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Rounded–unrounded vowel harmony in Turkish

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The goal of this paper is to demonstrate that rounded–unrounded vowel harmony (R-U harmony) operated in spoken Turkish earlier than it is generally believed. Evidence is provided from the texts written by Karalms and Armenians. Although the existence of Turkish texts in Armenian, Hebrew, Georgian, Syrian, Greek, Cyrillic and Latin scripts is a well-established fact, only Latin and to some extent Cyrillic, Greek and Armenian texts were extensively employed in research. For an overview of ‘transcription texts’ see Hazai (1990). There are also some arguments that can be formulated on a comparative basis. Attention is also drawn to the existence of two social variants of Turkish in its history and different norms.

1. Rounded–unrounded vowel harmony throughout the history of Turkic

The history of this process may be presented in the following way. As for Proto-Turkic, there are different opinions. Serebrennikov and Gadžieva (1986: 26) doubt in its existence in Proto-Turkic, for it is not clearly evident in the majority of modern languages, as they maintain. Róna-Tas supposes that Proto-Turkic had front-back “sound harmony” and probably “some traces of labial harmony” (1998: 73).

There are also different views on R-U harmony in Old Turkic (OT). Cahain (1959: 56–57) does not discuss R-U harmony in the chapter “Lautharmonie” of her grammar. Johnson is of the opinion that the existence of R-U harmony in the OT predecessor of West Oguz is uncertain ([1979] 1991: 31). In Tekin’s opinion, this process was at the beginning of its development in OT, and it was mostly binding vowels and CVC suffixes that were harmonized (Tekin 2000: 55).

In Karakhanid Turkic R-U harmony was well in progress. For example, the OT aorist suffix -Ur, -yUr (Erdał 2004: 129) is seen in many words in Karakhanid Turkic in the harmonized forms -Ur, -yUr, -lr, -ylr. Most of noun suffixes were harmonized, but some were not, e.g. -I (e.g. köz), -I (e.g. közin), some varied, as e.g. -un- in (e.g. közin -küzun). The harmonization of verb suffixes in Qutadığ Bilig and Divān Lugāt al-Tūrk was well beyond noun suffixes, but it was better developed than in OT.¹

After the Karakhanid period, all literary Turkic languages which used Arabic script acquired the written standards which mostly remained unchanged until the end of its employment. These standards do not reflect phonological processes occurring in the spoken languages and sometimes even the pronunciation of written texts. This was the case

¹ See the index to Qutadığ Bilig, e.g. the suffixes attached to the nouns bag ‘head’ and köz ‘eye’ (KBI 62-63 and 287-288), and the verbs bar- ‘to go’ and kör- ‘to see’ (KBI 56-58 and 280-284).
with literary Eastern Turkic or Chaghatai, Tatar,4 and literary Western Turkic or Turkish throughout all its stages of development. Moreover, the tendency to "dissimilation" in Old Turkish increased in relation to Old Turkic. It is possible that this process started in the Oghuz period before the separation of the Seljuks, as we can conjecture from some indirect hints by Mahmud al-Kashgari, e.g. that the Oghuz say *ben bardum 'I went' while the other Turks say *men bardum (Dankoff and Kelly 1982: 85).

More detailed studies tend to establish rules for particular suffixes rather than to formulate general rules for R-U harmony in a language or historical period (e.g. Bombaci 1952, Thomsen 1963, Johansen [1979] 1991: 31ff, Erdal 2004: 129–130, Grumina 1991: 34). The essence of these views is a classification of the suffixes of the second or non-initial syllables containing close vowels into three classes, (Bombaci 1952: 95, Thomsen 1963: 313, Johansen [1979] 1991: 31, [1979] 1991: 71, [1986] 1991: 78): (1) [I], e.g. *-mîk; (2) [W], e.g. *-dîk; (3) [X], e.g. *-lx, and if we add a middle vowel, there is also a (4) [O] class, as probably in Old Turkic (Thomsen 1963: 317).

There is no written evidence to show clearly when R-U vowel harmony reached the stage of a fully accomplished process in any Turkic language. However, owing to the fact that it operates in most Turkic language areas (south-western, north-western and north-eastern), it is hard to believe that it could have developed in each group independently. Therefore, since the last great separation of Turkic languages occurred after the fall of the Golden Horde, we can assume that at least a far-going tendency to R-U vowel harmony must have been present in the 15th century at the latest. If we agree, for example, that Troki Karaim which possesses R-U harmony separated from the Crimea in the 14th century, we have to agree with the supposition that it must have inherited R-U vowel harmony from 14th-century Crimean Turkic.

What is called 'some traces of labial harmony' or 'labial harmony at the beginning of its development' is that some suffixes are harmonized and some are not.

2. Written standards and phonology

It is a well-established fact that orthography always remains behind phonological processes in a language.

Some Turkic writing systems reflect vowel harmony fairly well, while others do not. Languages which have newly created scripts such as Altai, Tuvan or Yakut usually acquire written standards which mirror their phonetic structure in an adequate way. In contrast, those languages which have a long literary tradition, even if scripts changed, have phonetically inadequate writing systems, since a new alphabet often continues an old standard. Modern Turkish which employs Latin script is exceptional, for it broke up completely with the old standard. Therefore, vowel harmony is well represented by modern Turkish orthography, although some changes are not shown in it, e.g. oluçak → [oluçak] 'it will be', görceğ → [görceğ] 'he will see'. In contrast, the new Uzbek orthography based on Cyrillic script is in fact a transliteration from Arabic and remains indifferent to the question of vowel harmony, enhancing the loss of it in the basic variety of spoken Uzbek. It is also true of the current Tatar orthography which does not reflect R-U harmony, although it does operate in Tatar (e.g. Faseev 1966: 813, Serdreminokov and Gadzhiev 1986: 26).

It is also an established fact that through education orthography may affect pronunciation, in this particular case the pronunciation of words as unharmonized sound sequences. We may even speculate what Modern Turkish would be like without its fundamental language and writing reform. One may imagine that because of a very long tradition of ignoring vowel harmony and pronouncing words like yotine (Vigier 1970: 285, Zaiczkowski 1936: 104) Modern Turkish would be in this respect like Modern Uzbek.

A good example of how an orthography may be durable and how it may influence pronunciation is Kazakh. Kazakh occupies a middle position between the languages that do not have a written tradition (e.g. the aforementioned Altai, Tuvan and Yakut) and languages which have one, e.g. Uzbek just across the border. Old Kazakh texts written with Arabic characters are quite different from Chaghatai texts and demonstrate R-U harmony quite well, e.g. the poem Adil Sultan from the 18th century (Issin 2001: körünüs) 'that it could be seen' (p. 51), قیزى [qızĩ] 'its tail' (p. 51), قۇزۇنى [qızunı] 'my dear; lit. my soul' (p. 52), the present standard being көрүнсүз, көзүүрсүз and күзүнүү, respectively.

R-U vowel harmony is also well evidenced in the texts written in Cyrillic script from the 19th century and the beginning of the 20th century, e.g. күргүз 'walking', ауыл 'he does not die', күрүү 'its tail', көзүнү 'I have seen' (Melioranski 1892: 40, 45, 46; мурзагой 'putting', жасош 'pupil' (Svatoe Evangelli 1901: 9, 95); бөрүүгө 'wie frühe', ой күзүн бөүрүк 'he has himself zu Grunde gerichtet' (Radloff 1911: 1823, 1894); жұмыр 'of the house', мөйи 'nine', әмдік 'bed' (Samojlovin 1915: 164, 166). R-U harmony was also established by Melioranski in his grammar in which he provided distribution of vowels in suffixes after stems (Melioranski 1894: 16).

However, books printed in Tatar and Uzbek printing houses5 as well as the reformed Arabic script, established by Aqmet Baytursunul (1926–1928), then Latin (1929–1940) and Cyrillic (from 1940 onwards) scripts that followed introduced a standard that completely ignored R-U vowel harmony. Therefore, both the Latin and the present-day Cyrillic standards were created on the basis of Baytursunul’s alphabet. We may suppose that it was probably so because Baytursunul wished to introduce a new script closer to Tatar and Chaghatai written standards. Although Baytursunul authored grammars and textbooks independently from Islamic Turkic tradition, for some reasons he did not want to break off completely the relations between Kazakh and the kindred Turkic languages.

3 In relation to Kazakh, it was observed as early as 1894 by Melioranski who noticed a strong impact of written texts in the pronunciation of some educated people (Melioranski 1894: 15).
4 It was in 1894 that Melioranski (1894: 15) noted that vowel harmony is not always represented in the written language.
3. Rounded–unrounded vowel harmony in Old and Middle Turkish

A general belief that R-U harmony appeared in Turkish by the end of the 18th century is based upon the evidence of Latin 'transcription texts' which in our view reflect a high Ottoman style and imitate the written standard, even such practical texts as Jakab Nagy de Harasznyi's Colloquia (1672). A theory of labial vowel harmony was elaborated by Johanson (1979, 1978–1979). His arguments are valid, but in my opinion only in relation to Old Turkish and Standard Ottoman Turkish. Johanson was aware of the restraints imposed by 'transcription texts', and later he extended his analysis with a non-Latin, Armenian text (1986), though he did not change his theory. He says that the development of vowel harmony in Turkic languages is far from being clear in detail (Johanson [1978–1979] 1991: 71).

Johanson's theory of R-U harmony may be summarized as follows. There are three classes of suffixes with vowels [i], [u], and [ı] → [i], [ı]. He postulates three stages of development, an initial, a final and a transitional. The essence of the transitional stage is the presence of [ɛ] and [ɛ] rounded) and [-rounded], i.e. a stage in which the vowel in the suffix is governed by a stem vowel ([1978–1979] 1991: 27–73). Johanson assumes that the first step of the development in Old Turkish started in the 14th century when [ı] → [ı].² In his view the process of West Oghuz R-U harmony started with the unrounding of the reduced vowel of type [u] to the neutral vowel of type [i] ([1979] 1991: 65). Johanson's observations were predominantly based on 'transcription texts', though he has taken into account nearly all that had been said and examined before. However, his ideas—with some additions and restraints—were in principle supported by Doerfer (1985: 96) who examined texts written in Arabic script.

In our view the 'transcription texts', at least those examined so far, do not validate the arguments for such a late existence of dissimilating tendencies in Turkish. Phonetic inexactness of many 'transcription texts' is a well established fact. For instance, Doerfer (1985: 7–9) says that he sees problems with conclusions built solely on 'transcription texts' and argues that their authors often noted traditional, not really spoken forms, other shortcomings being their poor competence of Turkish and influence of Balkan dialects.

There are opinions supporting our belief that some phonological processes had started in Turkish long before they were noted in writing and that spoken Turkish existed through the whole period of Classical Ottoman, being quite different in style from it (Duman 1999: 331–359).² Among the arguments Duman quotes there are texts in Viguière's compendium, recorded in a double style, one high and educated, one colloquial (Duman 1999: 342–343). As we can see, there are very important differences in vowel harmony among those two styles. In the following, we will show some doublets (H – high, Q – colloquial) quoting them directly from Viguière (1790):

H vudjoudi (vucud) – H vudjoudou (vucudu), H oldughu itschin (oldugh için) – Q oldughou itschin (oldugh için), H këndu (kendi) – Q këndi (kendi), H qërqwsi ile (korkusi ile) – Q qorgwsi ov (korkusyla), H olmech (olms), Q olmouch (olms), H sanwar samurs – Q saner sanurs (p. 284), H yokral (yolne) – Q yolouna (yolun), H euzmûde (üzünde) – Q euzmûde (üzünde), H idub (idib) – Q idib (edib), H chûdrin (şâkîn) – Q chûdrin (şâkîn) (p. 285), H aqîlî (aâkîlî) – Q aqelî (aâkîlî), H qarchusinde (karşusinde) – Q qarchusinde (karşusinde), H yoloz mi (yoloz mu) – Q yolozou mou (yolozu mu), H ëyni (eynî) – Q ëyni (eynî) (p. 286), H dosten (dostun) – Q dostun (dostun) (p. 287).

As we can see, in spoken style R-U harmony works perfectly, whereas in high style it follows the literary standard. Viguière's evidence is one of the most important, since his book is a brilliant work and in our opinion a recapitulation of Turkish studies from pre-modern time, being one of the best compendia of Turkology prior to the 19th century. Viguière was able to discover how Turkish phonotactic rules work and was aware of different social variants of language. One of the next authors shortly after Viguière in whose works the pronunciation of spoken Turkish is really demonstrated is Hindoglu (1829).

However, Viguière composed his work at the end of the 18th century and it does not invalidate the periods of development in Johanson's theory. Therefore, we have to refer to other evidence.

3. 1. Evidence of Karaim Turkish

Turkish texts written by Karaites, Armenians and Greeks who lived in Turkey are very important, since their authors were at least bilingual and Turkish was a natural environment to them. As a rule, the Levantines knew Turkish much better than Western traders and travellers. However, those of them who wrote in Turkish were educated and knew Arabic writing,⁷ they were aware of the written standard. Some authors and copyists

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² However, owing to al-Kashgari's observation quoted above, we see that it started much earlier as a process of assimilation to bilabial consonants.

⁶ One of the first researchers who has pointed to the difference between a high variety of Ottoman Turkish and spoken language on the basis of 'transcription texts' was Ananiaz [Ananiasz] Zajęczkowski. Comparing the original text of a letter by Sultan Süleyman I to the Polish King Sigismund August of 1551 with its Latin transcription by Ibrahim Bey, a Polish-born Turkish interpreter at Sultan's court, he demonstrated that many Arabo-Persian constructions were in the transcription replaced with Turkish equivalents, even such verbs as tavakkuf etmek by katlanmak 'to withdraw' (Zajęczkowski 1936: 112–113). However, in this transcription vowels are shown as they were pronounced in the high style (ibid 105–109).

⁷ Even the appearance of many manuscripts and books demonstrates Ottoman influence, e.g. the ornaments on the title page of the Armenian manuscript reproduced in Sunjian and Tietze (1981: 3). See also the nisbat-like ornaments on Jewish tombstones in Turkey (Rozen 1994: 116f).
conformed to this standard and therefore, their works are roughly of the same relevance as Western transcription texts, but some apparently preferred spoken forms. It seems that in most cases two and stylistic variants of Turkish, one high and the other low, were intertwined in their writings. Nevertheless, an analysis may take into account such factors as whether the addressee in correspondence, the readership to which a work was directed, as well as the genre and topic of a work.

1. The first evidence for R-U harmony is a very scarce Turkish material in a Karaite Hebrew prayer book published in 1741/1742 in Qale (Poznański 1913–1914: 40, 224)4 Бадетеем ба саарим, су 'alam yaradaan; bit miinazi padisahdar, karar olmaz aktina; avval onu ol gendirir, kimse ermez sirna; anacak ki az sefa'a'tan eyler ese kulana 'I bow to the Creator of this world; He is like a ruler who fights, his wisdom is unequalled; He is the first and the last, nobody can understand his secret, unless He gives some grace to his servant'.

In this short text we see normal spoken forms which contrast with the literary standard of M oldie Türk is: padisahdur versus padisahdar, gendirir versus gendirdir, kulana versus kuluna.

2. Two financial documents prior to 1758, published in Jankowski (2010). The documents were written in the Crimean in Crimean Turkish, with some admixture of Crimean Karaim. There are two phonotactic rules relevant to the question we are concerned with in this paper.

(1) Rounded stems + rounded suffixes.

Two suffixes obey to this rule: +IXK, and -(X)r, e.g. günük – günük 'daily; for a day, for ... days', and olur 'is; will be'. Because of kömürük 'coal cellar', we may assume that this process did not go further than the second syllable. There is one exception to this rule, i.e. göttiren 'leads', while the forms kapu 'door' and yapulan 'made' are phonetically motivated.

(2) Unrounded stems – unrounded suffixes.

The suffixes which obey to this rule are the following: +IXK, -(X)r, e.g. şahım 'my Shah', efendimiz 'our lord', telli 'here: embroidered', beşlik 'five-plaster piece', oaksiş of one okka, of ... okkas', yuvarı 'above', çektiği 'when going out', ārıkten (sona)'after giving'.

R-U harmony also works in stems of both genuine words, e.g. cebuk 'rod', gümüş – gümüş 'silver', kömür 'coal', kütük 'balk'; textile; üçuk 'distaff', ulu 'great', üçin (4 occurrences) – için (2 occurrences) 'for', yıtıpk 'ring'; and loanwords, e.g. zürüm 'emerald' and havlı 'towel'.

8 Poznański, who did not understand Turkic languages, called this poem 'Tata'. He also quoted another 'Tata' poem which was later (p. 224) identified as a Tatar refrain of a Greek hymn first printed in Venice in 1528/1529. Unfortunately, Poznański's quotation in Hebrew characters seems to be inexact, therefore further research is needed, the more so as in his later paper (Poznański 1918: 43) he confused the numbers of these two poems. More for the discussion on this controversy see Shapiro (2003: 692) and Agay (2009: 20).

9 Although it may be affected by confusion with ketir, since the verb ketir also occurs in these texts in a similar meaning.

We have to stress that unrounded stems are better attested to in the material available than rounded ones.

3. A manuscript of mucuma type, copied in the 18th century, among the holdings of the Institute of Oriental Manuscripts in St. Petersburg, shelfmark A 59. As in the preceding document, the vowel harmony seems to be operating in most cases, though there are a few exceptions. R-U harmony may be evidenced in the following suffixes:

(1) Possessive suffixes, e.g. sözi (1a) 'his speech', sözi (67b) 'your speech', oğlunda 'at his son', malm (68b) 'my property'.

(2) Genitive case suffix, e.g. Osman'lini 'of the Ottomans', şehirlerini 'of their cities', danyanı 'of the world' (1b); an exception being bani (28b) 'of this'; this suffix may be influenced by the Karaim genitive suffix which occurs in only two variants, -ni and -ni, cf. İbrahimini (32b) 'Ibrahim's'.

(3) Jussive suffix, e.g.-git (12b) 'let them go', öptürsin (12b) 'let him / make him kiss', gelsin (68b) 'let him come'.

(4) Past tense suffix, e.g. (aman) oldular (12b) 'they became (safe)', (muzeyin) oldular (12b) 'they became (elegant)', an exception being kod (12a) 'he put'.

(5) Aorist suffix, e.g. veririm (12a) 'I give', verirler (12a) 'they give', severim (68b) 'I love'.

(6) Participle or verbal noun suffix -DIK, e.g. getirdi (28b) 'brought by him', met etti (32b) 'praised by him'.

This manuscript contains popular stories and the language mirrors a low style. Besides the forms showing such accommodated forms as cemaliçin (32b) for his sake, there are some unharmonized suffixes like -(X)K, e.g. uzunlkıları (1b) 'their distance' and konsulgümürdan (12a) 'from our neighbourhood'.

4. Translation of the Bible into Karaim Turkish, printed edition of 1832–1835 in Istanbul (Tora 1832–1835). The Karaim Turkish text is vocalised, so we can clearly see the quality of each vowel. R-U harmony in this translation demonstrated as a fully operating process, with some exceptions in morphological archaisms, e.g. the genitive case suffix -ni after stems ended with a consonant or phonetically motivated environments like the presence of bilabial consonants (b p m f). R-U harmony in this translation may be exemplified by the following pairs: 'Tatraniz' or 'God' – gıcızmü 'our strength' (p. 709); gögü 'heaven-ACC' – yeri 'the earth-ACC' (p. 5); eydir 'it is good' – yoktur 'there is not' (p. 5);NotFoundError (He) did' (p. 5), verdi '(He) gave' (p. 709) – gördü '(He) saw', oldu '(it)' was' (p. 5); gizlenmiş 'hidden' – olunmuş 'been' (p. 709); devşirilse 'that they could be assembled' – görünsün 'that it could be seen' (p. 5).

10 In Poznański's bibliographies it is shown as printed in Constantinople (Poznański 1913: 45, Poznański 1918: 71), but a catalogue note in the copy I saw says that it is "Ortakol 1835".

11 The language of this translation is called by the editors "Yunus'un dispası" i.e. leton yitma el.
As said above, exceptions are rare, e.g. some suffixes that only have I vowel, e.g. üçüctü'third' (p. 6), and the old genitive suffix -nūt, e.g. zuvnu't of the waters', göknu't of heaven' (p. 5), but if the suffix appears in the form +Xn, the vowel is harmonized, e.g. göğün (p. 7).12

3.2. Evidence of Armenian Turkish

The observations below are based on Armenian Turkish and the abundant Armeno-Kipchak literature of the 16th and 17th centuries from outside Turkey, though also influenced by Turkish, is disregarded. Since most Armenian Turkish texts available are late, mostly from the second half of the 19th century, our observations are limited to two 17th century texts by Yeremya/Ermeni Kömürçiyan, published by Schütz (1971: 401–430) and The Jewish Bride, a longer poem written by the same author, published by Sanjian and Tietze (1981).

1. The letters. The importance of these texts to Turkish phonetics was obvious for Schütz (1971: 421). With reference to R-U harmony, Schütz finds out that personal suffixes are mostly harmonized (1971: 425–426), but only of IPS, e.g. efendim 'sir', sultanım 'my lord', gyzum 'my eye(s)'. However, in his analysis Schütz does not quote such harmonized forms as senin ayınam 'your son' for 2PS and onunde 'inside' before of' for the 3PS (p. 415).

As for grammatical noun and verb suffixes, Schütz says that normally unrounded variants are employed. Despite this it should be remarked that the old evidential suffix -niš often takes a round vowel, e.g. omluş, ıllnluş, tatmus, gurmüş after a rounded stem, but retains its unrounded shape after an unrounded one, e.g. vurmaştım, olmnştır (p. 415), while the convert -Ub is mostly rounded, what Schütz explains by the effect of billabial -b (Schütz 1971: 426). In general, the unrounding tendency is stronger than the rounding tendency. After most unrounded stems suffixes appear in unrounded variants while in Turkish written with Arabic characters they are rounded, e.g. devletli, goldin, dukendikde (tukendikde).

The language of these two Armenian Turkish texts is closer to spoken Turkish than native Turkish or 'transcription texts' of a similar genre, though the second text demonstrates a stronger impact of written standard, e.g. hazretlerin en (2 occurrences), giru,

idesuz, serifinuz (perfiniz), kendu and kilu, probably because this letter was written to the Persian Shah.

2. The poem. According to Tietze, the poem reveals "a relatively well developed labial harmony" (Sanjian and Tietze 1981: 57; see also p. 60). On the basis of the analysis of phonetic features and that what we know about the history of Turkish, Tietze explains the irregularities by the transitional shape of 17th century Turkish staying between Old Ottoman and Modern Turkish (Sanjian and Tietze 1981: 56). However, it seems that these irregularities may be explained by what Tietze writes later, namely by the fact that Kömürçiyan tried to imitate the high style in Ottoman poetry (Sanjian and Tietze 1981: 66). There is no need to present R-U harmony in this poem, since it has been done by Johanson. Johanson regarded this text as a low variety style and more vital "der soziolatexisch niedrigere, vitale" (1986 [1991]: 79). Comparing it with the language of Jakob Nagy de Harsányi's Colloquia, which was written at roughly the same time, Johanson came to the conclusion that Kömürçiyan's poem is phonologically more progressive and shows a clear rounding tendency. We should only add that:

(1) Some suffixes are mostly harmonized, e.g. possessive suffixes expect for the third person singular suffix if not followed by another suffix (Sanjian and Tietze 1981: 56–58); jussive (Sanjian and Tietze 1981: 60, 188, 189); participle or verbal noun suffix -Dlig (Sanjian and Tietze 1981: 165, 166).

(2) Some suffixes are mostly rounded, unharmonized, e.g. the verb convert -ub (Sanjian and Tietze 1981: 60). Therefore, the assimilating tendency of the billabial consonant [b] is still stronger than R-U harmony.

(3) Some suffixes are mostly unrounded, unharmonized, e.g. -ci (Sanjian and Tietze 1981: 176). In this case we are faced with the retention of the Old Turkish feature.

As a whole, we may say that the evidence of Armenian texts is weaker than that of Karaim texts. It may be attributed to the fact that Kömürçiyan was an educated man and adhered more to the Turkish written standard, trying to imitate the Ottoman verse style, although it is true that there are many colloquial features in his poem.

4. Conclusion

It is an indisputable fact that the process of the development of R-U harmony in Old Turkish, which was inherited from Common Oghuz in an initial stage, was weakened by the assimilating and dissimilating tendencies in phonetic environments. A relatively late tendency to R-U harmony in Turkish may be explained by its early separation from other languages. However, with the time of the power of R-U harmony or distant assimilation became stronger. In other words, the force of a distant vowel turned stronger than the force of an adjacent consonant. However, the written standard fixed the forms of the suffixes and sometimes stems from the period before R-U harmony had developed and it imposed a norm that was in use as long as Arabic script was employed. The Ottoman
policy of elision-i elidæ and the dominating position of Arabic and Persian words to which R-U harmony could not be applied additionally favoured unharmonized writing and pronunciation. It is for this reason that even genuine Turkish words started to be pronounced in a vocally dissimilating way, opening the way to such forms as anleri (onlar)'they-ACC' and oltmge (olmaga) 'to be, for being'. This way of pronunciation was adopted by high Ottoman social groups as a label of education and social position to distinguish them from ordinary people. Needless to say, this fashion could not be without any effect on language development, but it could not stop the inherent tendencies of spoken Turkish. It is very likely that even educated people employed spoken Turkish in their private life, but used a different style to show their social position in official discourse.

Therefore, theories built on the evidence of 'transcription texts' and Turkish texts written in Arabic script should only be applied for high Standard Ottoman Turkish. They are of a limited value in relation to Turkish used in natural situations.

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Working memory and relative clause attachment preferences in Turkish: An eye-tracking study*

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1. Introduction

Readers have to understand the grammatical structure of a sentence while they read in order to accomplish this task. Therefore, they have to analyze the grammatical structure of sentences and place the constituents in their nodes in the hierarchical structure of language. Readers have greater difficulty in the parsing of ambiguous sentences and literature of sentence parsing has focused on the way participants react to these ambiguous sentences.

Researchers agree on the fact that during sentence processing the processor uses syntactic, lexical, semantic, pragmatic information and general world knowledge. Frazier (1987) indicates that the debate is about when all these kinds of information are included into the sentence processing. This conflict resulted in the emergence of different sentence processing models.

Papadopoulos (2006) categorizes sentence processing models using several criteria each one referring to one major question about parsing: The first can be the type of processing, which can be either parallel or serial. The type of processing refers to what processor does when it encounters an ambiguous structure, which is open to more than one interpretation. Parallel processing refers to the simultaneous parsing of two or more possible structures; whereas, in serial processing the processor handles the possibilities one by one. If the first interpretation is not plausible it reanalyzes the input. The second criterion for the categorization of parsing models is the type of information used in the processes, which can be either modular or interactive. Modular models (the first and most eminent model is Garden-Path Model by Frazier 1987) suggest that only one type of information (e.g. syntax) can be used at once. For instance, a modular model may argue that the first parsing of the sentences uses only syntactic information and there is no role of semantics. It can only determine the way the second analysis will be conducted. Interactive models hold that more than one type of information can be used at once during the processing (Van Gompel & Pickering 2009). For example, semantic knowledge may interfere with the syntactic analysis (Pickering & Traxler 1998). The third is about whether parsing mechanisms are universal or not. Some models like Garden-Path advocate the universality of parsing mechanism while some others accept that there are cross-

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