

Suffixal Vowel Alternation in Turkish
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The vowel in the aorist morpheme in Turkish exhibits an alternation among /Ø/-/I/-/A/¹. In the literature, the environment in which this alternation occurs is described as the following (Emre 1945; Gencan 1967; Kornfilt 1997):

- i) {-Ør} is attached to stems ending with a vowel;
- ii) {-Ir} is attached to polysyllabic stems;
- iii) {-Ar} is attached to monosyllabic stems except for those ending with /r/, /l/, and /n/;
- iv) the nature of the vowel in the aorist is unpredictable with monosyllabic stems ending with the sonorants /r/, /l/, and n; it may be either /I/ or /A/.

In this paper, I will try to present an account for the Turkish facts about this alternation in terms of Optimality Theory. I will argue that the underlying forms of the morpheme are {-Ar} and {-Ør}; {-Ør} is attached to a vowel-final stem; as for the ‘unpredictable cases’, I will argue that it is the liquid in the final position of the stem that triggers the deletion of the vowel and that /I/ is epenthesized not to violate No Complex Coda. I will further argue that the alternation between the vowels of the aorist attached to polysyllabic vs monosyllabic stems can be accounted for by the constraint ranking responsible for the rest of the data. Taking into consideration that the alternation is described by making reference to the number of syllables of the stems, an analysis based on stress and its implications will also be discussed.

1. V-Final Stems or Words and the Aorist

There are two instances where the aorist is attached to V-final stems/words. The first one is the case of V-final verb stems, the second is the case of verb stems inflected with the V-final negative morpheme {-mA} in Turkish.

1.1. V-final Verb Stems and the Aorist

The aorist appears as {-Ør} when attached to V-final stems as may be observed in the data below:

(1) kapa	(close)	kapar	(s/he closes)
oku	(read)	okur	(s/he reads)
dile	(wish)	diler	(s/he wishes)

Considering this observation, we might argue that the underlying form of the morpheme is {-r}. As has been noted above, however, this morpheme surfaces as {-Ar} or {-Ir} as well. Evidence from historical facts and from language acquisition as well as

¹ /I/ stands for high vowels and /A/ for non-high vowels. Note that there is a vowel harmony in Turkish, which applies across morpheme boundaries as well as within morphemes. Vowels agree with the preceding vowel in backness and if they are high, they also agree in roundness (Gencan 1966; Kornfilt 1997).

other arguments which will be presented at further stages of this analysis indicate that -Ar is (or one of) the underlying form(s).

Historically, there is an ongoing process of lowering in the vowel of the aorist. Ahmet Cevat Emre (1945) illustrates this observation through the following data (the forms in the first column are the former and those in the second column are the modern forms of the aorist attached to the same stem):

(2) kil-ur	kil-ar	(s/he makes/causes to be)
er-ur	er-er	(s/he reaches the state of)

As may be observed in (2) the high vowel of the aorist has undergone lowering; /-I/ has become /A/ (/a~/e/ alternation is due to vowel harmony).

In studies on child language acquisition, it has been noted that children acquire {-Ar} much earlier than {-Ir}. This observation supports the idea that {-Ar} is the underlying form. Secondly, it has also been noted that the process of epenthesis is acquired at a much later stage of acquisition (Ayhan Aksu-Koc p.c.) In cases of epenthesis - such as complex onset cases in burrowed words, i.e. istasyon/station - a high vowel is inserted. This correlation between the late acquisition of the process of epenthesis, which is an insertion of a high vowel, and the late acquisition of the -Ir form of the aorist implies that the high vowel /I/ of the aorist might be an epenthesized segment.

Taking {-Ar} to be the underlying form of the morpheme, we account for data (1) by arguing that the vowel of the aorist is deleted when attached to a V-final stem. Deletion of the vowel of the V-initial suffixes is a process observed in Turkish though the opposite, that is, the deletion of the stem vowel rather than that of the suffix vowel is accepted to be more common (Gencan 1967).

Another instance - actually the only other case of deletion of the vowel of the suffix that I have observed - where a similar process can be observed is the behaviour of {-ImsI} , the derivational suffix similar to *-ish* in English. {-ImsI} seems to trigger the deletion of the final vowel of the stem:

(3) beyaz	(white)	beyazimsi	(whitish/whitelike)
kara	(black)	karamsi	(blackish/blacklike)
yumurta	(egg)	yumurtamsi	(egglike)
sari	(yellow)	sarimsi	(yellowish)

As may be observed in the first example in (3), the underlying form of the suffix is {-ImsI} since consonant final stems are attached {-ImsI}. With vowel final stems, when the final vowel of the stem is a high one, we cannot distinguish which vowel, that of the stem or that of the suffix, is deleted. The second and third examples in the data which have a low vowel in the final position of the stem clearly indicate that it is the vowel of the suffix that is deleted since the low vowel of the stem is retained.

It is interesting to observe such a deviation from the general tendency, in the language under concern, to apply epenthesis to resolve hiatus across morpheme boundaries and to delete the vowel of the stem in some cases as the following. An instance of a deletion of the stem vowel seems to be triggered by the Imperfect Aspect marker {-Iyor} in Turkish:

(4) kapa (close) kapiyor (s/he is closing)

I have already noted that hiatus is commonly resolved via epenthesis in Turkish. Some of the most common environments are the following:

(5) araba	(car)	araba + I	arabayi
		(car+Accusative case marker -I)	
araba	(car)	araba+A	arabaya
		(car+Dative case marker -A)	
ara	(look for)	ara+AcAk	arayacak
		(look for+Future Tense marker -AcAk)	

To review,

- (i) data in (5) illustrate the general tendency in Turkish to resolve hiatus across morpheme boundaries via epenthesis;
- (ii) data in (1) and (3) illustrate two instances of hiatus resolved via deletion of the suffix vowel;
- (iii) data in (4) illustrates a case of hiatus resolved via deletion of the stem vowel.

These observations pose the following problems:

We would expect a language which commonly resolves hiatus via epenthesis to have DEP-IO as a constraint ranking lower than MAX-IO. Consider the constraint ranking and tableau I below which accounts for data (5):

I. *VV > MAX-IO > DEP-IO

/ ara + Acak/	*VV	MAX-IO	DEP-IO
a. ra . a. cak	*!		
a. ra. <a>cak		*!	
⇒ a. ra. ya. cak			*

The first candidate loses because it violates the highest constraint No Hiatus. Hiatus can be resolved by either deletion of one of the vowels (violation of MAX-IO) or by epenthesizing a glide as an onset of the third syllable (violation of DEP-IO). Since the optimal candidate violates DEP-IO, it must be ranked lower than MAX-IO. Deletion of the suffix vowel or that of the stem vowel both violate MAX-IO and this ranking does not account for the choice of the vowel for the time being. *VV must be higher than both of the faithfulness constraints because it enforces the violation of the latter.

The constraint ranking in tableau I accounts for data (5). But we still have to answer the following questions posed by the rest of the data:

- (a) Why would Turkish prefer a violation of a higher ranking constraint, i.e, Max-IO in some cases (data 1,3,4), and
- (b) why would it delete the vowel of the suffix in some such cases (data 1,3) and delete that of the stem in others (data 4)?

A possible answer to the question in (a) is that there might be a constraint ranked higher than both of the faithfulness constraints that forces the violation of MAX-IO, allowing candidates with deleted vowels beat candidates with epenthesized vowels. Such a constraint should activate a process of deletion in a grammar that favours epenthesis over deletion. Considering that epenthesis increases the number of syllables whereas deletion retains it, we might argue that this constraint is a kind of faithfulness constraint that demands faithfulness to the input with respect to the number of syllables. Let's call it #S-IO for Number of Syllables-IO.

Consider the ranking and tableau II below:

/ara+ Ar/	*VV	#S-IO	MAX-IO	DEP-IO
a. ra. ar	*!			
a. ra. <a>r		*!	*	
⇒ a. ra. yar				*

The optimal output our constraint ranking yields is the ungrammatical “*arayar” whereas the actual optimal output in the language is the second candidate “arar”! (I am not concerned with the issue on the choice of the deleted vowel for the time being). For our ranking to yield the expected optimal output, the constraint that dominates the other two faithfulness constraint should demand a minimum number of syllables or at least one less than that of the input! First of all, it would no longer be a faithfulness constraint; secondly, it would be quite impossible to account for such a demand as “one less syllable than that of the input”; thirdly, if we assume it to be demanding “minimum # of syllables”, a candidate with fewer number of syllables, including a null case would beat the actual optimal candidate.

This problem can be solved in two ways: One is to regard this constraint to be demanding minimum number of syllables but with a condition which ensures that no morpheme is totally deleted. The other one is to argue that the aorist has an alternative form -{Ør}.

The first solution would require a special kind of MAX-IO which prevents deletion of all segments of a morpheme and we would not need a constraint on the number of syllables. Although it would account for the data above, we would run into trouble in other cases observed in Turkish, such as the occurrence of the aorist with the negative suffix that will be discussed in the following section. We will see that the aorist alternates with -{Ø}. Such an alternation would violate the constraint proposed as the first solution.(However, I will argue that a faithfulness constraint on the number of syllables does exist in Turkish after having provided evidence in favor of it.)

The second solution would simplify the analysis in that we would not need to account for deletion in a language which favors epenthesis but it would have to assume two underlying forms for the aorist.

Before we continue with the consequences of the second possible solution on the aorist, let's go back to question (b) above. If there is a deletion of the suffix vowel in cases like the aorist and {-ImsI} (data 1,3), why would there be a deletion of the stem vowel (data 4) in the same language? While trying to answer this question, we should still keep in mind that Turkish favors epenthesis over deletion, i.e., it ranks DEP-IO lower than MAX-IO.

Consider the data below which illustrates the data in (1-5) with the stress patterns (the stressed syllable is given bold):

(6) ara+AcAk	aray acak
ara+Iyor	ari yor
kara+ImsI	kara msi
ara+Ar	arar

First consider the second and third examples where there is a hiatus formed by a sequence of two vowels, the preceding one being a low vowel and the following one being a high vowel. In the former one hiatus is resolved via deletion of the *stem vowel* which is a low vowel and in the latter one, it is resolved via the deletion of the *suffix vowel* which is a high vowel. The choice in the deletion of a vowel to resolve hiatus may be due to two reasons:

- 1) The constraint which requires syllables to have an onset might be responsible for the deletion of the following vowel; but such an analysis would not be able to account for the deletion of the preceding vowel which is the nucleus of a syllable with an onset.
- 2) The nature of the vowels might be determining the choice; but in both of the cases above, the preceding and the following vowels are of the same nature, that is sequences of low vowel+high vowel are given but there is no consistency in the choice of the deleted vowel.

Considering the universal hierarchy of sonority, we should note that low vowels are more sonorant than high vowels and when one has to be deleted to satisfy a constraint on hiatus, it would be plausible for a language to delete the less sonorant one and leave the more sonorant one as a nucleus. This analysis based on the "survival of the more sonorant" accounts for the deletion of the suffixal high vowel in "karamsi" but why then is the high vowel in "ariyor" not deleted? The stress pattern gives a hint. Although Turkish is regarded as a Final Stress language, there are morphemes with an exceptional stress and {-Iyor} is one of them. The high vowel in {-Iyor} is always stressed (or prestressed as Barker 1989 calls it) and that might be the reason why it is not deleted.

To sum up, I have argued that in cases where hiatus is resolved by a violation of MAX-IO rather than DEP-IO, the choice of the vowel to be deleted depends on the sonority of the vowel; the less sonorant one is deleted *except when* it is not stressed.

Before we move on to the discussion of a constraint enforcing this choice, let's consider the other examples in (6). In the first example the hiatus formed by a

sequence of two low vowels is resolved by epenthesis. Neither of the low vowels is stressed and they have an equal value of sonority, hence the epenthesis. In line with our analysis above, we can argue that when two vowels with an equal value of sonority cooccur forming a hiatus and neither of them is stressed, hiatus is resolved via epenthesis. Now consider the aorist example “arar”. Aorist is similar to {-Iyor} in that it is always stressed. Under our analysis above, if the underlying form is regarded to be -Ar, the low vowel would not be deleted; then it should be the stem vowel that is deleted. This analysis seems to account for the data in (6) very nicely.

However, consider the data in (7):

(7) oku+ Ar okur

Our analysis that accounted for the data in (6) fails here. We would expect the less sonorant and unstressed high vowel of the stem to be deleted in the optimal output whereas it is not deleted. At this point, I think the only point where this analysis fails is the assumption that {-Ar} is the underlying form of the aorist. The same assumption led our former analysis given in tableau II to run into trouble. Note that a possible solution to the problem of trying to account for a deletion case in a language like Turkish which favors epenthesis is assuming {-r} to be an underlying form as well. Consequently, I would like to argue that the aorist in Turkish has two underlying forms {-Ar} and {-r}, the former failing to yield an optimal output with vowel-final stems because it violates hiatus, the latter being favored. With consonant-final stems, {-Ar} is favored since {-r} would violate No Complex Coda.

Up to this point, we have accounted for the form of the aorist when attached to V-final stems. We have started by the assumption that {-Ar} is the underlying form and tried to account for V-final cases by deletion. First, we have seen that a constraint on the number of syllables cannot be plausible as an argument in favor of the {-Ar} assumption. Secondly, having observed the epenthesis favoring properties of Turkish and investigating other cases where deletion does occur, we have argued that such deletion cases are enforced by other constraints which do not apply to the aorist.

Note that the following constraint ranking *VV > MAX-IO > DEP-IO proposed in tableau II could not account for the data. To account for the elimination of all candidates except for the optimal one and also for the data in (6), we can propose a constraint that I call Survival of the More/Most Sonorant (SMS) in line with the arguments presented for data (6).

Consider the constraint ranking and the tableau in III below:

*VV > SMS > MAX-IO > DEP-IO

Tableau III

/ara+Ar/				
/ara+ r/	*VV	SMS	MAX-IO	DEP-IO
a. ra. ar	*!			
a. ra <a>r		*!	*	
a. r<a>ar		*!	*	
a. ra. yar				*!
⇒ a.rar				

In this tableau, there are two possible inputs with two forms of the aorist. The candidate which selects {-Ar} violates hiatus and fails. The candidates which pick up the {-Ar} form of the aorist and have undergone deletion violate SMS and MAX-IO and lose; one of them is the case of a stem vowel deletion, the other is that of a suffix vowel deletion. The candidate which resolves hiatus via epenthesis violates DEP-IO and fails. The optimal candidate violates none of these constraints and wins.

1.2. V-Final Words and the Aorist

Another environment where {-r} is attached to a V-final word is observed in verb stems inflected with the verbal negative morpheme -mA. The aorist undergoes the following alternations in this environment:

- (8)(i) {r ~ Ø} alternation when followed by a V-initial morpheme (1st person singular agreement morpheme {-Im});
- (ii) {r ~ z} alternation when followed by a C-initial morpheme (2nd and 3rd person singular and plural agreement morphemes: {-sIn}, {-sInIz}, {Ø}, {-lAr});
- (iii) {r ~ y} alternation when followed by a V-initial morpheme (1st person plural agreement morpheme {-Iz}).

One interesting issue concerning the environments given above is that two sound changes occur in the same environment, i.e., before a V-initial morpheme. In (i), /r/ becomes /Ø/, whereas in (ii) /r/ becomes /y/. We will come back to this issue in 1.2.3.

The alternations given in (8) above are illustrated in (9) below:

(9) git+me+r+im	→	gitmem	(I don't go)
git+me+r+sin	→	gitmezsIn	(You don't go -sing)
git+me+r+Ø	→	gitmez	(S/he doesn't go)
git+me+r+iz	→	gitmeyiz	(We don't go)
git+me+r+siniz	→	gitmezsIniz	(You don't go -plu)
git+me+r+ler	→	gitmezler	(They don't go)

1.2.1. {r ~ Ø} Alternation

Consider the first example in the data above, i.e., “gitmem”. The input and the optimal output are given in (10):

(10) git + me + r + im ²	gitme<r><i>m
go +Neg+Aor+ist per sing	

² Based on the arguments in the former section, I am disregarding -Ar in the input. We have already posited that V-final stems or words would pick -r since a candidate picking up -Ar would not yield the optimal output.

In (10) above, there is no hiatus to trigger the deletion of any segment, yet there are two violations of MAX-IO. The deletion of the vowel can be accounted for by the constraint ranking in our former analysis (repeated in (11) below) only after /r/ is deleted since a candidate that does not delete the vowel would lose by a violation of hiatus (*gitmeim); a candidate that deletes the low vowel would violate the constraint SMS (*gitmim); and a candidate with an epenthized glide would violate DEP-IO (*gitmeyim) whereas the optimal candidate violates none of these constraints (gitmem). Observe the tableau IV below (I am disregarding the deletion of the aorist -r for the moment):

(11) *VV > SMS > MAX-IO > DEP-IO

Tableau IV

/git+ mE+Im//	*VV	SMS	MAX-IO	DEP-IO
git.me.im	*!			
git.m<e>im		*!	*	
git.me.yim				*!
⇒				
git.me<i>m				

We have to account for the deletion of the aorist -r in the first place for the analysis above to account for (11). Deletion of a liquid in an intervocalic position is not an observed process in Turkish and moreover, there does not seem to be a plausible natural motive for it.

There is an alternative approach to data (11). In (11) we have taken the underlying form of the first person singular agreement marker to be _Im, whereas there is no strong evidence favoring this assumption.³ If the underlying form lacks a vowel, the input will be

(12) git+me+r+m

A candidate that is totally faithful to the input would violate No Complex Coda (NCC). In Turkish, complex codas are not allowed except for sonorant + noncontinuant obstruent sequences. NCC might trigger the deletion of the aorist but then we have to account for the observation that it is the aorist -r, not the nasal that is deleted.

According to the constraint SMS, we would expect the less sonorant one that is the nasal to be deleted but it is not the case. If the nasal were deleted, on the other hand, some significant morphological information, i.e., that of agreement, would be lost. The deletion of the aorist, an aspect marker seems to be tolerated. In fact, this is not a rare instance in Turkish as well. Another functional category, Tense exhibits a similar alternation. Present Tense is argued to be marked by null morpheme (Tosun 1998 among others). It seems that morphemes with functional properties such as Tense and Aspect

³ There is actually an ongoing controversy on this issue. Some linguists argue that the underlying form might as well be -m and epenthesis, which is a common process in Turkish, resolves No Complex Coda, yielding the -Im form. I cannot make reference to such claims for the time being.

may be phonologically null whereas morphemes denoting agreement cannot.⁴ It follows that a constraint higher than No Complex Coda forbids the deletion of the agreement morpheme. Similar cases need to be further investigated before such a constraint is fully described. For the time being, I will argue that this constraint is sensitive to the nature of the morphemes and forbids the deletion of all the segments of a morpheme except for Tense and Aspect. Let's call it a No Null Morpheme constraint (*NM).

*NM restricts the violations of MAX-IO, therefore it must be higher than the latter. NCC enforces the MAX-IO violation and must be higher as well. For the time being we do not have evidence with respect to the ranking of *NM against NCC. We have one more task: Since DEP-IO is lower than MAX-IO in the constraint hierarchy posited above, a candidate which resolves NCC through epenthesis would beat the optimal candidate which deletes the aorist -r. A constraint higher than both of the faithfulness constraints would eliminate such a candidate. Such a constraint might be the one discussed in the former section: A faithfulness constraint that requires the optimal candidate to be faithful to the input in terms of the number of syllables, i.e. #S-IO. This constraint would restrict violations of DEP-IO and MAX-IO, and would be minimally violated when a higher constraint demands violations of the latter. It must be ranked higher than MAX-IO to eliminate satisfaction of NCC via epenthesis. We do not have evidence to rank it against the highest constraints for the time being.

Consider the constraint ranking (13) and Tableau V below:

(13) {NCC, *NM, #S-IO} >MAX-IO>DEP-IO

/git+me+r+m/	NCC	*NM	#S-IO	MAX-IO	DEP-IO
git. merm	*!				
git. mer<m>		*!		*	
git.me.rim			*!		*
git. me<r>m				*	

The first candidate that is totally faithful to the input violates NCC and fails. The second candidate which resolves an NCC violation through the deletion of the agreement morpheme violates another higher constraint No Null Morpheme and fails. The third candidate satisfies NCC through epenthesis; violation of DEP-IO is not fatal since it ranks the lowest but it violates the faithfulness constraint #S-IO by introducing a new syllable and fails. The last candidate is optimal through a minimal violation of MAX-IO because it satisfies the highest constraints.

1.2.2. {r ~ z} Alternation

This alternation is a historically observed fact in Turkish (Emre 1945). Some instances of such an alternation in the word final position is given below:

- (14) gor ~ goz
 semir ~ semiz
 kudur ~ kuduz

⁴ Agreement has significant syntactic properties in Turkish, such as heading the highest functional category of a clause. It has been noted that there are structures without Tense and Aspect but all verbal or substantive clauses bear agreement in Turkish (Tosun 1998a; 1998b)

The same alternation is observed in Chuvash and Cagatay (Emre 1945). This alternation is an instance of obstruent formation. When the sonorant liquid occurs in the final position or is followed by a fricative or another liquid in a syllable coda, an obstruent bearing the same features with /r/, that is /z/ is formed. Consider the data below:

- (15) git+me+r gitmez
 git+me+r+sin gitmezsın
 git+me+r+ler gitmezler

The environment in which this sound change occurs is interesting. If it had occurred only in the final position, we would argue about a fricativization of /r/ , an observation that has been made in the literature. If it had only occurred when followed by an obstruent, we could argue that a constraint which forbids son~obs sequences across morpheme boundaries triggers this alternation. If it had only occurred when followed by a liquid coda, a *son~son could be responsible. But this historically verified obstruent formation occurs in all these three environments. Moreover, a similar change does not occur in identical environments in Turkish. We have already seen in our data on the aorist that /r/ may be followed by these same suffixes, that is the same obstruent and liquid, and occurs in the final position without undergoing a change:

- (16) gider
 gidersin
 giderler

I do not have an account for this observation (yet).

1.2.1. {r ~ y} Alternation

This alternation occurs before the first person agreement morpheme. In our discussion on the {r ~ Ø} alternation, we have argued that the underlying form of the first person singular agreement morpheme {-m} not {-Im}. Considering the same reasons, I will the first person plural agreement marker to be {-z} not {-Iz}.

Consider a verbal stem inflected with the negative morpheme, the aorist and the first person agreement morpheme:

- (17) git+me+r+z gitmeyiz

The constraint ranking proposed in Tableau V should account for this case since a similar problem of complex coda is observed in the input. But that ranking would yield “gitme<r>z” as the optimal candidate. Note that the candidate expected to be optimal under that ranking , namely “gitmez” , which means “We don’t go” is homophonous with the data referring to the {r ~ z} alternation “gitmez”, which means “S/he doesn’t go”. Consequently, we can argue that violation of both DEP-IO and #S-IO is preferred due to a constraint on homophony (No Homophony) which ranks higher than the faithfulness constraints. NH should be higher than #S-IO, which we have grouped at the same level with other higher constraints like NCC and *NM. We have no evidence to rank NH against NCC and *NM but I will posit NH higher than all of them. (This is somewhat plausible since NH is a constraint sensitive not only to the full sequence of segments in a word but also to the difference in meanings. This might allow us to rank it higher than other constraints.)

Through the constraint ranking below, the input violates NCC and its satisfaction by deletion violates NH. Therefore a new syllable is introduced through an insertion of a vowel at the expense of lower ranking constraints #S-IO and DEP-IO. But this yields to hiatus which is resolved through another common glide insertion and another violation of the lowest ranking DEP-IO constraint.

Consider the constraint ranking and Tableau V below:

(18) NH > {NCC, *VV, *NM, #S-IO} >MAX-IO>DEP-IO

git+me+r+z	NH	NCC	*VV	*NM	#S-IO	MAX-IO	DEP-IO
git.merz		*!					
git.mer<z>				*!		*	
git.me<ɾ>z	*!					*	
git.me.iz			*!		*	*	*
git.me.yiz					*	*	**

To conclude, {r ~ y} alternation is in fact an instance of {r ~ Ø} alternation and /y/ is an epenthesized glide.

1.2.4. Conclusion

In this section, I have proposed three new constraints to account for the alternations observed in the aorist morpheme when attached to V-final stems or words. No Homophony, No Null Morpheme and faithfulness of the output to the input in terms of the number of syllables. The basic problem in this analysis is the ranking of constraints referring to different components of grammar against each other. NH is sensitive not only to the sequence of sound segments but also to the semantic content of the form; NNM is sensitive to the morphosyntactic functions of the form. This fact about the ranking needs to be studied in terms of OT. Secondly, the consequences of the ranking proposed in this analysis needs to be checked on other data to see if it accounts for the general phonological processes observed in Turkish. Finally, the r~z alternation which is not observed in similar environments in the language needs to be accounted for.

2. Monosyllabic Verb Stems and the Aorist

There are two generalizations about the form of the aorist morpheme when attached to monosyllabic verb stems:

- (i) {-Ar} is attached to monosyllabic stems, except for those ending with /r/, /l/, and /n/;
- (ii) the nature of the vowel in the aorist is unpredictable with monosyllabic stems ending with the sonorants /r/, /l/, and /n/; it may be either /I/ or /A/.

2.1. {-Ar} attached to monosyllabic stems (except those ending with coronal sonorants)

First of all this generalization is not accurate in that there are only two verb stems ending with a coronal nasal to which {-Ir} is attached and both forms have {-Ar} attached in some dialects, including one of the (so called) standard Istanbul dialects:

- (1) san ~ sanir & sanar
kon ~ konur & konar

As already noted, there is a historical and current shift from /I/ to /A/. It is very likely that these two forms are within such a shift. Since there is no other instance of an /n/-final verb stem followed by -Ir, we can exclude the coronal nasal from the exceptional cases.

In the title of this subsection, the term “coronal sonorants is used” but this not a precise term for the segments under concern since the coronal glide /j/, which is a sonorant

does not behave as the liquids:

- (2) koy ~ koyar
soy ~ soyar

Consequently, exceptional cases are observed on verb stems ending with liquids.

2.2. {-Ir} attached to monosyllabic stems ending with liquids /l/, /r/

Historical study on the suffixes of the language indicates that there are some derivational suffixes that behave similarly and exhibit a high vs low vowel alternation in Turkish.

Among such suffixes, I will focus on the one homophonous with the aorist: {-Ir}~{-Ar} which derives verbs from nouns (Emre 1945):⁵

(2) kiz (girl)	kizar (blush)
an (moment)	anir (onomatopoeic)
cil	ciler
ag (net)	agir/agar (heavy/fade away)

Let's consider the data on the aorist (3) where the verb stems ending with a liquid occur with {-Ir}:

(3) bilir	durur
bulur	gorur
gelir	verir
kalir	vurur
olur	varir
olur	

What in the nature of liquids could trigger the occurrence of /I/? Since the aorist either has a low vowel or no vowel in our analysis and since there is on the a lowering process going on in Turkish, but not the opposite, it is very likely that /I/ is an epenthesized vowel. Since we do not observe a similar pattern of behaviour in stems ending with less sonorant nasals, the sonorancy of liquids might be triggering the attachment of {-r} not the {-Ar} giving rise to a NCC violation, which is resolved through epenthesis. (A problem with this analysis is that, if segments more sonorant than nasals are accepted to be nuclei and the aorist attaches as the coda of the final syllable, how come a glide /j/ does not trigger the same process? I do not have an answer to this question yet.)

Consider the tableau VI below:

⁵ It is very likely that this is the very same morpheme functioning as a derivational suffix. The aorist is known to derive nouns from verbs, such as "yaz/write ~ yazar/writer". But in this case, it drives verbs from nouns or adjectives from verbs as may be observed in data (2) in the text.