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Low vowel dissimilation in Mazandarani

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Abstract: Similar patterns of vowel change in loanword adaptation have been documented for several Iranian languages and language varieties including Mazandarani. However, no convincing accounts of the nature of these processes in Mazandarani have been presented in the literature. We argue that for this language, these vowel alternations are best explained as low vowel dissimilation, a process affecting adjacent syllables with low vowels whereby one of the vowels is raised. Low vowel dissimilation is typologically rare, with the overwhelming majority of the cases identified belonging to the Oceanic family. To show that the vowel changes in question are indeed cases of low vowel dissimilation, we invoke evidence from the language's verbal morphophonology where vowel changes show a more regular behavior and then expand the analysis to loanword adaptation. The dialects discussed in the article are those of Amol, Reineh, and Babol. The two vowels that trigger the process in Mazandarani are the low vowels /æ/ and /ɒ/, but only the former can undergo change. We show that unlike almost all other known cases of this phenomenon, it is the second vowel that undergoes raising in the Mazandarani case in many situations, with this being the preferred way in the dialect of Babol. We end the paper with a discussion of why the two low vowels behave differently, suggesting that /ɒ/'s resistance to change is due to the fact that it is a long vowel phonologically, even if not phonetically.

Keywords: low vowel dissimilation; vowel raising; loanword adaptation; verbal morphology; Mazandarani

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Introduction

1. Introduction

In this article, we analyze a very frequent form of vowel alternation in Mazandarani that has received very little attention in the literature and propose that it can best be described as low vowel dissimilation. We then examine the theoretically significant ways in which the dissimilation process in Mazandarani differs from similar phenomena identified in other languages.

The body of scholarly work done on the synchronic phonology of Mazandarani is relatively small compared to the other languages of the region with similar numbers of speakers. This may be due to the high degree of similarity between the phonological system of Mazandarani and that of modern Persian, which is a product of not only genetic proximity but centuries of close contact. The two languages have almost identical consonant inventories, with the biggest differences lying in the status of /ɢ/, /ʁ/, and /ʒ/ in some of the two languages' varieties (For more on this, see Borjian 2019). They also have similar syllable structures, with Persian generally allowing for more universally marked coda clusters as seen in (originally Arabic) words such as [æɢl] ("wisdom") and [sæbr] ("patience"), which are resolved in Mazandarani with the addition of epenthetic schwas ([æɢəl] and [sæbər] respectively). The stress systems are also very similar at the word level, with stress generally falling on the last syllable in nouns and adjectives but having a tendency towards the initial position in verbs. The vowel systems are more divergent. However, even there, the difference is most visible in how the sounds correspond (in both loanwords and cognates) rather than the shapes of the vowel inventories. This is visible in the prevalent vowel changes that loanwords entering Mazandarani from Persian typically undergo. This article introduces Low Vowel Dissimilation as the process behind many of these changes. This analysis serves two purposes. First, it accounts for what is arguably the most salient phonological phenomenon setting apart the phonological systems of Persian and Mazandarani, which has often been alluded to but never explained. Second, it introduces a new case of the typologically rare phenomenon of Low Vowel Dissimilation, the study of which has mostly been confined to Oceanic languages (see Section 1.3). We demonstrate that even though the environments that trigger Low Vowel Dissimilation in Mazandarani are the same as those observed in the other few languages in which the phenomenon has been studied, Mazandarani follows a different mechanism in its choice of which vowel to raise (with interesting systematic patterns of further variation among its dialects).

This study examines the dialects of Mazandarani spoken in the urban centers Amol and Babol as well as the small town Reineh (sometimes spelled

as “Rineh”) south of Amol, the dialect of which shows differences in its vowel alternations that are interesting from a theoretical point of view. Amol and Babol are both cities of more than 200,000 residents located near the center of the plains on the southern shores of the Caspian. Reineh is located in the cold mountainous region below the Caspian plain, some 85 kilometers south of Amol. As of 2016, fewer than 1000 people lived in Reineh during winters, but the population reaches several thousand during the summers according to locals, with most of these part-time settlers based in Amol and a smaller percentage based in the capital Tehran (which is 115 kilometers southeast of Reineh). In spite of the close contact with Amol, Reineh has its distinct variety of Mazandarani. The phenomenon under investigation, i.e. Low Vowel Dissimilation, occurs in all three dialects as well as other varieties of the language, with differences in details. Both native words and loanwords are considered in this article, but in native words the discussion is mostly limited to verbs, where low vowel dissimilation can be observed as an exceptionless process interacting with morphology.

1.1. Vowel alternations

The raising of an underlying /æ/ to a mid vowel ([ə] in the dialects of Amol and Reineh, [e] in that of Babol) is the most salient process in Mazandarani’s adaptation of loanwords from Persian. A few examples are presented below (our data sources are discussed in the next section).

(1)

	Persian	Maz. (Amol)	Maz. (Babol)	Gloss
a.	ɢæ̲ˈtɒr	ɢə̲ˈtɒr	ɢe̲ˈtɒr	‘train’
b.	xæˈbæ̲r	xæˈbə̲r	xæˈbe̲r	‘news’
c.	ɒˈdæ̲m	ɒˈdə̲m	ɒˈde̲m	‘human’
d.	xælæ̲ˈbɒn	xælə̲ˈbɒn	xæle̲ˈbɒn	‘pilot’
e.	ziˈnæ̲t	ziˈnə̲t	ziˈne̲t	(female first name)

With the exception of a few cursory remarks, this phenomenon has not been discussed in the linguistic literature. Characterizing the phenomenon in the context of a more general phenomenon of vowel raising occurring in several Iranian languages and language varieties, Kord Zafaranlu and Ezatabadi Pour (2018) present a few examples from the Mazandarani dialect of Babol and argue that the raising process only targets stressless syllables. The examples they provide have the same general structure as example (a) above. However, as examples (b), (c), and (e) in the above table suggest and further examples in the following sections demonstrate, this is not the case in

Mazandarani (although stress might be relevant in determining which vowel undergoes raising; see Section 4). For mostly independent reasons, Modarresi Ghavami (2020) rejects Kord Zafaranlu and Ezatabadi Pour's (2018) characterization. Discussing in the same general family-wide context, she attributes the vowel raising process to syllable structure. She does not offer exact criteria for when raising occurs in languages such as Mazandarani, but attempts to limit the environments by arguing that raising is blocked in closed syllables. Her generalization has important exceptions as we shall see in the following sections, but may hold as a statistical tendency or even as an inviolable constraint in some dialects. However, this leaves the more important question of what triggers vowel change unanswered.

Given the increase of Persian influence in recent decades and the speed of changes resulting from this, loanword adaptation processes in Mazandarani are difficult to study. The high degree of variation across words, dialects, generations, and idiolects in how much a Persian word changes when used in Mazandarani means that finding the prevalent patterns is not always straightforward. To overcome this obstacle, we build the foundations of our proposal by investigating vowel change processes in the productive and exceptionless domain of verbal morphophonology and then use our results to explain the data we observe in loanwords. We argue that factoring out a few independent lexical effects, the vowel alternations observed in Mazandarani loanword adaptation can be viewed as low vowel dissimilation, a process preventing the occurrence of two low vowels in adjacent syllables.

1.2. Data

The core of the observations leading to the present analysis comes from the linguistic knowledge of the authors, both of whom are heritage speakers of Mazandarani (one speaking the variety spoken in Reineh with near-native fluency, the other having a working knowledge of the dialect of Babol, and both of them having years of exposure to the dialect of Amol). However, the entire data presented in this article have been verified through elicitation sessions with native speakers of the language. Thus, the interviews (especially as far as the dialects of Babol and Reineh are concerned) may be viewed as merely a complementary (and confirmatory) source of data.

The interviews were conducted in person in Amol, Reineh, and Babol. We interviewed one male and one female consultant from each of the big cities and only one female speaker from Reineh. The ages of the participants ranged from 30 to 62, and all were born and raised in Amol, Babol, and Reineh. Our speaker from Reineh (82 years old) had lived in Amol for 15 years in her

adulthood (after the age of 50), but as the data shows and the authors' own knowledge of the varieties of Mazandarani in the region confirm, her speech did not show any obvious signs of influence from the Amoli variety. For all of the participants but one of the Amoli speakers, Mazandarani was the dominant language at home throughout the speakers' lives. All participants were bilingual in Persian and Mazandarani with no working knowledge of any other language. For the data on the place of raising in disyllabic words with identical vowels (Section 3.2), we consulted a third Amoli speaker as well (born and raised in Amol).

It must be noted that the use of Mazandarani is rapidly declining in urban areas (see Shahidi 2008 for a detailed report of the situation). Persian influence is ubiquitous and it is in fact difficult to find settings in larger urban areas such as Amol and Babol where entire conversations take place in Mazandarani between younger people without code switching or heavy use of long Persian phrases. This situation results in a lot of inter-speaker variation with respect to loanwords and sometimes makes it difficult to tell apart the use of loanwords from instances of code mixing. Thus, some of the loanword data presented in this paper may occur with higher or lower degrees of change in other speakers' speech.

The goal of the interview sessions was only to confirm the status of the vowels of the words presented in this paper and obtain systematic and reliable data regarding the vowel change under question in the three dialects of the language. The words consist only of verbs and a set of loanwords (from Persian, some ultimately from Arabic). In the case of loanwords, a major worry was that simply presenting the words in Persian and asking for the Mazandarani version might affect the authenticity of the participants' responses. To overcome this issue as much as possible, we divided each interview session into smaller parts, leaving direct questions to the last part and limiting it to words for which other methods had failed.

Each interview session had four parts. First, we asked the participant general questions in order to get a general picture of their speech patterns, especially with regard to Persian influence and patterns of vowel alternation. This part of the interview was conducted in Mazandarani. In the second part, we presented them with Persian verbs (mostly within the context of sentences) and asked them to translate them to Mazandarani. In the third part, we presented the participants with small puzzles. For instance, to get the word for "forest", we would ask them about the name of the vast area with many trees which is home to wild animals. These questions were presented in Mazandarani. Finally, in the fourth part, the words for which the puzzle method was not successful (and had not appeared in the speaker's spontaneous speech either) were presented to the speakers one by one in Persian. It is worth noting that, with only one or two marginal cases, the

answers provided by the participants in this last part did not show signs of having been affected by the Persian prompt.

1.3. Low Vowel Dissimilation

Low vowel dissimilation (henceforth, LVD) is a phonological process affecting adjacent syllables with low vowels whereby one of the vowels is raised. In the most common case, the sequence aCa changes to əCa or eCa. For years, the only cases of LVD introduced in the literature belonged to Oceanic languages. Most notably, in two consecutive works, Blust (1996a, 1996b) did an extensive study on LVD in various Oceanic languages, introducing numerous occurrences of it (mostly as a diachronic process, but in some languages as a productive synchronic process) and reducing the historical sources of the cases to at most five independent instances.

The restriction of the cases to Oceanic languages made it difficult to identify the nature of the process in more detail. As Blust (1996b) pointed out, it was not clear immediately whether certain other circumstances that apply in these languages are inherently related to the nature of low vowel assimilation or not. In particular, in all Oceanic languages discussed by Blust, it is always the first of the two vowels that undergoes change. Moreover, a phenomenon of final vowel loss is observed in all the languages discussed, whose relationship with LVD is not clear.

Further studies by Lynch (2003) and Blevins (2009) shed more light on the subject. Lynch identified LVD as a diachronic sound change process in several other Oceanic languages as well and reduced their historical origins to a few cases. He also showed that the final vowel loss process occurs *after* LVD in all cases. Finally, Blevins (2009) expanded the scope of the study of LVD outside of Oceanic (and Austronesian) by bringing into attention the case of synchronic LVD in Alamblak using data from Bruce and others (1984). Alamblak is a Sepik-Hill language with no confirmed genetic relationship to Oceanic languages. Like the previously studied cases, it is the first vowel that is raised in Alamblak. Blevins also mentions processes in a few other languages (Kera, Russian, and certain East Slavic languages) that may count as LVD.

The present article presents a productive form of LVD in Mazandarani. Unlike the previously seen cases, there are two low vowels that take part in providing the environment for LVD in Mazandarani (/æ/ and /ɒ/), but only one of them (/æ/) can undergo raising. This gives rise to more complex patterns in the occurrence of LVD. Moreover, in Mazandarani, it is usually the second — rather than the first — vowel in a pair of consecutive syllables with low vowels that is raised. As we shall see in Section 3.2, this varies depending on dialect.

2. LVD in Mazandarani verbs

We base our discussion on the dialect of Amol — which stands in the middle of those of Babol and Reineh with regard to the features that are of interest to us — and make reference to the other two dialects only when necessary. Unless otherwise stated, all of the vowel change patterns reported in the paper apply in the dialects of Reineh and Babol too (with minor differences that are irrelevant to LVD in certain words). In this section, the only point of difference worthy of mentioning is that in all cases of vowel raising, the resulting vowel is [e] rather than [ə] in Baboli.

There are six vowels in the dialect of Amol: two low vowels (/æ/ and /ɒ/) plus four non-low vowels (/i/, /u/, /e/, and /ə/).[1] For some speakers (presumably those more influenced by Persian), the vowel /o/ shows up too in some loanwords. More conservative speakers replace it with other vowels (/ə/ or /u/). The vowels are shown in (2).

(2)

	Front	**Center**	**Back**
High	i		u
Mid	e	ə	(o)
Low	æ		ɒ

Both of the low vowels are involved in LVD. We begin by examining how adjacency of syllables containing /æ/ and /ɒ/ in the underlying form is handled in verbal morphology. We use the Mazandarani negation verbal prefix to demonstrate the effect of LVD. The unmarked form of the negation prefix is /næ/, used for both past and present verbs as (3) demonstrates.

(3)

	Verb		Negated form	
a.	ˈxərdə	‘was eating’	ˈnæ-xərdə	‘was not eating’
b.	ˈʃurdə	‘was washing’	ˈnæ-ʃurdə	‘was not washing’
c.	ˈgirnə	‘gets’	ˈnæ-jinə	‘does not get’
d.	ˈʃunə	‘goes’	ˈnæ-ʃunə	‘does not go’
e.	ˈdenə	‘gives’	ˈnæ-denə	‘does not give’
f.	ˈdiə	‘was seeing’	ˈnæ-diə	‘was not seeing’
g.	ˈzuə	‘was hitting’	ˈnæ-zuə	‘was not hitting’

[1] For a general survey of vowels in different dialects of Mazandarani, see Borjian (2019).

The examples above are chosen such that verb stems with different non-low vowels (/i u e ə/) as their first vowel are represented. Moreover, the stems in these examples cover all possibilities in terms of the number of consonants following the first vowel: two (examples a to c), one (examples d and e), and zero (examples f and g). The negation prefix and the verb stem both remain intact in all cases as long as the first vowel of the stem is a non-low vowel.
Let us now look at cases where the first vowel of the stem is underlyingly the low vowel /æ/. Vowels that undergo change are marked with underlines in (4).

(4)

	Verb		Negated form	
a.	ˈʃæ̲nəssə	'was spilling'	ˈnæ-ʃə̲nəssə	'was not spilling'
b.	ˈvæ̲rdə	'was carrying'	ˈnæ-və̲rdə	'was not carrying'
c.	ˈkæ̲ʃiə	'was pulling'	ˈnæ-kə̲ʃiə	'was not pulling'
d.	ˈpæ̲ʤənə	'cooks'	ˈnæ-pə̲ʤənə	'does not cook'
e.	ˈzæ̲nnə	'hits'	ˈnæ-zə̲nnə	'does not hit'
f.	ˈvæ̲nnə	'closes'	ˈnæ-və̲nnə	'does not close'

When the first vowel of the stem is /æ/, adding another syllable with the vowel /æ/ to the left creates a sequence of two syllables with low vowels. Our analysis is that in order to avoid this sequence, the second vowel changes to a non-low vowel ([ə]). Unlike the Oceanic cases, it is the second (rather than the first) vowel that is raised.
The examples in (4) only involve /æ/. By bringing the other low vowel of the language (/ɒ/) into the game, things get more complicated. Consider the verbs in (5), in which the first vowel of the verb stem is /ɒ/.

(5)

	Verb		Negated form	
a.	ˈsɒtə	'was building'	ˈnə̲-sɒtə	'was not building'
b.	ˈdɒə	'was giving'	ˈnə̲-dɒə	'was not giving'
c.	ˈkɒʃtə	'was planting'	ˈnə̲-kɒʃtə	'was not planting'
d.	ˈsɒzənə	'builds'	ˈnə̲-sɒzənə	'does not build'
e.	ˈkɒjnə	'plants'	ˈnə̲-kɒjnə	'does not plant'

In these examples, it is the vowel in the verbal prefix itself (i.e. the first vowel in the word) rather than the verb stem that undergoes raising. What these examples suggest — and other cases discussed in the next section confirm — is that even though the vowel /ɒ/ counts as a low vowel in creating the environment for LVD, it never undergoes raising.
The data presented above involved only the negation prefix /næ/. The effect is visible in the same manner in the behavior of other verbal prefixes too,

most notably the prefix /bæ/ that appears behind perfective, subjunctive, and imperative verbs. For instance, from the stem /værd/for 'carry' (row b in 4), we get [bæ-vərd-ə] `she/he/it carried' with the vowel changing in exactly the same manner as we saw in (4). Similarly, the prefix /bæ/ itself undergoes vowel raising when followed by a syllable featuring /ɒ/. For instance, from the stem /sɒt/ (row a in 5), we get [bə-sɒt-ə] 'she/he/it built' in the same manner as we see in (4). For verbs that require the preverb /dæ/ instead of /bæ/, the same phonological change occurs in either the stem or the prefix in the same manner as we see in (4) and (5).

One might argue that the vowel change under discussion may be viewed as vowel reduction or involve a related metrically induced phenomenon. However, we have sufficient reason to rule out this possibility. Mazandarani (like most — perhaps all — Iranian languages) does not have secondary stress. Thus, there is hardly any motivation to assume binary feet of any kind for this language (but see Rahmani 2019 for an attempt to attribute binary feet independent of stress to Persian words). Focusing on main stress alone, we observe that the stress pattern is not related to the vowel alternation in any meaningful way. In all of the verbs we examined, the stress is on the preverb; yet raising targets the preverb in some cases and the stem in others. Moreover, note that the vowel is raised to [e] rather than [ə] in the dialect of Babol. In this case, it is not easy to argue that the target vowel is "reduced". In the next section, it is shown that LVD targets both stressed and unstressed vowels.

3. LVD in Mazandarani loanwords

The vast majority of loanwords in Mazandarani, including the ones that originally come from Arabic or European languages, have entered the language through Persian. Thus, in what follows, we take the Persian forms of the words as their underlying forms. This does not complicate matters since the phonological systems of the two languages are very close.

The vowel /o/ is relatively rare in the dialects of Amol and Reineh (but not Babol), and Persian /o/ is usually replaced with [ə] or [u]. Beside this, the main process of vowel change in loanword adaptation is that the low vowel /æ/ is sometimes replaced by [ə] ([e] in Baboli). We argue that this change must be analyzed differently from what we see in the case of /o/. Unlike /o/, /æ/ is present in the language's vowel inventory. Thus, the driver for changing /æ/ in loanwords cannot be a categorical tendency to avoid this vowel, but to satisfy other context-dependent constraints.

We argue that the vast majority of the cases where a Persian /æ/ changes in loanwords must be analyzed as cases of LVD, functioning in the same manner as what we observed in verbs. Looking at the vowel change as a

manifestation of a phonological constraint against adjacent syllables with low vowels, one can expect there to be a bias against such sequences in the lexicon of the language too. This is indeed confirmed at least tentatively; the authors could not find any native words with adjacent syllables that have low vowels. When it comes to LVD in loanwords, the entirely systematic and exceptionless process that is visible in the native words and the verbal system cannot be observed. However, the power of LVD to account for the cases of vowel raising in loanwords in general is still quite significant.

3.1. Adjacent syllables with non-identical vowels

A list of loanwords with sequences of two adjacent syllables involving both the vowels /æ/ and /ɒ/ in the underlying form is shown in (6). Note that in most of the example sets presented in this section, some of the loanwords are recent, bearing witness to the fact that the process under discussion is still productive in the language. Recall that /o/ changes to [ə] for independent reasons.

(6)

	Persian	Mazandarani	Gloss
a.	xæ̲ˈtɒ	xə̲ˈtɒ	'error'
b.	fæ̲ˈrɒr	fə̲ˈrɒr	'escape'
c.	ɢæ̲ˈtɒr	ɢə̲ˈtɒr	'train'
d.	tæ̲sɒˈdof	tə̲sɒˈdəf	'accident'
e.	mostæ̲ˈfɒ	məstə̲ˈfɒ	(male first name)
f.	mobtæ̲ˈlɒ	məbtə̲ˈlɒ	'afflicted'
g.	ɒˈdæ̲m	ɒˈdə̲m	'person'

As expected, based on what we saw in verbs, it is always the vowel /æ/ that is raised, regardless of the order of the syllables. In all of these examples, the syllable that undergoes raising has at most one coda consonant. Examples with two coda consonants (which is the maximum allowed in Mazandarani) are rare, but in the few examples that the authors could find, LVD does not occur, suggesting that only syllables with fewer coda consonants are susceptible to change: [nɒmærd] "unmanly" and [ɒhæng] "music".

In the examples we have seen so far, the two vowels are separated by only one consonant. The process can occur when consonant clusters separate the two vowels too, as shown in (7). The second example in this list may be viewed as a cognate rather than a loanword, but it helps in showing the effect under discussion nevertheless. As we shall see, the same word appears without raising in the dialect of Reineh. In all of the examples in (7), the first vowel is /æ/ and the second one is /ɒ/. We could not find cases of raising where the

original Persian word features ɒCCæ. However, this may be due to the fact that /ɒ/ is long (VV) in Persian and words with medial VVC syllables are rare in the first place, reflecting a bias in the Persian lexicon disfavoring two coda consonants following long vowels (Samareh 2009 [1999], pp. 146–147).

(7)

	Persian	Mazandarani	Gloss
a.	ʃæ̲lˈvɒr	ʃə̲lˈvɒr	'pants'
b.	hæ̲ʃˈtɒd	hə̲ʃˈtɒd	'eighty'
c.	æ̲rˈvɒh	ə̲rˈvɒ(h)	'souls'

Nevertheless, consonant clusters apparently do make it less likely for LVD to occur, as there is a large number of loanwords of this type where LVD does not occur, e.g. [xæjjɒt] ("tailor"), [ærbɒb] ("master"), [æxlɒɢ] ("behavior"), [pɒjtæxt] ("capital city"), [pɒkdæst] ("incorruptible"). The effect of consonant clusters is more visible when different dialects are compared. This is one of the cases where the dialects we examined seem to behave differently. The dialect of Amol, which is represented in (7), stands somewhere in the middle in terms of how much it favors raising. In the dialect of Reineh, all of the words in (7) occur without vowel raising. In other words, consonant clusters seem to block raising in this variety (more examples of this are presented later when adjacent syllables with the vowel /æ/ are discussed in Section 3.2.). On the other hand, Baboli shows a stronger tendency towards raising in words involving consonant clusters, applying raising in some words that the dialects of Amol and Reineh do not change, e.g. [ɢəssɒb] (cf. Persian [ɢæssɒb] "butcher"), [pəndʒ̄ɒh] (cf. Persian [pændʒ̄ɒh] "fifty"). This is part of a more general trend that we shall see through this work; the dialect of Reineh shows the lowest degree of tendency towards raising while the dialect of Babol is most likely to raise vowels.

To confirm that it is indeed LVD that is responsible for the changes discussed so far, it is necessary to also look at cases where the syllables with low vowels are *not* adjacent to other syllables with low vowels. A list of such words where raising simply does not occur is shown in (8).

(8)

	Persian	Mazandarani	Gloss
a.	ziˈvær	ziˈvær	(female first name)
b.	sæbˈzi	sæbˈzi	'vegetable'
c.	mæˈriz	mæˈriz	'ill'
d.	kæˈbed	kæˈbed	'liver'
e.	æruˈsæk	æruˈsæk	'doll'
f.	mohˈkæm	məhˈkæm	'firm'
g.	muˈʃæk	muˈʃæk	'missile'

There are exceptional cases where raising occurs in such environments too. The most important set of examples is words ending in the (originally Arabic) nominalizing suffix /æt/. The vowel in this suffix is often raised (especially in Baboli), for reasons that are not related to LVD. Examples with this suffix are presented below. Our Amoli speakers pronounced only some of these with raising and did not always agree. The dialect of Reineh does not feature raising in any of these words.

(9)

	Persian	Maz. (Babol)	Gloss
a.	nowˈbæt	noˈbe̲t/nuˈbe̲t	‘turn’
b.	mosiˈbæt	mosiˈbe̲t	‘disaster’
c.	ziˈnæt	ziˈne̲t	(female first name)
d.	suˈræt	suˈre̲t	‘face’
e.	sohˈbæt	suˈbe̲t/sohˈbe̲t	‘conversation’
f.	mosɒfeˈræt	mosɒfeˈre̲t	‘travel’

In addition to these, there are some words in which raising occurs in the absence of the environment for LVD, especially in Baboli and always in the last syllable. A few examples are presented below. We do not have an explanation for these cases, but their restriction to the last syllable does suggest that they involve an effect independent of the phenomenon we are interested in. It must be noted that the last three examples in the list below are words of Iranian origin (the first one is probably of Turkic origin; Hassandoost 2016 [2013], p. 2136). Therefore, at least in theory, rather than viewing them as loanwords, it is possible to view them as cognates or (more plausibly) affected by now-obsolete cognates in their pronunciation.

(10)

	Persian	Maz. (Babol)	Gloss
a.	koˈtæk	keˈtek	‘beating up’
b.	suˈzæn	suˈzen	‘needle’
c.	rowˈʃæn	ruˈʃen/roˈʃen	‘lighted’
d.	dʒ̅iˈgær	dʒ̅iˈger	‘liver’

We argued earlier that vowel raising in Mazandarani is largely independent of stress, citing as evidence the fact that it targets all positions in a word. One might argue that these cases pose a counterexample to our generalization by showing that word-final syllables are indeed special. However, the fact that these words do not involve adjacent syllables with low vowels shows that they are of a different nature from the LVD process we see in verbs and the vast majority of the raising cases in loanwords. In other

words, there is independent motivation to treat these cases as being of a different nature than the main raising phenomenon we are interested in.

We also have good reason to believe that even though stress may have some minimal role in LVD (see Section 4), the data in (10) are not related to stress. When there is interaction between vowel alteration and stress, the cross-linguistic pattern is that reduction (as well as other forms of vowel change) is *prevented* in stressed positions. This is true in known LVD cases that interact with stress too (see Blevins 2009). What we see here is the opposite effect; the exceptional Baboli cases show raising in the final (stressed) positions only. Thus, it is reasonable to assume that the effect we see in these Baboli words is related to word-final position but independent of stress.

3.2. Adjacent syllables with identical vowels

It is now time to look at cases where two adjacent syllables have identical low vowels in the underlying form. When the two vowels are /ɒ/, raising categorically fails to apply.[2]

(11)

	Persian	Mazandarani	Gloss
a.	bɒˈlɒ	bɒˈlɒ	'up'
b.	ɒˈzɒd	ɒˈzɒd	'free'
c.	bɒʃˈgɒh	bɒʃˈgɒh	'club'
d.	ɒmɒˈde	ɒmɒˈdə	'ready'
e.	modɒˈrɒ	mədɒˈrɒ	'tolerance'
f.	ɒgɒˈ(h)i	ɒgɒˈ(h)i	'police station'

The more interesting cases are those in which both vowels in a sequence of syllables in the underlying form are /æ/. In such words, the choice of which syllable to change depends on the dialect. In the speech of our Baboli speakers, it is usually the second vowel that is raised in words of this type (similar to what we saw in verbs). In the dialect of Reineh, however, it is always the first vowel that changes. Our three Amoli speakers were divided in where they apply the raising in such words. Note that since words

[2] Some of the examples in (11) are of Iranian origin. An anonymous reviewer expresses concern over the fact that Mazandarani words of Iranian origin may be cognates rather than loanwords. We believe this is very unlikely in these particular cases based on what we know about the phonology of the two languages and the history of these words. However, even if this is the case, what matters most is that the Mazandarani words in (11) allow sequences of syllables with /ɒ/ in their surface forms.

generally do not end in [æ] in either Persian or Mazandarani, none of the examples have a word-final open syllable.

(12)

	Persian	Maz. (Reineh)	Maz. (Babol)	Gloss
a.	bæˈlæd	bə̲ˈlæd	bæˈle̲d	'knowing'
b.	ɢæˈlæt	ɢə̲ˈlæt	ɢæˈle̲t	'wrong'
c.	hæˈsæn	hə̲ˈsæn	hæˈse̲n	(male first name)
d.	næˈzær	nə̲ˈzær	næˈze̲r	'opinion'
e.	ɢæˈdæm	ɢə̲ˈdæm	ɢæˈde̲m	'stroll'

What triggers the raising is the tendency to prevent two adjacent syllables containing [æ]. The above data show that dialects may vary regarding how they avoid this surface configuration, but they share the active constraints that drive LVD in the first place.

As before, LVD seems to occur with very few exceptions wherever only a single consonant separates the two low vowels. When a consonant cluster comes in between the vowels, LVD does not occur in the dialect of Reineh, but it sometimes does in Amol and Babol. The examples below show the data for Amol. Those of Babol are identical, with [e] instead of [ə] as the raised vowel.

(13)

	Persian	Maz. (Amol)	Gloss
a.	mæɢˈsæ̲d	mæɢˈsə̲d	'destination'
b.	mæxˈzæ̲n	mæxˈzə̲n	'container'
c.	mærˈɢæ̲d	mærˈɢə̲d	'shrine'
d.	pænˈtʃæ̲r	pænˈtʃə̲r	'flat tire'

We may now take a step further and consider cases where more than two syllables are involved in LVD. Let us start with words containing three consecutive syllables with the vowel /æ/ in the underlying form. These cases shed light on the nature of the phenomenon. In such words, in the few examples we could find, it is always the middle syllable that undergoes raising, as shown in (14). Under a constraint-based view, this may be accounted for simply as the option that is most faithful to the underlying form (in terms of the number of changes involved) while avoiding adjacent syllable pairs with low vowels. Note that in (14a), the vowel that is expected to raise is in fact omitted in the dialects of Amol and Reineh. We do not have a method for testing whether raising precedes the deletion (either diachronically or synchronously under a serial account) or not.

(14)

	Persian	Maz. (Amol)	Maz. (Reineh)	Maz. (Babol)	Gloss
a.	mætæˈlæk	mætˈlæk	mætˈlæk	mæteˈlæk	'teasing'
b.	kæmærˈbænd	kæmærˈbænd	kæmærˈbænd	kæmerˈbænd	'belt'
c.	kærgæˈdæn	kærgæˈdæn	kærgəˈdæn	kærgeˈdæn	'rhinoceros'

With the same logic, it comes as no surprise that in æ-æ-ɒ sequences, it is again the vowel in the middle that gets raised (if LVD occurs at all). Examples are presented below. Note that raising occurs only in Baboli for some of these examples. For ɒ-æ-æ, we could not find an example that undergoes a consistent vowel change.

(15)

	Persian	Maz. (Amol and Reineh)	Maz. (Babol)	Gloss
a.	xælæˈbɒn	xæləˈbɒn (only Amol)	xæleˈbɒn	'pilot'
b.	sælæˈvɒt	sæləˈvɒt	sæleˈvɒt	'religious praise'
c.	tæræfˈdɒr	tæræfˈdɒr	tærefˈdɒr	'supporter'
d.	tælæˈfɒt	tælæˈfɒt	teleˈfɒt	'casualties'
e.	dæs(t)ænˈdɒz	dæsənˈdɒz	dæsenˈdɒz	'bump'

To summarize our findings, we present the differences in vowel raising across the three dialects examined in this study in (16).

(16)

	Amol	Reineh	Babol
Raising pattern	æ → ə	æ → ə	æ → e
Preference in æ-æ sequences	(divided)	Raise the first vowel.	Raise the second vowel.
Features word-final raising?	rarely	rarely	occasionally
Features raising in VCCV environments?	rarely	no	occasionally

4. Discussion

There are a number of factors that make LVD in Mazandarani theoretically and typologically interesting. First of all, LVD is a typologically rare phenomenon and little progress has been made in understanding the

articulatory or structural factors that induce it. In fact, the very existence of true vowel dissimilation in human languages has been called into question (see Bennett 2015, Section 1.1). Outside of Oceanic, the cases of LVD identified by Blevins (2009) are limited to Alamblak (Sepik-Hill), several East Slavic language varieties, Kera (Chadic; Ebert 1979), and Wintu (Witnun; Pitkin 1984). Even among these few cases, not all are straightforward cases of LVD. In the East Slavic cases, rather than an underlying low vowel raising to a non-low vowel, the dissimilatory effect manifests itself through a vowel failing to change to [a] in certain environments. In Wintu, the process targets /eCa/ and /oCa/ sequences (meaning that rather than low vowels, it targets non-high vowels), but fails to apply in the case of /aCa/ sequences.

One of the most important aspects of the Mazandarani LVD mechanism is that it often leads to the raising of the second syllable in the sequence. In /ɒCæ/ sequences (e.g. 6g and 6h), this can be explained by the systematic avoidance of altering /ɒ/ (we discuss the reasons for the different behavior of /ɒ/ in the next section). However, in Baboli, even in /æC(C)æ/ sequences, it is the second vowel that undergoes raising (see the examples in 12 and 13). Moreover, in prefixed verbs (but not in nouns and adjectives), the Mazandarani dialects of Amol and Reineh also favor raising the second syllable (see the examples in 3). This is interesting because in almost all other known cases of LVD, it is the first vowel that undergoes raising. The only potential exception according to Blevins (2009) is the Neve'ei (Oceanic), where the suffix /-Vn/, in which the vowel changes shape in harmony with the preceding vowel, fails to appear as [a] after a preceding [a], presumably for dissimilatory reasons (LVD does occur elsewhere in the language too, but targets the first vowel in those cases). While invoking LVD to explain the failure of vowel harmony in such environments in Neve'ei seems reasonable, the effect is less clear than the Mazandarani case. Thus, Mazandarani (especially in its Baboli variety) gives us the only clear example of LVD preferring to raise the second vowel.

There is another aspect of the choice of vowels to raise that is worthy of examination. In the dialect of Babol, raising the second vowel is always preferred. However, in the dialects of Reineh, we observed that while raising targets the first vowel in nouns and adjectives (e.g. /næzær/ 'opinion' appearing as [nəzær]) it targets the second vowel in prefixed verbs (e.g. /næ+værdə/ 'did not carry' appearing as [næ+vərdə]). This may be due to the fact that the first syllable is stressed in prefixed verbs. This is in line with the general cross-linguistic observation that stressed vowels are more stable and the fact that being unstressed is a precondition for undergoing raising in LVD in some other languages too (Lynch 2003, Blevins 2009). However, confirming this hypothesis requires examining a wider range of examples,

e.g. cases where none of the vowels in a /æCæ/ sequence is stressed and there are no low vowels in adjacent syllables. Given the scarcity of such words and the limitations of our elicited data, we leave a thorough examination of the issue for future research.

5. LVD and vowel length

We end this paper with a relatively short discussion on the difference between the two low vowels /ɒ/ and /æ/ in Mazandarani. We observed that even though both of these vowels participate in creating the environment for LVD, it is only /æ/ that can be raised. Further research is needed to arrive at a definitive explanation of this fact, but one particular tentative answer seems to be worth mentioning. It is already well-known in the literature on Persian phonology that the long vowels (/ɒ u i/) are more stable and less susceptible to change in comparison to the short vowels /æ e o/ (Lazard 1957, Toosarvandani 2004). It seems reasonable to argue that their etymological counterparts in Mazandarani, i.e. /ɒ u i/ are long too.[3] We are already aware of the long status (both phonetically and phonologically) of these vowels and their "stability" in the closely related language Gilaki (Rastorgueva et al. 2012 [1971], p. 9).

We do not have access to phonetic evidence to support this and our impressionistic assessment is that duration differences between the two sets of vowels in Mazandarani are either small or non-existent. However, at least at an abstract phonological level, we argue that the vowels /ɒ u i e/ behave as long while the other vowels are short. In this regard, the situation is similar to modern spoken Persian, where most phonetic measurements suggests that duration differences between the so-called "short" and "long" vowels have largely (if not completely) disappeared (e.g. see Moosavi 2011, Sheykh Sang Tajan & Bijankhan 2013, Jones 2019, but also Sadeghi 2013) while phenomena sensitive to phonological vowel length such as versification in this language variety (e.g. in folk poetry) still treat the two vowel classes differently in terms of moraic length (Vahidian Kamyar 1978, Fatemi 2014, Mahdavi Mazdeh 2020). If this is the case in Mazandarani, the permissibility of applying changes to /æ/ (but not /ɒ/) is parallel to the phenomenon observed in Persian by Lazard (1957) wherein only short vowels readily undergo changes. The higher susceptibility of short vowels to change is

[3] The other long vowel in Mazandarani is /e/. From a diachronic perspective, this vowel does not correspond to modern Iranian Persian /e/, but to Early New Persian long /e/ (the vowel traditionally referred to as *yâ-ye majhul*). This vowel has merged with /i/ in modern Iranian Persian. For instance, Mazandarani /ser/ "full" and /ged͡ʒ/ "absent-minded" correspond to the same forms in Early New Persian, but to /sir/ and /gid͡ʒ/ in modern Iranian Persian.

cross-linguistically common and, as pointed out by Blevins (2009), is reflected in known LVD cases too.

One important piece of evidence for the claim that phonological vowel length distinctions may be active in Mazandarani phonological processes comes from the choice of vowels in loanword adaptation. Let us start with the case of /o/ in loanwords. The phenomenon that is of interest to us manifests itself most clearly in the dialects of Amol and Reineh. In these dialects, Persian /o/ is generally replaced with /ə/:

(17)

	Persian	Maz. (Amol and Reineh)	Gloss
a.	mo̲ʃˈkel	mə̲ʃˈkel	'problem'
b.	ɢo̲rˈbun	ɢə̲rˈbun	(male first name)
c.	taʃakˈko̲r	təʃækˈkə̲r	'thanks'
d.	ko̲d	kə̲d	'code'

Crucially, in environments where the vowel is followed by a deleted coda consonant, the vowel replacing /o/ is generally an [u]. Examples are shown below.

(18)

	Persian	Maz. (Amol)	Maz. (Reineh)	Gloss
a.	so̲hˈbæt	su̲ˈbət	səhˈbæt	'conversation'
b.	no̲wˈbæt	nu̲ˈbæt/nu̲ˈbət	nu̲ˈbæt	'turn'
c.	ho̲wl	hu̲l	hu̲l	'fear'
d.	ho̲wseˈle	hu̲sˈlə	hu̲sˈlə	'patience'

This can be accounted for as follows: deleting the consonant (or, under an alternative analysis of cases b to d, the second part of the diphthong) removes a mora. In many languages, when a coda consonant is removed, the missing mora is compensated for by replacing the short (monomoraic) vowel with a long (bimoraic) vowel. This cross-linguistically common process of compensatory lengthening occurs in Persian too (Darzi 1993, Shademan 2005, Sadeghi 2011). We may argue that in Mazandarani, the choice of /u/ instead of /o/ is related to the loss of the consonantal mora. In the words in (18), a long vowel is preferred because it compensates for the missing mora. If this account is correct, it serves as evidence showing that /u/ behaves as a phonologically long vowel in this variety (and probably other varieties) of Mazandarani, while /ə/ behaves as short.

The above discussion suggests that a vowel length distinction is indeed active in Mazandarani phonology. To show that /ɒ/ is long too, we need to find similar cases where /ɒ/ appears in the output when long vowels are

expected. We could find two examples where the sequence /oh/ is rendered as [ɒ] in Mazandarani.

(19)

	Persian	Maz. (Amol)	Maz. (Reineh)	Gloss
a.	moh̲ˈsen	muˈsen	mɒ̲ˈsen	(male first name)
b.	foh̲ʃ	fɒ̲ʃ	fɒ̲ʃ	'profanity'

Even though the two examples above for /ɒ/ are far from adequate, the similarity to the case of /u/ and our prior knowledge of the long status of /ɒ/ in related languages give plausibility to the idea that /ɒ u i e/ are phonologically long in Mazandarani. Thus, we may argue that LVD applies in Mazandrani to prevent adjacent syllables with low vowels, but it can only raise short vowels. From a constraint-based standpoint, this may be justified by assuming that changing two moras is costlier than changing one mora, and (as the data provided in this paper suggest) costlier than having two adjacent syllables with low vowels on the surface.

BIBLIOGRAPHY

Bennett, Wm. G. (2015), *The phonology of consonants*, Cambridge: Cambridge University Press.

Blevins, J. (2009), "Low vowel dissimilation outside of Oceanic: The case of Alamblak", *Oceanic Linguistics*, vol. 48(2), pp. 477–483.

Blust, R. (1996a), "Low vowel dissimilation in Ere", *Oceanic Linguistics,* vol. 35(1), pp. 96–112.

Blust, R. (1996b), "Low vowel dissimilation in Oceanic languages: An addendum", *Oceanic Linguistics,* vol. 35(2), pp. 305–309.

Borjian, H. (2019), "Mazandarani: A typological survey", in: *Essays on Typology of Iranian Languages*, eds. Alireza Korangy & Behrooz Mahmoodi-Bakhtiari, Berlin: De Gruyter, pp. 79–101.

Bruce, L. (1984), *The Alamblak language of Papua New Guinea (East Sepik)*, Canberra: The Australian National University.

Darzi, A. (1993), "Keshesh-e jobrâni-e mosavvethâ dar fârsi-e mohâvere'i-e emruz [Compensatory lengthening of vowels in contemporary Colloquial Persian]", *Zabânshenâsi,* vol. 10(2), pp. 58–75.

Ebert, K. H. (1979), *Sprache und Tradition der Kera (Tschad), Teil III: Grammatik*, Berlin: Dietrich Reimer.

Fatemi, S. (2014), "Rythmique enfantine en Iran", *Revue Des Traditions Musicales Des Mondes Arabe et Méditerranéen*, vol. 8(1), pp. 85–108.

Hassandoost, M. (2016) [2013], *Farhang-e risheshenâkhti-e zabân-e fârsi [Persian etymological dictionary],* vol. 4), Farhangestân-e Zabân-o Adab-e Fârsi.

Jones, T. (2019), "A corpus phonetic study of contemporary Persian vowels in casual speech", *University of Pennsylvania Working Papers in Linguistics*, vol. 25(1), pp. 129–137.

Kord Zaferanloo Kambuzia, A., and Ezatabadipour, T. (2018). "Barresi-e farâyand-e erteqâ-ye vâke va vâzhguni-e in qâ'ede dar gunehâ-ye zabân-e fârsi: ruykard-e zâyeshi [Vowel raising and its rule conversion in varieties of Persian language: A generative phonology approach]", *Motâle'ât-e Zabânhâ va Guyeshhâ-ye Gharb-e Irân,* vol. 5(1), pp. 19–36.

Lazard, G. (1957), *Grammaire du persan contemporain*, Paris: Lib C Klincksieck.

Lynch, J. (2003), "Low vowel dissimilation in Vanuatu languages", *Oceanic Linguistics*, vol. 42(2), pp. 359–406.

Mahdavi Mazdeh, M. (2020), "Quantitative meter in Persian folk songs and pop lyrics", in: *Advances in Iranian linguistics*, eds. Richard Larson & Sedigheh Moradi & Vida Samiian, Amsterdam: John Benjamins, pp. 237–255.

Modarresi Ghavami, G. (2020), "Naqsh-e sâkht-e hejâ dar farâyand-e erteqâ-ye vâke dar zabânhâ va guyeshhâ-ye irâni [The role of syllable structure in vowel raising in Iranian languages and dialects]", *Zabân va Zabânshenâsi*, vol. 16(2), pp. 31–48.

Moosavi, N. (2011), "Barresi-e âkustiki-e vazn-e hejâ dar zabân-e fârsi [An acoustic study of syllable weight in Persian]", *Pazhooheshhâ-ye Zabânshenâsi*, vol. 3(1), pp. 67–76.

Pitkin, H. (1984), *Wintu grammar*, Berkeley: University of California Press.

Rahmani, H. (2019), *An evidence-based new analysis of Persian word prosody*, Amsterdam: LOT.

Rastorgueva, V., Kerimova, A., Mamedzade, A., Pireiko, L., Edel'man, D., and Lockwood, R. M. (2012), *The Gilaki language*, Uppsala: Uppsala University.

Samareh, Y. (2009) [1999], *Âvâshenâsi-e zabân-e fârsi [Persian phonetics]*, Tehran: Markaz-e Nashr-e Dâneshgâhi.

Sadeghi, V. (2011), "Keshesh-e jobrâni dar fârsi: yek âzmâyesh-e edrâki [Compensatory lengthening in Persian: a perception experiment]", *Pazhooheshhâ-Ye Zabâni*, vol. 2(2), pp. 77–94.

Sadeghi, V. (2013), "Barresi-e âvayi-e kâhesh-e vâke'i dar zabân-e fârsi [Phonetic measurement of vowel reduction in Persian]", *Jostârhâ-ye Zabâni,* vol. 6(3), pp. 165–187.

Shademan, Sh. (2005), "Glottal-deletion and compensatory lengthening in Farsi", *UCLA Working Papers in Phonetics*, vol. 104, pp. 61–68.

Shahidi, M. (2008), *A sociolinguistic study of language shift in Mazandaran*, Uppsala: Uppsala University.

Sheykh Sang Tajan, Sh., and Bijankhan, M. (2013), "Barresi-e mâhiat-e sowtshenâkhti-e vâkehâ-ye fârsi dar hejâhâ-ye CV-e goftâr-e ezhâri [A study of the phonetic nature of Persian vowels in CV syllables in citation form]", *Zabânpazhoohi*, vol. 4(1), pp. 97–116.

Toosarvandani, M. D. (2004), "Vowel length in modern Farsi", *Journal of the Royal Asiatic Society*, vol. 14(3). pp. 241–251.

Vahidian Kamyar, T. (1978), *Barresi-e vazn-e she'r-e âmiâne [A study of meter in folk poetry]*, Tehran: Âgâh.