

Affix-Placement Variation in Turkish

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Affix-placement variation in Turkish

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0. Introduction

According to the standard descriptions, complex Turkish nouns and verbs are formed by adjoining multiple suffixes, in a specific order, to a basic root. For example, the suffixes used to form the complex noun in (1) can only occur in that particular order.

- (1) *ev* *-ler* *-in* *-den*
 'house' PL 3rd.POSS ABL
 'from his house'

However, certain tense, mood, and aspect (TMA) markers regularly occur in different orders relative to each other.

- (2) a. *brak -ti -ysa -m*
 'leave' PAST COND 1st.SG
 'if I left ...'
 b. *brak -sa -ydi -m*
 'leave' COND PAST 1st.SG
 'if I would have left ...'

The fact that the two different suffix orderings in (2) produce verbs with different meanings shows that the ordering of the TMA suffixes above is not truly variable but is a function of morphology and semantics. However, it turns out that there are some limited cases where there is true variable suffix ordering in Turkish. Personal agreement endings, like *-m* in the verbs in (3), do not necessarily have to occur in their canonical position at the end of the verb (3a). It has been observed (Sezer 1998) that they can also be in penultimate position (3b) without producing any difference in meaning.

- (3) a. *brak -ti -ysa -m*
 'leave' PAST COND 1st.SG
 'if I left ...'
 b. *brak -ti -m -sa*
 'leave' PAST 1st.SG COND
 'if I left ...'

Variable ordering of the personal endings is not completely unconstrained however. The data in (4) shows that the combination of the progressive marker and the past marker only allows the personal ending in word-final positions.

- (4) a. *oyn -uyor -du -k*
 'play' PROG PAST 1st.PL
 'we were playing'
 b. **oyn -uyor -k -tu*
 'play' PROG 1st.PL PAST

The purpose of this paper is to examine the restrictions on the variable ordering of personal endings in Turkish. We begin with an overview of Turkish verbal morphology in section 1. Personal agreement suffix placement variability and its formal analysis in terms of Optimality Theory (Prince & Smolensky 1993; McCarthy and Prince 1995) are presented in section 2. The distribution and the formal analysis of the Turkish plural marker *-lEr* is discussed in section 3. Theoretical implications of the analysis and concluding remarks are given in sections 4 and 5.

1. Turkish verbal morphology

1.1 Overview

The basic morphological structure of the Turkish verb is a verb root followed by a minimum of one, and possibly several, suffixing morphemes. These mark for tense, aspect, mood, and subject. In (5a), a basic schema is given with optional suffixes marked in parentheses. Underneath in (5b) is a verb that uses a variety of these markers.

- (5) a. **Root** (Negation) **Aspect** (Tense/Mood) **Personal Ending**
 b. *git -m -iyor -du -ysa -m*
 'go' NEG PROG PAST COND 1st.SG
 'If I were going ...'

The schema in (5a) shows the personal agreement ending as being verb-final because the personal ending always can, and for the most part does, appear in that position.

1.2 Personal endings

Turkish has four personal agreement paradigms. Here, we are only concerned with the two below which we have designated the *z*-paradigm and the *k*-paradigm in reference to the consonant in their first person plural forms.

- | | | | | |
|---------------|-------------------|---------------|-------------------|---------------|
| (6) | z-paradigm | | k-paradigm | |
| | Singular | Plural | Singular | Plural |
| First | <i>-(y)Im</i> | <i>-(y)Iz</i> | <i>-m</i> | <i>-k</i> |
| Second | <i>-sIn</i> | <i>-sInIz</i> | <i>-n</i> | <i>-nIz</i> |
| Third | \emptyset | \emptyset | \emptyset | \emptyset |

The *k*-paradigm endings only follow the two suffixes in (7a). The *z*-paradigm endings follow most other TMA suffixes. The TMA suffixes that take the *z*-paradigm that are referred to in this paper are given in (7b).

- (7) a. Suffixes taking *k*-paradigm endings.
 -*DI* Past (PAST)
 -*sE* Conditional (COND)
- b. Suffixes taking *z*-paradigm endings.
 -*Iyor* Progressive (PROG)
 -(y)*EcEk* Future (FUT)
 -*Er* Aorist (AOR)
 -*mIş* Unwitnessed/Evidential (EVID)

2. Personal ending ordering variability and its formalization

2.1 Data regarding personal ending ordering variability

Turkish grammars and textbooks (e.g. Sezer 1998, Underhill 1976) mention the possible ordering variability seen in (2) and (3). Sezer gives the following partial paradigm of the verb *görmek* 'to see' illustrating that the ordering variability can occur with the *k*-paradigm personal endings (8). Such variability is not possible for the *z*-paradigm suffixes.

- | | | | |
|--------|-----------------------|----------------------|------------------------|
| (8) a. | <i>gör-dü-yse-m</i> | <i>gör-dü-m-se</i> | 'if I saw ...' |
| b. | <i>gör-dü-yse-n</i> | <i>gör-dü-n-se</i> | 'if you (sg.) saw ...' |
| c. | <i>gör-dü-yse-k</i> | <i>gör-dü-k-se</i> | 'if we saw ...' |
| d. | <i>gör-dü-yse-niz</i> | <i>gör-dü-niz-se</i> | 'if you (pl.) saw ...' |
| | 'see'-PAST-COND-PER | 'see'-PAST-PER-COND | |

As stated above, according to most authors (cf. Lewis 1967, Sezer 1998, Underhill 1976), there is no semantic difference between the pairs of verbs above. Kuroglu (1986), however, does claim that there is a slight difference of scope in the meanings of the above pairs. Our informants, nonetheless, agreed with most authors in believing the forms were equivalent in meaning, and we will be analyzing their dialects.

In addition to those patterns reported above, we found that Turkish also allows variable personal ending ordering in sequences such as the past perfect (-*DI* + (y)*DI*) (9a) and the past conditional (-*sE* + -(y)*DI*) (9b).

- | | | | |
|--------|--------------------------|--------------------------|----------------------------|
| (9) a. | Past Perfect | | |
| | <i>ara-dı-ydı-m</i> | <i>ara-dı-m-dı</i> | 'I had looked for' |
| | <i>ara-dı-ydı-n</i> | <i>ara-dı-n-dı</i> | 'you (sg.) had looked for' |
| | <i>ara-dı-ydı-k</i> | <i>ara-dı-k-tı</i> | 'we had looked for' |
| | <i>ara-dı-ydı-nız</i> | <i>ara-dı-nız-dı</i> | 'you (pl.) had looked for' |
| | 'look for'-PAST-COND-PER | 'look for'-PAST-PER-COND | |
| b. | Past Conditional | | |
| | <i>gel-se-ydı-m</i> | <i>gel-se-m-di</i> | 'I had looked for' |
| | <i>gel-se-ydı-n</i> | <i>gel-se-n-di</i> | 'you (sg.) had looked for' |
| | <i>gel-se-ydı-k</i> | <i>gel-se-k-ti</i> | 'we had looked for' |
| | <i>gel-se-ydı-niz</i> | <i>gel-se-niz-di</i> | 'you (pl.) had looked for' |
| | 'come'-PAST-COND-PER | 'come'-PAST-PER-COND | |

Grammatical Turkish verbs cannot be marked with more than two *k*-paradigm-taking verbal TMA markers. Given this restriction, there are four possible combinations of the two verbal suffixes which take the *k*-paradigm and, therefore, there are four potential cases to test for variable placement of *k*-paradigm personal endings. These are past+conditional (8), past+past (9a), conditional+past (9b), and conditional+conditional. This last combination is not allowed by Turkish semantics. The data above is, thus, fully representative of variable ordering of *k*-paradigm endings.

2.2. A formal analysis

To capture the facts discussed so far formally, we propose to account for patterns such as (8) and (9) in terms of Optimality Theory.

The constraints employed here are defined in (10).

- (10) **MAX-M(orphan)** A morphosyntactic feature must have a realization in the output.
LICENSE A personal ending must be licensed by the immediately preceding suffix.
ECON(omy) Allow only one realization of a morphosyntactic feature. (Noyer 1993)

The LICENSE constraint is required to account for the facts described in (7) that some verbal TMA suffixes are always followed by *z*-paradigm endings while the rest are always followed by *k*-paradigm endings. For LICENSE to be effective, we must assume some sort of blocking or allomorph selection mechanism (cf. Riehemann 1993, Jurafsky and Koenig 1994, or Orgun 1996). A detailed description of such a mechanism, however, is beyond the scope of this paper (however, see Yu and Good [in press] for a morphosyntactic account of paradigm-selection). What is critical for this paper is simply that LICENSE will be violated by any forms in which the paradigm of the personal ending following a TMA suffix is not the one specified in (7).

The tableau in (11) illustrates how the constraints in (10) can account for the variable ordering described in (8) and (9). Because candidates in the tableau represent possible phonological forms, we use IPA notation for them. For ease of reference, however, outside of tableaux we have used the standard Turkish orthography.

(11)

giD, PAST, COND, 1 st .PL	MAX-M	ECON	LICENSE
a. git-ti-jse-k			
b. git-ti-k-se			
c. git-k-ti-jse			*!
d. git-ti-jse-jiz			*!
e. git-ti-k-se-k		*!	
f. git-ti-jse	*!		

Forms (11a) and (11b) violate none of the proposed morphological constraints. Both are therefore acceptable outputs for the combination of the verb stem and morphological features given. Thus, we can account for why both forms can be

observed. A form like (11c) demonstrates how variable ordering is constrained. Verb stems do not license personal endings and, therefore, cannot be followed by them. So the suffix order in (11c) is not a grammatical output. Forms (11e) and (11f) are not possible simply because they violate one of the two constraints which, together, force outputs to realize all morphological features once and only once. Finally, a form like (11d) is ungrammatical since it has a *z*-paradigm ending following the suffix *-(y)sE* which licenses the *k*-paradigm.

In the tableau (12) we demonstrate how the constraints as defined account for the ordering variability of the past perfect as seen in (9a).

(12)

giD, PAST, PAST, 1 st .PL	MAX-M	ECON	LICENSE
a. \mathcal{E} git-ti-jdi-k			
b. \mathcal{E} git-ti-k-ti			
c. git-k-ti-jdi			*!
d. git-ti-jdi-jiz			*!
e. git-ti-k-se-k		*!	
f. git-ti-jdi	*!		

Like in (10), the constraint rankings allow the two acceptable forms as outputs since they violate none of the morphological constraints. Other plausible candidates violate the constraints in (10) and are ungrammatical.

Our analysis of variable ordering cannot be considered complete yet. Only the *k*-paradigm endings permit variable ordering. When a verb contains two TMA suffixes which license the *z*-paradigm, the personal ending can only appear word-finally.

- (13)
- a. *bul -uyor -sun*
'find' PROG 2nd.SG
'you are finding'
 - b. *bul -uyor -muş -sun*
'find' PROG EVID 2nd.SG
'you are apparently finding'
 - b'. **bul -uyor -sun -muş*
'find' PROG 2nd.SG EVID

The data in (13) reveals a deficiency in our constraints as defined so far. As can be seen in the tableau in (14), both (13b) and (13b') are predicted to be grammatical since neither violates LICENSE.

(14)

bul, PROG, EVID, 2 nd .PL	MAX-M	ECON	LICENSE
a. ☞ bul-ujor-mu f -sun			
b. ☛ bul-ujor-sun-mu f			
c. bul-sun-ujor-mu f			*!
d. bul-ujor-mu f -n			*!
e. bul-ujor-mu f	*!		

How can we account for the ungrammaticality of z-paradigm variable ordering and still maintain a system that allows us to analyze as grammatical the variable ordering of the k-paradigm? To answer this question, we need to take a closer look at the behavior of the two personal agreement paradigms. It turns out that their asymmetric behavior is not limited to variable ordering. In the next section, we show that the z-paradigm endings are actually clitics, while the k-paradigm endings are true inflectional suffixes.

2.3 A short digression: The clitic status of the z-paradigm

The claim that the z-paradigm personal endings are clitics is central to the rest of our analysis. We will present evidence from the phonological, morphological, and syntactic domains to support our argument. For ease of reference, the two paradigms are reproduced below (15).

(15)

	z-paradigm		k-paradigm	
	Singular	Plural	Singular	Plural
First	-(y)Im	-(y)Iz	-m	-k
Second	-sIn	-sInIz	-n	-nIz
Third	\emptyset	\emptyset	\emptyset	\emptyset

The most notable phonological difference between the two paradigms is that the k-paradigm endings can be stressed when they are word-final (16b) whereas z-paradigm endings can never be stressed (16a).

(16)

	z-paradigm endings	k-paradigm endings
a.	unut acák smız 'forget'FUT 2 nd .PL 'you (pl.)will forget'	b. unut -tu -núz 'forget'PAST 2 nd .PL 'you (pl.) forgot'

Default Turkish stress is word-final. Thus, word-final k-paradigm markers behave as though they are truly suffixed to the word preceding them. One of the defining phonological features of clitics is an inability to be stressed (Sadock 1991, Zwicky 1985b). Thus, the phonological behavior of the paradigm endings is consistent with an analysis that the ones of the z-paradigm are clitics and those of the k-paradigm are suffixes.

In the morphological domain, k-paradigm endings behave like suffixes insofar as they can only attach to a very limited class of lexical items—namely, the past marker -(y)DI or the conditional -(y)sE. On the other hand, z-paradigm markers can follow not only the verbal markers in (7b) but also nouns and adjectives in

nominal sentences. This relative freedom of attachment is another characteristic of clitics (cf. Zwicky 1985a).

- (17) a. *adam -smız* **adam -nız*
 ‘man’ 2nd.PL ‘man’ 2nd.PL
 ‘you are men’
 b. *iyi -yız* **iyi-k*
 ‘good’ 1st.PL ‘good’ 1st.PL
 ‘we are good’

Finally, in the syntactic domain, there is evidence that *z*-paradigm endings behave as independent units in the syntax—another important property of clitics—whereas *k*-paradigm endings do not. There is a phenomenon in Turkish affecting conjoined verbs known as suspended affixation (cf. Lewis 1967, Orgun 1995) in which markers on the final verb in a conjunct have semantic scope over all the verbs in the predicate. For example, suspended affixation is observed in (18a) and the unsuspended counterpart is given in (18b). Note that the personal agreement suffixes in (18a,b) are from the *z*-paradigm. Personal agreement suffixes from the *k*-paradigm are prohibited from participating in this suspended affixation construction. In (18c) we have attempted to suspend a personal agreement suffix from the *k*-paradigm. However, this sentence is ungrammatical. The well-formed equivalent of (18c) is given in (18d) where both the conjoined verbs are marked for personal agreement.

- (18) a. [*Hastane -ye gid -er, onu gör -ür*] *-üm*
 ‘hospital’ DAT ‘go’ AOR 3rd.SG.ACC ‘see’ AOR 1st.SG
 b. [*Hastane -ye gid -er*] *-im, [onu gör -ür]* *-üm*
 ‘hospital’ DAT ‘go’ AOR 1st.SG 3rd.SG.ACC ‘see’ AOR 1st.SG
 ‘I go to the hospital and see him.’
 c. *[*Hastane -ye git -ti, onu gör -dü*] *-m*
 ‘hospital’ DAT ‘go’ PAST 3rd.SG.ACC ‘see’ PAST 1st.SG
 d. [*Hastane -ye git -ti*] *-m, [onu gör -dü]* *-m*
 ‘hospital’ DAT ‘go’ PAST 1st.SG 3rd.SG.ACC ‘see’ PAST 1st.SG
 ‘I went to the hospital and saw him.’

Since the *z*-paradigm endings can take part in this syntactic reduction process, while the *k*-paradigm endings cannot, suspended affixation also suggests that the *z*-paradigm markers are clitics while the *k*-paradigm markers are suffixes.

2.4 Formalization of the behavior of the *z*-paradigm

Having established that the *z*-paradigm is a clitic paradigm, it is now possible to formalize its behavior by introducing a new constraint.

- (19) ALIGN-C(litics) Align(*z*-paradigm, R, word, R)
 The *z*-paradigm must be the last morpheme of word.

The tableau in (20) illustrates how this new constraint accounts for the data in (13). Only (13b) is now ranked as grammatical and (13b') is excluded.

(20)	bul, PROG, EVID, 2 nd .PL	MAX-M	ALIGN-C	LICENSE
a.	☞ bul-ujor-muſ-sun (13b)			
b.	bul-ujor-sun-muſ (13b')		*!	
c.	bul-sun-ujor-muſ			*!
d.	bul-ujor-muſ-n			*!
e.	bul-ujor-muſ	*!		

The ranking of ALIGN-C above LICENSE is required to rule out ungrammatical forms like the one in (21) where a non-final suffix, the progressive marker *-iyor*, licenses the *z*-paradigm but the final suffix, the past tense marker *-DI*, licenses only the *k*-paradigm.

- (21) **gid* -*iyor* -*uz* -*du*
 'go' PROG 1st.PL PAST

The tableau in (22) shows how the ranking shown in (20) correctly rules out the forms in (21) and only allows the grammatical form *gidiyorduk* to surface.

(22)	giD, PROG, EVID, 1 st .PL	ALIGN-C	LICENSE
a.	☞ gid-ijor-du-k		
b.	gid-ijor-uz-du	*!	
c.	gid-ijor-k-tu		*!

There is one last fact that needs to be captured in our analysis. The variable ordering we have seen in (8) and (11) clearly shows that the *k*-paradigm endings do not need to be word-final. However, there are cases where a non-final *k*-paradigm ending would be licensed but is ungrammatical. The data in (23) shows verbs which contain a conditional followed by an evidential suffix. The conditional *-(y)sE* licenses the *k*-paradigm while the evidential *-(y)mİſ* licenses the *z*-paradigm.

- (23) a. *yürü* -*se* -*ymiş* -*sin*
 'walk' CONDEVID 2nd.SG
 'if you are supposedly walking . . .'
 b. **yürü* -*se* -*n* -*miş*
 'walk' COND 2nd.SG EVID

The form in (23b) is ungrammatical even though it does not violate any sort of licensing constraint. The reason for this is an additional sort of licensing constraint which is sensitive to the final suffix of a verb. We define this constraint in (24)

- (24) F(INAL) S(SUFFIX) A(GREEMENT): The agreement suffix on the verb must be from the agreement paradigm licensed by the last suffix of the verb.

Like LICENSE, FSA requires some sort of allomorph selection or blocking mechanism. The ranking of FSA is not crucial. For clearer exposition, we will give it the same ranking as LICENSE since they are both licensing constraints. (25) shows how our constraints account for the data in (23).

(25)

jyry, COND, EVID, 2 nd .SG	ECON	ALIGN-C	LICENSE	FSA
a. ☞ jyry-se-jmif- sin				
b. jyry-se- n -mif				*!
c. jyry-se-jmif- n			*!	*
d. jyry-se- sin -mif		*!	*	
e. jyry-se- n -mif-sin	*!			

3. The plural marker *-IEr*

The constraints ranking proposed so far to account for the *k*- and the *z*-paradigms has the added advantage of accounting for another variable suffix ordering phenomenon in Turkish. The plural marker *-IEr* in Turkish is optionally used on verbs to mark for third-person plural subjects. (It is also optionally used on nouns to mark plurality.) Like the personal agreement endings, it shows possibilities for variable ordering on the verb (25a,b).

- (25)
- a. *at* *-acak* *-ti* *-lar*
 'throw'FUT PAST **PL**
- b. *at* *-acak* *-lar* *-di*
 'throw'FUT **PL** PAST
 'they were throwing'
- c. **at* *-lar* *-acak* *-ti*
 'throw'**PL** FUT PAST

Like all personal agreement endings, *-IEr* cannot follow verb roots (25c). Importantly, *-IEr* is not a member of any personal ending paradigm. It is simply a plural marker. It is clearly very different morphologically than the personal endings since it is optional and since it can attach to any noun (as opposed to the *z*-paradigm endings which can only attach to predicative nouns).

In the formalism developed here, it is not necessary to amend the analysis developed so far to account for the sort of ordering seen in (25). *-IEr* is simply taken to be a suffix licensed by all TMA markers. The tableau in (26) illustrates that the grammatical forms in (25a,b) are both judged grammatical using the constraint ranking developed above while other forms are not.

(26)

	giD, PROG, PAST, PL	MAX-M	LICENSE
a. ☞	gid-ijor-du- lar		
b. ☞	gid-ijor-d l -lar		
c.	git- ler -ijor-du		*!
d.	gid-ijor-du	*!	

There is no grammatical verb form in Turkish which has three suffixes which license the *k*-paradigm. Thus, we could not test to ensure that variable ordering of personal endings would allow for a personal ending to be followed by more than one TMA suffix. However, there are verb forms in Turkish with three TMA suffixes which license *-lEr*. It is the case with such verb forms that *-lEr* can appear after any of the three suffixes.

- (27)
- a. *koş* -*uyor* -*du* -*ysa* -**lar**
 'run' PROG PAST COND PL
- b. *koş* -*uyor* -*du* -**lar** -*sa*
 'run' PROG PAST **PL** COND
- c. *koş* -*uyor* -**lar** -*dı* -*ysa*
 'run' PROG **PL** PAST COND
 'if they were running ...'

The data in (27) verifies our analysis by showing that, barring other constraints, verbal suffixes can follow any suffix which licenses them and variable ordering is not limited to the 'flip-flopping' of the last two suffixes seen in all the other examples. In (28), we show how our constraints predict the data in (27).

(28)

	koş, PROG, PAST, COND, PL	MAX-M	LICENSE
a. ☞	gid-ijor-du- <i>jsa</i> - lar		
b. ☞	gid-ijor-d l - <i>lar</i> - <i>sa</i>		
c. ☞	gid-ijor- lar - <i>dı</i> - <i>jsa</i>		
d.	git- ler -ijor-du- <i>jsa</i>		*!
e.	gid-ijor-du- <i>jsa</i>	*!	

4. Theoretical implications

4.1 Level-ordering in the Turkish lexicon

Within the traditional theory of Lexical Phonology and Morphology (LPM: Kiparsky 1982), it has been argued that levels are strictly ordered with respect to each other. Inkelas and Orgun (1995, 1998), based on the interaction of the phonology and the morphology of Turkish, argue for a principle in LPM called Level Economy, according to which a form is subject to the phonology only of those levels at which it is morphologically derived—thus, they depart from the traditional, strictly serial approach to the lexicon.

The variable ordering of the plural suffix *-lEr* described here constitutes more evidence against traditional LPM. Based on the productive morphology and

phonology of Turkish, Inkelas and Orgun (1998) give the following organization to the Turkish lexicon:

(28) Level:	1	2	3	4	5
Morphology	root	passive aspect relative negative	plural possessive	case	tense agreement interrogative

If LPM is applied in strict serial-order fashion, then it is predicted that the placement variation of *-lEr* is impossible. Pluralization, according to Inkelas and Orgun, takes place at level 3 while tense suffixation takes place in level 5. In order for (25ab) and (27) to be grammatical, strict level ordering must be relaxed and allow level 3 pluralization before *and* after tense suffixation. The pluralization evidence observed here concerns the interaction between morphological processes in the lexicon and is unrelated to Turkish morphophonology—thus this data offers support for Inkelas and Orgun's proposals from another area of Turkish grammar.

4.2 Morphological free variation

Cases of affixal placement variation have generally been analyzed as motivated by the phonotactics and the phonology of the language, such as the so-called *um*- infixation in Tagalog (McCarthy & Prince 1995) or mobile affixes in Huave and Afar (Noyer 1997). The suffix- placement variation discussed in this paper enriches the typology of affix-placement variation described since it is purely morphologically conditioned.

5. Conclusion

This paper illustrates the known variable affix ordering in Turkish: personal suffix placement and plural suffix placement. We argue that the different ordering behavior of the *k*- and the *z*-paradigms is a matter of lexical status. That is, the *z*-paradigm endings are argued to be clitics, while the *k*-paradigm endings are argued to be lexical suffixes. The phenomena presented here have repercussions for the strict level ordering approach to the theory of Lexical Phonology and Morphology.

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