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Turkish and The Maximal Onset Principle*

Türkçe ve Büyükçül Önses İlkesi

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Abstract: Syllables are fundamental units in phonology and articulation, and are characterized by internal structures. A syllable consists of less sonorant sounds (consonants) surrounding a more sonorant sound (a vowel). In this sense, a syllable is composed of a *nucleus*, which is a vowel, and initially and finally placed consonants (*onset* and *coda*, respectively). The Maximal Onset Principle is based on phonological constraints and it determines the placement of syllable boundaries by defining the maximum number of consonants allowed in a sequence while taking their sonority into account. The Maximal Onset Principle is used to eliminate complexities seen in syllabification caused by suffixation by assigning as many consonants as possible to an onset instead of a coda in languages like English. On the other hand, Turkish is an agglutinative language in which words are formed by joining multiple morphemes together in a way that allows for the separation and identification of individual word stems and affixes, thereby indicating specific inflections or derivations. In other words, even though syllabification is relatively easier for monosyllabic words, it can get complicated due to this complex system of suffixes in Turkish, which relies heavily on suffixation. The present paper aims to demonstrate how the complicated syllabification process caused by suffixation can be resolved by the principle of maximal onset. Therefore, beginning from syllables and moving on to noun compounding, this study will illustrate a pattern concerning syllabification and provide evidence that Turkish abides by the principle of maximal onset and the principle can be reflected in syllables to even noun compounding. The pattern revealed in the present paper can help teachers and learners of Turkish as a foreign language understand and solve the syllabification difficulties caused by suffixation.

Structured Abstract: Syllables are the basic building blocks of words in phonology and articulation. They are made up of a vowel, which is the most sonorant (or loudest) sound, and a group of consonants, which are less sonorant. The Maximal Onset Principle is a rule that helps determine where syllable boundaries go. It says that, whenever possible, consonants should be assigned to the onset (beginning) of a syllable rather than the coda (end), which helps to make syllabification simpler and more consistent. For example, in the English word extra the Maximal Onset Principle tells us to syllabify it as /ɛk-strə/ rather than /ɛks-trə/ because the onset of a syllable can be more complex than the coda, and the Maximal Onset Principle is used to ensure that the onsets of syllables are as complex as possible. The Maximal Onset Principle is especially important in languages like English, where suffixation (adding affixes to the end of words) can create complex syllable structures.

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Basic syllable structure in many languages requires a nucleus (a vowel) surrounded by a consonant (onset) and a consonant cluster (coda) to form the rhyme. Although Turkish permits six syllable permutations, the canonical syllable structure is Consonant+Vowel for Turkish, and Turkish is a language that relies heavily on adding suffixes to words to change their meaning. This can make it difficult to syllabify Turkish words because the suffixes can create consonant clusters that do not follow the usual rules of syllabification. Even though Turkish is accepted to follow the Maximal Onset Principle, which says that consonants should be assigned to the beginning of syllables whenever possible, to the best knowledge of the researcher, there is no study showing the principle of maximal onset on syllabification of Turkish words with suffixes. Syllabification is a dynamic process in Turkish in which syllables change regarding the suffix they take and this change is quite visible in a wide variety of morphological elements ranging from single syllables to compound nouns. As a result, this paper aims to illustrate how the Maximal Onset Principle is reflected in Turkish syllables after attaching suffixes and even noun compounding.

To achieve this aim, the present paper focuses on various suffixes that can reflect the nature of the syllabification caused by suffixation. Namely, suffixes used in Turkish to indicate case, possession, person, and tense are analyzed and examples concerning the effects of them on syllables are given in this paper. In addition to that, since Turkish is an agglutinative language, noun compounding is also analyzed in the present paper. The analysis shows that Turkish does abide by the phonological rule of the Maximal Onset Principle and when a vowel-initial suffix is attached to a syllable-final consonant, the consonant moves from the coda to the onset of the new syllable. In other words, the consonant is pulled from the coda (the end of the syllable) like a magnet and placed in the onset (the beginning of the syllable) of the new syllable via the vowel (nucleus) of the suffix. This enables Turkish to create a place in the syllable reserved for (potential) codas in the newly formed syllable since the maximum number of consonants a syllable can include in the onset is limited to one and in the coda is limited to two in Turkish. On the other hand, no such movement is seen in cases of attaching a consonant-initial suffix or an epenthetic consonant-initial suffix to any syllable. The reason for the absence of such a movement is related to the nature of the new syllables formed via such suffixes since they create syllables that can stand alone unlike a vowel-initial suffix, which acts upon the principle of onset maximization in terms of syllabification.

Although the suffixes analyzed in the present paper are limited in number due to space limitations, they reveal the nature of syllabification and the findings can be reflected in other suffixes and their effect on syllabification in Turkish. Yet, in future studies, the effects of other derivational and inflectional suffixes on Turkish or even borrowed words from other languages can be analyzed and the number of examples can be multiplied. Also, the effects of vowel harmony on sound shifts are left for another study.

Turkish is also taught as a foreign language in many countries and although Turkish has a grapheme-to-morpheme correspondence, syllabification can be difficult to teach or learn for students, regarding suffixation especially. What this study reveals can be useful for learners of Turkish as a foreign language who are struggling with the syllabification process in Turkish by showing the pattern and the effects of suffixation on syllables. Therefore, students can grasp the basic mechanics of syllabification and reflect them onto suffixation processes in Turkish.

Keywords: Turkish, The Maximal Onset Principle, Turkish Phonology, Turkish Morphology, Syllabification, Suffixation.

Öz: Heceler sesbilim ve eklemlemede temel birimlerdir ve içsel yapıları ile belirtilirler. Bir hece, daha titreşimli bir sesi (bir ünlü) çevreleyen daha az titreşimli seslerden (ünsüzler) oluşur. Bu bağlamda, bir hece, merkezinde *çekirdek* olarak kabul edilen ünlü bir ses, *önses* ve *sonses(ler)* olarak kabul edilen ünsüz seslerden oluşur. Büyükçül Önses İlkesi sesbilimsel kısıtlamalara dayanır ve seslerin titreşimlilik özelliklerini dikkate alırken bir dizide izin verilen en fazla ünsüz sayısını tanımlayarak hece sınırlarının yerleşimini belirler. Büyükçül Önses İlkesi, İngilizce gibi dillerde bir seslem sonu öğesi yerine hece başına mümkün olduğunca çok sayıda ünsüz atayarak sonekleme yoluyla hecelemede görülen karmaşıklıkları ortadan kaldırmak için kullanılır. İşlevli eklerin birbiri ardına eklenmesi ile yeni birimler oluşturduğu dillerden olan Türkçe gibi bitişimli dillerde hecelemede farklılık görülebilir. Bir başka deyişle, her ne kadar tek heceli sözcükleri hecelerine ayırmak kolay olsa da eklerin bu bileşik sistemi nedeniyle heceleme karmaşıklaşabilir. Bu makale, son eklerin neden olduğu karmaşık heceleme sürecinin Büyükçül Önses İlkesi ile nasıl çözülebileceğini göstermeyi amaçlamaktadır. Bu

nedenle, bu çalışma hecelerden başlayarak bileşik ad oluşturmaya kadar heceleme ile ilgili bir örüntü ortaya koymayı hedeflemekte ve Büyükçül Önses İlkesinin Türkçede hecelemeye yansıtılabileceğine dair kanıtlar sunmayı hedeflemektedir. Bu makalede ortaya konan örüntü ile yabancı dil olarak Türkçe öğrenenlerin ve öğretmenlerinin son eklerin neden olduğu heceleme zorluklarını anlamalarına ve çözmelerine katkıda bulunulacaktır.

Anahtar Kelimeler: Türkçe, Büyükçül Önses İlkesi, Türkçe Sesbilim, Türkçe Biçimbilim, Heceleme, Sonekleme.

Introduction

Language can be seen as a complex system comprised of interconnected units and structures. Among these interconnected structures, syllables play a crucial role as units with their internal structures, serving as fundamental components of phonology and articulation. They can be considered as the foundational elements upon which everything else in language is defined (Trask, 1999: 201). Despite being independent units, syllables are made up of sub-units or structures, influenced by the sonority of sounds and the phonotactic rules of a particular language. Consequently, syllables are formed by surrounding more sonorant sounds (vowels) with less sonorant sounds (consonants), with the vowels acting as the core of the syllable while consonants form the surrounding group of sounds.

This distinction between vowels and consonants becomes evident when examining the formation of syllables via syllabification which involves identifying the syllable boundaries within a word, which are formed following the phonotactical rules of the language. In this sense, syllabification can be described as the process of dividing a word into its constituent syllables (Bigi et al., 2010). In most languages, vowels take on the role of creating the core of a syllable, while consonants cluster around them. The arrangement of vowels and consonants, as well as their combinations, are designated with specific labels. For example, the vowel positioned at the center of a syllable is referred to as the nucleus, while the consonants appearing at the beginning of a syllable are known as the onset. Conversely, consonants placed at the end of a syllable are referred to as the coda. The combination of the nucleus, onset, and coda forms the rhyme structure. Despite potential variations, the majority of languages adhere to a fundamental syllable structure. In this sense, the syllable components for a monosyllabic English word *run* are syllabified as /rʌn/, where /ʌ/ functions as the vowel serving as the nucleus of the syllable. Following /ʌ/, the consonant /n/ becomes the coda, and together they constitute the rhyme, with /r/ positioned as the onset of the syllable.

Though syllabification of words sounds easy for many languages, there are instances where things get complicated. As part of this complication, this paper aims to focus on the Maximal Onset Principle (MOP) and the syllable structure of Turkish and present evidence for a pattern to see MOP at work on Turkish syllables. The outline of the paper is as follows: the next section provides a brief explanation of MOP and is followed by information about the syllable structure of Turkish. Then, I will present examples that support the presence of a pattern concerning MOP on Turkish syllables and end up with a generalized rule explaining the presence of MOP on Turkish syllables.

The Maximal Onset Principle (MOP)

Although The Maximal Onset Principle (MOP) has different names such as the Principle of CV-Precedence (Ito, 1986) or The Onset First Principle (Clements and Keyser, 1983), it refers to a principle for syllabification which states that unless it contradicts universal or language-specific constraints, consonants should be assigned to the syllable onset rather than the syllable coda. As Kahn (1976) puts it, when there are consonants between two vowels, the syllables should be divided so that as many consonants as possible are at the beginning of the syllable (onset) rather than at the end (coda). To put it differently, as summarized by Baertsch (2010), the process of syllabification

involves first identifying suitable nuclei, then assigning as many pre-nuclear consonants (onsets) to the syllable as possible, and finally designating any remaining unassociated consonants as coda segments, following the Maximum Onset Principle (MOP). In this sense, English multi-syllabic words such as *extra, diploma,* or *contract* are syllabified as /ɛk-strə/, /dɪ-ploʊ-mə/, or /kɒn-trækt/ instead of /ɛks-trə/, /dɪp-loʊ-mə/ or /kɒnt-rækt/ When inspected closely, it can be seen that the consonants are placed in the onset rather than the coda since /ks/, /pl/ or /nt/ are not acceptable according to the phonotactic constraints of English.

Syllable Structure of Turkish

Turkish syllables are formed around a vowel and the canonical syllable structure in Turkish is Consonat+Vowel (CV) (Güven and Friedmann, 2019). As mentioned, Turkish syllables are formed around a vowel and although the canonical syllable structure in Turkish is CV, other structures can also be seen (Güven and Friedmann, 2019). According to Yavuz and Balcı (2011), Turkish exhibits six possible permutations of single-syllable structures, and instances of the permutations allowed, along with corresponding example words, are as follows:

- VOWEL: *o* (him/her)
- VOWEL + CONSONANT: *at* (horse), *su* (water)
- CONSONANT + VOWEL: *bu* (this), *şu* (that)
- CONSONANT + VOWEL + CONSONANT: *sel* (flood), *yol* (road)
- VOWEL + CONSONANT + CONSONANT: *ırk* (race), *üst* (upper/superior)
- CONSONANT + VOWEL + CONSONANT + CONSONANT: *Türk* (Turkish), *sert* (tough)

When the permutations given above are studied, certain rules can be seen. For example, all syllables must contain one vowel in Turkish as evident in the examples. In other words, Turkish requires a vowel as the nucleus in every syllable, as most languages do. However, the number of consonants allowed in the onset and the coda are limited in Turkish (Göksel and Kerslake, 2005; Güven and Friedmann, 2019). Each syllable can have only one consonant as the onset and a maximum of two consonants as a coda. In this sense creating syllables that would be allowed in other languages such as English is not permitted in Turkish.

The Maximal Onset Principle and Turkish

Turkish is an agglutinative language and the morphology of Turkish is rich and complicated. Complying with the rules of vowel harmony, Turkish allows words to receive multiple suffixes simultaneously. Though this feature of Turkish seems hard to cope with, Turkish has a grapheme-phoneme correspondence (Güven and Friedmann, 2019). In other words, the orthography is transparent in terms of the phonemes it represents. Therefore, this enables speakers of Turkish to identify the suffixes and words easily during inflection or creating new words. In this sense, I believe that the Maximal Onset Principle should be studied in Turkish at the morpho-phonological level which reveals itself in syllables. As the main principle of MOP is to move the consonant acting as the coda to the onset of a new syllable, I shall present evidence of a pattern concerning MOP and its effects on Turkish syllables.

On the other hand, Turkish has a rich and complex morphology, which makes it difficult to cover in a single paper. To focus on the Maximal Onset Principle's impact on Turkish syllables, this paper focuses on only some of the language's morphological complexities. Also, even simple processes are representative of the suffixation processes and can be reflected in other derivational or inflectional processes. In this sense, although suffixation is seen in other linguistic elements in Turkish such as verbs, postpositions, adjectives, etc., this paper focuses primarily on nouns.

However, stepping from noun suffixation, a brief presentation of suffixation reflecting the effects of MOP on verbs and even on noun compounds could reflect the suffixation process. As a result, the outline of the paper is as follows: First, examples from case and possessive markers attached to nouns will be provided and the effects of MOP on syllables will be shown. Then, person and tense markers attached to verbs will be touched upon in short, and evidence showing that the effect of MOP on syllables is extensive and can go beyond simple words to noun compounding will be demonstrated. Finally, a general claim concerning Turkish and the Maximal Onset Principle when forming new syllables will be presented.

Inflectional Suffixes and MOP in Turkish

Inflectional suffixes show how the parts of a sentence are connected, and they express grammatical relationships. Therefore, I will provide examples concerning forming new syllables as the result of case and possession markers in Turkish in this section and I will present evidence that Turkish abides by the Maximal Onset Principle for each of these suffixes when certain conditions are met.

Case suffixes

As explained above, the syllabification process for monosyllabic words in Turkish is straightforward and can be further illustrated with numerous examples. For instance, words like *hap* (pill), *sal* (raft), *taş* (stone), *bal* (honey), and *kol* (arm) can be easily syllabified since each one of them has a vowel acting as the nucleus and one consonant as coda and the other one as the onset. On the other hand, Göksel and Kerslake (2005) show that Turkish has six cases, five of which have markers (accusative, dative, locative, ablative, genitive), including an unmarked nominative case. Examples of the cases with markers functioning as suffixes can be seen below in (1)-(5).

(1)

Accusative case suffix: -(y)I

(a) *kedi*-yi
cat-ACC
'the cat'

(b) *kolon*-u
column-ACC
'the column'

(2)

Dative case suffix: -(y)A

(a) *okul*-a
school-DAT
'to the school'

(b) *kova*-ya
bucket-DAT
'to the bucket'

(3)

Locative case suffix: -DA

(a) *masa*-da
table-LOC
'at the table'

(b) *bardak*-ta
glass-LOC
'in the glass'

(4)

Ablative case suffix: -DAn

(a) *sıra*-dan
desk-ABL
'from the desk'

(b) *sınıf*-tan
class-ABL
'from the class'

(5)

Genitive case suffix: -(n)In/-Im

(a) *kuzu*-nun
lamb-GEN
'of the lamb'

(b) *ceket*-in
jacket-GEN
'of the jacket'

Every example given above in (1)-(5) includes two-syllable words and every word in (a) ends with a vowel while every word in (b) ends with a consonant. When viewed closely, it can be seen that accusative, dative, and genitive case suffixes require epenthetic consonants -(y) and -(n) when the syllable ends with a vowel. For instance, as seen above in examples given in (a) for (1), (2) and (5), these consonants are required words like *kedi* (cat), *masa* (table) or *kuzu* (lamb) when attaching accusative, dative and genitive case suffixes, which lead to the formation of new syllables as in *kedi*-yi (cat-ACC), *masa*-ya (table-DAT) or *kuzu*-nun (lamb-GEN). However, as shown in (3) and (4), since locative and ablative case suffixes begin with consonants, no epenthetic consonants are needed when attaching these case suffixes to syllables. Epenthetic consonants are not required for case suffixes when a syllable ends with a consonant as in examples shown in (b) and this applies to every case suffix in Turkish including accusative, dative, and genitive case suffixes as well.

As mentioned above, syllables are formed around vowels in Turkish and the nature of case suffixes determines the requirements for the occurrence of an epenthetic consonant immediately

before the case suffix. In addition to the previous examples that show how case markers are attached to words, examples given below from (6) to (10) show instances of the syllabification process concerning every case suffix in Turkish. The examples are classified into two main groups depending on the final syllable ending either in a vowel or a consonant. Every sample in (a) shows a word with the final syllable ending in a vowel and every sample in (c) shows a word with the final syllable ending in a consonant along with their syllables. In addition to that, every sample presented in (b) shows the syllables of the word in (a) while every sample presented in (d) shows the syllables of the word in (d) when a related case marker is attached. Samples in (b) and (d) also show the syllables occurred when case suffixes are attached.

(6)

Accusative case suffix: -(y)I

(a) pencere
/pen-ce-re/
‘window’

(b) pencere-yi
/pen-ce-re-yi/
window-ACC
‘the window’

(c) makas
/ma-kas/
‘makas’

(d) makas-ı
/ma-ka-sı/
scissors-ACC
‘the scissors’

(7)

Dative case suffix: -(y)A

(a) ayna
/ay-na/
‘mirror’

(b) ayna-ya
/ay-na-ya/
mirror-DAT
‘to the mirror’

(c) çatal
/ça-tal/
‘fork’

(d) çatal-a
/ça-ta-la/
fork-DAT
‘to the fork’

(8)

Locative case suffix: -DA

(a) tahta
/tah-ta/
‘board’

(b) tahta-da
/tah-ta-da/
board-LOC
‘at the board’

(c) yelek
/ye-lek/
‘vest’

(d) yelek-te
/ye-lek-te/
vest-LOC
‘on the vest’

(9)

Ablative case suffix: -DAn

(a) kapı
/ka-pı/
‘door’

(b) kapı-dan
/ka-pı-dan/
door-ABL
‘from the door’

(c) dolap
/do-lap/
‘closet’

(d) dolap-tan
/do-lap-tan/

closet-ABL

'from the closet'

(10)

Genitive case suffix: -(n)In/-Im

(a) düğme

/düğ-me/

'button'

(b) düğme-nin

/düğ-me-nin/

button-GEN

'of the button'

(c) duvar

/du-var/

'wall'

(d) duvar-ın

/du-va-rın/

wall-GEN

'of the wall'

When the examples given above are studied, it can be seen that case suffixes in Turkish require an epenthetic consonant when they are to attach to syllables ending in vowels. In this sense, an epenthetic consonant is needed for accusative, dative, and genitive case suffixes when they are to attach to a syllable ending in a vowel as shown in every sample (a). As syllables are formed around vowels, this enables these case suffixes shown in every (b) to create syllables that can stand on their own and act as new syllables. In addition to that, the same process applies to ablative and locative cases, which can be seen in every sample concerning them. Since ablative and locative case suffixes begin with consonants, they are, indeed, syllables that can stand on their own regardless of the final syllable. On the other hand, when the examples in (c) and (d) concerning accusative, dative, and genitive cases are studied, no epenthetic consonant is needed for a syllable ending with a consonant, and case suffixes are easily attached to the final syllables, which leads to a true representation of MOP on Turkish syllables. For instance, when *makas* (scissors) in 6(c), *çatal* (fork) in 7(c), and *duvar* (wall) in 10(c) are attached with accusative, dative, and genitive case markers, the final consonant, which is the coda of the final syllable, is moved to the onset position of the new syllable created by the attachment of the vowel acting as the case suffix. To present a clearer idea, more focused examples reflecting the same process are presented below in (11) - (13).

(11)

Accusative case suffix: -(y)I

(a) masal

/ma-sal/

'story'

(b) masal-ı
story-ACC
/ma-sa-lı/
*/ma-sal-ı/
‘the story’

(12)

Dative case suffix: -(y)A

(a) *çit*
/çit/
‘fence’

(b) *çit*-e
fence-DAT
/çi-te/
*/çit-e/
‘to the fence’

(13)

Genitive case suffix: -(n)In/-Im

(a) *barut*
/ba-rut/
‘gun powder’

(b) *barut*-un
gun powder-GEN
/ba-ru-tun/
*/ba-rut-un/
‘of the gun powder

In every example given above, every (a) shows the syllables of sample words, and every (b) presents the syllables that occurred after accusative, dative, and genitive case suffixes are attached. When the examples are studied, one can see that the coda of the final syllable in every word is moved to the onset of the new syllable formed by the attachment of the vowel instead of remaining at the syllable as the coda. For instance, while *masal* (story) is normally syllabified as /ma-sal/, the /l/ in the coda of the second syllable is moved to the onset of the new syllable formed as the result of the attachment of accusative case marker -I and the final syllabication of *masal*-ACC becomes /ma-sa-lı/ instead of /ma-sal-ı/. The same pattern is visible in other examples as well. For example, *çit* (fence) and *barut* (questionnaire) are syllabified as /çit/ and /ba-rut/ respectively. However, the codas of the final syllable, /t/ in both words, are moved to the new syllables when the dative and genitive case markers are attached, resulting in /çi-te/ and /ba-ru-tun/ instead of /çit-e/ and /ba-rut-un/.

The examples regarding accusative, dative, and genitive case markers can be multiplied. However, the pattern standing is quite clearly visible: if a case marker beginning with a vowel is to

be attached to a syllable ending with a consonant, the vowel, acting as the nucleus of the new syllable, pulls the coda towards itself and charges it as the onset of the new syllable instead of leaving it in the coda of the old syllable. Therefore, the onset is maximized. The same pattern of syllabification or maximization can be seen in possession suffixes as well.

Possession Suffix

As Turkish is an agglutinative language, it relies heavily on suffixation to convey meaning. One of these suffixes with a special function is possessive suffixes, which are to indicate a possession depending on the possessor. Göksel and Kerslake (2005, p .66) classify possessive suffixes as follows:

- 1st person singular -(I)m ‘my’
- 2nd person singular (familiar) -(I)n ‘your’ (formal) -(I)nIz ‘your’
- 3rd person singular -(s)I(n) ‘his’, ‘her’, ‘its’, ‘their’
- 1st person plural -(I)mIz ‘our’
- 2nd person plural -(I)nIz ‘your’
- 3rd person plural -lArI(n) ‘their’

Except for the 3rd person plural suffix, every other possessive suffix requires an epenthetic vowel when attaching to a noun ending in a consonant and this attachment results in a change in the new syllable created by the new suffix. The process can be seen below in (14).

(14)

Possessive Suffix

(a) oyun
/o-yun/
‘game’

(b) oyun-um
oyun-1SG.POSS
/o-yu-num/
*/o-yun-um/
‘my game’

(c) anahtar
/a-nah-tar/
‘key’

(d) anahtar-ın
key-2SG.POSS
/a-nah-ta-rın/
*/a-nah-tar-ın/
‘your key’

(e) dümen
/dü-men/
‘rudder’

(f) dümen-i
dümen-3SG/PL.POSS
/dü-me-ni/
*/dü-men-i/
‘his/her/its/their rudder’

To highlight the pattern concerning the Maximal Onset Principle and syllabification in Turkish, possessive suffixes that begin with a vowel only are presented in the examples in (14) above as any possessive suffix beginning with either an epenthetic consonant or a consonant can form a new syllable that can stand alone. The examples (a), (c) and (e) show how normal syllabification of the words *oyun* (game), *anahtar* (key), and *dümen* (rudder) are. As mentioned above, each syllable in these words takes place around a vowel and the maximum number of consonants an onset or a coda can take is predetermined via the phonologic constraints in Turkish (Güven and Friedmann, 2019). Therefore, the syllables for each word are /o-yun/, /a-nah-tar/ and /dü-men/. However, when inflected with possessive suffixes, the same process of suffixation reflected in the previous section arises and can be seen in examples (b), (d), and (f). The final consonants in the final syllable are moved to the onset position due to the attachment of the vowel (possessive suffix) and function as the onset in their new syllables instead of remaining in the previous syllable. As a result, syllabification results in /o-yu-num/, /a-nah-ta-rın/ and /dü-me-ni/ instead of /o-yun-um/, /a-nah-tar-ın/ and /dü-men-i/. Although the examples can be multiplied, the same pattern would keep revealing itself when the necessary conditions are met. When a possessive suffix beginning with a vowel only is to attach to the final syllable including a consonant as the coda, the nucleus of the new syllable, that is the vowel in the possessive suffix, pulls the consonant in the coda of the final syllable to itself and forces it to become the onset of the new syllable created. However, any possessive suffix beginning with either an epenthetic consonant or a consonant is exempt from this process because it meets the requirements to form a new syllable that follows the phonologic constraints of Turkish and therefore, does not need to change the inner structure of the syllable they are to attach.

Person and Tense suffixes

Presenting the effects of the Maximal Onset Principle on syllabifying every case suffix in Turkish is beyond the scope of the present paper and so far, inflections limited to nouns only are focused, as mentioned previously. However, the very same process can be seen in different suffixes attached to verbs and a glance at the syllabification process seen as the result of person and tense markers being attached to verbs might be of use to understand the generalizability of MOP in Turkish. In this sense, examples below in (15) present instances of verbs attached with person and tense markers.

(15)

Person markers

1st Singular: -Im

(a) dur
/dur/
‘stop’

(b) dur-ur-um
stop-AOR-1SG
/du-ru-rum/
*/dur-ur-um/
'I stop'

3rd Singular: -Ø

(c) kal
/kal/
'stay'

(d) kal-ır
stay-AOR.3SG
/ka-lır/
*/kal-ır/
'he/she/it stays'

Present Continuous tense (-Iyor) + 1st Singular: -Im

(e) gel
/gel/
'come'

(f) gel-iyor-um
come-IMPF-1SG
/ge-li-yo-rum/
*/ge-li-yor-um/
'I am coming'

Present Continuous tense (-Iyor) + 3rd Singular: -Ø

(g) bak
/bak/
'look'

(h) bak-ıyor
look-IMPF.3SG
/ba-kı-yor/
*/bak-ıyor /
'he/she/it is looking'

Turkish grammar requires all finite verbs to be marked and although the examples represent a very brief instance of person and tense markers, the effect of MOP is still visibly present in (15). For example, in (15) (a), the verb *dur* (stop) can be syllabified easily. However, as seen in (b), when

it is attached with the first-person singular marker, /r/ in /dur/, acting as the coda, is moved to the onset of the syllable formed by aorist -Ir. Parallel with this, /r/ in aorist -Ir is then forced to move to the final syllable and acts as the new onset of the syllable /rum/ instead of remaining as the coda of the syllable. Therefore, the *dururum* (I stop) is syllabified as /du-ru-rum/ instead of /dur-ur-um/. The very same process is seen in (15) (c) and (d) as well. Namely, even though *kal* (stay) can be syllabified with ease as /k/ as the onset, /a/ as the nucleus, and /l/ as the coda, syllabification changes when it is marked with the 3rd person singular marker. Though the 3rd person singular marker in Turkish does not have a suffix in this tense, as a result, /l/ in *kal* is moved to the onset of the new syllable formed by the aorist. Regarding the other examples, (e), (f), (g) and (h) represent a combination of tense and person markers attaching to verbs *gel* (come) and *bak* (look) and the magnetic force of the nucleus of the suffix on the coda of the previous syllable it is attached to is also present. Words in (e) and (g) can easily be syllabified with designated syllable constituents but syllables are inter-mingled when they are attached with new suffixes. For instance, /l/ in /gel/ moves to the next syllable formed by the present continuous tense marker -Iyor, which is then divided into two other syllables, one of which is formed around the person marker, and the final syllabification is seen in (f). Namely, *geliyorum* (I am coming) is syllabified as /ge-li-yo-rum/ instead of /ge-li-yor-um/. The same process is seen in (h) as well: the final consonant, /k/ in /bak/, is moved to the onset position of the syllable formed by the present continuous tense marker -Iyor and then /-yor/ becomes a whole new syllable. In this case, *bakıyor* (he/she/it is looking) is not syllabified as /bak-ıyor/ but as /ba-kı-yor/.

By nature, fusing many case suffixes is very common in Turkish and the effect of the Maximal Onset Principle is visible, regardless of the number of syllables to be attached. In other words, the very same trend with attaching a single suffix in Turkish is followed even when attaching multiple suffixes to a lexical item. The pattern that should be taken into account is the relationship between the suffix and the final syllable. The pattern seen can be used to account for syllabification when a vowel functioning as a suffix is to be attached to the syllable containing a consonant in the coda. Then, the consonant becomes the onset of the new syllable and the vowel resides as the nucleus of that syllable. As one might expect, this pattern goes beyond syllable level and finds its way into noun compounding as well.

Noun Compounds

The effect of the Maximal Onset Principle extends well beyond the syllable level and can be seen when compounding nouns. A noun compound can be written as one word or two separate words in Turkish. However, since MOP is reflected in syllables, noun compounds written as two words are excluded in this paper. Also, noun compounds in Turkish have two types: bare compounds and -(s)I compounds (Göksel and Kerslake, 2005). The difference between noun compounds is based on the suffix they take. While bare compounds take no suffixes, the first noun in -(s)I compounds has no suffixes but the second is marked with the 3rd person possessive suffix, -(s)I, which is not to highlight a possession but to show an affixation between the first and the second noun (Göksel and Kerslake, 2005). Also, as Yavuz and Balcı (2011) mention, -(s)I noun compounds can be found more commonly in Turkish. Therefore, only -(s)I compounds that are written as one word are included in the analysis and examples focusing on such noun compounds are given below in (16).

(16)

(a)	*bal*	*ayı*
	/bal/	/a-yı/
	balayı	
	‘honeymoon’	
	/ba-la-yı/	

*/bal-a-yı/

(b) *göz* *altı*

/göz/ /al-tı/

gözaltı

'custody'

/gö-zal-tı/

/göz-al-tı/

(c) *huzur* *evi*

/hu-zur/ /e-vi/

huzurevi

'nursing home'

/hu-zu-re-vi/

*/hu-zur-e-vi/

(d) *yayın* *evi*

/ya-yın/ /e-vi/

yayınevi

'publishing house'

/ya-yı-ne-vi/

*/ya-yın-e-vi/

Every -(s)I compound in the sample words in (16) includes a noun ending with a consonant in the first noun and a noun beginning with a vowel in the second noun, creating a new noun compound written as one word. When the examples are studied, a similar process mentioned above concerning creating new syllables and the effect of MOP is seen. Namely, the final syllable of the first noun is formed around the vowel in the final syllable but when the nouns are compounded, the coda of the syllable is moved to the new syllable and begins to act as the onset of the newly formed syllable. For example, before compounding, /l/ in /bal/ in (a) is in the coda but is moved to the onset position of the new syllable after compounding and creates the /la/ syllable. Similarly, even though /göz/ in (b) includes /z/ in the coda position, it becomes the onset in /zal/ after compounding. Other examples in (c) and (d), namely /r/ in /huzur/ and /n/ in /yayın/ also act as the onset after noun compounding and are moved to the proceeding syllable and become part of /re/ and /ne/ syllables of the new words. In this sense, it can be said that in addition to the effects seen on syllables in single words, MOP is also effective when it comes to noun compounding when they are to form a new word.

Conclusion

The Maximal Onset Principle might fall short in explaining some instances in languages but it correctly helps the syllabification of a consonant in most cases of a binary choice between treating it either as a coda or an onset (Hayes, 2009; Baertsch, 2010). When the examples given above are studied, a certain pattern in the syllabification process related to the Maximal Onset Principle can be observed in Turkish. In cases where a case suffix begins with a vowel and is to be attached to a syllable ending in a consonant, it pulls the consonant from the coda like a magnet. Then, it places it

in the onset of the new syllable instead of keeping it in the rhyme in Turkish. In other words, as the name suggests, attaching a suffix beginning with a vowel to a syllable ending with a consonant causes the maximization of the onset of the new syllable instead of remaining at the coda. In fact, the pattern is recursive in a forward-moving fashion in terms of attaching multiple suffixes simultaneously. Namely, the very same process is evident during attaching multiple suffixes to syllables or noun compounding. Whenever new suffixes are attached to previous syllables, the final consonant in the coda is moved to the onset of the new syllable, revealing a tendency to follow the same pattern mentioned above. This way, Turkish abides by the phonotactic constraints and rearranges syllables. Namely, by onset maximization, a place in the syllable reserved for (potential) codas in the newly formed syllable is created as the maximum number of consonants a syllable can include in the onset is limited to one, and in the coda is limited to two in Turkish. On the other hand, MOP does not apply to suffixes beginning with (epenthetic) consonants for a straightforward reason: such suffixes can create syllables that can stand on their own following the phonotactic constraints of Turkish. Therefore, it can be said that MOP can be used as an effective tool to explain the syllabification process regarding suffixation in Turkish in cases following the pattern that occurs.

The findings of the present study can be reflected in teaching Turkish as a foreign language. Even though Turkish has a grapheme-morpheme correspondence (Güven and Friedmann, 2019), syllabification can be difficult for learners of Turkish. Therefore, presenting the process by emphasizing the principles of maximizing onset on syllabification and spelling can help learners understand the process and facilitate the learning process. Furthermore, material developers for teaching Turkish as a foreign language can also benefit from this study. They can include explanations concerning the relationship between MOP and Turkish and can provide examples along with exercises to assist learners in grasping the process of suffixation and syllabification.

This paper limits itself to certain suffixes due to space limitations. Therefore, other aspects of Turkish morphology and phonology including other inflectional and derivational suffixes are briefly dealt with and sound shifts or the effects of vowel harmony are not touched upon. However, the very same process of syllabification presented in this paper can be applied to Turkish in a broader scope. For instance, focusing on other suffixes as well as sound shifts in Turkish might reveal a deeper reflection of the effects of MOP in Turkish, though I suspect the results would still point to the pattern revealed in this paper. Similarly, in a future study, the effect of MOP on the suffixation of loan words borrowed from other languages can be studied to show how they are adapted into Turkish phonology.

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