

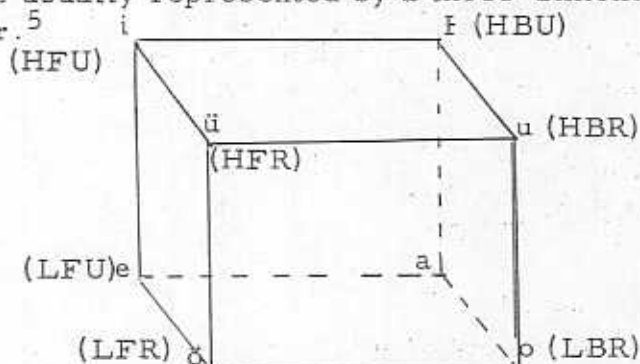
CONSONANTALLY CONDITIONED ALTERNATION OF VOCALIC MORPHOPHONEMES IN TURKISH

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In a recent discussion of morphophonemics, H. A. Gleason remarks that "Turkish vowels are . . . units in a system, the interrelationships of which are of fundamental significance in the language."¹ The phenomenon of vowel alternation to which Gleason was referring, particularly noticeable in Turkish suffixes, has been of special interest to many grammarians and structural linguists, including H. A. Gleason, A. C. Emre,² and J. E. Pierce.³ Two morphophonemes or vowel alternations, which Pierce calls V₁ and V₂, have been identified in Turkish suffixes. These alternations account for most of the Turkish suffix vowels.⁴ Rules of vowel harmony applicable to each morphophoneme govern the choice of phonemes within V₁ and V₂. The conditioning factor which accounts for the occurrence of the specific vowel within each morphophoneme has been thought to be the vowel of the preceding syllable and ultimately a non-alternating root vowel.

To define V₁ and V₂, and their constituent phonemes, a brief look at the phonemic character of the Turkish vowel system is necessary. The eight vowels in Turkish are usually represented by a three-dimensional diagram in the following manner.⁵



The characteristics of V₁ and V₂, as specified by previous analyses, may be illustrated by means of the following chart which lists the morphophonemes, the vowels constituting each, and the nature of vowels in the preceding syllable which determine the selection of the particular vowel within the alternant.⁶

		Morphophonemes	
		V ₁	V ₂
Determiners	ı	i	e
	e		
	ü	ü	
	ö		a
	İ	İ	
	a		
	u		
	o		

As may be observed from the preceding representations, V_1 and V_2 appear as units with easily definable characteristics. This is also true of the rules of vowel harmony which govern the choice of phonemes within each morphophoneme. Suffixes containing V_1 are shown to have four allomorphs: those with /i/, /ü/, /ɛ/, and /u/. They occur after syllables containing the four groups of vowels contrasted as unrounded front (UF), rounded front (RF), unrounded back (UB), and rounded back (RB), respectively. On the other hand, suffixes containing V_2 have two allomorphs: one with /e/, and one with /a/. /e/ allomorphs occur after syllables containing front vowels; /a/ allomorphs after syllables with back vowels. In all cases, a preceding vowel has been thought to be the determining factor explaining the choice of phonemes within suffix morphophonemes.

However, vowel alternation in Turkish suffixes does not seem to be predictable within a structural system composed of vowels alone. Proximal alveopalatal consonants, which shall be henceforth represented as /Y/, seem to determine choice among morphophonemes: V_1 and V_2 share all contexts except that before /Y/, where only V_1 occurs.⁷ Furthermore, alveopalatal consonants seem to restrict the vowels composing V_1 to a subset consisting only of /i/ and /ɛ/. Immediately before or after alveopalatal consonants the rounded-unrounded contrast of V_1 disappears; the choice of /i/ is governed by all front vowels, the choice of /ɛ/ by all back vowels. In the present study, this subset within V_1 will be called V_{1a} .

Suffix alveopalatal consonants in Turkish, namely /Y/s, are /y/, /j/, and /ɟ/.⁸ Of these, /y/ often alternates with /∅/ in initial position in suffixes with a vowel in post-initial position, /y/ occurring after morphemes ending in a vowel, /∅/ after morphemes ending in a consonant. The context for alternating /y/s may be represented by the following diagram.⁹

Form	Context	
	Previous Morpheme	Suffix
/y/	...V-	-V...
/∅/	...C-	-V...

/j/, /ɟ/, and sometimes /y/ occur as non-alternating phonemes within a Turkish suffix.

Many cases which have been regarded as exceptions to the vowel alternations within V_1 and V_2 can apparently be accounted for by the conditioning of such alveopalatal consonants. The presence of phenomena which could not be accommodated by earlier formulations first came to the writer's attention in reading Pierce's recent analysis of Turkish suffixation.¹⁰ In his description Pierce uses the two morphophonemes V_1 and V_2 . He specifies only the vowel alternations and the consonants in each suffix. In most cases V_2 and the standard form of V_1 are sufficient for a description of spoken Turkish. But Pierce's analysis of some suffixes containing /Y/, while fitting them within the conventional descriptive framework based on written Turkish, inaccurately represents

their spoken form. For example, after the verb stems /ölç/ measure and /dur/ stop the allomorphs of the verb suffix Let me — $-(V_2)yV_1m^{11}$ are /iyim/ and /ıyım/ respectively: /ölçiyim/ let me measure and /durıyım/ let me stop. On the other hand, predictions of the same morpheme forms, on the basis of Pierce's analysis, are /ölçeyim/ and /durayım/, which are non-occurrent in standard Turkish.¹²

Another example is the progressive suffix which Pierce symbolizes as $-(V_1)yor$.¹³ The vowel preceding the alveopalatal consonant /y/ is described as alternating with /ø/ and as constituting part of the standard V_1 . This alternation, symbolized by parentheses around V_1 , denotes the fact that a vowel occurs only when the preceding syllable ends in a consonant. Thus after verb stems such as /gel/ come and /sor/ ask the forms would be /geliyor/ and /soruyor/. After verb stems ending in vowels, for example /ye/ eat and /oku/ read where no such buffer is necessary, the pronunciations predicted by Pierce's analysis are /yeyor/ and /okuyor/. Speakers of standard Turkish, however, would pronounce the latter terms as /yiyor/ and /okıyor/, with an unexplained commutation of stem vowels. While customary renditions of /geliyor/ do not offer counterexamples to Pierce's formulations, the vowel before the /y/ alternates with /ø/ only in a limited sense, since assimilation occurs even if the verb stem ends in a vowel. V_1 is represented either by the addition of a vowel, or by a replacement of the final stem vowel. Even more important is the fact that it is not possible to describe the vocalic morphophoneme before /y/ as the standard form of V_1 , since after the verb stems /oku/ read and /sor/ ask, both of which contain rounded vowels, the sound which occurs before /y/ is the high unrounded vowel /ɪ/, where the analysis would lead us to expect the high rounded vowel /u/. In fact, a closer examination of spoken Turkish reveals that the two unrounded high vowels (UH), /i/ and /ɪ/, occur consistently before /y/, regardless of the vowel preceding the progressive suffix.

A similar case provides added evidence for the hypothesis that alveopalatal consonants may be conditioning factors in Turkish vowel harmony. The negative suffix, described by Pierce as $-m(V_2)$, occurs between the progressive suffix and the verbal stem. Thus one finds the series $-m(V_2)(V_1)yor$ where both V_2 and V_1 , according to Pierce's analysis, are 'optional'.¹⁴ Since the optionality rule precludes the overt representation of two successive morphophonemes, the low vowel V_2 is dropped, leaving a high vowel before the alveopalatal consonant /y/. The rule governing this solution is very vaguely formulated by Pierce: he states that "the first optional vowel is usually dropped, but sometimes assimilation occurs producing a different vowel altogether."¹⁵ Moreover, the fact that the selection of the vowel before /y/ is inexplicable on the basis of either the conventional form of V_1 or V_2 also suggests the need for further investigation.

Pierce lists thirteen verbal suffixes containing alveopalatal sounds, all of which except numbers 5 and 9, have alternating /Y/s. Numbers 8 and 9 have non-alternating /Y/s.

- | | | |
|-----|--|--|
| 1) | the second person imperative analyzed by Pierce as | -(y)V _{1n} |
| 2) | " adverb formative | " " " " -(y)V _{1p} |
| 3) | " noun formative | " " " " -(y)V _{1s} |
| 4) | " perfect or quotative | " " " " -mV _{1s} |
| 5) | " adverb formative | " " " " -(y)V ₂ |
| 6) | " adjective formative | " " " " -(y)V _{2n} |
| 7) | " adverb formative | " " " " -(y)V ₂ ¹ V ₁ |
| 8) | " verb suffix (Let me --) | " " " " -(V ₂)yV _{1m} |
| 9) | " progressive | " " " " -(V ₁)yor |
| 10) | " future tense | " " " " -(y)V _{2c} V _{2K} ₂ |
| 11) | " verb suffix (Let us --) | " " " " -(y)V ₂ ¹ V _{1m} |
| 12) | " adverb formative | " " " " -(y)V _{2r} V _{2k} |
| 13) | " adverb formative | " " " " -(y)V _{2s} V _{2y} V ₂ |

Pierce also lists the following two noun suffixes with alternating /Y/ in suffix initial position:

- 1) the accusative analyzed by Pierce as -(y)V₁
- 2) " dative " " " " -(y)V₂

It is notable that in spoken Turkish alveopalatal sounds occurring in any of these suffixes are invariably preceded and frequently followed by certain high vowels. Closer examination shows that these alveopalatals seem to regressively condition a preceding vowel, whether in the same or preceding morpheme; and, moreover, that they seem to progressively condition following high vowels. Only /i/ or /ɛ/ occur before /Y/; only /i/ or /ɛ/ occur after /Y/ unless in the allomorph without /Y/ the following vowel is a member of V₂, i.e., a low vowel, in which case the normal rules for V₂ still hold. However, no account is taken of this complex situation in Pierce's analysis. For example, if the future tense suffix is added to the verb stems /ye/ eat and /oku/ read, the pronunciations would be /yiyicek/ will eat and /okɣyɣcak/ will read. The phenomenon occurs consistently in speech and, in spite of traditional spelling, it is frequently reflected in informal writing. Yet, according to Pierce's analysis of the future tense suffix as -(y)V_{2c}V_{2K}₂,¹⁶ the predicted forms are the non-occurrent /yeyecek/ and /okuyacak/.¹⁷

In an informal experiment conducted by the present writer, several native speakers of Turkish were asked to pronounce each of these verbal suffixes after verb stems ending in four different vowel types all of which elicited /y/ allomorphs.¹⁸ The verb stems utilized were the following:

Form	Meaning	Type
/ye/	<u>eat</u>	UF
/sakla/	<u>hide</u>	UB
/üşü/	<u>be cold</u>	RF
/oku/	<u>read</u>	RB

These words present the contrasts front vs. back, and rounded vs. unrounded. High-low contrasts were also examined informally but proved to be without morphophonemic significance, as they are in suffixes before V₂ and the standard form of V₁.

The noun suffixes were analyzed after the following stems which present the same four contrasts as the verbal stems:

Form	Meaning	Type
/meze/	<u>salad</u>	UF
/masa/	<u>table</u>	UB
/ütü/	<u>iron</u>	RF
/kutu/	<u>box</u>	RB

A further control was introduced into the experiment: the pronunciation of each suffix was also recorded after the same verb stems followed by the negative suffix -m(V₂) to see whether the phenomenon of assimilation is confined to root vowels. Assimilation of the negative suffix occurred regularly and, in fact, no suffix has been found where the phenomenon was not observed.

Through analysis of the results, it was possible to determine the structure of V_{1a}, its context for alternating and non-alternating /Y/s in Turkish suffixes, and the rules governing the choice of its constituent phonemes.

Structure: The constituent phonemes of V_{1a} are restricted to the two alternants /i/ and /ɛ/ instead of the four alternants /i/, /ü/, /ɛ/, and /u/ comprising V₁. The rounded-unrounded contrast of the V₁ alternants disappears, leaving only /i/ and /ɛ/ as the V_{1a} phonemes. The selection among the two phonemes within V_{1a} is governed by the front-back contrast of vowel harmony, front vowels conditioning the occurrence of /i/, back vowels of /ɛ/.

The occurrence of /i/ and /ɛ/, the UH pair, instead of /e/ and /a/, the UL pair, contrasts V_{1a} with V₂, although the vowel harmony rules represented by the front-back contrast are identical in both cases.

The following diagram recapitulates the proposed morphophonemic structure of Turkish suffixes, positing an additional subset within the morphophoneme V₁. It is a modified and extended version of a previous diagram already presented in this study to illustrate the structure of V₁ and V₂. The morphophonemes, the phonemes within each, and the rules of vowel harmony governing the choice of phonemes are specified by the schema.

		Morphophonemes		
		V ₁	V _{1a}	V ₂
Determiners	i	i	i	e
	e	ü	ɛ	e
	ü	ö	ɛ	e
	ö	ɛ	ɛ	e
	ɛ	u	ɛ	e
	u	o	ɛ	e

Context: A. Alternating /Y/: The occurrence of morphophonemes in the proximity of alternating /Y/ in Turkish suffixes may be illustrated by the following diagram.¹⁹

	-/ϕ/	-/Y/	/ϕ/-	/Y/-
V _{1a}		+		+
V ₁	+		+	
V ₂	+		+	+
Invariant root vowel ²⁰	+			

Thus alternating /Y/ regressively conditions the alternation of V₁ with V₂, replacing V₂ with V₁, and further transforming V₁ into V_{1a}. If the stem final vowel is invariant (non-alternating), as in the case of vowels in root morphemes, this vowel is replaced by V_{1a}. /Y/ also progressively determines the alternation of V₁ with V_{1a} in suffix post-initial vocalic morphophonemes, replacing V₁ with V_{1a}.

B. Non-alternating /Y/: For non-alternating /Y/s in a Turkish suffix, the selection of V_{1a} before /Y/, and after /Y/ in the case of high vowels, is, of course, invariant. However, previous representations of suffixes containing non-alternating /Y/s need to be revised, since they have utilized only the standard V₁ and V₂.

Paradigmatic versus Syntagmatic Determination of V_{1a} Phonemes:

A: Alternating /Y/: The introduction of alternating /Y/ into suffixes involves the replacement of proximal vowels by V_{1a}. In this case the selection of morphophonemic variants of V_{1a} is made on the basis of the supplanted phoneme, i.e., the selection is determined by paradigmatic context. Replaced front vowels select the V_{1a} variant /i/, back vowels the variant /ɨ/. We are forced to the conclusion that the determination in these cases is paradigmatic rather than syntagmatic by the fact that where the replaced vowel is also the initial vowel in the word (in cases of monosyllabic open-syllable roots before variable /Y/), there is, of course, no relevant syntagmatic context.

B. Non-alternating /Y/: The case of non-alternating /Y/ precludes any possibility for replacement of phonemes. The selection of V_{1a} variants before /Y/, and after /Y/ for high vowels, is determined by syntagmatic context, /i/ being selected after front vowels in the preceding syllable, and /ɨ/ after back vowels. V_{1a} thus enters the regular vowel harmony system of Turkish.

On the basis of these observations, the following two general rules may be proposed to explain the morphophonemic structure of Turkish suffix vowels preceded or followed by /Y/:

I. In Turkish suffixes alveopalatal consonants, whether alternating or non-alternating, are always preceded by V_{1a}.

II. In Turkish suffixes alveopalatal consonants, whether alternating or non-alternating, are always followed by V_{1a} or V_2 .

Pierce's analysis of suffixes containing /Y/ can now be revised along the lines suggested by this study: that is, on the assumption that vowel harmony in Turkish involves instead of only two basic morphophonemes, an additional subset within V_1 . The following table shows such an analysis. In the first column, the grammatical function of each suffix is described. Column 2 shows the revised forms of the suffixes on the basis of this study and is followed by examples after each of the four types of stems described above.²¹ The negative suffix -m(V_2) is also mediated between each verbal suffix and the respective verb stems to show that the assimilation phenomenon is not confined to root vowels. Column 3 shows a similar analysis with examples based on Pierce's formulations positing only the two standard vowel alternations, V_1 and V_2 .²² Column 4 shows how each example traditionally appears in writing.²³

Verbal Suffixes

1	2	3	4
Grammatical Function of Morpheme	Analysis Based on the Present Study	Analysis Based on Pierce's Formulation	Written Form
1. Second Person Imperative	- $V_{1a}yV_{1a}n$ /y + iyin/ /sakl + İyİn/ /üşü + iyin/ /ok + İyİn/	-(y) V_1n /ye + yin/ /sakla + yİn/ /üşü + yün/ /oku + yun/	yiyin saklayın üşüyün okuyun
(after negative)	/ye + m + iyin/ /sakla + m + İyİn/ /üşü + m + iyin/ /oku + m + İyİn/	/ye + me + yin/ /sakla + ma + yİn/ /üşü + me + yin/ /oku + ma + yİn/	yemeyin saklamayın üşümeyin okumayın
2. Adverb Formative	- $V_{1a}yV_{1a}p$ /y + iyip/ /sakl + İyİp/ /üşü + iyip/ /ok + İyİp/	-(y) V_1p /ye + yip/ /sakla + yİp/ /üşü + yüp/ /oku + yup/	yiyip saklayıp üşüyüp okuyup
(after negative)	/ye + m + iyip/ /sakla + m + İyİp/ /üşü + m + iyip/ /oku + m + İyİp/	/ye + me + yip/ /sakla + ma + yİp/ /üşü + me + yip/ /oku + ma + yİp/	yemeyip saklamayıp üşümeyip okumayıp
3. Noun Formative	- $V_{1a}yV_{1a}ş$	-(y) $V_1ş$	

1 Grammatical Function of Morpheme	2 Analysis Based on the Present Study	3 Analysis Based on Pierce's Form- ulation	4 Written Form
	/ y + iyiš/ / sakl + İyİš/ / üš + iyiš/ / ok + İyİš/	/ ye + yiš/ / sakla + yİš/ / üšü + yüš/ / oku + yuš/	yeyis saklayıtş üşüyüş okuyuş
(after neg- ative)	/ ye + m + iyiš/ / sakla + m + İyİš/ / üšü + m + iyiš/ / oku + m + İyİš/	/ ye + me + yiš/ / sakla + ma + yİš/ / üšü + me + yiš/ / oku + ma + yİs/	yemeyiş saklamayış üşümeyiş okumayış
4. Perfect or Quotative	-mV _{1a} ş	-mV ₁ ş	
	/ ye + miš/ / sakla + mİš/ / üšü + miš/ / oku + mİš/	/ ye + miš/ / sakla + mİš/ / üšü + müš/ / oku + müš/	yemis saklamıtş üşümüş okumus
(after neg- ative)	/ ye + me + miš/ / sakla + ma + mİš/ / üšü + me + miš/ / oku + ma + mİš/	/ ye + me + miš/ / sakla + ma + mİš/ / üšü + me + miš/ / oku + ma + mİš/	yememiş saklamamıtş üşümemiş okumamıtş
5. Adverb Formation	-V _{1a} yV ₂	-(y)V ₂	
	/ y + iye/ / sakl + İya/ / üš + iye/ / ok + İya/	/ ye + ye/ / sakla + ya/ / üšü + ye/ / oku + ya/	yiye saklaya üşüye okuya
(after neg- ative)	/ ye + m + iye/ / sakla + m + İya/ / üšü + m + iye/ / oku + m + İya/	/ ye + me + ye/ / sakla + ma + ya/ / üšü + me + ye/ / oku + ma + ua/	yemiye saklamıtya üşümeye okumaya
6. Adjective Formative	-V _{1a} yV _{2n}	-(y)V _{2n}	
	/ y + iyen/ / sakl + İyan/ / üš + iyen/ / ok + İyan/	/ ye + yen/ / sakla + yan/ / üšü + yen/ / oku + yan/	yiyen salkıyan üşüyen okuyan

1 Grammatical Function of Morpheme	2 Analysis Based on the Present Study	3 Analysis Based on Pierce's Form- ulation	4 Written Form
(after neg- ative)	/ ye + m + iyen/ / sakla + m + İyan/ / üşü + m + iyen/ / oku + m + İyan/	/ ye + me + yen/ / sakla + ma + yan/ / üşü + me + yen/ / oku + ma + yan/	yemiyen saklamayan üşümeyen okumayan
7. Adverb Formative	-V ₁ a _y V ₂ l V ₁ / y + iyeli/ / sakl + İyalİ/ / üş + iyeli/ / ok + İyalİ/	-(y)V ₂ lV ₁ / ye + yeli/ / sakla + yalı/ / üşü + yeli/ / oku + yalı/	yeyeli saklayalı üşüyeli okuyalı
(after neg- ative)	/ ye + m + iyeli/ / sakla + m + İyalİ/ / üşü + m + iyeli/ / oku + m + İyalİ/	/ ye + me + yeli/ / sakla + ma + yalı/ / üşü + me + yeli/ / oku + ma + yalı/	yemeyeli saklamayalı üşümeyeli okumayalı
8. Verb Suf- fix (<u>Let me--</u>)	-V ₁ a _y V ₁ am / y + iyim/ / sakl + İyİm/ / üş + iyim/ / ok + İyİm/	-(V ₂)yV ₁ m / ye + yim/ / sakla + yİm/ / üşü + yüm/ / oku + yum/	yyim saklayım üşiyim okuyum
(after neg- ative)	/ ye + m + iyim/ / sakla + m + İyİm/ / üşü + m + iyim/ / oku + m + İyİm/	/ ye + me + yim/ / sakla + ma + yİm/ / üşü + me + yim/ / oku + ma + yİm/	yemeyim saklamayım üşümeyim okumayım
9. Progress- ive	-V ₁ ayor / y + iyor/ / sakl + İyor/ / üş + iyor/ / ok + İyor/	-(V ₁)yor / ye + yor/ / sakla + yor/ / üşü + yor/ / oku + yor/	yyor saklıyor üşüyor okuyor
(after neg- ative)	/ ye + m + iyor/ / sakla + m + İyor/ / üşü + m + iyor/ / oku + m + İyor/	/ ye + m + iyor/ / sakla + m + İyor/ / üşü + m + üyor/ / oku + m + uyor/	yemiyor saklamıyor üşümüyor okumuyor

1 Grammatical Function of Morpheme	2 Analysis Based on the Present Study	3 Analysis Based on Pierce's Form- ulation	4 Written Form
10. Future Tense	-V _{1a} yV _{1a} cV ₂ K ₂ /y + iyicek/ /sakl + İyİcak/ /üş + iyicek/ /ok + İyİcak/	-(y)V ₂ cV ₂ K ₂ /ye + yecek/ /sakla + yacak/ /üşü + yecek/ /oku + yacak/	iyicek saklayacak üşüyecek okuyacak
(after neg- ative)	/ye + m + iyicek/ /sakla + m + İyİcak/ /üşü + m + iyicek/ /oku + m + İyİcak/	/ye + me + yecek/ /sakla + ma + yacak/ /üşü + me + yecek/ /oku + ma + yacak/	yemeyecek saklamayacak üşümeyecek okumayacak
11. Verb Suf- fix (<u>Let me--</u>)	-V _{1a} yV ₂ lV ₁ m /y + iyelim/ /sakl + İyalİm/ /üş + iyelim/ /ok + İyalİm/	-(y)V ₂ lV ₁ m /ye + yelim/ /sakla + yalİm/ /üşü + yelim/ /oku + yalİm/	iyelim saklıyalım usuyelim okuyalım
(after neg- ative)	/ye + m + iyelim/ /sakla + m + İyalİm/ /üşü + m + iyelim/ /oku + m + İyalİm/	/ye + me + yelim/ /sakla + ma + yalİm/ /üşü + me + yelim/ /oku + ma + yalİm/	yemeyelim saklamayalım üşümeyelim okumayalım
12. Adverb Formative	-V _{1a} yV ₂ rV ₂ k /y + iyerek/ /sakl + İyarak/ /üş + iyerek/ /ok + İyarak/	-(y)V ₂ rV ₂ k /ye + yerek/ /sakla + yarak/ /üşü + yerek/ /oku + yarak/	iyerek saklayarak üşüyerek okuyarak
(after neg- ative)	/ye + m + iyerek/ /sakla + m + İyarak/ /üşü + m + iyerek/ /oku + m + İyarak/	/ye + me + yerek/ /sakla + ma + yarak/ /üşü + me + yerek/ /oku + ma + yarak/	yemeyerek saklamayarak üşümeyerek okumayarak
13. Adverb Formative	-V _{1a} yV ₂ sV _{1a} yV ₂ /y + iyesiye/ /sakl + İyasİya/	-(y)V ₂ sV ₁ yV ₂ /ye + yesiye/ /sakla + yasİya/	yeyesiye saklayasıya

1 Grammatical Function of Morpheme	2 Analysis Based on the Present Study	3 Analysis Based on Pierce's Form- ulation	4 Written Form
	/ üŝ + iyesiye/ / ok + İyasİya/	/ üŝü + yesiye/ / oku + yasİya/	usuyesiye okuyasıya
(after neg- ative)	/ ye + m + iyesiye/ / sakla + m + İyasİya/ / üŝü + m + iyesiye/ / oku + m + İyasİya/	/ ye + me + yesiye/ / sakla + ma + yasİya/ / üŝü + me + yesiye/ / oku + ma + yasİya/	yemeyesiye saklamasıya usumeyesiye okumasıya

Noun Suffixes

1. Accusative	-V _{1a} YV _{1a}	-(y)V ₁	
	/ mez + iyi/ / mas + İyİ/ / üt + iyi/ / kut + İyİ/	/ meze + yi/ / masa + yİ/ / ütü + yü/ / kutu + yu/	mezeyi masayı ütüyü kutuyu
2. Dative	-V _{1a} YV ₂	-(y)V ₂	
	/ mez + iye/ / mas + İya/ / üt + iye/ / kut + İya/	/ meze + ye/ / masa + ya/ / ütü + ye/ / kutu + ya/	mezeye masaya ütüye kutuya

First of all, it will be observed that there are radical discrepancies between the forms predicted by Pierce's formulae and those which actually occur as predicted by formulae including V_{1a}. These errors are in general attributable to a failure to recognize the regressive conditioning of /Y/ and to the use of V₁ instead of V_{1a} after /Y/. On the other hand, the table also reveals an interesting correspondence between Pierce's predicted forms and written Turkish. It is particularly noteworthy that where these two sets of forms do not coincide, a reason can be found in recent innovations in written Turkish in the direction of the spoken language.

Forms that one would expect to find if one accepts the V_{1a} subset within V₁ conform to those present in spoken Turkish. One must make a minor exception in the case of certain speakers whose speech obviously reflects an attempt to conform to written usage.

Since the proposed analysis with V_{1a} seems to reflect the speech of native Turks with accuracy, it is hoped that the study represents a contribution to the linguistic specification of spoken Turkish. To account for morphophonemic

alternation in Turkish suffixes, findings of earlier structural and traditional analyses should be modified by positing another subset within the vocalic alternant V_1 . V_{1a} exhibits certain properties distinguishing it from V_1 and V_2 .

1) The set of alternating vowels within V_{1a} differs from that within V_2 and is more restricted in number than those in V_1 .

2) In V_{1a} a consonant determines the selection of the specific morphophoneme subset; the selection of V_1 and V_2 do not seem to be influenced by contiguous consonants.

3) For alternating alveopalatal consonants, the selection of phonemes within V_{1a} depends upon a paradigmatic rather than syntagmatic vowel harmony. The phonemes are selected on the basis of a replaced element, i. e., V_1 or V_2 , rather than a contiguous element, the vowel of the preceding syllable.

4) Assimilation of both the progressive and the regressive type occurs, not just the former, as in the case of the vowel harmony rules applying to V_1 and V_2 .

5) The influence of the conditioning phoneme extends only to contiguous segments, not as in the case of the vowels conditioning V_1 and V_2 , to segments at a distance as well.

6) /Y/ is also remarkable in the fact that it is the only conditioning factor which replaces an invariant root vowel, thereby introducing a morphophoneme into the root.

The results of the present study also suggest that Turkish vowels and consonants do not form isolated, independent systems, but are closely integrated structures. It is hoped that the study will prompt further investigation of the interactions of the systems. It is also hoped that such studies will further the current effort toward achieving greater isomorphism between the Turkish writing system and spoken Turkish.

NOTES

1. H. A. Gleason, *Introduction to Descriptive Linguistics*, New York: Holt, Rinehart and Winston, 1961, p. 267.

2. Ahmet C. Emre, *Türk Dilbilgisi*, Istanbul: Cumhuriyet Matbaası, 1945.

3. Joe E. Pierce, *A Frequency Count of Turkish Affixes*, AL 3:9. 31-42 (1961).

4. There are a few non-alternating vowels in Turkish suffixes which do not belong to the two morphophonemes V_1 and V_2 . An example is the /o/ in the progressive suffix $-(V_1)yor$.

5. The cubic representation does not make any assumptions about the

fact that Turkish vowels represent equidistant phonetic characteristics; they merely represent relative frontness, backness, and roundedness. The abbreviations stand for these characteristics: H: relatively high; L: relatively low; B: relatively back; F: relatively front; R: relatively rounded; U: relatively unrounded.

6. The identification and analysis of the morphophonemes is based on traditional and structural renditions. The present writer is indebted to William Nemser of Columbia University for suggesting the representation given here.

7. The present writer is indebted to Professor Robert L. Allen of Teachers College, Columbia University, for suggesting the possible existence of such further conditioning factors.

8. Descriptive analyses such as those of Pierce and Emre, as well as the writer's observations, have shown that /y/, /j/, and /ɣ/ are the only alveopalatal consonants occurring in Turkish suffixes. The /j/ is spelled as c in Turkish, and /ɣ/ as ş.

9. The schematic representation has been proposed by Professor William Nemser of Columbia University on the basis of Pierce's analysis.

10. Pierce, *op. cit.*

11. According to Pierce's analysis, enclosing a morphophoneme in parenthesis denotes the fact that when such vocalic morphophonemes are in suffix initial position they are overtly represented only if the preceding morpheme ends in a consonant. When they are in morpheme terminal position, they are overtly represented when the initial sound of the next morpheme is a consonant.

12. Formulations in this study are based on the writer's native dialect, that of Istanbul, recognized as standard Turkish.

13. In a previous analysis Voegelin and Ellinghausen state that the /o/ in the progressive suffix is invariant or fixed; that is, it is outside the V₁, V₂ system.

14. Pierce, *op. cit.*, p. 33.

15. *Ibid.*

16. K₂ can be replaced by the phonemes /k/ or /g/ depending upon the context.

17. It is interesting to note that H. A. Gleason, on page 114 of his *Introduction to Descriptive Linguistics*, New York: Holt, Rinehart and Winston, 1961, describes the progressive suffix in the same way as Pierce does, but neglects to introduce a high vowel before /j/ in the future tense suffix symbolized by Pierce as -(y)V₂cV₂K₂. This description is in line with Pierce's analysis of the same morpheme, but is not borne out by the findings of the present study.

18. The subjects were educated native speakers of Turkish who were familiar with traditional Turkish grammar. In spite of this, the phenomenon posited here was observable in the pronunciation of all suffixes.

19. Professor William Nemser of Columbia University has recapitulated the findings into the schema given above.

20. Prefixes do not occur in Turkish.

21. Replaced final vowels of root morphemes are not included in the representations.

22. The forms are presented in phonemic transcription to indicate their spoken form. Forms in Turkish orthography appear in column 4. The only difference is the use of the Turkish letter ç in place of /j/, and ı in place of /i/, and of ş in place of /ʃ/.

23. In some samples of informal writing, the forms approximate their pronunciation.

1945.

3. Joe
42 (1961).

4. There are a
not belong to the two mor
the progressive suffix -(V₁)

5. The cubic representation

upon the
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