by duration (i.e. it is cued, in addition to a sharp F0 rise, only by intensity) is not surprising if it is trochaic, as I argue here. Trochaic feet tend to be even cross-linguistically; i.e. heads are not greater in duration than non-heads or other unstressed syllables, and duration differences, if any, are lost or are minimal (Hayes 1995, Kager 1999; though see e.g. Piggott 1995, 1998).

Can we conclude, then, based on the above discussion, that Turkish final prominence is formally *pitch-accent*? The answer is no, for pitch accents are intonational tones that appear on or near accented syllables (Gussenhoven 2004). If final prominence in Turkish were pitch-accent, we would expect it to move to the stronger exceptionally stressed syllable in contexts where there is an exceptional (pre-stressing or stressed) suffix, and therefore, we would expect no secondary stress (or rather prominence) on the final syllable in such words. This does not, however, seem to be the case; in words with exceptional stress that are long enough, final syllables bear secondary stress (see Revithiadou et al. 2006). From this, we can conclude that the intonational tone is not pitch-accent, but is instead a boundary tone, which is phonetically the same as a pitch-accent, but is attracted to the edges of prosodic constituents (see e.g. Pierrehumbert 1980, Pierrehumbert & Beckman 1988, Gussenhoven 2004 for discussion of how to categorize an intonational tone as a pitch-accent vs. a boundary tone).

This fact constitutes an additional inclusionary criterion to categorize Turkish final prominence as intonational prominence, for intonational prominence of the pitch-accent type might be confounded by ‘stress’, since the two usually co-occur, but a boundary tone can be nothing other than intonational prominence, especially if it occurs *in addition to* the other type of (trochaic) stress (i.e. in the same word). In fact, Gussenhoven (2004) argues that while not all languages show the phonetic effects of foot structure, or stress, in the same way, “it would be entirely unexpected to find a language that realized stressed syllables in phonetically conflicting ways” (p. 15). The acoustic studies on Turkish final vs. non-final stress have findings that are clearly in this direction, which is, in Gussenhoven’s words, “unexpected,” if the two types of prominence are both considered “stress” (i.e. foot-based prominence). I have argued, in this section, that they are not, and that final prominence in Turkish is instead intonational prominence (a ‘boundary tone’ to be more exact, though the exact categorization does not seem to matter much for the formal analysis presented here).

## 4.2 EXCLUSIONARY CRITERIA

In addition to the findings outlined above that seem to indicate that final prominence in Turkish is best analyzed as intonational prominence, there is evidence demonstrating that the alternative, that final prominence is foot-based (i.e. ‘stress’), should be rejected outright. Final prominence in this language looks neither like trochaic nor iambic stress (bounded or unbounded).

First, it does not look iambic, because iambic languages favor left to right iterative footing (though see Everett 2003), and they are argued to always be quantity-sensitive (see

e.g. Hayes 1981, 1995, Kager 1999; cf. Altshuler 2009). In fact, Hayes (1995) argues that iambic feet are inherently asymmetrical since the head is durationally enhanced compared to the non-head, making the foot quantitatively uneven (though this has been argued against recently, see e.g. Revithiadou & van de Vijver 1997 and van de Vijver 1998). Recall, though, that for Turkish, duration is not a good cue of final (or non-final) prominence; that is, iambs, if posited, would have to be even in this language. Further, Levi (2005) has found that, for Turkish verbs, non-final syllables are slightly longer in duration than the stressed final syllable. So, for verbs, at least, the foot would be a very strange weight-insensitive iamb of the type (HĹ), which, is indisputably unattested (see e.g. Hayes 1995). In addition, there are some (borrowed) nouns in Turkish which have inherently long vowels in penultimate position, such as *va:li* ‘governor.’ Despite the presence of the long vowel in the first syllable, regular stress falls on the final syllable. If Turkish regular stress were to be analyzed as iambic, this would, once again, constitute a weight-insensitive parse (i.e. [(va:li)] – [(HĹ)], which, as mentioned above, is unattested for iambic languages.

A trochaic analysis of final prominence can also be rejected, for analyzing it as trochaic would require a lot of stipulations, such as having final catalexis (preventing null syllables), as in Kiparsky (1991) and Inkelas (1999), or proposing empty ON syllables for vowel-final words, as in Charette (2008). An additional problem for the trochaic analysis would be the result that there are two types of trochaic stress in the same language which have different cues: exceptional stress being cued by a sharp rise in F0 together with intensity, and final stress being cued only by a slight F0 rise that is optional.

Aside from finding no evidence for final stress as trochaic or iambic, Turkish does not show other evidence of an obligatory foot constituent either. For example, it does not place any lower limit on the size of lexical words, allowing, thus, several subminimal words. Given that the well-formed foot is binary across languages (Hayes 1981, 1995), that every PWD must contain at least one foot (Selkirk 1996), and that lexical words are PWDs in the unmarked case (McCarthy & Prince 1993), one would optimally expect no subminimal words in a language that has foot structure, such as English, in which lexical words are minimally bimoraic. In Turkish, however, examples such as [su] ‘water,’ [de] ‘say,’ and [ye] ‘eat’ are all subminimal, i.e. smaller than a binary foot,<sup>5</sup> despite the fact that they are all lexical words and that all can be uttered in isolation without articles, tense markers, etc.

## 5 FURTHER EVIDENCE FROM HIGHER-LEVEL PROSODY

I have argued above that regular ‘stress’ in Turkish does not involve foot structure whereas exceptional stress is a result of the proposal that certain morphemes are footed in the input and that the input foot is preserved in the output. A number of observations were presented above in support of this proposal. There is, in addition, some evidence supporting this proposal that comes from higher-level prosody in Turkish.

We start with some background on higher-level prosody. Prosodic constituents are typically assumed to be organized into a hierarchy. In the case of higher-level constituents, PWDs are organized into phonological phrases (PPhs), and PPhs into intonational phrases (I-phrases). As with lower-level prosodic constituents, such as the Foot, each higher-level constituent has a head, either the rightmost constituent it dominates, or the leftmost, and the

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<sup>5</sup> In fact, one does not need to focus only on CV words to find subminimal words in Turkish; since neither long vowels nor codas contribute to stress assignment in Turkish (see above), any monosyllabic lexical word, including CVC, of which there are many in Turkish, can be taken as subminimal.



- (21) a. Adám **gel-dí-mi**  
 man arrive-PAST-Q  
 “Did a man arrive?”
- b. Adám **gel-dí-mi**  
 man arrive-PAST-Q  
 “Did the man arrive?”

a'. \***Adám** gel-dí-mi

In sum, these facts show, once again, that only exceptional stress involves foot structure in Turkish, whereas so-called regular stress is nothing more than optional intonational prominence

## 6 CONCLUSION

To conclude, the present account captures, within a single grammar, both regular and exceptional (pre-stressing and stressed) suffixes of Turkish. Both the regular and exceptional suffixes are subject to the same parameter settings; exceptional suffixes are different only in that they are already footed in the input. Regular suffixes vacuously satisfy the parameter settings of the grammar that act on the Foot. In other words, though the grammar is trochaic and feet are binary in Turkish, these considerations become important only if there is an input foot available, for the grammar itself has no mechanism to force syllables to be parsed into feet. If footless languages exist, as is proposed here, it is normal, and expected, for a system like Turkish to exist where the grammar assigns no feet, but when a foot is available as a result of the lexical specification of a morpheme, other parameters, which are independent of the grammar’s ability to *assign* foot structure, work in principled ways to place stress on the first syllable of that foot.

Finally, the current account is not without independent empirical support. The fact that there are no monosyllabic stressed exceptional suffixes in Turkish (i.e. ‘stressed’ despite more suffixes being added), and that stressed exceptional suffixes are always bisyllabic, and are always stressed on their first syllable (i.e. never on the second) follows directly from the current account.<sup>6</sup> Not only is the material that is footed in the input footed in the output, but this foot must abide by the other parameter settings of the grammar; it needs to be binary and left-headed. In a system that prespecifies the location of a stressed syllable instead of foot edges, the fact that the two hypothetical exceptional stress patterns are unattested would be left without an explanation (since any syllable could be pre-specified for stress in such a system).

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<sup>6</sup> Bisyllabic exceptional suffixes can also be prestressing (e.g. aksám-leyin), as it is possible for them to be footed only on their first syllable in the input (i.e. /-(1e)<sub>F1</sub>yin/). That is, bisyllabic exceptional suffixes can either be fully footed as in the examples in (5b) (i.e. /( $\sigma$ . $\sigma$ )<sub>F1</sub>/), footed on their first syllable only (i.e. /( $\sigma$ )<sub>F1</sub> $\sigma$ /), or footed on their second syllable only (i.e. / $\sigma$ ( $\sigma$ )<sub>F1</sub>/), whereas monosyllabic exceptional suffixes have only one option, to be footed on the single syllable available, as with the examples in (5a) above, i.e. /( $\sigma$ )<sub>F1</sub>/. That is, every option that should exist under the current account is actually attested, and all these are captured through the same grammar. The difference between bisyllabic exceptional suffixes that are fully footed vs. bisyllabic exceptional suffixes footed only on their second syllable is, of course, difficult to tell, since, under either option, the first syllable of a bisyllabic exceptional suffix will normally be stressed, given the parameter settings outlined in this paper, though see Özçelik (to appear), where the difference is revealed through cases in which a bisyllabic exceptional suffix and a monosyllabic exceptional suffix are immediately adjacent. What is important to note is that the prosodic grammar of Turkish proposed here takes into account the set of *all* possible inputs, in terms of footing options, and gives, as output, only those that can actually be uttered in Turkish, and filters out those that cannot, such as monosyllabic exceptional suffixes that are stressed and bisyllabic exceptional suffixes that are stressed on their second syllable.

The current approach to exceptionality avoids, for this reason, one of the most common criticisms directed against pre-specification: Unlike other pre-specification accounts in the literature which have come under attack for having too much information specified in the underlying representation (see e.g. Mester & Itô 1989 and Steriade 1995), on the current account, certain predictions can actually be made about which forms occur (or do not occur) in a given language since URs are not completely adjusted to fit the observed data.

#### SELECTED REFERENCES

- Alderete, John (2001). Root-controlled accent in Cupeño. *Natural Language and Linguistic Theory* 19. 455-502.
- Beckman, Mary E. (1986). *Stress and non-stress accent*. Dordrecht: Foris.
- Charette, Monik (2008). The vital role of the trochaic foot in explaining Turkish word endings. *Lingua* 118. 46-65.
- Demuth, Katherine (1995). Markedness and development of prosodic structure. In J. Beckman (ed.) *Proceedings of the North Eastern Linguistic Society (NELS 25)*. Amherst, MA: GLSA, University of Massachusetts. 13-25.
- Fikkert, Paula (1994). *On the acquisition of prosodic structure*. PhD dissertation, Leiden University/HIL. Published 1994, The Hague: Holland Academic Graphics.
- Goad, Heather (1997). Codas, word minimality, and empty-headed syllables. *Child Language Research Forum* 28. Stanford: Center for the Study of Language and Information. 113-122.
- Goad, Heather (to appear). Phonological processes in child speech. In J. Lidz, W. Snyder & J. Pater (eds.) *The Oxford handbook of developmental linguistics*. Oxford: Oxford University Press.
- Gussenhoven, Carlos (2004). *The phonology of tone and intonation*. Cambridge: Cambridge University Press.
- Hayes, Bruce (1981). *A metrical theory of stress rules*. PhD dissertation, MIT. [distributed by Indiana University Linguistics Club].
- Hayes, Bruce (1995). *Metrical stress theory: principles and case studies*. Chicago & London: The University of Chicago Press.
- Hualde, José Ignacio, Gorra Elordieta, Iñaki Gamind & Rajka Smiljanic (2002). From pitch-accent to stress-accent in Basque. In C. Gussenhoven & N. Warner (eds.) *Laboratory Phonology* 7. Berlin: Mouton de Gruyter. 547– 584.
- Hulst, Harry van der & Jeroen van de Weijer (1991). Topics in Turkish phonology. In H. Boeschoten & L. Verhoeven (eds.) *Turkish linguistics today*. Leiden: Brill. 11-59.
- Hyman, Larry M. (2006). Word-prosodic typology. *Phonology* 23. 225-257.
- Inkelas, Sharon (1999). The exceptional stress-attracting suffixes in Turkish: representations versus the grammar. In R. Kager, H. van der Hulst & W. Zonneveld (eds.) *The prosody-morphology interface*. Cambridge: Cambridge University Press. 134-187.
- Inkelas, Sharon & Cemil Orhan Orgun (1998). Level (non)ordering in recursive morphology: evidence from Turkish. In S. G. Lapointe, D. K. Brentari & P. M. Farrell (eds.) *Morphology and its relation to phonology and syntax*. Stanford: CSLI. 360-410.

- Inkelas, Sharon & Cemil Orhan Orgun (2003). Turkish stress: a review. *Phonology* 20. 139-161.
- Jakobson, Roman (1941/68). *Child language, aphasia, and phonological universals*. Mouton: The Hague.
- Kabak, Barış & Irene Vogel (2001). The phonological word and stress assignment in Turkish. *Phonology* 18. 315-360.
- Kager, René (1999). *Optimality Theory*. Cambridge: Cambridge University Press.
- Kaisse, Ellen (1985). Some theoretical consequences of stress rules in Turkish. *Proceedings of the 21st Meeting of the Chicago Linguistic Society (CLS 21:1)*. 199-209.
- Kiparsky, Paul (1991). *Catalexis*. Ms, Stanford University & Wissenschaftskolleg zu Berlin.
- Konrot, Ahmet (1981). Physical correlates of linguistic stress in Turkish. *University of Sussex Language Centre Occasional Papers* 24. 26-52.
- Konrot, Ahmet (1987). Stress in Turkish: is it determined phonologically or morphologically? In H. E. Boeschoten & L. T. Verheoven (eds.) *Studies on modern Turkish: Proceedings of the third conference on Turkish linguistics*. Tilburg University Press.
- Ladd, D. Robert (1996). *Intonational phonology*. Cambridge: Cambridge University Press.
- Lees, Robert B. (1961). *The phonology of Modern Standard Turkish*. Bloomington: Indiana University Publications.
- Levi, Susannah V. (2005). Acoustic correlates of lexical accent in Turkish. *Journal of the International Phonetic Association* 35:1. 73 -97.
- Lewis, Geoffrey (1967). *Turkish grammar*. Oxford: Oxford University Press.
- McCarthy, John & Alan Prince (1993). Generalized Alignment. In G. E. Booij, & J. van Marle (eds.) *Yearbook of Morphology*. Dordrecht: Kluwer. 79-153.
- Mester, Armin & Junko Itô (1989). Feature predictability and underspecification: palatal study in Japanese mimetics, *Language* 65. 258-293.
- Özçelik, Öner (2009). Exceptions in stress assignment: feet in input. Paper presented at the 40th Annual Meeting of the North East Linguistic Society (NELS 40) (to appear in *Proceedings of NELS 40*). MIT, Cambridge, MA.
- Özçelik, Öner (2010). English/Turkish interlanguage prosody: implications for UG, Prosodic Transfer Hypothesis and Full Transfer/Full Access. In Y. Otsu (ed.) *Proceedings of the 10th Tokyo Conference on Psycholinguistics (TCP 2010)*. Tokyo, Japan: Hituzi Publishing Company. 221-237.
- Özçelik, Öner (to appear). Exceptions in stress assignment: feet in input. In S. Kan, C. Moore-Cantwell & R. Staubs (eds.) *Proceedings of 40th Annual Meeting of the North East Linguistic Society (NELS 40)*. Amherst, MA: GLSA.
- Özçelik, Öner & Miho Nagai (2011). Multiple subject positions: a case of perfect match between syntax and prosody. In M. Byram & B. Tomaszewicz (eds.) *Proceedings of the 28th West Coast Conference for Formal Linguistics (WCCFL 28)*. Somerville, MA: Cascadilla Press. 303-312.

- Pater, Joe (2000). Nonuniformity in English stress: the role of ranked and lexically specific constraints. *Phonology* 17. 237-274.
- Pierrehumbert, Janet B. (1980). *The phonetics and phonology of English intonation*. PhD thesis, MIT.
- Pierrehumber, Janet B. & Mary E. Beckman (1988). *Japanese tone structure*. Cambridge, MA: MIT Press.
- Piggott, Glyne (1995). Epenthesis and syllable weight. *Natural Language and Linguistic Theory* 13. 283-326.
- Piggott, Glyne (1998). Foot form and the parsing of weightless syllables. *Proceedings of the 34th Meeting of Chicago Linguistic Society (CLS 34)*. 315-332.
- Pycha, Anne (2006). A duration-based solution to the problem of stress realization in Turkish. *UC Berkeley Phonology Lab Annual Report*. 141-151.
- Revithiadou, Anthi, Hasan Kaili, Sophia Prokou & Maria-Anna Tiliopoulou (2006). Turkish accentuation revisited: a compositional approach to Turkish stress. In S. Yağcıoğlu, A. Cem Değer, Ö. Koşaner & A. Çeltek (eds.) *Advances in Turkish linguistics: proceedings of the 12th International Conference on Turkish Linguistics*. İzmir: Dokuz Eylül Yayınları. 37-50.
- Selkirk, Elisabeth (1995). Sentence prosody: intonation, stress and phrasing. In J. Goldsmith (ed.) *The handbook of phonological theory*. Cambridge, MA: Blackwell. 550-569.
- Selkirk, Elisabeth (1996). The prosodic structure of function words. In J. Morgan & K. Demuth (eds.) *Signal to syntax: bootstrapping from speech to grammar*. Mahwah, NJ: Lawrence Erlbaum. 187-213.
- Sezer, Engin (1983). On non-final stress in Turkish. *Journal of Turkish Studies* 5. 61-69.
- Steriade, Donca (1995). Underspecification and markedness. In J. Goldsmith (ed.) *A handbook of phonological theory*. Cambridge, MA: Blackwell. 114-174.
- Underhill, Robert (1976). *Turkish grammar*. Cambridge, MA: MIT Press.
- Vogel, Irene (2009). Universals of prosodic structure. In S. Scalise, E. Magni, & A. Bisetto (eds.) *Universals of language today*. Dordrecht: Springer. 59-82.