

A BOUNDARY ANALYSIS OF THE EXCEPTIONS  
TO THE FINAL-STRESS RULE IN TURKISH

İnci Özkaragöz

Turkish is traditionally known as a fixed stress language which allows primary stress only on the final syllable of the word. However, there are several suffixes which do not accept primary stress and thus are exceptions to the final-stress rule. These are the negative suffix, the copula personal suffixes, the interrogative suffix, the postclitics, and the adverbial suffixes. In order to account for the exceptions, Turcologists have simply marked them with the diacritic feature [-stress]. This paper proposes an = boundary analysis to account for and predict the assignment of primary stress in all Turkish words including the so-called exceptions. It is claimed that the exceptions fall into a natural class of suffixes which all have higher predicatehood. Thus, the = boundary marker is posited before the "exceptional" suffixes according to their morpho-syntactic structure. Phonological, morphological, and semantic evidence is presented as independent motivation for the claim that the exceptional suffixes are of a higher predicate nature.

0. Introduction

Turkish is traditionally known as a fixed stress language which allows primary stress only on the final syllable of the word. An aspect of Turkish stress which has received less attention in Turcological literature, at least from the perspective of generative phonology, is the fact that there are several exceptions to the final-stress rule. The existence of the exceptions is acknowledged by Swift (1962), Lewis (1967), Sebüktekin (1971), and Underhill (1976); but only Lees (1961), Foster (1969), and Hankamer (class, 1977), that I am aware of, attempt

to formulate stress rules to account for them. The latter three linguists unanimously relegate the exceptions to the lexicon marked with the diacritic feature [-stress].

The main aim of the paper is to propose an alternative approach to account for and predict the placement of primary stress in all Turkish words including the so-called exceptions. The exceptions consist of the following suffixes: the copula personal suffixes<sup>1</sup>, the negative suffix, the interrogative suffix, the postclitics, and the adverbial suffixes.<sup>2</sup> I claim that an = boundary is assigned in front of these exceptional morphemes as a result of their position in the syntactic structure, which has been erased at some earlier point in the derivation. In the case of the postclitics, which can also appear as separate words, I claim that the word boundary before the clitics is reduced to the = boundary by a readjustment rule. As pointed out in SPE (p.372), this rule will be sensitive to the hierarchical syntactic structure, "...but [it] will also involve certain parameters that relate to performance, e.g. speed of utterance." With respect to the Turkish postclitics, the rule will also be sensitive to style, such as informal vs. formal. Following SPE (p.371), the status of the = boundary is such that it is "stronger" than the formative (+) boundary but "weaker" than the word (#) boundary. Consequently, with the = boundary convention, I show that the exceptions do not need to be marked as exceptions in the lexicon ad hocly. Rather, they derive their exceptionality from the = boundary which reflects their position in the syntactic tree. Furthermore, I show that a more 'natural' primary stress rule can be formulated with the use of the = boundary marker.

In Section 1, I present a sketch of Turkish suffixes and clarify the notion of wordhood in Turkish. Primary stress placement in words with and without unexceptional suffixes is discussed.

In Section 2, Lees' and Foster's analyses which purport to account for the exceptional suffixes, are presented. I propose an analysis which I claim is non-ad hoc, unlike Lees' and Foster's, namely, the = boundary analysis. This analysis claims that the exceptions are of a higher predicate nature.

In Section 3, I show that the = boundary analysis is motivated by three types of evidence: phonological, morphological, and semantic. I also posit a primary stress rule which differs from Lees' and Foster's primary

stress rule, in that it automatically accounts for the exceptions.

1. Preliminaries

In this section, I present some basic facts about Turkish suffixes and define the parameters of Turkish wordhood. I claim that the Turkish word is the domain which can undergo certain phonological rules such as vowel harmony. I also discuss primary stress placement in words which do not consist of any exceptional suffixes. Finally, I give examples of words that are exceptions to the primary stress placement rule and categorize the exceptional suffixes into different classes.

1.1. Basic Facts About Turkish Suffixes

Turkish, as is well known, is a highly agglutinative language with a large repertoire of suffixes<sup>3</sup> which may be affixed to a stem. Most of the suffixes which will be used in examples throughout this paper are given in the following chart.<sup>4</sup>

(1)	<u>Suffix</u>	<u>Possessive</u>	<u>Personal</u>
	1 sg	+(I)m	+(y)Im
	2 sg	+(I)n	+SIn
	3 sg	+(s)I(n)	+∅
	1 pl	+(y)Im+Iz	+(y)Iz
	2 pl	+(I)n+Iz	+SIn+Iz
	3 pl	+LAR+I(n)	+LAR <sup>5</sup>
	<u>Relational</u>		<u>Postclitics</u>
	NOM ∅		Copula with a past sense +DI
	ACC +(y)I		Presumptive participial +mİş
	DAT +(y)A		Gerundive +ken
	LOC +DA		Conditional +SE
	GEN +(n)In		

The postclitics, alternatively, can appear phonologically separate from the stem in formal speech. For example, #çocuksa# 'if it's a child' is #çocuk#ise#in a more formal style. An outline of the permitted order of suffixes for different word classes is sketched in (A)-(C).

(A) Nominals

Root + Possessive Suffix + Relational Suffix + Interrogative Suffix + Personal Suffix + Post-clitics.

Example (2) illustrates the order of suffixes in (A).

- (2) #Sandalye+sin+de+mi+Ø+miş?#  
chair+POSS+LOC+Interr.+3 sg+Presumptive Postcl.  
'Was s/he in her/his chair?'

(B) Participles

Root + Tense Suffix + Interr. Suffix + Personal Suffix + Postclitics.

Examples (3)-(4) illustrate the order in (B).

- (3) #Gel+ecek+mi+yim?#  
come+FUT+Interr.+1sg  
'Am I going to come?'

- (4) #Gel+eceğ+im+se#  
come+FUT+1sg+Conditional Postcl.  
'If I'm going to come'

(C) Verbals

Root + Tense Suffix + Personal Suffix + Postcl. Interr.

The word in (5) exemplifies the order in (C).

- (5) #gel+di+m+se#  
come+PST+1sg+Conditional Postcl.  
'if I came'

### 1.2. Wordhood

As can be seen from the examples given in (2), the notion "word" for Turkish needs to be defined more clearly. The examples would not be exceptions to the final primary stress rule if it was claimed that the placement of the boundary # was more or less arbitrary. The words in the above examples belong to the category 'sentence'; the category 'sentence' dominates major lexical categories such as noun and verb. Categories such as sentence, noun, and verb, can be automatically delineated by the boundary #, as stipulated by the general convention in SPE (p.366). I will make the extra language-specific claim that a word in Turkish is defined as the domain which can undergo certain phonological rules (SPE:367), such as the vowel harmony rule, the consonant assimilation rule, and velar softening. In Stanley's (1973) terms, these rules are said to be ranked by the word boundary.

(6) Vowel Harmony Rule (VH):

$$\left[ \begin{array}{c} v \\ \langle +hi \rangle \end{array} \right] \text{---} \rightarrow \left[ \begin{array}{c} \alpha \text{ back} \\ \langle \beta \text{ round} \rangle \end{array} \right] / \left[ \begin{array}{c} v \\ \alpha \text{ back} \\ \beta \text{ round} \end{array} \right] \text{Co} \text{---}$$

(7) Consonant Assimilation Rule (CA):

$$\left[ \begin{array}{c} -\text{cont} \\ -\text{del rel} \end{array} \right] \text{---} \rightarrow \left[ \lambda \text{ voice} \right] / \left[ \alpha \text{ voice} \right] \% \text{---}$$

(8) Velar Softening Rule (VS):

$$\left[ \begin{array}{c} -\text{cont} \\ -\text{ant} \\ -\text{cor} \end{array} \right] \text{---} \rightarrow \emptyset / \left[ v \right] \text{---} \left[ v \right]$$

The above rules apply internally to the word; i.e. they never apply across the # boundary marker. Examples which demonstrate the application of these rules follow. (9) illustrates the application of VH.

(9) #gider+AcAk+lEr+I#  
 remove+FUT+3pl+POSS  
 #gider+ecek+ler+i#                      VH, rule (6)  
 #gider+ecek+ler+i#                      Final Stress  
 giderecekleri  
 'their removing of it'

Note that in (10), the VH rule cannot apply across the boundary #. The vowels in benim are front while they are

(10) #ben+Im# #masa+DA#  
 I +POSS table+LOC  
 #ben+im# #masa+Da#                      VH, rule (6)  
 #ben+im# #masa+da#                      CA, rule (7)  
 #ben+im# #masa+da#                      Final Stress  
 benim masada  
 'at my table'

back in masada. (11) illustrates the application of CA.

(11) #git+AcAk#  
 go +FUT  
 #git+ecek#                                  VH, rule (6)  
 #gid+ecek#                                  CA, rule (7)  
 #gid+ecek#                                  Final Stress  
 gidecek  
 's/he will go'

(12) illustrates that CA cannot apply across #.

(12) # #su# #terzi# #  
 this tailor  
 # #su# #terzi# # CA, rule (7)  
 # #su# #terzi# # Final Stress  
 şu terzi  
 'this tailor'

If CA applied across the # boundary, the end result would be \*şu derzi and not şu terzi. (13) illustrates the application of VS, rule (8).

(13) #yap+AcAk+Im+A#  
 make+FUT+POSS+DAT  
 #yap+acak+im+a# VH, rule (6)  
 #yap+aca +im+a# VS, rule (8)  
 #yap+aca +im+a# Final Stress  
 yapacağ<sup>6</sup>ıma  
 'to my doing '  
 making

(14) shows that VS cannot apply across #. If VS applied

(14) # #bu# #gömlek# #  
 this shirt  
 # #bu# #gömlek# # VS, rule (8)  
 # #bu# #gömlek# # Final Stress  
 bu gömlek  
 'this shirt'

across the # boundary, \*bu ömlek would be derived instead of bu gömlek.

Thus, the examples (9)-(14) show that the rules of vowel harmony, consonant assimilation, and velar softening can apply across boundaries weaker than the word boundary, but not across the word boundary itself. The rule of primary stress placement, as will be shown, is also ranked by the word boundary. In addition, it will be shown that primary stress placement is sensitive to the boundary marker =, and is thus ranked by the = boundary as well as the # boundary.

### 1.3. Primary Stress Placement

Primary stress in Turkish polysyllabic words predictably appears on the last syllable. Monosyllabic words also receive primary stress. Consider the following:

- |      |  |  |
|------|--|--|
| (15) | #kabá <sup>́</sup> k#<br>#kabakta#<br>#kabaklar#<br>#kabaklarda#<br>#kabaklarında# | 'squash'<br>'on the squash'<br>'squash' (pl)<br>'on the squash' (pl)<br>'on their squash' (pl) |
| (16) | #göz#<br>#gözüm#<br>#gözümde#<br>#gözlerimde#                                      | 'eye'<br>'my eye'<br>'in my eye'<br>'in my eyes'   |
| (17) | #ölmek#<br>#öl#<br>#ölecek#  | 'to die'<br>'die!'<br>'s/he's going to die'  |

Regardless of the number of suffixes that are attached to the stem, primary stress falls on the last syllable. Thus, it appears the main stress rule for Turkish can be formulated simply as the following:

- (18)  $v \rightarrow [+1 \text{ stress}] / \text{---} C_0^2 \#$

#### 1.4 Exceptions to Primary Stress Placement

As noted in the Introduction, there is a substantial number of exceptions to the final stress rule in Turkish. Examples are cited in (19)-(23).

- |      |  |
|------|--|
| (19) | #gider+e+me+yecek+ler#<br>remove+OPT+NEG+FUT+3pl<br>gideremeyecekler<br><br>'they will not be able to remove it' |
| (20) | #gider+ecek+ler+mi#<br>remove+FUT+3pl+Interr.<br>gidereceklér mi?<br><br>'are they going to remove it?'          |
| (21) | #çocu+um#<br>child+1sg<br>çocugum<br>'I am a child'  |
| (22) | #çocuk+ça#<br>child+Adv<br>çocukça<br><br>'childishly'   |
| (23) | #çocuk+sa#<br>child+conditional postcl.<br>çocuksa<br><br>'if it's a child'                                      |

Note that in (20), even though the interrogative suffix mi is orthographically separate from the stem, it is still considered part of the word, since it undergoes vowel harmony. (See Sec. 1.2.) The high vowel in mi has assimilated to the frontness of the vowel in the last syllable of the stem.

Certain suffixes, then, do not allow stress although they constitute the last syllable of the word, as in (19)-(23). Or, if we assume the stress rule scans the structural description starting from the left, certain suffixes block stress from applying to the last syllable as in (19)-(20). The major set of exceptions as exemplified in (19)-(23) fall into the following categories: the interrogative, the negative, the (copula) personal suffixes, the adverbial suffixes, and the post-clitics.

## 2. Lees' and Foster's Analyses

In this section, I present Lees' (1961) and Foster's (1969) account of the exceptional suffixes. The two analyses are basically the same in that both posit the exceptions marked with [-stress] in the lexicon. I claim that their solution is not at all explanatory and misses a generalization that can be made about the exceptional suffixes; namely, that they are of a higher predicate nature, and hence, are delineated by the = boundary marker.

### 2.1. Lees' Analysis

In accounting for the exceptions, it has traditionally been assumed that these suffixes are inherently unstressable. Lees (1961), who attributed the idea to Swift, adhered to this assumption. Lees posits a rule which places primary stress on the final syllable of the root, i.e. what he calls the 'base'. He furthermore distinguishes suffixes found in the lexicon into two types: the unstressed and the stressed. The primary base-final stress rule (24) is obligatory. Therefore, if a stressed suffix is affixed to the root, the need arises for another rule which will reduce the primary stress on the final syllable of the root, so that, ultimately, primary stress will appear only on the final syllable of the word. See rule (25).

(24) Lees' Base-final Stress Rule<sup>7</sup>

$$\begin{bmatrix} \# \\ \ominus \end{bmatrix} X \check{V} (N) (N) \begin{bmatrix} \# \\ // \\ + \end{bmatrix} \longrightarrow \begin{bmatrix} \# \\ \ominus \end{bmatrix} X \acute{V} (N) (N) \begin{bmatrix} \# \\ // \\ + \end{bmatrix}$$

Where X contains no /#/ , // / , nor /+ / .

(25) Lees' Primary-stress-sequence reduction

$$\left[ \begin{array}{c} \# \\ // \\ \vee \end{array} \right] Y \acute{V} Z \acute{V} \longrightarrow \left[ \begin{array}{c} \# \\ // \\ \check{\vee} \end{array} \right] Y \check{\vee} Z \acute{V}$$

Where Z represents sequences of consonants and/or morphological junctures which can appear intervocalically within a word, i.e. Z = (+) (C) (+) (C) (+) (C). (Lees does not specify what Y represents.)

If the suffix attached to the base is unstressed, the primary-stress-sequence reduction rule will not apply and primary stress will remain base-final. It may also be the case that several stressed suffixes interspersed with inherently unstressable suffixes are attached to the base. This would result in a number of primary stressed syllables. What we would like to effect is the following: starting from the left, retain the first primary stress that appears directly before an unstressed syllable to intermediate degrees of stress by rule (26).

(26)a.  $\acute{V} \times \acute{V} \longrightarrow \acute{V} \times \hat{V}$   
 b.  $\hat{V} \times \hat{V} \longrightarrow \hat{V} \times \check{V}$

The rules (24), (25), and (26) are ordered as presented. To illustrate the application of these rules, let us consider first an example with unexceptional suffixes.

(27) #gider+ÁcÁk+lÉR+Í#  
 remove+FUT+3pl+POSS  
 #gider+éček+lér+í#           VH, rule (6)  
 #gider+éček+lér+í#           rule (24)  
 #gider+ecek+ler+í#           rule (25), applied 4 times  
 giderecekleri  
 'their removing of it'

Now let us consider an example with exceptional suffixes.

(28) #git+mE+yÉcÉk+lÉR+mI#  
 go+NEG+FUT+3pl+Interr.  
 #git+mi+yécék+lér+mi#       VH, rule (6)  
 #git+mi+yécék+lér+mi#       rule (24)  
 #git+mi+yecék+lér+mi#       rule (25)  
 #git+mi+yecék+lér+mi#       rule (25)  
 #git+mi+yecék+lér+mi#       rule (26. a)  
 'aren't they going to go?'

Rule (24) applies final stress on the monosyllabic base.  
 Rule (25) reduces the first primary stress, which is

adjacent to another primary stress in the suffix -yéčÉk. This suffix follows the first unstressed syllable mĚ. Rule (25) then reduces the second primary stress in -yéčÉk since it is followed by another primary-stressed suffix -lĚr. After rule (25) has applied twice, it cannot apply again because the structural description for (25) is no longer met; there is no other primary-stressed syllable following -lĚr. However, two primary-stressed syllables are not allowed within one word and (26a) applies to reduce the latter primary stress to an intermediate degree of stress. Only git bears primary stress ultimately.

Thus, we see that Lees' account of the exceptions to the word-final stress rule requires the notion of unstressed or stressed suffixes which are marked as such in the lexicon.

## 2.2. Foster's Analysis

Foster (1969) follows Lees in handling the exceptions by assuming that they are inherently prestressed (i.e. unstressable). However, he revises Lees' base-final stress rule (24) by expanding the domain of its application to the word rather than only to the base. Also, in delineating the environment for the application of the primary stress rule, Foster conglomerates the word boundary # and the prestressed suffixes into one class which he labels 'prestressed'. Since the word boundary marker will never be stressed, it seems expedient to make this generalization. Thus, he appears to avoid adopting a brace notation which would have encompassed the word boundary marker and the prestressed suffix class; i.e.  $\left\{ \begin{array}{c} \# \\ \text{Exceptional Suffixes} \end{array} \right\}$ . See (29).

(29) Primary Stress Rule  
 $[+ \text{slb}] \rightarrow [1 \text{ str}] / \underline{\quad} [+ \text{PrStr}]$   
 applies wherever the structural description is met.

Foster then postulates a subsidiary rule (30) which reduces all primary stresses except for the first one (from the left) to tertiary.

(30) Primary Stress Reduction Rule  
 $[1 \text{ str}] \rightarrow [3 \text{ str}] / \left[ \begin{array}{c} + \text{slb} \\ 1 \text{ str} \end{array} \right] (\text{Co } [+ \text{slb}] \text{Co}) \underline{\quad}$

Applying rule (29) to form (31), we arrive at form (32). The underlined suffixes are prestressed.

(31) #gelmiyecek miydiniz#  
NEG Interr.  
'weren't you (pl) going to come?'

(32) #gélmiyecék miydiníz#

Now primary stress is reduced by rule (30) and the form (33) results.

(33) #gélmiyecèk miydinìz#

Basically, Foster and Lees' approach in accounting for exceptional suffixes is the same. They both posit that they are marked [-stress] in the lexicon. But whereas Lees claims all the suffixes actually bear stress, primary or weak stress, at the point when they are attached to the base (see fn. 7), and are subsequently subject to stress reduction rules, Foster claims only the exceptional suffixes are marked so as to not receive stress; he does not claim the unexceptional suffixes bear stress at the point of affixation.

Lees' and Foster's account of the exceptions to the final stress rule in Turkish words is neither very intuitively satisfying nor explanatory. It is not made clear why Turkish, traditionally conceived as a fixed stress language, should have these exceptions. Furthermore, a major question that remains unanswered is the following: what special property, if any, is common to the class of exceptional suffixes?

### 2.3. The = Boundary Marker Analysis

I propose that the factor which makes the exceptional suffixes exceptions to the final stress rule is that these suffixes are all marked by the = boundary. The boundary marker = reflects the syntactic position of the exceptions in a hierarchical syntactic structure which has been erased at some previous point in the derivation. It is beyond the scope of this paper to give a precise structural description of what the syntactic tree would look like; however, an alternative within a generative semantics framework would be to treat the exceptions as higher predicates which take sentential subjects at some deeper level. Another possibility from a semanticist's point of view would be to treat the exceptions as having scope over the entire sentence. The main idea is that the exceptions would command or have scope over the sentence.

### 3. Evidence for the = Boundary Marker Analysis

An alternative, then, to marking the exceptional suffixes in the lexicon as unstressable, is to assign

an = boundary marker in front of the suffixes in the phonological word according to their morpho-syntactic structure, i.e. their higher predicatehood. As pointed out in SPE, it is relatively uncontroversial that languages make use of formative (+) and word (#) boundary markers; what needs to be shown is that other types of boundary markers, such as the = boundary marker, are necessary in the phonological make-up of the word. Langdon (1975) emphasizes the fact that boundary markers depict "...the morpho-syntactic structure of a language and not... uniquely phonological units."

In this section, I present phonological, morphological (i.e. the existence of independent-word alternants for some suffixes), and semantic motivation for the = boundary marker analysis. It is also claimed that the boundary marker = can be used in the primary stress rule to effect the correct placement of primary stress. See rule (34).

$$(34) \quad v \longrightarrow [+1 \text{ str}] / \text{---} \left\{ \begin{array}{l} \# \\ = \end{array} \right\}$$

Thus, Lees' and Foster's device of marking the exceptions in the lexicon will not be necessary; indeed, such machinery will appear only ad hoc.

### 3.1. The Phonological Evidence

Assigning the = boundary marker before the exceptional suffixes is a way of retaining morpho-syntactic information about the suffixes, i.e. that they are of a separate syntactic or semantic category from the unexceptional suffixes.

#### 3.1.1. Contraction

The non-phonological = boundary marker, however, has phonological effects upon the final outcome of the word. That is, if the assignment of the = boundary marker before the exceptional suffixes is assumed, we can predict and explain why the low-level phonetic rule of contraction (35) applies to certain forms and not to forms which are otherwise identical. Before considering such constructions in (37)-(39), let us posit the optional rule of contraction.

$$(35) \quad v \longrightarrow \emptyset / v + \underline{\quad} c$$

It is clear that the vowel undergoing deletion by the contraction rule is the vowel following the formative boundary and not the vowel preceding it. Consider the following example in which optional contraction occurs.

- (36) #ocak+Im#  
 stove+POSS 1sg
- #ocak+i#m# VH, rule (6)  
 #oca +i#m# VS, rule (8)  
 #oca + m# Contraction, rule (35)  
 #oca' + m# Primary Stress, rule (34)  
 ocam
- 'my stove'

Note that it is the high back vowel in the last syllable which is deleted. If no contraction had applied, the careful output would have been ocai#m. It is also clear that the contraction rule must precede primary stress placement. If stress placement occurred before contraction, we would expect the starred form \*ocam in which there is no stress; or alternatively, assuming that contraction affects only unstressed vowels, we would expect only the uncontracted careful form ocai#m. That is, rule (34) would block the application of rule (35). Now let us consider the constructions (37)-(38) which illustrate the derivations of the careful and casual forms of 'my child'. It is claimed that contraction can apply in (38) because of the formative boundary before the possessive suffix and that contraction cannot apply in (39) because of the = boundary marker before the first person singular suffix.

- (37) #çocuk+Im#  
 child+POSS 1sg
- #çocuk+um# VH, rule (6)  
 #çocu +um# VS, rule (8)  
 #çocu +u#m# PS, rule (34)  
 çocuum
- 'my child'

- (38) #çocuk+Im#  
 child+POSS 1sg
- #çocuk+um# VH, rule (6)  
 #çocu +um# VS, rule (8)  
 #çocu + m# Contraction, rule (35)  
 #çocu + m# PS, rule (34)  
 çocum
- 'my child'

- (39) #çocuk=Im#  
 child= 1 sg.
- #çocuk=um# VH, rule (6)  
 #çocu =um# VS, rule (8)  
 #çocu = m# Contraction, rule (35)  
 #çocu' = m# PS, rule (34)

\*çocum

'I am a child'

If (39) is allowed to undergo contraction, the resulting form is ungrammatical in that it loses its original meaning 'I am a child' and becomes 'my child' like (38).

Comparing the forms in (37) and (40) (formerly (21)), we notice that they are identical except for the placement of stress. The first person singular possessive and copula-personal forms are homophonous.

(40) çocúum 'I am a child'

Aside from stress placement, these two forms also differ in that (40) cannot optionally undergo contraction as shown by (39).

If, as it is being claimed, an = boundary marker occurs before the copula(tive)-personal suffixes which reflects their morpho-syntactic structure, the contraction rule can straightforwardly be prevented from applying to forms like (39). The contraction rule is simply formulated so as to not apply across =. Further, the exceptionality of stress placement in (40) can also be explained by appealing to =. That is, whereas Lees and Foster would have to mark ad hocly the exceptional suffixes with the feature [-contraction rule (35)] in addition to the ad hoc feature [-stress], the = boundary marker analysis straightforwardly predicts correct primary stress placement as well contracting the right constructions.

### 3.1.2. Fricativizing Rule

Another type of casual-speech phenomenon which is sensitive to the = boundary marker is an optional fricativizing rule<sup>10</sup>:

(41) ç ---> s/v \_\_\_ t

The rule can also take place when a formative boundary marker is present but it cannot take place when there is an intervening = boundary marker. Consider (42)-(43).

(42)	#geç+DI#	
	pass+PST	
	#geç+Di#	VH, rule (6)
	#geç+ti#	CA, rule (7)
	#geş+ti#	Fric., rule (41)
	#geş+ti#	PS, rule (34)
	geşti	
	's/he passed'	

- (43) #aç+DI#  
 open+PST
- |                      |                  |
|----------------------|------------------|
| #aç+D <sub>i</sub> # | VH, rule (6)     |
| #aç+t <sub>i</sub> # | CA, rule (7)     |
| #aş+t <sub>i</sub> # | Fric., rule (41) |
| #aş+t <sub>i</sub> # | PS, rule (34)    |
- aşt<sub>i</sub>
- 's/he opened (it)'

(44) and (45) show that although the appropriate phonological environment is present for the application of the Fricativizing Rule (41) after the application of VH and CA, the rule cannot apply because of the = boundary marker before the clitic.

- (44) #geç# #idi#  
 late Past Postcl.
- |             |                    |
|-------------|--------------------|
| #geç = idi# | Boundary weakening |
| #geç = di#  | Clitic. i --> ∅    |
| #geç = di#  | VH, rule (6)       |
| #geç = ti#  | CA, rule (7)       |
| #geş = ti#  | Fric., rule (41)   |
| #geş = ti#  | PS, rule (34)      |
- \*geşti
- 'it was late'

- (45) #aç# #idi#  
 hungry Past Postcl.
- |                        |                    |
|------------------------|--------------------|
| #aç = idi#             | Boundary weakening |
| #aç = di#              | Clitic., i --> ∅   |
| #aç = d <sub>i</sub> # | VH, rule (6)       |
| #aç = t <sub>i</sub> # | CA, rule (7)       |
| #aş = t <sub>i</sub> # | Fric., rule (41)   |
| #aş = t <sub>i</sub> # | PS, rule (34)      |
- \*aştı
- 's/he was hungry'

Note that the postclitic idi is an independent word in underlying form since it does not undergo vowel harmony with the preceding final syllable until after # weakens to =. (See Sec. 1.2.) As pointed out in the Introduction, a readjustment rule which is sensitive to speed of utterance and style, will reduce the word boundary # to =. Then cliticization can apply; cliticization: i --> ∅ / = \_\_\_\_.

Thus, if we were to adhere to Lees' and Foster's analysis of the exceptional suffixes by marking the exceptions in the lexicon [-stress] [-contraction], we would have to additionally specify ad hocly that they also bore the feature [-Fric. rule]. Whereas the = boundary marker analysis would straightforwardly block the application of the Fricativizing rule (41) in constructions such as

(44) and (45).

It should be noted that, alternatively, the Fricativizing rule might be sensitive to stress instead of to the = boundary marker. That is, perhaps the rule could be formulated as the following11:

(46)      ç ---> ʃ / ǃ \_\_\_ t   or ç ---> ʃ / v \_\_\_ t ǃ

If the rule is formulated as (46), then, naturally, the primary stress rule (34) must precede the application of the Fricativizing rule (46). There is no evidence that I am aware of which will help to decide between the two formulations of the rule, i.e. rule (41) or (46). However, since there is evidence for ordering the casual speech rule of contraction before the primary stress rule (see Sec. 3.2.1.), I will propose that all casual speech rules in Turkish precede the rule of primary stress. This proposal will allow us to adopt the Fricativizing rule as formulated in (41).

### 3.1.3. The Fronting Rule

One further process called "Fronting" is again a casual speech phenomenon. This rule is sensitive to the boundary marker = but it differs from the other two casual speech rules in that Fronting does not take place across the boundary markers; rather, Fronting is sensitive to the boundary marker which precedes the morpheme in which it is to take place.

(47)      [v] ----> [-.bck] / +v [  $\begin{matrix} C \\ +pal \end{matrix} \right] \underline{\quad}$

Consider the application of this rule in (48)-(50). Note that Fronting cannot occur in roots (49) nor in suffixes demarcated by = as (48) exemplifies.

(48)      #çocuk=caIz#                   child=Diminutive Adv.  
           #çocuk=ca z#                   VH, rule (6)  
           #çocuk=ca z#                   Contraction, rule (35)  
           #çocuk=ce z#                   Fronting, rule (47)  
           #çocuk=ce z#                   PS, rule (34)  
           \*çocukcez

'the poor child' (said in pity--not necessary that the child be materially poor)

(49)      #ocak+Im#                   stove+Poss 1sg  
           #ocak+im#                   VH, rule (6)  
           #oca +im#                   VS, rule (8)

#oca + m#	Contraction, rule (35)
#oce + m#	Fronting, rule (47)
#oce + m#	PS, rule (47)
*ocem	
'my stove'	

In (50), Fronting is followed by another casual speech rule called Raising:

(50)	#başla+AcAk=Im#	
	start+FUT =1 sg	
	#başla+acak=im#	VH, rule (6)
	#başla+yacak=im#	Y insertion
	#başla+yaca =im#	VS, rule (8)
	#başla+yace =im#	Fronting, rule (47)
	#başla+yice =im#	Raising
	#başla+ ce =im#	Syncope
	#başla+ cé =im#12	PS, rule (34)
	başliceim	
	' I'm going to start'	

However, it is not clear that this optional Fronting rule is not morpheme-specific. That is, it may be operating only within the future suffix -AcAk. It is difficult to discern whether this is the case since the only other suffix which is similar to the future phonetically is the adverbial suffix -CAIZ. This suffix we are claiming is marked by the = boundary marker because it is an adverbial and adverbials in general are of a higher predicate nature.<sup>13</sup> Thus, we would not expect Fronting to apply in this suffix anyway. If it is the case that the Fronting rule is (Future) morpheme-specific, then the above examples do not constitute a clear argument for the = boundary marker. It could be said that the Fronting rule does not apply in (48) simply because it is an adverbial suffix and not because of the alleged presence of the = boundary marker. However, in either case, the examples (48)-(49) would be consistent with the = boundary marker analysis.

Assuming that the adverbial suffix -CAIZ is marked with the boundary marker =, we can easily explain and predict why Fronting does not occur in (48). Lees and Foster would have to add the further ad hoc feature [-Fronting rule (47)] to the exceptional suffixes in the lexicon.

### Summary

In summary, I have shown in this section that phonological motivation exists for assigning the = boundary marker before the so-called exceptional

suffixes. Further, by assuming the = boundary marker in the phonological make-up of the word, we automatically account for the placement of primary stress. We postulate the PS rule (formerly (34)) as the following:

$$(51) \quad v \text{ ---} \rightarrow [+1 \text{ stress} / \text{---} \left. \begin{array}{l} \# \\ = \end{array} \right\}$$

Thus, it is not necessary to posit the "exceptions" in the lexicon with the diacritic [-stress] as Foster and Lees suggest. The = boundary marker takes care of proper PS placement as well as accounting for the application of the low-level phonetic rules discussed above.

Also, in formulating the PS rule as in (51), a generalization can be made which claims that the PS rule is ranked by all boundaries stronger (i.e. higher on the hierarchy) than the formative boundary. Foster's formulation of the rule (29), however, implicitly makes the claim that the word boundary marker and the prestressed exceptional suffixes constitute a natural class since he conglomerates the two groups into one class. It should be noted however that the less natural rule (29) is simpler, according to the simplicity metric.

#### 3.1.4. Casual Speech Phenomena Reflect Boundary Markers

It is interesting to note that all the examples used in the arguments for an = boundary marker are constructions taken from casual speech. Low-level phonetic rules which account for casual speech phenomena are sensitive to the = boundary marker in that they are blocked from applying if the = boundary marker is present in the structural description. My claim that the exceptional suffixes are assigned the = boundary marker because of their morpho-syntactic structure is supported by Zwicky's (1972:611) assertion that "...the structural closeness of items is often a factor in how they will be affected by casual speech processes." He cites examples from English and other languages in which he argues that certain rules (i.e. casual speech) are sensitive to the location of morpheme boundaries. He does not refer to other types of boundaries, however. It is assumed that in fixed stress languages, such as Turkish, stress has a demarcative function (Hyman, 1975:205). In words containing unexceptional suffixes, stress signals a word boundary. This idea can be extended to make the claim that stress, in words housing exceptional suffixes, also demarcate boundaries but of a different type from the word boundary, namely, the = boundary. This is because primary stress placement in Turkish is bounded by the = boundary marker (as well as the word boundary, of course) as the other low-level phonetic rules are. Phonological rules such as Vowel Harmony, Consonant

Assimilation, and Velar Softening, which are obligatory and apply before low-level rules operate over the = boundary marker as well as the formative boundary marker. These rules are ranked by the word boundary marker whereas the low-level rules are ranked by the word boundary marker and the = boundary marker. Casual speech phenomena, then, can be said to make reference to the hierarchy of rule ranking as postulated by Stanley.

### 3.2. Morphological Evidence

In this subsection, I present morphological evidence in favor of the = boundary marker analysis. The negative suffix and the postclitics have alternants that are independent words, as defined by their behavior with respect to the phonological tests (see Sec. 1.2.) for wordhood. Assuming that these exceptions are of a higher predicate nature, we can automatically account for the existence of such independent-word alternants. It is clear that Lees' and Foster's account of the exceptional suffixes, i.e. placing them in the lexicon marked [-stress], would not be able to predict the possibility of independent-word alternants.

#### 3.2.1. The Negative Suffix Alternant

Consider (52) (formerly (19)) which illustrates that the negative suffix does not accept primary stress--- the syllable preceding it takes the stress.

- (52) gider+é+me+yecek+ler  
remove+OPT+NEG+FUT+ 3 PL  
'they will not be able to remove it'

The = boundary marker which is posited before the negative suffix was justified by phonological evidence in the previous section. It is also claimed that this negative suffix, as the other exceptional suffixes, is of a higher predicate nature. Thus, in claiming that these suffixes are not tightly bound to the stem, it is not surprising to find that the negative suffix has an independent-word alternant, namely, değil 'is not'. This negative is used with participials and nominals, not with verbals such as (52). Consider (53) in which değil is used with a participial form and (54) with a nominal.

- (53) #ye+me+dik# #değil#  
eat+NEG+PART NEG  
'it's not that we didn't eat'
- (54) #kedi# #değil#  
cat NEG

'it's not a cat'

3.2.2. The Postclitics

Examples of postclitics which are cliticized to the stem are given below. These are the informal versions.

- (55)a. #çocuk=sa#  
child=Conditional Postcl.  
'if it's a child'
- b. #çocuk=tu#  
child=PST Postcl.  
'it was a child'
- c. #çocuk=ken#  
child=Gerundive Postcl.  
'while a child'
- d. #çocuk=muş#  
child=Presumptive Postcl.  
'it was (presumably) a child'

All the postclitics (except -ken which is non-harmonic) have undergone Vowel Harmony thus indicating that they are part of the phonological word. Now consider the more formal versions of (55):

- (56)a. #çocuk# #ise#  
child Conditional  
'if it's a child'
- b. #çocuk# #idi#  
child Past  
'it was a child'
- c. #çocuk# #iken#  
child Gerundive  
'while a child'
- d. #çocuk# #imiş#  
child Presumptive  
'it was (presumably) a child'

Note that during cliticization, in the informal style, i undergoes deletion and the word boundary weakens to = by a readjustment rule (see Sec. 3.1.2.).

### 3.2.3. The Interrogative

The interrogative does not have an independent-word alternant. As pointed out in Section 1.4., mI is considered part of the phonological word although it is orthographically separate from the stem. Imposing separation in the orthography may well be a reflection of the native speaker's intuition that the interrogative is exceptional in some way, i.e. an indication of its higher predicate nature. It is interesting that out of the entire repertoire of suffixes in Turkish, the interrogative, which is a member of the "exceptional" set of suffixes, was chosen to be written separately from the stem. It seems to be more than accidental.

### 3.3. Semantic Motivation

In claiming that the "exceptional" suffixes are of a higher predicate nature, we are claiming that they all in some sense have sentential scope. As noted in previous sections, the exceptions are the following: the postclitics, the interrogative, the negative, the adverbial suffixes, and the copula-personal suffixes (copula is considered to be an AUX). The latter four types have traditionally been treated by generative semanticists as higher predicates which have scope over the sentence. It does not appear to be an accident that these particular suffixes exhibit "exceptional" behavior. Lees' and Foster's account obviously misses the generalization that these exceptional suffixes belong to a natural class, namely the class of suffixes which have higher predicatehood. It does not seem to be the case that the postclitics belong to this natural class; rather, the postclitics appear to derive their exceptionality by being posited in the syntactic structure as independent words. Then, the word boundary is reduced to a = boundary marker by a readjustment rule.

In Section 3, I have presented three types of evidence for the = boundary marker analysis: phonological, morphological, and semantic. These three types of evidence constitute independent motivation for the claim that the exceptional suffixes are of a higher predicate nature, and hence, for positing the = boundary marker in the underlying phonological make-up of the word. Thus, independently motivated, we can utilize the = boundary marker in the primary stress rule which automatically accounts for the so-called exceptions in Turkish words. Further, we have shown that unlike Lees' and Foster's analyses, the = boundary marker analysis is non ad hoc. The = boundary marker analysis accounts for casual speech phenomena which Lees' and Foster's does not.

Footnotes

1. For exposition on the copula-personal suffixes, see Lees (1961:31).
2. I will not be dealing with the placement of stress in compounds. In compounds, stress generally appears on the last syllable of the first word. Other exceptions such as loanwords lokanta 'restaurant' (Italian), place-names Bébek, a suburb of Istanbul on the Bosphorus, some nouns which denote relatives such as ábla 'elder sister', ánne 'mother', will be consigned to the lexicon with an exception feature. Also, the adverbials I will be investigating are polymorphemic. I will consign monomorphemic adverbials such as símdi 'now', as exceptions in the lexicon. See Lewis (1967) for more examples.
3. Turkish is not a prefixing language.
4. In Standard Turcological practice, it is customary to use capital letters to denote segments which are not fully specified until after the rules of vowel harmony and consonant assimilation have applied.
5. It is not clear why 3pl -lAr accepts stress although other personal suffixes do not. It may be simply that -lAr, which is a plural marker, accepts stress because it is marking plurality to the null third person. An = boundary marker, then, would not be assigned before the null third person marker.
6. In Turkish orthography, the velar which has undergone softening is depicted as 'ğ'. It is phonetically null.
7. Lees' use of the symbols @ and || is not crucial to the presentation. @ is used with compounds and || denotes a non-harmonic root. Also, rule (24) is the second part of Lees' main stress rule. The first part is not relevant to the point at hand since its function is to introduce weak stress on all harmonic-base vowels:

$$\begin{bmatrix} \# \\ @ \end{bmatrix} x v \text{ ----} \rightarrow \begin{bmatrix} \# \\ @ \end{bmatrix} x \check{v}$$

8. Note that the VH rule (6) will have to be reformulated so as to allow its operation over =.
9. The contraction rule (35) as it is formulated will not allow contraction to take place across an = boundary since the environment is delineated by a formative boundary. Since we are claiming here as

in SPE (p.364), that there is a hierarchy of boundaries and the = boundary marker is stronger than the formative boundary marker, we expect the contraction rule to apply only across the + boundary marker and in SD's where there is no + boundary marker. This is what in fact we find. The rule does not apply across = but applies when there is no +, such as in ağız 'mouth' ---> [a:z]. (It applies, of course, when + is present, too.)

10. This rule is due to Swift although he makes no mention of boundaries.
11. This suggestion is due to Sandy Chung.
12. I am dealing exclusively with an upper-class Istanbul dialect in which native speakers tend to pronounce (50) as [başlâcéim]. There is a current trend, however, among the younger generation to pronounce this form as [başlâcém]. That is, they apply contraction across the = boundary marker. It is also possible that = is reduced to + so that the regular contraction rule can apply.
13. It is not clear that non-sentential adverbials have higher predicatehood. However, since non-sentential adverbials are handleable by the = boundary marker analysis, it can be surmised that non-sentential adverbials have generalized to the sentential adverbials as far as their behavior in e.g. stress placement is concerned.

#### References

- Chomsky, N. and Morris Halle. 1968. The sound pattern of English. Harper and Row: New York.
- Foster, J. 1969. On some phonological rules of Turkish. Unpublished University of Illinois doctoral thesis.
- Hankamer, J. 1976-1977. Unpublished class lecture notes at the University of the Bosphorus (Boğaziçi Üniversitesi in Istanbul).
- Hyman, L. 1975. Phonology: theory and analysis. Holt, Rinehart, and Winston: New York.
- Langdon, M. 1975. Boundaries and lenition in Yuman languages. IJAL Vol. 41:218-233.
- Lees, R. 1961. The phonology of modern standard Turkish. Indiana University: Bloomington.

- Lewis, G. 1967. Turkish grammar. Oxford University Press: Oxford.
- Sebüktekin, H. 1971. Turkish-English contrastive analysis. Mouton: The Hague.
- Stanley, R. 1973. Boundaries in phonology. Festschrift for Morris Halle, ed. by S. Anderson and P. Kiparsky.
- Swift, L. 1962. A reference grammar of modern Turkish. Indiana University Press: Bloomington.
- Underhill, R. 1976. Turkish grammar. The MIT Press: Cambridge.
- Zwicky, A. 1972. On casual speech. CLS 8: 607-615.