

**Morphologization in Turkish:
Implications for phonology in grammaticalization**

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1. Introduction

1.1. Phonology in grammaticalization

- Grammaticalization theory assumes that the gradual progression from a content item to a grammatical marker is accompanied by a number of interdependent phonological, morphosyntactic and functional processes.

(1) Grammaticalization & associated processes

	Content item	Function word	Clitic	Affix	Zero
Phonetic processes	Adaptation, erosion, fusion, and loss				
Morphosyntactic processes	Permutation, cliticization, affixation, and fossilization compounding				
Functional processes	Desemanticization, expansion, simplification, and merger				

(Hopper & Traugott 1993; Heine & Reh 1984; Heine, Claudi & Hünnemeyer 1991; Croft 2003: 253ff.; Lehmann [1982] 1995)

(2) Major differences between grammaticalization and reanalysis (Haspelmath 1998: 327)

<i>Grammaticalization</i>	<i>Reanalysis</i>
loss of autonomy/substance	no loss of autonomy/substance
gradual	abrupt
unidirectional	bidirectional
no ambiguity	ambiguity in the input structure
due to language use	due to language acquisition

(3) “Erosion is a process by which the phonological substance of a morpheme is reduced, usually in accordance with its new evolutionary status. Thus, a bisyllabic word may be reduced to a monosyllabic morpheme once it has undergone affixation.” (Heine & Reh 1984: 21)

1.2. Linguistic rhythm and phonology in grammaticalization

- Drawing data from a variety sample of cliticization phenomena in nineteen languages, Schiering (2006) proposes a number of revisions with respect to the phonological effects of grammaticalization.

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- Cliticization may be accompanied by *structure preservation*, *assimilation*, *weakening* and *strengthening*. These processes can apply to segments at the morpheme boundary (= *junctional*) or across whole syllables of the host-clitic combination (= *syllabic*).
- The distribution of a number of the documented phonological rules applying in cliticization can be predicted by a rhythm-based typology of language which distinguishes between mora-, syllable- and stress-based rhythm.
- Languages of the different rhythmic types differ significantly with respect to erosion: whereas mora- and syllable-based languages retain syllables of cliticized elements, stress-based phonologies reduce and delete unstressed syllables of clitics.
- In morphologization, systematic reduction in stress-based languages leads to subminimal clitics and affixes, whereas the systematic lack of reduction in mora- and syllable-based languages leads to disyllabic clitics and affixes.

1.3. Outline of the talk

- This talk will test the predictions made by the rhythm-based typology against data from Turkish. It will address the questions of how findings based on synchronic data can be translated to diachronic data and if different morphologization processes behave alike.
- First, after laying out the essentials of the linguistic study of rhythm, Turkish will be situated within the rhythm-based typology of language. The latter's predictions with respect to phonological processes in grammaticalization will be made explicit.
- Second, two morphologization processes in the verbal domain (*pronoun > person marker*, *verb > tense marker*), will be traced from Old Turkish to Modern Turkish, with particular reference to the phonological changes involved.
- Finally, the actual diachronic data from Turkish will be compared with the predictions made by the rhythm-based typology and the major findings will be discussed with respect to their impact on grammaticalization theory.

2. Turkish in a rhythm-based typology of language

2.1 A rhythm-based typology of language

- Within a rhythm-based typology of language, the following phonological properties are associated with prototypical mora-, syllable- and stress-based languages (Auer 1993, 2001; Dufter 2003, Schiering 2006).

(4) Selected phonological properties of rhythmic prototypes

	<i>Mora-based</i>	<i>Syllable-Based</i>	<i>Stress-Based</i>
ACCENT	none/weak	none/weak	strong
STRESS EFFECT	none/weak	none/weak	strong
SYLLABLE TYPES	simple/moderate	simple/moderate	complex
LENGTH CONTRASTS	unrestricted	restricted	restricted
VOWEL HARMONY	word domain	word domain	disyllabic domains

- Note that the distribution of morphophonological rules which apply to consonant clusters or in hiatus situations (assimilation, coalescence and epenthesis) show an erratic distribution across languages of all rhythmic types.

2.2. The rhythm of Turkish

2.2.1. Phonetic correlates of stress and segmental effects of stress

- Stress may be realized phonetically by pitch only (= *weak*) or by a combination of pitch, duration and intensity (= *strong*) (Beckman 1986). The realization of stress in Turkish relies on pitch movement and to a certain extent on loudness (Lewis 2000: 19, Kornfilt 1997: 503).²
- Segmental effects of stress include vowel reduction and consonant weakening in unstressed syllables, and vowel lengthening and consonant strengthening in stressed syllables (Bybee et al. 1998). Although there are some hints at vowel reduction of unstressed syllables in Old Turkish (5), Modern Turkish lacks segmental effects of stress altogether (Lewis 2000: 19).³

(5) Vowel reduction in unstressed syllables in Old Turkish (Gabain 1950: 43f)

- yiti* ~ *yitti* ~ *yti* ‘sharp’
- munta* → *muntuda* ‘from here’
- anča* ~ *munča* → *ančulayu* ~ *munčulayu* ‘so (many)’
- oçur* → *oçurinta* ~ *oçrinta* ‘at the opportunity’
- işit* → *işitil* ~ *iştil* ‘being heard’
- açız* → *açzan* ‘being said’

2.2.2. Syllable complexity and length contrasts

- Syllable complexity can be measured by the number of possible syllable types in the language. Languages with maximally CV syllables count as simple, those with complex onset and coda clusters are said to be complex (Blevins 1995).

(6) Syllable types in Turkish (Gabain 1950, Kornfilt 1997: 491ff.)

	Old Turkish	Modern Turkish	
a. V	<i>o</i>	<i>o</i>	‘he/she/it’
b. VC	<i>at</i>	<i>at</i>	‘horse’
c. CV	<i>bu</i>	<i>bu</i>	‘this’
d. CVC	<i>sol</i>	<i>sol</i>	‘left’
e. VCC	<i>ilk</i>	<i>ilk</i>	‘beginning’
f. CVCC	<i>qırq</i>	<i>kırk</i>	‘forty’

- Allowing for six possible syllable types and a maximal CVCC syllable shell with one onset and two coda consonants, Turkish has had a simple/moderate degree of syllable complexity throughout its recorded history.

² Since there are some segmental effects of stress, it seems that the phonetic realization of stress in Old Turkish was stronger than in Modern Turkish (Gabain 1950: 42).

³ Kornfilt (1997: 483) notes that “(v)oiceless plosives in syllable-initial position are aspirated, but aspiration is clearly perceptible only when the syllable is stressed.” However, this aspiration seems to be more phonetic than truly phonological.

- The distribution of vowel length and geminates can be restricted to stressed syllables or may be phonemic independent of stress. Turkish lacks both types of length distinctions in the phonemic inventory, however, exhibits secondary length in vowels and consonants at the phonetic level.

(7) Vowel length in Turkish (Gabain 1950: 44ff., Lewis 2000: 13f.)

Old Turkish	Modern Turkish
a. * <i>siām</i> (chin.) > <i>siin</i> ‘thought’	<i>barāber</i> (pers.) > <i>ber[a:]ber</i> ‘together’
b. <i>kidiz</i> > * <i>kiyiz</i> > <i>kiiz</i> ‘felt’	<i>değil /deyil/</i> > [di:l] ‘not’
c. <i>bu</i> ~ <i>buu</i> ‘this’	<i>asla</i> > <i>aslaaa</i> ‘never!’

(8) Geminates in Turkish (Gabain 1950: 55f., Lewis 2000: 13f.)

Old Turkish	Modern Turkish
a. <i>id-ti</i> ~ <i>it-di</i> ~ <i>it-i</i> ~ <i>idi</i> ‘he sent’	<i>batı</i> ‘west’ ~ <i>bat-tı</i> ‘it sank’

2.2.3. Vowel harmony

- Although vowel harmony *per se* is possible in all rhythmic types, word-spanning vowel harmony systems are only possible in languages which lack vowel reduction. Turkish vowel harmony is of the word-spanning type and is already present in Old Turkish.

(9) Palatal assimilation in Turkish (Gabain 1950: 57, 88, Lewis 2000: 19)

Old Turkish	Modern Turkish
a. <i>yol-ta</i> ‘on the way’	<i>anla-yacak</i> ‘he will understand’
b. <i>yir-dä</i> ‘at the place’	<i>bekle-yecek</i> ‘he will wait’

(10) Labial assimilation in Turkish (Gabain 1950: 47, 62, 66)

Old Turkish	Modern Turkish
a. <i>ay-i-siz</i> ‘invaluable’	<i>kapı-cı</i> ‘janitor’
b. <i>yazuq-suz</i> ‘sinless’	<i>spor-cu</i> ‘sportsman’
c. <i>ilk-i-siz</i> ‘beginningless’	<i>kahve-ci</i> ‘coffee-maker’
d. <i>ög-süz</i> ‘motherless’	<i>göz-cü</i> ‘oculist’

2.2.4. Summary

- With respect to the phonological parameters discussed here, Turkish is a prototypical member of the syllable-based rhythm class. The Old Turkish facts suggest that the membership in this rhythmic class shows a remarkable degree of diachronic stability.

(11) Selected phonological properties of rhythmic prototypes in Turkish

	<i>Mora-based</i>	<i>Syllable-Based</i>	<i>Stress-Based</i>
ACCENT	none/weak	none/weak	strong
STRESS EFFECT	none/weak	none/weak	strong
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- Finally, junctural processes of cluster simplification and epenthesis are possible in all rhythmic types; therefore these processes can also be at work in syllable-based languages like Turkish.
- Note that this typology excludes syllabic erosion in the form of vowel reduction and deletion as a possibility. If at all, erosion should be restricted to the junctural context, for instance in cluster simplification.

3. Morphologization in Turkish

- To test the predictions made by the typology in (12), we will examine two cases of morphologization in Turkish: i) the cliticization of personal pronouns ii) the compounding of verbal complexes (Givón 1976, Lehmann [1982] 1995: 29ff.).

3.1. Cliticization of subject pronouns in Turkish

- In Old Turkish, sentences with pronominal subjects were formed with a postponed pronoun at the end of the (non-verbal or verbal) predicate. If the subject of the sentence needs to be emphasized or contrasted, another personal pronoun is realized in the preverbal subject position (Good & Yu 2005: 323ff.).
- (14) Postponed subject pronouns in Old Turkish (Adamović 1985: 27, Gabain 1950: 183)
- | | |
|--|---|
| a. <i>(ben) bay ben</i> ‘I am rich’ | <i>(ben) kelür ben</i> ‘I am coming’ |
| d. <i>(sen) kişi sen</i> ‘you are a man’ | <i>(sen) kelür sen</i> ‘you are coming’ |
| c. <i>(ol) ädgü Ø ~ ol</i> ‘he is good’ | <i>(ol) qilür Ø ~ ol</i> ‘he is doing’ |
- In thirteenth century texts, the postponed pronouns in predicate-final position appear cliticized to the preceding word. Representative paradigms for non-verbal and verbal predicates are given in (15).
- (15) Cliticized subject pronouns in 13th century Turkish (Adamović 1985: 27f., 48ff.)
- | | |
|--|--|
| a. <i>(ben) bay-van ~ bay-am</i> ‘I am rich’ | <i>(ben) diler-ven ~ diler-em</i> ‘I am wishing’ |
| b. <i>(sen) bay-sin</i> ‘you are rich’ | <i>(sen) gelür-sin</i> ‘you are come’ |
| c. <i>(ol) bay-durur</i> ‘he is rich’ | <i>(ol) gelür</i> ‘he is coming’ |
| d. <i>(biz) bay-uz</i> ‘we are rich’ | <i>(biz) bilür-üz</i> ‘we are knowing’ |
| e. <i>(siz) bay-siz</i> ‘you are rich’ | <i>(siz) diler-siz</i> ‘you are wishing’ |
| f. <i>(anlar) bay-durur(lar)</i> ‘they are rich’ | <i>(anlar) gelür(ler)</i> ‘they are coming’ |
- In Modern Turkish, the cliticized subject pronouns form the backbone of the z-paradigm of subject agreement marking. The bound markers illustrated in (16) still behave as clitics with respect to phonological and morphosyntactic criteria (Kornfilt 1996, Good & Yu 2005).
- (16) The z-paradigm in Modern Turkish (Lewis 2000: 93f., 117f.)
- | | |
|--|--------------------------------------|
| a. <i>(ben) hazır-ım</i> ‘I’m ready’ | <i>(ben) gelir-ım</i> ‘I come’ |
| b. <i>(sen) hazır-sın</i> ‘you are ready’ | <i>(sen) gelir-sin</i> ‘you come’ |
| c. <i>(o) hazır(-dır)</i> ‘he is ready’ | <i>(o) gelir</i> ‘he comes’ |
| d. <i>(biz) hazır-ız</i> ‘we are ready’ | <i>(biz) gelir-iz</i> ‘we come’ |
| e. <i>(siz) hazır-sınız</i> ‘you are ready’ | <i>(siz) gelir-siniz</i> ‘you come’ |
| f. <i>(onlar) hazır(-dır)-lar</i> ‘they are ready’ | <i>(onlar) gelir-ler</i> ‘they come’ |

- Although the construction exemplified for the different diachronic changes did not change significantly, the phonological status and the surface realizations of the bound morphemes underwent a number of changes (see Appendix A).
 - Whereas preverbal subject pronouns constitute words of their own, i.e. they receive stress, the postponed pronouns have been unstressed in postverbal position ever since. Note that this prosodic behavior is regular in terms of phrasal stress assignment in Turkish.
 - Arguably, this phrasal stress pattern has been reinterpreted as irregular word stress in Modern Turkish (see Kabak & Vogel 2001 and Inkelas & Orghun 2003). With respect to prosodic integration, the cliticized elements have not been integrated into the stress domain of their hosts.
 - The reduction of stress is not accompanied by syllabic reduction in the form of vowel reduction or deletion. However, the phonological bonding of these elements is accompanied by the integration into the vowel harmony domain of the host with respect to palatal assimilation, e.g. *-sen* > *-san/-sen*.
 - In the course of a more general sound change of delabialization in the 15th century, a number of forms in the paradigm became sensitive to labial assimilation and have four surface forms, e.g. *-(y)um/- (y)üm* > *-(y)Im*.
 - A number of regular phonological processes apply at the host-clitic boundary. In the first person pronouns, the initial /b/ assimilates to /v/ in sandhi (17). This /v/ is then further deleted in the context of consonant clusters (18). The initial /d/ of the third person marker is subject to devoicing (19).
- (17) *b* > *v* Sandhi in Old Turkish (Gabain 1950: 53, Adamović 1985: 29)
- | | |
|---|--|
| a. <i>ab</i> ~ <i>aw</i> ‘hunting’ | b. <i>sābin-</i> ~ <i>sāwin-</i> ‘to rejoice’ |
| c. <i>sab</i> ~ <i>saw</i> ‘word’ | d. <i>qabšur-</i> ~ <i>qawšur-</i> ‘to put together’ |
| e. <i>köbrüg</i> ~ <i>köwrüg</i> ‘bridge’ | f. <i>-ben</i> ~ <i>-ven</i> ‘I’ |
- (18) Cluster simplification (Gabain 1950: 53, 56, Adamović 1985: 35, 55)
- | |
|--|
| a. <i>äwrił-</i> ~ <i>ärił-</i> ‘to revolve’ |
| b. <i>baqar-vuz</i> ~ <i>baqar-uz</i> ‘we are looking’ |
| c. <i>Türk-vüz</i> ~ <i>Türk-üz</i> ‘we are Turks’ |
- (19) *t/d* in suffixes (Gabain 1950: 54f.)
- | |
|---|
| a. <i>-da</i> ~ <i>-ta</i> ‘locative’ |
| b. <i>-dın</i> ~ <i>-tın</i> ‘ablative’ |
| c. <i>-dur</i> ~ <i>-tur</i> ‘3.sg.’ |
- Additionally, the cliticized elements are affected by the regular sound change $\eta > n$, e.g. in *siniz* > *siniz*, and labialization after /v/ (20).
- (20) Labialization after /v/ (Adamović 1985: 36)
- | |
|---|
| a. <i>avın-</i> > <i>avun-</i> ‘to calm down’ |
| b. <i>levin</i> > <i>levün</i> ‘color’ |
| c. <i>-viz</i> > <i>-vüz</i> ‘we’ |

- As effective as the phonological changes involved, a number of morphological processes, such as analogical extension (optative to aorist person markers, conditional to aorist person markers, possessive to person markers), and morphophonological analogy, e.g. *(v)uz* > *(y)uz*, shaped the present forms of the *z*-paradigm.
- One form of the *z*-paradigm did not evolve from a bound pronoun, but has a verbal origin, *dur-* ‘to stand’. In the course of history it underwent desemantization, deaccentuation and haplology. Since these processes are typical for the grammaticalization of verbal complexes, we will discuss this in the following section.

3.2. Compounding of verbal complexes

- In Old Turkish, a number of semantic nuances of verbs were expressed in verbal complexes which consisted of a non-finite⁵ and a finite verb (21). Such constructions are usually written as two separate words.

(21) Verb complexes in Old Turkish (Gabain 1950: 129, Adamović 1985: 116ff.)

- | | |
|--|------------------------------|
| a. <i>gel-i yür-ür</i> ‘he is coming’ | (<i>yür-</i> ‘to go, walk’) |
| b. <i>kör-ü bil-</i> ‘to know how to obey’ | (<i>bil-</i> ‘to know’) |
| c. <i>qıl-u u-</i> ‘to be able to do’ | (<i>u-</i> ‘be able’) |
| d. <i>ay-u bir-</i> ‘communicate’ | (<i>bir-</i> ‘to give’) |
| e. <i>alta-yu tur-</i> ‘to keep cheating’ | (<i>tur-</i> ‘to stand’) |
| f. <i>kü-yü tut-</i> ‘to keep guarding’ | (<i>tut-</i> ‘hold’) |

- Albeit the converb marker changed in some of these cases, the construction is still in use in Modern Turkish. However, with respect to their grammatical status, the forms in (22) constitute different stages of morphologization. At least *-(I)yor* ‘progressive’ and *-(y)Abil* ‘potential’ have been reanalyzed as disyllabic suffixes.

(22) Compound verbs in Modern Turkish (Lewis 2000: 106f., 153, 190f.)

- | | |
|--|------------------------------|
| a. <i>gel-iyor-um</i> ‘I am coming’ | (<i>yor-</i> ‘to go, walk’) |
| b. <i>gel-ebil-ir-im</i> ‘I can come’ | (<i>bil-</i> ‘to know’) |
| c. <i>neler çek-e-gel-di</i>
‘what things he has always suffered’ | (<i>gel-</i> ‘to come’) |
| d. <i>onu kaldır-t-ver-elim</i>
‘let’s quickly remove it’ | (<i>ver-</i> ‘to give’) |
| e. <i>söylen-e-dur-ur</i>
‘he keeps grumbling’ | (<i>dur-</i> ‘to stand’) |

- Unlike the cliticization of subject pronouns discussed above, the compounding of verbal complexes is accompanied by very little phonological effects. Essentially, the phrasal stress pattern in which the first verb receives main stress is reinterpreted as irregular word stress, e.g. $[(geli)_{\omega} (yür-ür)_{\omega}]_{\Phi} > [(geli)_{\omega} (yür-ür)]_{\omega}$.
- Prosodic integration does not apply, such that the suffixed element remains outside the domain for final word stress and vowel harmony does not spread to the suffix. Apart from some regular sound changes, the only noteworthy phonological process which is at work in the development of *yür-* and *dur-* is the application of haplology (23).

⁵ See Erdal (1979) on the actual converb forms used in Old Turkish.

(23) Haplogy in Old Turkish (Gabain 1950: 56)

- a. *sür-ür-çi* > *sürçi* ‘painter’
- b. *ot-a-daçi* > *otaçi* ‘doctor’
- c. *yür-ür* > *yür*
- d. *dur-ur* > *dur*

3.3. Summary

- Both in cliticization and in compounding, morphologization in Turkish is accompanied by the reinterpretation of phrasal stress patterns as word stress patterns. The elements in question, however, shun prosodic integration into the stress domain of their hosts.
- The reduction of stress is not accompanied by vowel reduction or deletion. In cliticization, the elements in question become sensitive to vowel harmony and junctural processes of cluster simplification. Compounding is not paralleled by the integration into domains of vowel harmony or junctural processes.
- The elements in question are subject to regular sound changes of the language, as much as elements which do not undergo grammaticalization. Morphological shifts which are based on analogy form a substantial ingredient in the diachronic development of these markers.

4. Conclusions

- The diachronic data discussed in this talk provide overall positive evidence for the rhythm-based typology of phonology in grammaticalization: the syllable-based rhythm of Turkish prohibits the erosion of grammaticalized elements which ultimately leads to the accretion of morphological markers.
- The prosodic clines which have been proposed as part of the rhythm-based typology, however, do not necessarily mirror diachronic change: the gradual integration of cliticized elements into the stress domains of their hosts has never been a factor in the history of Turkish.
- As already demonstrated by other studies (Kabak & Schiering 2004), different grammaticalization processes in a single language may trigger different phonological processes: whereas cliticization leads to the spreading of vowel harmony and the application of junctural processes, compounding doesn't.
- In sum, the findings of this study cast doubt on universal scenarios for grammaticalization and its independence from other forms of morphological change as expressed in ‘grammaticalization theory.’

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