

**The Sociophonetics of Vowel Height:
A Study of Variation in Tehran Persian**

By

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Abstract

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This dissertation employs the variationist method to investigate vowel height variation (VHV) in Tehran Persian (TP). Viewing spoken TP as a continuum between Vernacular Tehran Persian (VTP) and Bookish Persian (BP), this study examines how VHV systematically differs between VTP and BP. Sociolinguistic interviews were conducted with a stratified sample of Persian speakers from Tehran, involving spontaneous conversation as well as written and oral translation tasks. A sample of vowel tokens was extracted from the interviews and coded impressionistically for vowel height. Data were divided into six variable contexts (VCs) and four stylistic contexts and were analyzed for the contribution of linguistic and extralinguistic factors, first individually and then using multivariate methods. Results reveal that VHV in TP is conditioned by both linguistic and extralinguistic (stylistic and social) considerations, with phonetic context, style and education as primary predictors. Using the term Bookish Persian, this research clarifies that VHV in TP includes both vowel raising and lowering, which operate in different VCs but exhibit the same sociolinguistic patterns. These results suggest that Persian may be better described as a situation of **bimodal diglossia** rather than a strictly binary system of H and L varieties. These theoretical tools could be applied to other diglossic situations.

Dedication

*Dedicated to
The woman who taught me the value of education,
My mother*

Acknowledgements

This dissertation would not be possible at this time or in its current form without the support and friendship of several remarkable individuals.

First and foremost, I would like to express my heartfelt gratitude to my classmate and friend, Gerry (Gerald) Turner. Gerry made time to help me delve as deeply as I have into the R program when it came to the multivariate analysis of my data. Likewise, Mehdi Saffari's expertise in organizing data in Excel saved me countless hours and prevented potential errors. Laura Zepeda's meticulous proofreading and data verification were invaluable, and José Moreira's coding skills, which enabled me to generate the charts for the univariate analysis, were crucial. Their contributions were more significant than they may realize.

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Lastly, I wish to thank Rose (Frezza-Edgecombe), our Graduate Program Administrator, for how she made my years-long journey at York University as smooth as it has been. In my mind she has earned the nickname "the Omniscient Clarifier of All Things Administrative". However, what sets her apart is her dedication to her work, which translates into unwavering support for students.

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1. Chapter One: Introduction

1.1. Background

1.1.1. The Persian Language

Persian, like any other language, has a geography, which is where it is spoken at any given point in time. This is the synchronic aspect of the language. The language also has a history, which is also the history of the places where it has been spoken since the beginning of its time. In other words, it is the history of how the geography of the language extends back in time. The term *linguistic spacetime* may be the most suitable term to refer to the language's territory as it extends in space and time. If we get into the hypothetical time machine and travel in time as far back as the origin of the language, we will witness, diachronically, how the language has been shrinking or expanding across space through time, i.e., the ebbs and flows of the linguistic spacetime.

The current research is synchronic in nature, not diachronic. This means that I will be dealing with a very specific contemporary section of the Persian language and within a fraction of its current geography at that, i.e., Tehran. However, in my estimation, a general look at the Persian spacetime can put everything into better perspective, which is why this chapter will embark on a small journey into some such background and will also shed some light on the contemporary varieties of the Persian language. In other words, before I focus on the variational fabric of the very specific synchronic section of the Persian language that I am researching, I will provide an overview of the full spacetime context within which said variation occurs.

1.1.2. Some Background to the Synchronic Varieties

Migrating from an Iranian province to the capital city of Tehran would, among other challenges, involve a dialectal integration into Tehran Persian, especially for a child who is more highly motivated to fit linguistically into the new environment. One would think that the Persian language and literature classes at school in Tehran would help the migrant child better adapt their linguistic performance to the Tehran dialect. Yet nothing could be farther from the truth, as evidenced by my personal experience as well as those of my peers with similar backgrounds, i.e., migrant children from households in which languages other than Persian or Persian dialects other than Vernacular Tehran Persian (VTP) were spoken. Linguistic observations and interactions at school were helpful as long as they were conducted in Vernacular Tehran

Persian whether in- or outside the classroom, but textbook content was not designed to have anything to do with VTP or anyone's native language or 'mother tongue'. What they were designed to teach was a standardized form of Persian and the subject matter was written in this standard form. However, the migrant child's real struggle was on the streets. This can be easily verified by going to regions of Iran where people go to schools that cover the same standard-Persian national curriculums but where the language spoken on the street is not VTP but rather a non-VTP dialectal variety of Persian (if Persian is the language of the region) or else a non-Persian language would be spoken while exposure to Persian would be limited mostly to classroom, media and interaction with non-locals.

The spoken form of the school-taught standard Persian, which I will refer to as Bookish Persian (BP) for reasons that I will elaborate on later, differs from the various regional vernaculars in numerous aspects, including syntax, morphology and phonology. Among these, the phonology (of vowels) is of specific interest to this research. The data for this research were collected from the cities of Tehran and Karaj. Therefore, an introduction to the geography and history of these two cities is in order to shed light on the Persian spacetime as far as these two spaces are concerned.

1.1.3. Tehran and Karaj

1.1.3.1. *Geography*

Tehran, the capital city of Iran, is located in north-central Iran at the foot of the Alborz Mountain Range (see Figure 3.1).



Figure 1.1—Provinces of Iran (adapted from Statistical Center of Iran 2020(a))

Tehran City is the center of Tehran Province. It is also the center of Tehran County, which, along with a few other counties, comprise Tehran Province (see Figure 3.2).



Figure 1.2—Tehran Province divided by County (adapted from Statistical Center of Iran 2020(a))

Karaj City, being the center of Karaj County, was one of these other counties in Tehran Province up until July 2010 (Mehr News Agency 2010), at which point it became part of the newly formed thirty-first and youngest province of Iran, named ‘Alborz Province’. Karaj City, being the center of Karaj County, is also the center (capital) of the newly carved-out province of Alborz in the foothills of the Alborz Mountain Range (see Figure 3.3).

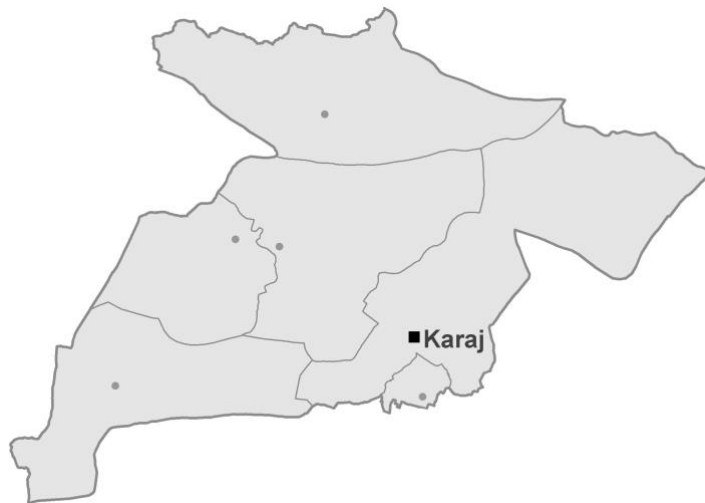


Figure 1.3—Map of Counties in Alborz Province (adapted from Statistical Center of Iran 2020(a))

The administrative split between Tehran and Karaj has not affected the humorous popular reference to Karaj as the ‘dormitory of Tehran’, which comes from the fact that a large portion of Karaj’s population commutes some 35 kilometers daily to reach their workplace in the city of Tehran. For the purposes of this research, VTP, or TP (Tehran Persian) will include the Persian spoken by the native speakers of Persian both in Tehran and Karaj counties. In other words, Tehran in this research covers Tehran Province before the 2010 split, as shown in the map in Figure 1.4 below:



Figure 1.4—Pre-2010 Tehran Province (adapted from Statistical Center of Iran 2020(a))

1.1.3.2. History

For centuries, Tehran was an insignificant village at the southern foothills of the Alborz Mountain Chain, overshadowed by the historically prominent city of Rey¹ to its south (see Figure 1.5 below). Rey has held a prominent position both in pre-Islamic Iran as well as in Iran’s Islamic era. Rey is featured in the Avesta

¹ Also spelled as ‘Ray’ and ‘Rayy’; Old Persian ‘Ragha’; Latin ‘Rhagae’.

(Zoroastrian Sacred Book from at least 600 B.C.) as a sacred place and was a Parthian capital city before the Islamic conquest of Iran while, under the Islamic Empire, it was second only to Baghdad.



Figure 1.5—Tehran and Rey (adapted from Statistical Center of Iran 2020(a))

Weakened by fierce religious rivalry and sectarianism, Rey’s glory began to wane when it was “[d]estroyed in the Mongol invasions” and “eventually succeeded by Tehran.” (Northedge 2016:182). Although the Mongol destruction did not spare Tehran either, the latter was still in better condition than Rey and could flourish in the subsequent centuries until it was picked some 200 years ago by Agha Mohammad Khan, the founder of the Qajar dynasty, as the capital city of Iran. Rey has now been reduced to a county in Tehran Province.

Karaj is a fertile agricultural plain located at the foot of the Alborz Mountain Range. Situated some 35 kilometers to the west of Tehran, it is, for all intents and purposes, a suburb of Tehran, although it has been the center of the recently formed province of Alborz for about ten years now and lies outside of Tehran administratively.



Historically, Karaj was a busy caravan route between Tehran and Qazvin, for which a large caravanserai was built under the Safavids (Hourcade, 2012). The caravanserai is now managed as a national heritage, although for many years after the 1979 Revolution, it was used as a fruit and vegetable market (*bazar e mive o tærebar*), that I often roamed and occasionally did some shopping in. Karaj used to be a sub-district of Savojbolagh. Nowadays, however, the relationship between Karaj and Savojbolagh (see Figure 1.6 below) has reversed in a way similar to that between Tehran and Rey, with Savojbolagh being a smaller county in Alborz Province and overshadowed by Karaj, the provincial capital. Karaj rose to national prominence from early 20th century when government policies targeted it as a center for industrial development.



Figure 1.6—Karaj and Savojbolagh (adapted from Statistical Center of Iran 2020(a))

One can quite reasonably and with certainty state that the prestigious status associated with TP has developed only in the last 200 years during which Tehran has been flourishing as the capital of the nation. It is similarly conceivable that, prior to this period, such a prestigious status was claimed by the previous capital or metropolitan cities that overshadowed Tehran in glory and significance, Rey being the nearest such city. Yet, although exploring such topics can be an exciting venture, it is far outside the scope of this research. Potentially, any such research, to be conducted successfully, is likely to require the replacement of TP (Tehran Persian) as CP, i.e., ‘Capital Persian’, or ‘Persian of the Capital’.

1.1.3.3. Demographics

According to the data provided by the Statistical Center of Iran on the most recent Population and Housing Census conducted in Iran (Statistical Center of Iran 2020), the nation had a population of 79,926,270 as of the year 2016, of which 13,267,637 (16.6%) live in Tehran Province and 2,712,400 (3.4%) in Alborz Province, with Tehran Province being the largest and Alborz Province the 11th largest province in the country by population. However, if we go by city, Karaj City (the center or capital of Alborz Province) is

the fourth largest urban center (with a population of 1,592,492 people) and Tehran City the largest (with 8,693,706 people) in the country in terms of population. The combined population of the two cities is 10,286,198, which is 12.87% of the entire population of Iran. This clarifies the weight of VTP as a variety within the national context, even if acknowledging that not every individual counted in said figure is a VTP speaker.

1.1.4. Varieties of Persian

Persian is a language within the Iranian branch of the Indo-European language, and a member of the West Iranian language group, along with such other Iranian languages, some still widely spoken to date, as Kurdish and Balochi. Within West Iranian, Persian is in the South-Western branch, together with such other dialects such as Luri and Bakhtiari that are spoken mainly in the southwestern province of Fars (Windfuhr 2003:81) (see Figure 3.7).

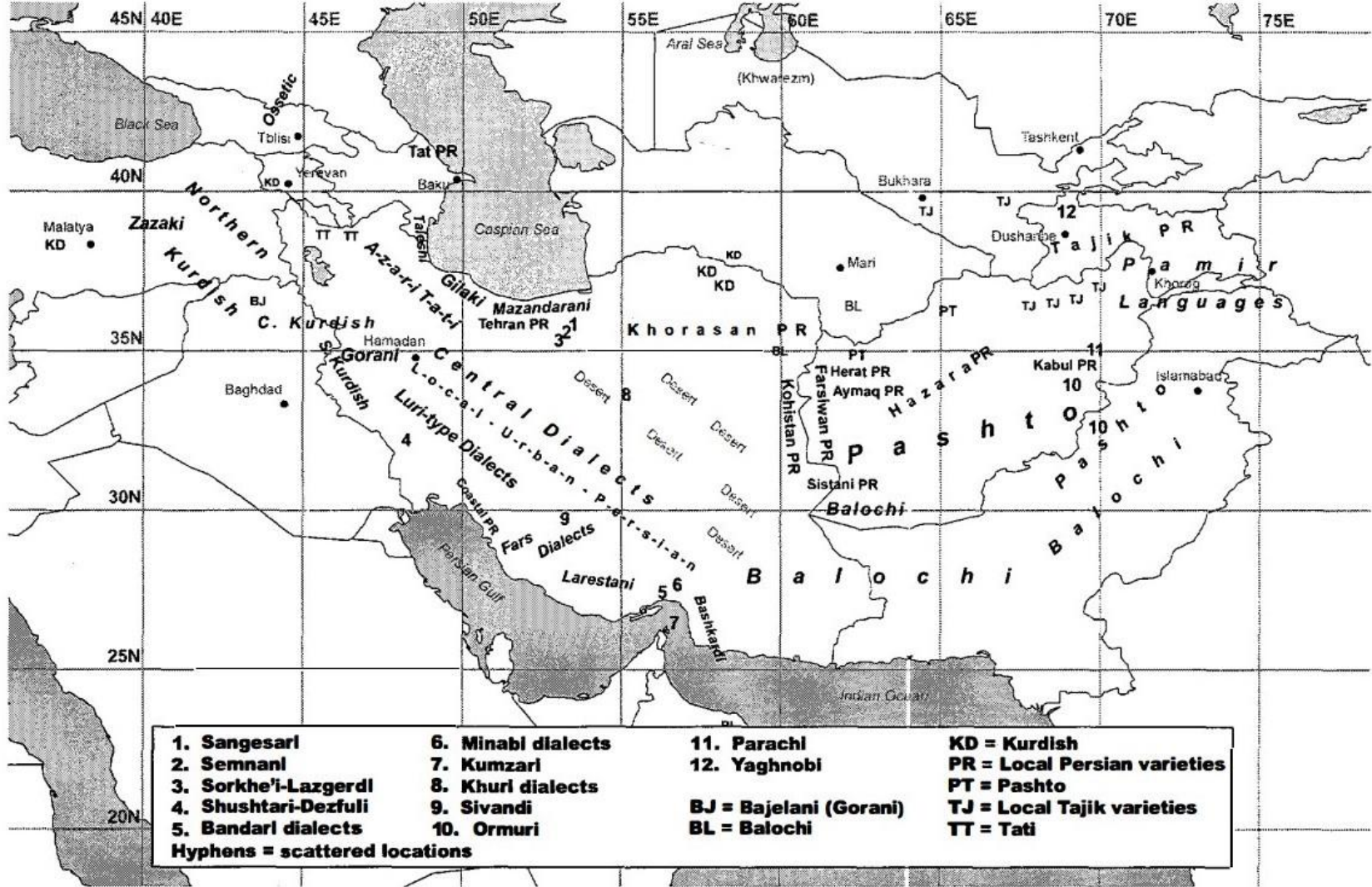


Figure 1.7—Map of the Iranian Languages (Windfuhr 2009:11)

The history of Persian is divided into three distinct eras: Old Persian, Middle Persian, and New Persian, with the last further subdivided into Classical and Modern Persian. Old Persian was the official language of the Achaemenids (559-331 BC), of which the few records that have survived for about 2,500 years in the form of cuneiform inscriptions (Humbach 2011) are the oldest records of the Persian language. Middle Persian, a quite widely documented language, was the language of the Sassanids (c. AD 225-651) (Windfuhr 2003:81). The turning point at which Middle Persian became, or dramatically shifted towards, New Persian is the Muslim conquest of Persia (i.e., Iran) around 650 A.D, that ended the Sassanid era.

There is indeed no clearcut line at which Classical Persian became Modern Persian. Rather, like similar situations in other languages, it was a gradual process. The literary language is said to have entered its Modern phase in the 19th century when waves of modernity swept the Iranian intellectual sphere, with writers beginning to simplify their writing while targeting a broader audience on the lower rungs of the socioeconomic ladder. New Persian “has a long literary tradition and is a language of high prestige. Under the names of Farsi, Dari and Tajik respectively, written variants of Persian are the official languages in Iran, Afghanistan and Tajikistan, respectively. As for the spoken language, it also shows dialectal differences, both between the different countries where it is spoken and also within these countries.” (Jahani 2005:79) Despite the three varieties of Persian in Iran, Afghanistan and Tajikistan having been “formalized through both academic and political processes” as Farsi (Persian), Dari² and Tajik, “they remain mutually intelligible” (Beeman 2010:138). The three national varieties are core varieties along a dialect continuum, with a great deal of regional variation in between.

According to William A. Stewart’s definition of standardization, Persian is a polycentric (or pluricentric) language, since, in the three national standards in the three countries, “different sets of norms exist simultaneously” (Stewart 1977:534), with orthographic, lexical, phonological, and syntactic differences between the three. Iranian Persian and Dari Persian use the same writing system, while Tajik Persian is written in a form of Cyrillic. “Whereas Modern Persian and Dari are very close in form, Tajik has more divergent discourse structures” (ibid:137). The Persian dialect continuum can in fact be mapped

² Although *Dari* as it is nowadays used in English to refer to Afghan Persian, the word ‘Dari’ in Persian is the same as New Persian. In Persian it means ‘from/related to the royal court’, referring to the variety of Persian spoken in the royal court and used as the literary language by classical Persian poets and scholars. *Dari* also refers to the variety of Persian spoken by the Zoroastrians in Yazd and Kerman in Iran.

onto the geographical locations of the three countries, with Iranian Persian and Tajik Persian being the two poles at the far ends of the continuum, and Dari lying somewhere in between and linking the two. The linguistic situation on the Iran-Afghan border, for example, is very similar to that of the German-Dutch border, where the dialects on the two sides of the border form a continuum (Gooskens & Kürschner 2009).

Despite all the interesting facts about variation in Persian across national borders, however, the scope of the current research is limited only to ‘Iranian Persian’ (*Farsi e Iran* or *Farsi e Irani*). Wherever I use ‘Persian’, unless I qualify it with Dari or Tajik, I mean it to refer to Iranian Persian, including all the varieties whether taught formally at schools as a single standardized national language or in its spoken forms. However, considering the central role of spoken language in variationist linguistics, the focus of the current research will indeed be the spoken language data obtained from interviews with Persian speakers in Tehran. Anywhere that written language is discussed, it is significant and relevant only as far as it relates to spoken language.

Persian in its spoken form within the current borders of Iran has geographical or dialectal varieties spoken in such major cities as Tehran, Shiraz, Isfahan, and Mashhad. None of these regional varieties is the standardized spoken form of Iranian Persian. The spoken form of Standard Iranian Persian, however, is what one might hear from the news anchor on TV. This ‘speaking style’ of Persian is consistent with standard written Persian but distinct from it in that it is the spoken or pronunciation dimension of it. The closest that I can think of in English is the RP (Received Pronunciation), which explicitly references the spoken dimension of English. I will refer to this speaking style as BP (Bookish Persian). ‘Bookish Persian’ is, hence, a speaking style, and not the written form of the language, which is typically referred to as written Persian. BP is a colloquial term but, in my estimation, very descriptive in its reference, which is why I continue to use it as a term to refer to this speaking style (Azadi 2011:18).

The *de facto* prestigious spoken variety of Persian in Iran among all the regional varieties is, unsurprisingly, that of the capital, Tehran. A person born and raised in Tehran would typically speak Vernacular Tehran Persian (VTP). However, with some education, he/she acquires full active command of BP and could speak that variety as well. This research is about the continuum at whose two extreme ends stand TP versus BP. The default position in the literature is that BP is the variety from which the TP forms have been systematically derived. This position, however, deserves some examining before being adopted.

1.2. Research Questions

The focus of the present research is on the following questions:

1. In what ways do vowels in Vernacular Tehran Persian differ from those in Bookish Persian?
 - a. Can the vowel differences be expressed in terms of vowel height?
 - i. Is there raising, lowering, or both?
 - b. Can the vowel differences be expressed in terms of vowel fronting or backing?
 - i. Is there fronting, backing or both?
2. What causes vowels in Vernacular Tehran Persian to differ from those in Bookish Persian?
 - a. Are these reasons linguistic, nonlinguistic or both?

In other words, the two main questions in this respect would be the how and the why of phonological variation of vowels in VTP as compared to BP. The how would cover how VTP vowels differ from those of BP, and the why would explain the reasons why they do.

1.3. Structure of the Dissertation

Considering the central role of vowels in this research, the following chapter (Chapter 2) will be dedicated to the discussion of vowels. Chapter 3, will examine ‘Chapter Three: Variation and the Literature Review’ in order to pave the way for Chapter 4, where the ‘Chapter Four: Method and Data’ will be discussed. Because of the key role of style in accounting for variation in variationist literature, Chapter 5 is Chapter Five: More on Style.

By the time we arrive at Chapter 8, I have done enough to engage in the Chapter Six: Results I: The Linguistic Factors that condition vowel variation in Vernacular Tehran Persian (VTP). Chapter 7 will do the same job for the Chapter Seven: Results II: The Extralinguistic Factors. It is with Chapter 10 (Chapter Eight: Results III: Multivariate) that my analysis will be completed by considering all the relevant variables in a multivariate analysis, a summary of which will be presented in Chapter 12

(Chapter Nine: Summary and Conclusion). The appendixes and bibliography (Appendix A: Interview Questionnaire), Appendix B: Written Translation Questionnaire), 14.313 (Appendix C: Additional Tables) and 13 (Bibliography) will wrap up the dissertation by providing the additional information that one may want to look into as regards this research and.

1.4. Significance and Expected Contributions

To the best of my knowledge, the current study holds significance on the three key levels, as follows:

Historical Significance

- In terms of methodology, it is the first major variationist study of Vernacular Tehran Persian since Modarresi (1978) and Jahangiri (1980).

Methodological Significance

- The first ever using advanced multivariate analysis models. By applying Rbrul—a tool designed for statistical analysis of linguistic variation—this research offers a robust quantitative approach to examining the factors that influence the spoken form of Persian in Tehran and introduces the application of mixed-effects models, which allow for the simultaneous analysis of multiple linguistic and social factors, and their interactions, in a way that was not previously used in Persian sociolinguistic studies. Such an approach provides deeper insight into the systematic nature of variation in Persian, enabling a nuanced understanding of how various linguistic and extralinguistic factors influence language use in the urban context of Tehran.

Conceptual Significance

- The study introduces a novel conceptual framework by adapting the term ‘Bookish Persian’ from colloquial discourse as a term that is distinct from ‘written Persian’ and using it as a highly descriptive label for a speaking style situated at the formal end of the spectrum of formality, with Vernacular Tehran Persian (VTP) positioned at the opposite end. Unlike the traditional binary distinction between the formal and informal, this framework emphasizes a continual quality with which Bookish elements intermingle with vernacular features in everyday spoken language. This underscores the dynamic role of Bookish Persian as a spoken form, not written, highlighting its

fluid integration into informal speech. It challenges the conventional view of Bookish Persian as exclusively written or formal, revealing its significant influence in modern spoken Persian contexts.

Together, these contributions underscore the pioneering nature of the study, both in the application of statistical models to Persian and in the expansion of our theoretical understanding of the relationship between Vernacular and Bookish forms of the language.

The contribution is to linguistic theory in general and to how the results of the current research may be applicable to the analysis of other languages that undergo similar vowel variation.

1.5. Chapter Summary

Persian was introduced as a pluricentric language with three major national varieties in Iran, Afghanistan and Tajikistan and more regional varieties within each of the three countries. After providing some background and demographics on Persian, the topic of this research, I introduced the research questions, presented the structure of the dissertation and then the significance and expected contribution of the current dissertation.

The next Chapter 2 will delve more deeply into the vowel situation in Persian.

2. Chapter Two: The Vowel Chart and the Vowels of Persian

2.1. Chapter Introduction

If consonants are seen as bricks, vowels can be likened to the cement that bonds them together to build the edifice that we call language and, in doing so, vowels show a great degree of variation. In the previous chapter, I introduced the Persian language and the major varieties of it in interaction. This chapter will provide a brief introduction to vowels in a broad sense but will then narrow the focus to examining the vowels of Persian and the way they are targeted by this research.

2.2. Vowels

Vowels are speech sounds that form syllable nuclei. Approximants are articulated with the least degree of stricture and require the least narrowing of the vocal tract among all consonants. Yet vowels, including the most closed ones, involve less narrowing of the vocal tract than any consonant and have the least stricture among all speech sounds.

While producing vowel sounds, the articulators do not come very close to each other, and the airstream is relatively unobstructed (Ashby 2011:84). Vowels are conventionally identified mainly by three features that are realized during the articulation of the vowel in question. These three features are the position of the highest point of the tongue, how front the highest point is as well as whether the lips are rounded (the corners of the lips are moved inward) or not. In other words, vowels are classified by tongue height, tongue advancement (i.e., the degree of ‘frontness’ or ‘backness’), and lip-rounding. They can be represented by an abstract concept of a ‘Vowel Quadrilateral’ that defines the vowel space, as presented in Figure 2.1 below.

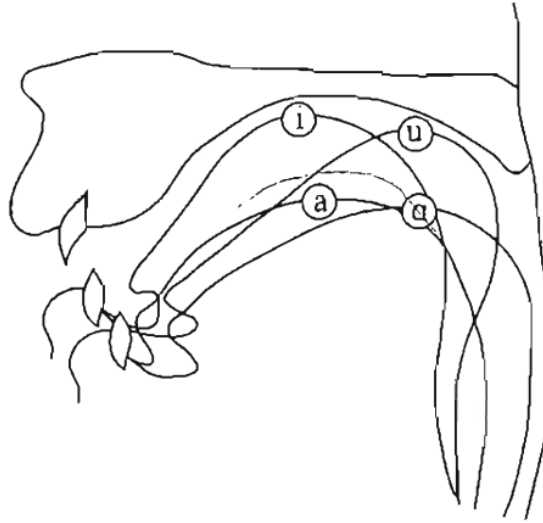


Figure 2.1—IPA Handbook (1999:11): Vowel Quadrilateral defining the Vowel Space

For example, to produce the vowel [i], the tongue body is moved forward and up in the mouth towards the hard palate, and the tongue is at the highest point near the roof of the mouth, hence ‘close’ or ‘high’. This is the vowel that is the syllabic nucleus in the Persian word *sib* [sib], ‘apple’, English *seat* [sit], or Spanish *sin* [sin] ‘without’. The vowel diagonally across from [i] is [ɑ], which appears in the English word *calm* [kam], for which the body of the tongue travels to the farthest point down and back.

Although the Vowel Quadrilateral is the most pragmatic way in auditory phonetics to depict and understand vowels, it is not necessarily the most precise. When pronouncing the vowel [i] as in *heed*, one pulls up the tongue so that it is positioned high and front in the mouth. While saying [u] as in *who’d*, however, the tongue remains high but further back in the mouth. The vowel [ɑ] as in *hod* has a very low tongue position, which is why, if you look in a mirror while saying it, you will see that the mouth is wide open and the tongue body very far back in the mouth. The equivalent of this description can also be given in exact F1 and F2 numbers, as shown in Figure 2.2 below:

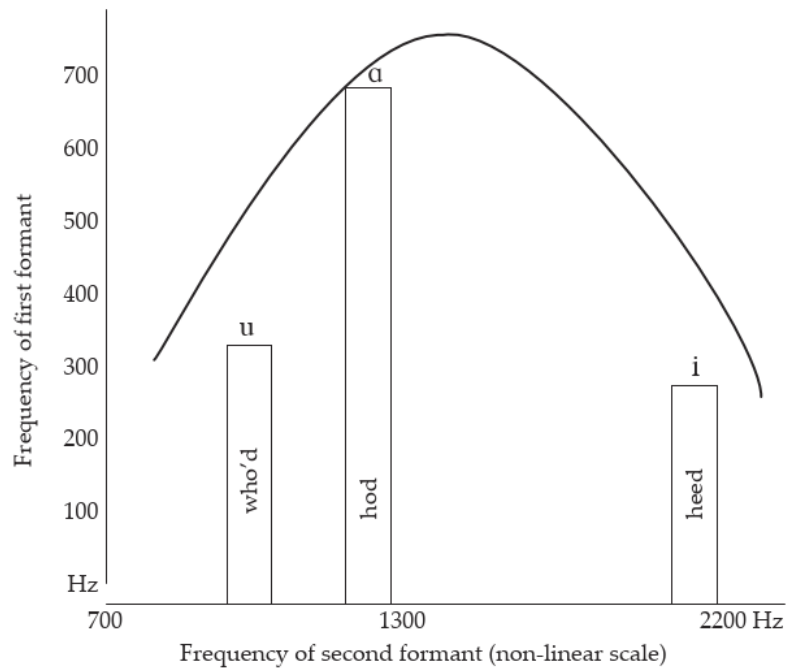


Figure 2.2—Example First and Second Formant Frequencies in Vowels (from Ladefoged et al 2012:40)

Figure 2.2 above shows the first two formants of the vowels in *hod*, *heed*, and *who'd*, i.e., [a i u]. The first formant has a low pitch for [i], a high pitch for [a] and a low pitch again for [u]. This shows an inverse relationship to tongue height, or vowel height. In other words, the higher the first formant, the lower the vowel (or vowel height). However, expressed in terms of openness, one can say F1 is directly proportional to openness. So, basically, presenting the formant frequencies (the first and second formants) is a more accurate way of analyzing the vowels than the vowel quadrilateral.

The fact that different individuals have different vocal tract anatomies does not impact the recognition of these formants. The frequencies are examined within a given speaker's speech. In order to compare the sounds across speakers, one needs to consider some sort of normalization procedure. Their formants will differ accordingly as well. However, what ultimately matter are the relative values of the formants. One can plot the average values of the first formant (F1) and the second formant (F2) for each vowel as articulated by a group of speakers of the language. The plot will reflect the approximate tongue positions during the articulation of vowels by arranging the scales appropriately (Ladefoged et al 2012).

The inverse relationship of F1 to height can be depicted by inverting the above Figure 2.2 to accommodate tongue height, as depicted in Figure 2.3 below:

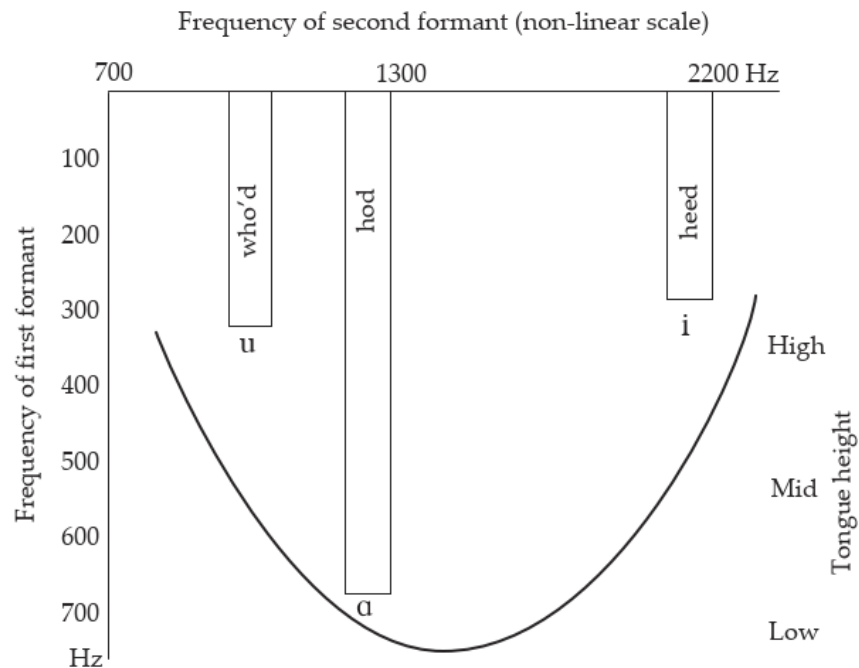


Figure 2.3—Formant Frequencies and Tongue Height in Vowels (from Ladefoged et al 2012:41)

The second formant is higher for [i] and lower for [u] because the second formant is determined by tongue advancement, or how front or back the tongue peak is. The more advanced (or front) the vowel, the higher the appropriate F2. One could also say that F2 is inversely proportional to backing, i.e., the further back a vowel is, the lower its F2 will be. The tongue is the furthest back in the pronunciation of [a] but its F2 is higher than that of [u] (see Figure 2.1 and Figure 2.3 above). This is because the lips are closer to each other in the pronunciation of [u] than in that of [a], which means that lip-rounding is also related to the second formant frequency. Lip-rounding lowers both the second and first formants. Figure 2.4 below contains labels that accommodate lip-rounding into the chart:

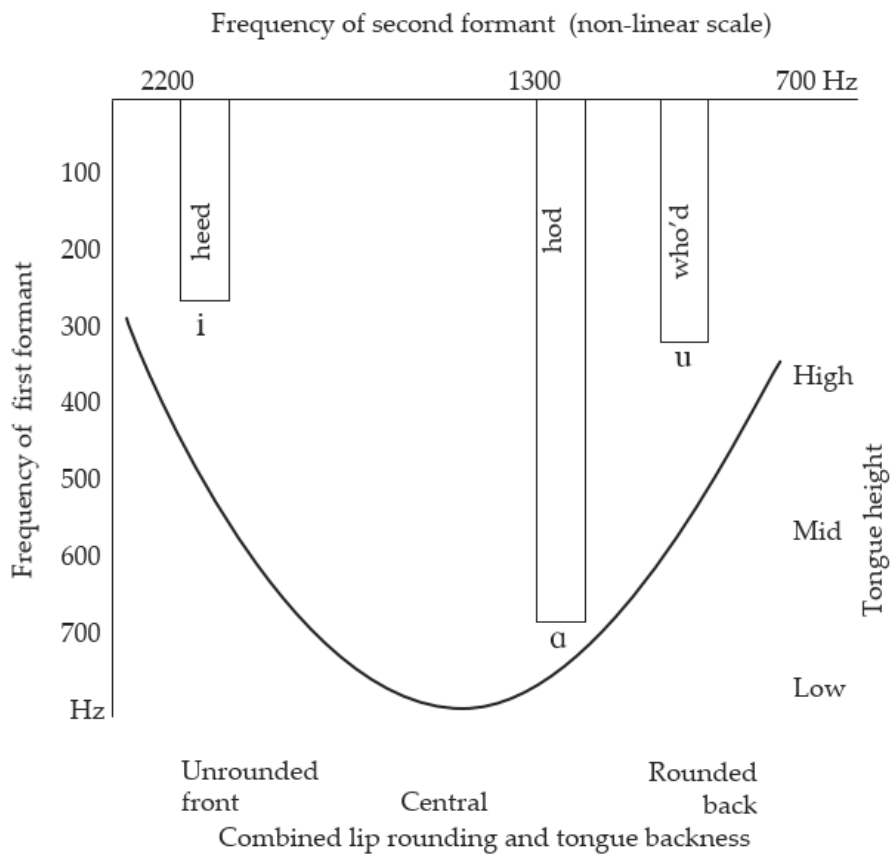


Figure 2.4—Formant Frequencies, Tongue Height, and Lip Rounding in Vowels (from Ladefoged et al 2012:42)

Figure 2.5 charts the American English vowels in terms of their three features while also providing the appropriate formant frequencies. The chart also includes arrows that mark the path in which the diphthongs are produced.

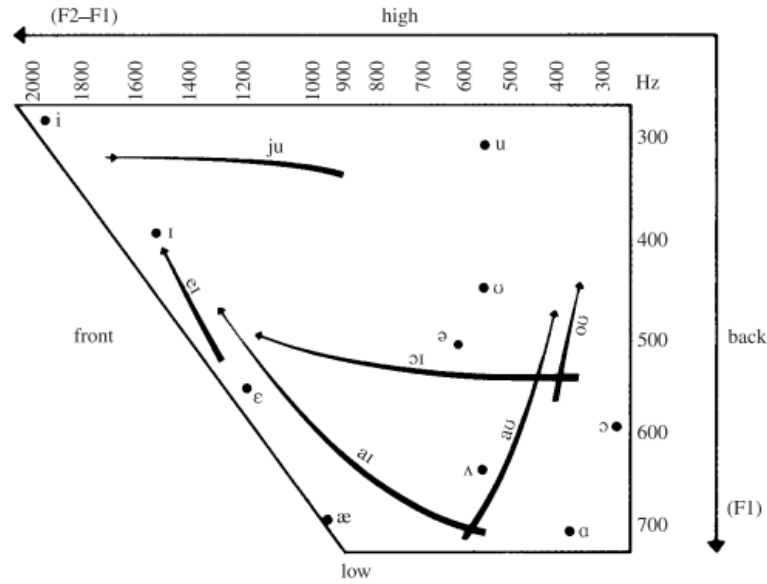


Figure 2.5—Vowels by Formant and Feature (from Ladefoged et al 2011:218)

By measuring the formants, one can detect tiny differences that may be otherwise imperceptible to the naked ear. Yet, clearly audible differences in vowel realizations may render the measurement of formants unnecessary and/or redundant. Prior to the advent of reliable acoustic measurement, impressionistic categorization of vowels was standard. With a good quality audio, this is still often the case, and one may simply rely only on the vowel chart, without needing measurements of formant frequencies, which was the case with the tokens included in the dataset in the current research. There, vowels are described by their height, backness and rounding instead of by their formant frequencies. This is especially useful in impressionistic analyses of vowels, which is the approach adopted in the current research. Acoustic analysis has become increasingly common in recent studies of vowel variation, particularly in English dialects, often replacing impressionistic coding. This approach is especially useful when the boundaries between vowel variants overlap or are ambiguous. However, for the present study, I opted for impressionistic coding because the vowel tokens were distinctly categorized, with no ambiguous cases in the dataset making it to the final token count. While future studies incorporating acoustic measurements could offer deeper insights into the phonetic realizations of Persian vowels, such an approach is not immediately necessary for addressing the research questions at hand.

Vowels are charted in a standard way with their three main features (height, advancement, rounding) can be readily inferred in reference to certain fixed points. The vowels mapped onto these fixed points are referred to as the ‘cardinal vowels’, after the British phonetician Daniel Jones:

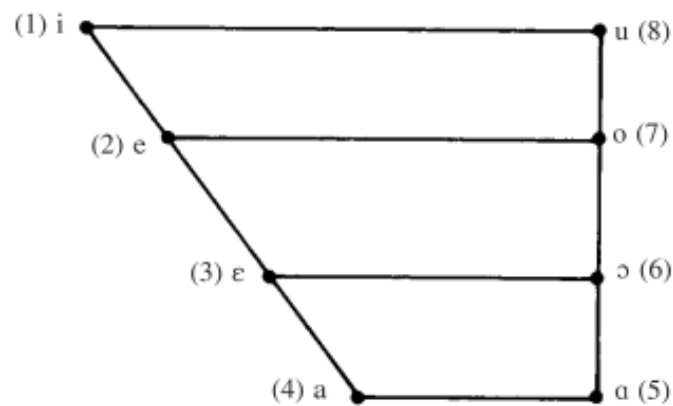


Figure 2.6—Daniel Jones' Cardinal Vowels (from Ladefoged et al 2011:221)

The evenly spaced reference vowels in Figure 2.6 above delimit the farthest boundaries of the vowel space in an ideal way. This means that, in terms of the exact location in the vowel space, they are not necessarily the same vowels that are used in any given language, say Persian or English, even though the same symbols may be used to represent the vowels in these languages. The exact location of the vowels produced in these languages, or any other language for that matter, can indeed always be figured out precisely by acoustically analyzing a sample group of speakers in order to specify their formant frequencies and by video-recording them to figure out their lip and jaw positions during their articulation of the vowels in question (Ladefoged et al 2011).

In addition to the primary cardinal vowels, there is a second set of vowels, referred to as the secondary cardinal vowels, which are charted below in Figure 2.7.

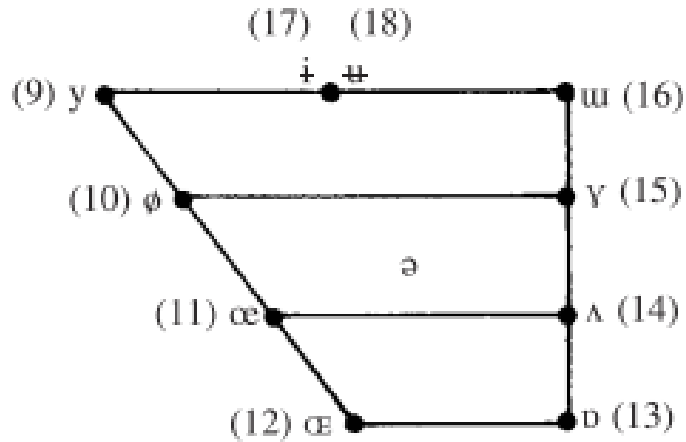


Figure 2.7—Daniel Jones' secondary cardinal vowels (from Ladefoged et al 2011:223)

Figure 2.7 above reflects the positions of the secondary cardinal vowels. For example, the secondary cardinal vowel [y], i.e., no. 9, is rounded and has a lower F2 than its unrounded counterpart [i], which shifts it further to the right of the vowel space as compared to the latter. The secondary cardinal vowel 16, i.e., [ɯ], on the other hand, is unrounded and has a higher F2 than its rounded counterpart, i.e., [u], resulting in shifting further to the left.

Among the three features of the vowels (height, tongue advancement, rounding), tongue height is of primary significance. “Even if a language has only two phonologically contrastive vowels, the differences will always be in this dimension rather than the front-back dimension.” (Ladefoged et al. 1996:286). The IPA (‘International Phonetic Alphabet’, also ‘International Phonetic Association’) recognizes four primary and three secondary levels of height, as depicted below in Figure 2.8:

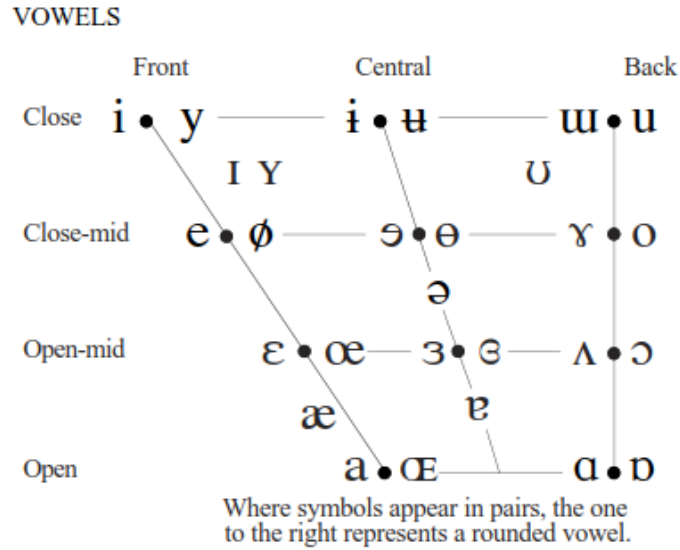


Figure 2.8—Vowel Chart (IPA revised to 2020)

‘Close’ in the above chart in Figure 2.8 can be replaced by ‘high’ and ‘open’ with ‘low’. The primary vowel height levels are high, high-mid, low-mid, and low, and the three secondary levels are near-high, mid, and near-low. Given the impressionistic nature of my approach to the study of vowels, I forgo formant measurements and will only use these three features in order to describe the vowels of Persian.

Throughout this research, I will use the symbol [a] interchangeably with [ɒ] (rounded low back vowel) in the context of Persian vowels. Wherever it is purely the IPA [a] (unrounded low front vowel), I will provide sufficient context to clarify the symbol reference. In terms of consonant symbols, I will use [c] for the IPA [tʃ], [j] for the IPA [dʒ] and [y] for the IPA [j] in the transcription of the Persian words.

2.3. The Vowels of Persian

The focus of this research is the vowels of Persian as they are spoken. I am presenting my data here in this dissertation in written form. In schools in Iran, children are taught that there are six vowels in Persian, three long and three short ones, of which the short ones are typically not represented in the orthography or otherwise marked as diacritics if not occurring in the beginning or end of a word. Among the graphemes that represent the vowels is the letter that in Persian orthography is referred to as *alef* (ا). The umbrella symbol in Latin for this is /a/, which can stand for the IPA [æ] or [ɒ], using ‘ā’ for the latter if necessary. In meters in Persian literature, [æ] is treated as a short vowel and /a/ (IPA: [ɒ] or [ɑ]), as a long one.

In the transliteration of Persian into the Latin alphabet, there is confusion around *alef* (i.e., /a/), more so in modern technologies such as texting or online chatting, where {a} can stand either for [æ] or [ɒ] in the absence of the macron. Even in more specialized texts, such as those that I will cite, different scholars, in the transliteration or phonetic transcription of Persian, choose symbols that are not necessarily consistent, entirely consistent with each other, or consistent with the IPA symbols. An {a} may be used for [æ] or [ɒ], and it may even be unclear whether the author perceived or meant to convey the sound as either [ɒ] or [ɑ]. In the case of texts that discuss Middle Persian or texts of older Iranian languages, it may not be clear whether they refer to the IPA [a] at all. Therefore, clarification will be needed in each case, which I will provide if and as much as needed. However, the vowels that will be provided later on will be shown on a vowel chart as well in order to provide a more concrete reference point as to the position of any given vowel in the vowel space and to make it possible to compare the symbols with those of the IPA in case there is any discrepancy.

Mahootian (2002) lists the vowel phonemes of Tehran Persian in Figure 4.9.

| PERSIAN VOCALIC PHONEMES | | |
|---------------------------------|-------|---------|
| | front | back |
| high | i | u |
| mid | e (ɛ) | o |
| low | æ | a |
| diphthong | | ow (ou) |

Figure 2.9—The Persian Vowel Chart (Mahootian 2006:286)

She makes clear that “the phonemic status of the diphthong /ow/, along with the status of another diphthong, [ey], which we are not considering phonemic, lacks unanimous consensus” (p.286). This is because [ow] has an allophonic relationship to [o], as does [ɛ] to [e]. Therefore, she is counting six phonemes for Persian, two of which have two allophones as just described.

In Figure 2.9 above, the symbol {a}, which appears as {a} when italicized, can be confused with the IPA /ɑ/. However, Mahootian does not comment on the rounding of this sound. Thus, it is not clear whether her {a} represents the IPA [ɑ] or [ɒ] (i.e., whether it is rounded or unrounded). Yet, her chart makes it clear that it is not an IPA [ɑ], as it is represented as a lower back vowel rather than a low front or low mid vowel.

In the late 19th century, in *A Grammar of the Persian Language*, John T. Platts (1894) writes:

In the last generation, *ā* was generally sounded like our *a* in *ball*; but though still so sounded in parts of Persia (and especially in the Kāshān dialect), it is now becoming very common to give it the sound of our *a* in *bar*, as it had in Persia in olden times, and has, even now, in the Persian of India.

Now we know that this trend of unrounding the rounded lower back vowel [ɒ] into [ɑ] did not continue to this date in TP, as it is pronounced in TP as [ɒ]. Miller (2011:1387) also emphasizes that the “current Iranian

tendency to continue using a rounded vowel, [ɒ], indicates that the above-mentioned trend did not catch on,” although “Indian and Afghan varieties” have lacked such rounding. Although as late as in 1957, Hodge uses the symbol /a/ and clarifies that it is “low back unrounded [ɑ]” (Hodge 1957:357), most of the literature identifies the lower back vowel (often written as /a/) as rounded, i.e., [ɒ] rather than as unrounded, i.e., [ɑ].

Later in another study of the Persian vowel system, Miller (2013) charts the vowels of Persian as follows:

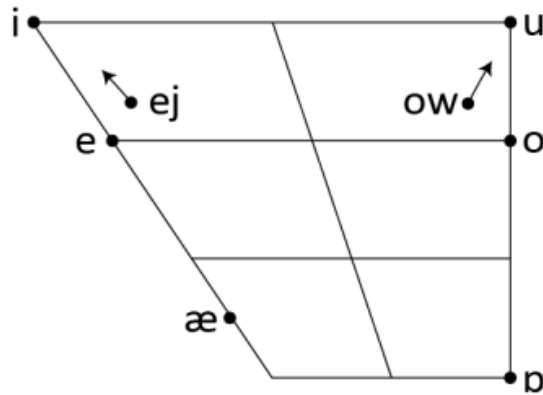


Figure 2.10—Vowel System of Contemporary Iranian Persian (Miller 2013)

Setting aside the diphthongs, in his chart, Miller clearly uses the symbol for the rounded version of the lower back vowel.

Mobaraki’s (2013) study of the “Persian Phonological System”, in the same year as that of Miller’s, charts the vowels of Persian slightly differently and as follows:

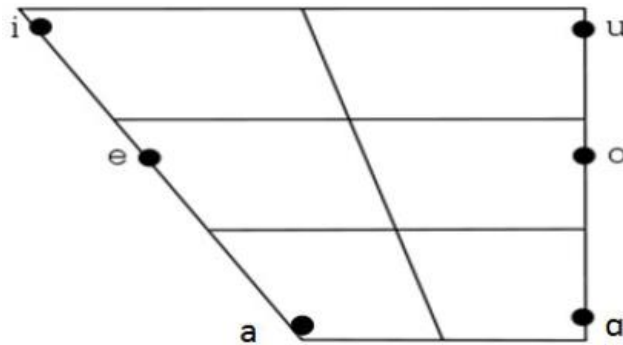


Figure 2.11—Persian Vowels according to Mobaraki (2013)

This chart positions all the vowels slightly lower, except for the low back vowel, which is positioned slightly higher than those provided by Miller (2013) in Figure 2.10. However, Mobaraki’s choice of ‘ɑ’ for the lower back vowel seems inaccurate considering that it has been positioned in the chart to the right of the vertical line as a rounded vowel. Therefore, for all intents and purposes, one can say that Mobaraki confirms the lower back vowel as rounded as well, in addition to the fact his /a/ in fact is the equivalent of the IPA [æ], considering its position and the ambiguous history of {a}.

One year after Mobaraki, Hosseini (2014:8) provides the following chart for the vowels of Persian:

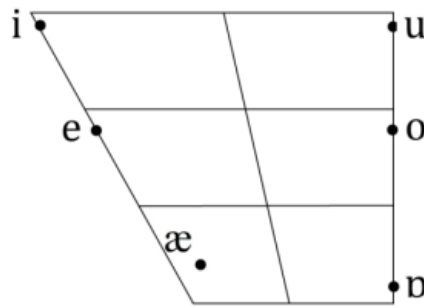


Figure 2.12—Hosseini’s (2014) Vowels of Persian

Miller’s and Hosseini’s choices of symbols are consistent with the IPA. In Hosseini’s study, the high vowels [i] and [u] are positioned similarly to those of Mobaraki.

Slightly earlier, Rohany-Rahbar (2008) presents the vowels of “Modern Persian” as follows:

| | |
|---|------------|
| | peripheral |
| i | u high |
| e | o |
| a | ɑ low |

Figure 2.13—Rohany-Rahbar’s (2008) Vowels of Persian

Clarifying that she uses “[peripheral], following Rice (1995, 2002), to replace the features [back] and [round] in vowels”, Rohany-Rahbar uses the feature [peripheral] for [ɑ], which effectively makes it a [ɒ] (Rohany-Rahbar 2008:236), hence clarifying the equivalency with the IPA symbol.

Based on the above studies, my working chart for the vowels of Persian (both BP and TP) will be as follows:

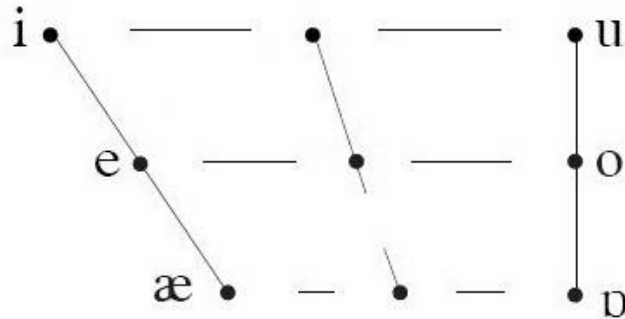


Figure 2.14—TP Vowel Chart

This is similar, in terms of positioning but not necessary every choice of symbol, to what Jahangiri (1980) presented for the Persian vowels in 1980:

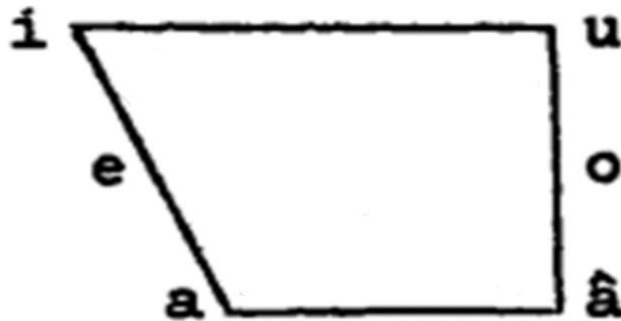


Figure 2.15—Jahangiri's Persian Vowel Variation Chart minus the Variations (Jahangiri 1980:57)³

³ Jahangiri is using 'a' for /æ/ (low front unrounded vowel) and 'â' for /ɒ/ (low back rounded vowel).

It is clear, based on the position of ‘â’, that Jahangiri considers the Persian lower back vowel to be rounded as well. Therefore, his {a} stands for the IPA [æ] and his {â} for the IPA [ɒ].

Figure 2.14 above, which is my working chart for the vowels of the Iranian Persian language, renders /i/ and /u/ as high, /e/ and /o/ as mid and /æ/ and /ɒ/ as low vowels. Contemporary Iranian Persian, therefore, has six monophthongal vowels. I have excluded the diphthong [ow] from my analysis as an allophone of [o] and have not studied [ej], as I have limited my research to vowel height variation, which these two vowels (or diphthongs) are not subject to.

The phonemic vowels of Persian are, therefore, either front or back. The front and back vowels are similar in that they are either high, mid or low but different in that all the front vowels are unrounded while all the back vowels are rounded. Persian, thus, has no phonemic central vowels, rounded front vowels or unrounded back vowels.

One can make a case for the existence of the schwa in VTP in such words as *cəhar* “four”, which often may be articulated as either of the four variants [tʃə'hɔr], [tʃɒ'hɔr], the more formal [tʃe'hɔr] or the reduced form [tʃɚ]. The *Great Sokhan Dictionary* records (the BP forms of) the word only as [tʃæ'hɔr] and [tʃɒ'hɔr]. Hodge, however, notices that one of his speakers uses [ə] in this word, but he dismisses it due to the putative influence of the speaker’s native language of Gilaki on his Persian (Hodge 1957:357). The schwa appears to occur in VTP in unstressed syllables and may even serve as an intermediary stage of syllable deletion. Examples include said *cəhar*, which may be reduced to *car*, and *təʔntr* ‘theater’, which may be reduced to *ntr* as an alternative and more common variant in VTP. However, this interesting yet understudied topic remains beyond and outside the scope of the current research.

2.4. Chapter Summary

I showed, in this chapter, that vowels can be identified by the three features of height (high vs. low, or close vs. open), tongue advancement (back vs. front) and lip rounding. These can be more accurately displayed by measuring the respective formant frequencies (F1 and F2). However, in view of the impressionistic nature of the current approach, the three features will sufficiently describe the vowels in question and there is no need to measure formant frequencies.

I clarified the use of symbols throughout the research both in the IPA and the adapted versions in reference to the way the vowels of Persian have been used in all earlier major research. While introducing the six vowels of Persian, I clarified how the vowels of Persian are presented differently by different researchers and how they compared to the IPA symbols. While examining the various vowel charts, including those of Persian in the literature, I introduced my working chart with the six monophthongs of Persian, which consist of three unrounded front and three rounded back vowels.

I have clearly introduced the vowels of Persian and excluded the ones (two diphthongs and a possible monophthong) that are not relevant to this research, while also pointing to some areas in which one could do research in the future. Sample Acoustic Vowel Plots have been provided later on under section 4.4.4.

3. Chapter Three: Variation and the Literature Review

3.1. Chapter Introduction

In the previous chapter (Chapter 2), I presented the approaches to the understanding and study of vowels at first, going on towards the end of the chapter to draw the vowel chart for the monophthongs of Persian, which are the sounds that are the subject of research in this dissertation. I will begin the current chapter by introducing variation and change in its broad sense but will then zero in on Persian vowels through the lens of variation and change.

3.2. Variation and Change

In linguistics, variation may be defined as referring “to differences in linguistic form without (apparent) changes in meaning” (Walker 2010:16). “In this sense, languages obviously differ from each other on a number of different levels” (Walker 2010:5). Most speakers are conscious of some sort of dialectal variation in their own language at the level of words or sounds, i.e., variation at lexical and phonological levels. However, variation will be defined here at a finer level. It may also be relevant and significant, for purposes other than those of the current research, to keep in mind the distinction between intralinguistic variation (variation within the same language) as opposed to interlinguistic variation (variation across languages).

Overall, variation appears at the interspeaker level as well as at the intraspeaker level. Interspeaker variation is the differences in the speech of various speakers of the same language. Intraspeaker variation, however, is the various ways in which the same individual speaks the language. One could say that “intraspeaker variation derives from and mirrors interspeaker variation” (Bell 1984:145), but it may also appear in any other number of ways in which the language system interacts with the physiological or psychological characteristics of the individual (Labov 1972:1).

Variation may persist over time without leading to change. However, it may also spread through the language community and establish new forms that contrast with old forms, or variants. “Finally, at some later stage, one or the other of the two forms usually triumphs, and regularity is achieved.” (Labov 1972:1) Such triumph achieved by a new variant over an old variant is referred to as change. Therefore, considering that, for example, the Middle-Persian variant of the Modern-Persian word *del* [del] “heart” is [dil]

(MacKenzie 1971:26), one can say that [dil] has over time changed to and been replaced by [del]. At some point, [dil] and [del] might have existed side by side as ‘free’ variants in a situation of ‘variation’ before the latter replaced the former, resulting in said ‘change’. However, as far as change is concerned, what matters is that the replacement has indeed taken place and the process has been completed, in this case in favor of a lower vowel replacing a higher vowel.

Change in the various aspects of a language may accumulate so much that a new language may be born. Examples for this are French, Spanish and Portuguese, which are languages that were born from Latin, or Kurdish and Persian, which were born from their own common ancestor. If the situation is less dramatic, i.e., one is not speaking of new languages being born but the history of the same language, it may still force us to divide the language into various periods. Persian, for example, like English, has an Old, a Middle and a New (including Modern) period. The terms "old," "middle," "modern," and "new" are relative designations that differ across languages. For example, Old Persian was spoken up to the 3rd century B.C. (Paul 2013), while Old English originated much later, in the mid-5th century A.D. (Hogg 2022:1).

Not all variation results in change. Variants may exist side by side for a long time in a rather stable situation and create various ways in which the same language is used. Categories in which some such variation is conceptualized include register, style, genre, text type and dialect (Biber 1994:vii). For example, the word for ‘minute’ in Vernacular Tehran Persian is pronounced as either of the variants *dæqiqe*, *dæyiqe*, *deyiqe*, *deqe*. These variants co-exist side by side and may continue to do so without one or the other of the four variants becoming the dominant form. The same co-existence of variants, i.e., variation, can be seen across the Iranian and Afghan dialects. For example, [del] ‘heart; stomach’ in Iranian Persian is pronounced as [dil] in Afghan Persian. (This variation in between the two dialects, of /e/ and /i/, exists systematically across other words as well.)

3.3. Vowels Height Variation across Languages

Phonological variation can be consonantal or vocalic. For example, the Cockney glottal stop variant of [ˈwiʔi] for ‘witty’ as opposed to the RP variant [ˈwiti] is consonantal variation. So is the flapped North American (and Australian) variant, i.e., [ˈwiri]. Here, there is inter-dialectal variation in English with the variable context being the intervocalic /t/ and the variants, [t]~[ɾ]~[ʔ]. (Carr 2008:8, 65)

Vowel variation is common across languages and dialects (among others, in Canadian raising of /aɪ/ and /aʊ/ that have a noticeably high onset before voiceless obstruents as in *wife*, *mice*, *south*, *mouse* (Chambers & Trudgill 2004:97-98). Nevertheless, vowel variation can, strictly speaking, be in features other than height, e.g., lip rounding and tongue advancement (degree of frontness vs. backness). All examples of vowels mentioned so far, however, both in Persian and English, are variation in vowel height, which is the target vowel feature for the current research. Raising or lowering the vowel height seems to be a very common source of variation and change. It is, in fact, at the top of Labov's "Three principles of vowel shifting" (Labov 1999:116), where Principle I is "In chain shifts, long vowels rise". In English, it has proved to be a centuries-old trend. Canadian Raising, which is geographically not uniquely Canadian and occurs in certain regional varieties of English in the United States as well, is heir to the Great Vowel Shift (GVS) (Carr 2008:67-68).

The GVS is a historical change that took place throughout the period when Early Modern English was spoken. In this section of the English linguistic timespace, long vowels became higher and shifted upwards in the vowel space, with vowels such as the high mid vowels /e:/ and /o:/ undergoing raising to /i:/ and /u:/, respectively. The high vowels /i:/ and /u:/, in turn, underwent diphthongization to become /aɪ/ and /aʊ/. The present-day pronunciations of words such as *divine* [dɪvaɪn] are living evidence of said vowel shift. They used to be pronounced with an [i:], i.e., [dɪvi:n]) (Carr 2008:67-68).

In the Northern Cities Shift in U.S. English, short-*a* words are raised, but in the Middle Atlantic states, raising affects only some short-*a* words (Labov 1994). In some varieties of English, /ɛ/ in words such as *pen* and *hem* is raised to [ɪ], making them homophonous with *pin* and *him*.

There are many more examples of vowel raising from other languages. Rohany-Rahbar (2012:112) cites multiple examples of raising from a wide variety of languages, such as the Indo-European vowel *e* before a cluster with an initial nasal becoming *i* in Proto-Germanic languages regardless of the vowel in the following syllable, as in *bhendh-* > *binda*, /ɛ/ and /ɔ/ in Tswana (Bantu) raised to [e] and [o], respectively, before syllabic nasal consonants, and variation between /e/ and [ɛ] in Tewa (Kiowa-Tanoan) before nasal consonants, as in [feh] 'stick' versus [fɛn], as well as other instances of raising in Grand Couli (Tinrin and Mea) and Slave (Athapaskan). (ibid.)

Diachronically speaking, the French vowel /u/, spelled in the regular orthography as ‘ou’, as in *trouver* ‘to find’, is the result of raising the earlier vowel /o/. In this case, the older variant was *trover* (Carr 2008:192). The word for ‘everything’ is ‘todo’ [ˈtoðo] in Spanish. In Portuguese, a sibling language of Spanish, however, the word is written with the first vowel raised to [u], i.e., ‘tudo’. However, in spoken Portuguese both vowels are higher than those in their Spanish counterpart and the word is pronounced as [ˈtu:du]. Such raising is a common pattern in Portuguese and applies to /e/ and /o/ in all unstressed syllables. The final vowel in the words *quando* ‘when’, *caminho* ‘path’ and *curso* ‘course’ is pronounced in spoken Portuguese with the raised variant [u], as is the masculine definite article *o*, which is pronounced [u]. Raising extends to the vowel /e/, occurring in unstressed syllables in words such as *leite* ‘milk’, which are raised to [i] (Rodrigues et al 2016).

Of special significance to the current research is the pre-nasal raising of /ɒ/ to [u] in Tehran Persian. The effect of nasality on vowel height has been widely documented across various languages, both synchronically and historically (e.g., as cited in Rohany-Rahbar (2012): Ohala 1975, Beddor 1982, 1993, Wright 1986, Krakow et al. 1988, Beddor and Hawkins 1990, Maeda 1993). In a discussion of lexical diffusion in the speech community, while referring to raising as a process that has been going on in English since the 10th century, Labov (1994) specifies that the most favored kind of raising is indeed that of words ending in (final front) nasals, such as *hand*, *man*, *ham*, etc., “which are raised almost everywhere” (Labov 1994:429). Pre-nasal raising is a big part of the vowel height variation in Tehran Persian as well. It is in fact the main vowel raising environment percentage-wise.

3.4. Vowel Height Variation in Persian

In this research I am examining Persian as spoken in Tehran (TP) with the two distinct spoken varieties of Vernacular Tehran Persian (VTP) and Bookish Persian (BP). However, TP might be better viewed as a continuum with BP and VTP at the two ends. The variation is manifested in the various aspects of the language, among others, in the morphology, syntax and, most importantly for the purposes of this research, in phonology.

VTP is phonologically distinguished from BP by variation in consonants and vowels, but in this research, my focus will be solely on the vowels. Table 3.1 below lists some examples of vowel variation within TP by providing the VTP vs. BP forms:

| <i>BP</i> | <i>VTP</i> | <i>English Gloss</i> |
|-----------------------------|--------------------------------------|-------------------------|
| am ædæn ⁴ | u mædæn | 'to come' |
| atæf | at i f | 'fire' |
| a n | u n | 'that' |
| beton | but u n | 'concrete' (<i>n</i>) |
| b am | b um | 'rooftop' |
| d an | d un | 'seed' |
| E ngelis | I ngilis | 'England' |
| hefdæh | hivdæ(h), hifdæ(h) | 'seventeen' |
| hendevane | hendev u ne, hend u ne | 'watermelon' |
| hæmm a m | hæm u m | 'bath' |
| jegær | jig æ r | 'liver; dear' |
| j o mhuri | j u mhuri | 'republic' |
| k o dam | k o dum, k u dum | 'which' |
| kuc æ k | kuc i k | 'small, little' |
| f e pef | f i pi f | 'louse' |
| f o kolat | f u kulat | 'chocolate' |
| ot o bus | ut u bus | 'bus' |
| xan o m | xan u m | 'lady; Ms.' |
| xan a dæn | xan u dæn | 'to read' |

Table 3.1—VTP vs. BP Vowels

Table 3.1 above provides examples of vowel variation between BP and VTP, such as the realization of /ɒ/ (or /ɑ/) as [u], /o/ as [u], /e/ as [i] and /æ/ as [i], as indicated using bold type. In all these words, the VTP vowel is a raised variant of the BP vowel, with a considerable number of raising instances occurring pre-nasally (before /m/ or /n/, i.e., *aN* → *uN*), raising /ɒ/ to [u]. Nevertheless, Table 3.2 below provides evidence of words in which such raising is never triggered pre-nasally. It can, therefore, be said that *aN* in Persian is variably triggered:

⁴ In the above table and throughout this dissertation, the symbol 'a' may be used interchangeably with 'ɒ'. Any exception will be clarified.

| <i>BP</i> | <i>VTP</i> | <i>English Gloss</i> |
|-----------|------------|---|
| amix'tæn | amix'tæn | 'to mix' |
| dam | dam | 'trap' |
| dan | dan | 'dan' (level after black belt in some martial arts) |
| kam | kam | 'palate; wish' |
| mam | mam | 'mother' |
| maman | maman | 'mom' |
| nam | nam | 'name' |
| ram | ram | 'tamed' |
| ʃam | ʃam | 'dinner' |
| vam | vam | 'loan' |
| xam | xam | 'raw' |

Table 3.2—Exceptions to Pre-nasal Vowel Raising in TP

Table 3.1 and Table 3.2 both indicate the presence or absence of raising in VTP as compared to BP. This research is dedicated to the analysis of any kind of vowel height variation in VTP, be it pre-nasal or not, raising or lowering, as compared to BP. An interesting question that would arise at this point would be why the BP forms are taken as the underlying forms and the VTP forms as varying from those, rather than the other way around.

Both Ariyaee (2018) and Modaressi (1978) note that pre-nasal raising rarely occurs in monosyllabic words that end in a nasal. This might raise the question how prosodic structure might be a contributing factor, which can be a research of its own. However, in Chapter 8, I do discuss the effects of syllable distance and stress position on vowel height variation.

3.5. Persian Vowel Variation

My preferred term 'Bookish Persian' (BP) for the variety of Persian that is otherwise typically referred to as Written Persian or Formal Persian refers to the variety of Persian in Iran which is acquired by education and is no one's native language, or mother tongue. Although the uneducated can comprehend BP to some degree, a nuanced understanding of it or its active use would require some degree of education on the part of the hearer-speaker. Classical Arabic, "a scholarly and purely literary language" (Fischer 2013:188) holds a similar position in Arabic-speaking countries in terms of not being anyone's native language. Similarly

to Classical Arabic, the often colloquial term ‘Bookish Persian’ (BP) is an idealized version of Persian that is not spoken as a native-spoken variety. I find this colloquial term to be more appropriate than ‘Written Persian’ or ‘Formal Persian’ for reasons that will hopefully be sufficiently clarified throughout this research.

This dichotomy is manifested, among other things, in vowel variation, which is the subject of this dissertation. This dually split variation has been observed and discussed for decades although, depending on the scholar and the zeitgeist, it has been conceptualized and analyzed not necessarily with the same terms. Whether this dichotomy is best captured in Ferguson’s (1959) notion of diglossia or with other theoretical tools is a question that will be explored through a review of the relevant literature below.

3.5.1. Hodge (1957)

Hodge’s 1957 paper, although pre-Labovian in terms of methodology, makes explicit references to linguistic variation, stating that he is trying to find an explanation that would account for “what were previously called ‘free variants’” (Hodge 1957:355). This clearly speaks to a variationist Zeitgeist that inevitably led to Labov ushering in what can be called ‘the Labovian era’ in linguistics in the subsequent years, i.e., variationist linguistics (e.g. Labov 1963).

In “Some Aspects of Persian Style”, Hodge (1957) sets out to apply “descriptive techniques to some aspects of style” in Persian, and by style he means “variations which occur within the speech of each one [speaker]” (i.e., intraspeaker variation) “but are common to all” (i.e., interspeaker variation). The basis for Hodge’s observations is Tehran Persian (which he calls ‘standard spoken language of Tehran’, or ST) as spoken by a number of Iranian students serving as tutors in the School of Languages, Foreign Service Institute. He supplements his data with his additional observations in Iran. Hodge looks at several factors, which include the choice of words, syntax, and morphological as well as phonological variation that correlate with style. He proposes a formal/informal dichotomy to describe stylistic variation in Persian. As far as the phonological variation of vowel height is concerned, which is the scope of the present research, he points out to the examples shown in Table 5.3:

| | Formal | Informal | English Gloss |
|----|-------------------|-------------------|-----------------------|
| a. | æst | e | ‘is’ |
| b. | an | un | ‘that’ |
| c. | ari | are | ‘yes’ |
| d. | cæhar | cehar | ‘four’ |
| e. | hæmmam | hæmum | ‘bath’ |
| f. | mehmanxane | mehmunxune | ‘hostel; living room’ |
| g. | xane | xune | ‘home; house’ |
| | xiyaban | xiyabun | ‘street, road’ |

Table 3.3—Hodge’s (1957) Examples of Vowel Raising from Tehran Persian

The ‘Formal’ vowels in bold type can be compared with their counterparts under ‘Informal’ to see how the Informal variants are the raised forms of those under Formal.

Hodge recognizes that his Formal vs. Informal dichotomy is too broad a framework to account for stylistic variation in Persian, and he divides each of his initial two categories in two, rendering a four-tier array, as shown in Figure 5.1:

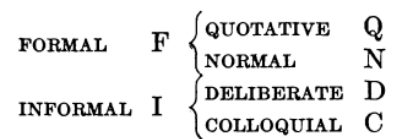


Figure 3.1—Hodge’s (1957) Stylistic Array for Persian

Hodge notes that /a/ in Persian may alternate with [u] when it appears next to /m/ or /n/. As he does not clarify whether by ‘next’ he means pre- or post-nasal [a]~[u], he could potentially be referring to such lexical items as in Table 3.4, in which the vowel [a] follows rather than precedes the nasal stop, i.e., $aN \rightarrow uN$ as well as $Na \rightarrow Na$.

| | Formal | Informal | English Gloss |
|----|---------------|-----------------|----------------------|
| a. | kenar | kenar | ‘side’ |
| b. | male | male | ‘trowel’ |
| c. | mar | mar | ‘snake’ |
| d. | mast | mast | ‘yogurt’ |
| e. | nadan | nadun | ‘ignorant’ |
| f. | nahie | nahie | ‘zone’ |
| g. | tumar | tumar | ‘scroll’ |

Table 3.4—Non-Variation of Post-Nasal Low Vowels in Tehran Persian

The words under ‘Formal’ in Table 3.4 above contain a Nasal+vowel in bold type that does not undergo any raising in in the Informal category. Hodge does not discuss or provide examples of *Na* → *Nu*. As it is evident from the examples in Table 3.4, vowel variation, or in this case raising, is not triggered in post-nasal positions and there is no evidence of such raising in TP (as confirmed in the literature as well as in my data: see Chapters 3 and 4).

Hodge’s discussion of vowel raising does not explain words (such as those in Table 3.2 earlier in the chapter) that seem to be exceptions to pre-nasal vowel raising in TP. However, he notes that “choice of words (or morphemes)” as well as syntax affect style. He further notes that the alternation of morphemic, rather than phonemic, variants is the main distinction between F(ormal) and I(nformal) and that most “phonetic (subphonemic) differences do not divide sharply on formal-informal lines” (Hodge 1957:361-2). To this end, he provides the examples listed below in Table 3.5:

| FORMAL | STEM | INFORMAL | STEM | MEANING |
|-----------|------|----------|------|--------------|
| míyaværæm | avær | míyaræm | ar | I'm bringing |
| mídæhæm | dæh | mídæm | d | I'm giving |
| míguyæm | gu | mígæm | g | I'm saying |
| mírævæm | ræv | míræm | r | I'm going |
| mísævæm | šæv | mísæm | š | I'm becoming |
| míšuyæm | šu | míšuræm | šur | I'm washing |
| míxahæm | xah | míxam | xa | I want |

Table 3.5—Hodge's (1957) morphemic alternants

Almost all the I-stems are reduced forms of the F-forms.

| FORMAL | ENDING | INFORMAL | ENDING | MEANING |
|----------|--------|----------|--------|---------------------|
| mírævæm | -æm | míræm | -æm | I'm going |
| mírævi | -i | míri | -i | you're going (sg.) |
| mírævæd | -æd | míre | *-e | he's going |
| mírævím | -ím | mírím | -ím | we're going |
| mírævid | -id | mírid | -id | you're going |
| mírævænd | -ænd | míræn | *-æn | they're going |
| míyayæm | -yæm | míyam | *-m | I'm coming |
| míya'i | -i | míya'i | -i | you're coming (sg.) |
| míyayæd | -yæd | míyad | *-d | he's coming |
| míya'im | -'ím | míya'im | -'ím | we're coming |
| míya'id | -'id | míya'id | -'id | you're coming |
| míyayænd | -yænd | míyan | *-n | they're coming |

Table 3.6—Hodge's (1957) F vs. I verb endings

It is important to note that variation in the examples in Table 3.5 and Table 3.6, whether we look at them as being morphemic or phonological, do not primarily have to do with raising. Actually, few of the examples involve vowel raising, with the exception of the Informal suffix /-e/ for the Formal suffix /-æd/, which contains but is not limited to raising, as the reduction of /-æd/ to /-e/ involves deletion besides, and perhaps before, raising. Here again, variation is viewed by Hodge not as vowel variation or raising but rather as morphemic alternation between full and reduced forms. Hodge seems to consider the alternation of [ær]~[e] at the end of F~I words such as ['ægær]~['æge] 'if', ['mægær]~['mæge] 'unless', and

[ˈdɪgæɹ]~[ˈdɪge] ‘other’ as morphemic variation as well, saying that “the alternants must be defined morphologically (listed by morphemes) rather than phonologically (automatic morphophonemic changes)” (Hodge 1957: 364).

A morphemic approach to TP variation is an interesting question raised by Hodge. In the analysis of my data, however, my focus is on vowel height variation as a phonetic/phonological issue. Therefore, of the examples discussed by Hodge, I will only consider, in addition to the I-ending [e] for F-ending [æd] of the third-person singular verb in its present form, the variation of [æɹ]~[e] at the end of F~I words such as [ˈæɡæɹ]~[ˈæge] ‘if’, [ˈmæɡæɹ]~[ˈmæge] ‘unless’, and [diˈgæɹ]~[diˈge] ‘other’.

3.5.2. Ferguson (1959)

When in 1959, Charles Ferguson famously presented his paradigm of diglossia, he began his article by mentioning Persian, alongside Italian, as the most familiar examples of a language spoken in a society “where many speakers speak their local dialect at home or among family or friends of the same dialect area but use the standard language in communicating with speakers of other dialects or on public occasions.” Ferguson does not provide a definition of “standard language” in the context of Iran but proposes the H (‘high’) and L (‘low’) varieties of the language, the former being higher and the latter lower on a hierarchy of prestige, while stating that the ‘standard language’ is the high form that people speak outside the home. H is the superposed variety while L is a regional variety. In the case of Arabic, for example, H is Classical Arabic while any regional variety, say Egyptian Arabic, would be an L. Similarly, in the case of German, H is Standard High German while, say, Swiss German is an L. In fact, Ferguson refers to the difficulty in determining what the L variety is in each case. Other than the challenges with the orthography of L, i.e., whether it is actually existent or how properly phonemic it is, the very choice of L can be quite arbitrary.

For example, in the case of Arabic, which national variety (Egyptian or Saudi) is to be considered as L? One can indeed choose any of these two or any other national variety of Arabic as L. This indicates that there can be multiple L’s for the same H variety. More importantly, however, Ferguson does not make note of the fact that, within each Arabic-speaking country, there are still other regional varieties that may have an L-to-H standing in relation to the national variety, with the latter being the H and the former an L. This means that, in the same way that Egyptian Arabic (spoken in Cairo) is L in relation to Classical Arabic

as H, a non-Cairo variety in Egypt can be L in relation to Cairo Arabic as H. As Cairo Arabic cannot be L and H at the same time, one would wonder how to describe this three-tier system that seems to befit the Arabic language. While Arabic is not the topic of this research, one would wonder whether Persian functions within a Fergusonian L-H dichotomy or similarly to the yet-to-be-explained three-tier system of Arabic, or ‘triglossia’, or a more complex model, or simply as a pluricentric language.

In my master’s thesis (Azadi, 2011), while reviewing as well as partly revising Ferguson’s conceptualization of the situation of Persian, I adopted, instead of Ferguson’s H to L, a general dichotomy of ‘Bookish Persian’ versus ‘Spoken Persian’, which I continue to use here in this research.⁵ While Ferguson’s H seems to be more similar to BP, the fact is that BP is not necessarily associated with prestige or status (Azadi 2011:27). In this sense, diglossia, at least in its Fergusonian sense, does not sufficiently and accurately characterize the variationist dichotomy of Persian. According to Ferguson (1959), for a language to be diglossic, its H and L forms have to be used in certain domains of life (i.e., settings) as presented in the following table:

| | H | L |
|--|---|---|
| Sermon in church or mosque | ✓ | |
| Instructions to servants, waiters, workmen, clerks | | ✓ |
| Personal letter | ✓ | |
| Speech in parliament, political speech | ✓ | |
| University lecture | ✓ | |
| Conversation with family, friends, colleagues | | ✓ |
| News broadcast | ✓ | |
| Radio “soap opera” | | ✓ |
| Newspaper editorial, news story, caption on picture | ✓ | |
| Caption on political cartoon | | ✓ |
| Poetry | ✓ | |
| Folk literature | | ✓ |

Table 3.7—Ferguson’s (1959) illustration of H and L (for French (H) and Creole (L) in Haiti)

⁵ Tehran Persian refers to the variety of Persian spoken by the those now living in Tehran. The original inhabitants of Tehran spoke a different dialect.

In Table 3.8 below, which is from my 2011 research, you can see that the situation of Persian is far from neatly fitting into Ferguson’s diglossia prototype. (The H forms can be compared to BP and the L forms to VTP).

| | <i>H</i> | <i>L</i> |
|--|----------|----------|
| Sermon in church or mosque | ✓ | ✓ |
| Instructions to servants, waiters, workmen, clerks | | ✓ |
| Personal letter | ✓ | ✓ |
| Speech in parliament, political speech | ✓ | ✓ |
| University lecture | ✓ | ✓ |
| Conversation with family, friends, colleagues | | ✓ |
| News broadcast | ✓ | |
| Radio “soap opera” | | ✓ |
| Newspaper editorial, news story, caption on picture | ✓ | ✓ |
| Caption on political cartoon | | ✓ |
| Poetry | ✓ | ✓ |
| Folk literature | | ✓ |

Table 3.8—An illustration of the usages of H (Bookish) versus L (Spoken) Persian (adapted from Azadi 2011)

According to Ferguson (1959), diglossia involves a High variety used in formal settings and a Low variety used in everyday conversation. He listed several criteria that differentiate H and L, such as function, prestige, literary heritage, acquisition, standardization, stability, grammar, lexicon, and phonology.

The nature of the Persian language does not align perfectly with Ferguson’s prototypical definition of diglossia. Instead, it displays characteristics that blur the distinctions between the High (H) and Low (L) varieties. For instance, both BP and VTP can be used in personal letters, political speeches, university lectures, and newspaper stories, which complicates the clear-cut H and L classification.

3.5.3. Henderson (1975)

Henderson (1975) leaves Hodge's N(ormal) style level out of his analysis of Persian variation on the grounds that distinction between Normal and Quotative is merely "morphological and lexical variation". This only further emphasizes the need to clarify which level of analysis provides the best account of the way vowel height variation functions in Persian.

Following in the footsteps of Ferguson, Henderson (1975) entitles his article "Diglossia in Kabul Persian Phonology", by making a three-way distinction between Formal (F), Deliberate (D), and Colloquial (C) styles, in which "F is heard in speeches, radio broadcasts, and the recitation of poetry. D is the style heard most commonly; it is typical of normal conversation among educated equals. C is heard in relaxed conversation among friends and relations." Henderson states that intraspeaker variation in Persian is manifested in phonology, saying, "Persian provides examples of phonological rules which derive the informal styles, Deliberate (D) and Colloquial (C), from the Formal (F) style." For example, according to Henderson, the Deliberate and Colloquial styles can be systematically derived from the Formal style on the basis of several phonological rules. The remainder of his paper is dedicated to data from Kabul Persian.

3.5.4. Modaresi (1978)

Modaresi-Tehrani's (1978) study of Persian in Iran seems to be the first ever study of the Persian language in the variationist paradigm, in which he is "aiming at the study of Persian in its socio-cultural context" (ibid.; p. 10) by examining variation in the two varieties of Persian in the capital city of Tehran as compared to the city of Ghazvin (or Qazvin), which is located some 150 kilometers to the northwest of Tehran. The "differences in the speech of the speakers of various social backgrounds are separately examined in the two speech communities in a vertical study." (Modaresi 1978:27), i.e., along the socioeconomic hierarchy. "Furthermore, by comparing the data collected in the two cities, the influence of Tehran Persian, as a prestige dialect, on the Ghazvin dialect is investigated on the horizontal dimension." (ibid.), i.e., geographically.

Modaresi sets out to "show that linguistic constraints, social parameters and geography account for a great part of variation in Persian which has previously been classified as "free variation" " (Modaresi 1978:10). Out of the five commonly examined sociolinguistic parameters of social class, age, gender, style,

and ethnicity, he excludes ethnicity and examines the correlation of age, education, gender, and style with linguistic variation, having three age groups (10-19, 20-29, 50<), four educational levels (C for ≥1 year of college, H for 10-years of high school, J for 7-9 years of junior high and U for less than 7 years of schooling) and the two genders along a style continuum of four levels of formality. Modaresi's style continuum is one that draws parallels between Hodge (1957) and Labov (1966) (cited in Modaresi)⁶, as in Figure 5.2:

| <u>Hodge (1957)</u> | | <u>Labov (1966)</u> |
|---------------------|---------|--|
| Colloquial | equates | style A (casual) |
| Deliberate | equates | style B (careful) |
| Formal | equates | style C (reading) |
| Quotative | equates | style D and D' (word list and minimal pairs) |

Figure 3.2—Modaresi's Stylistic Array (1978:24)

Hodge's (1957) stylistic array seems to have been adapted, rather than directly cited, by Modaresi, who replaces Hodge's 'Normal' with 'Formal'. In Hodge's array (Figure 3.1), 'colloquial' comes at the bottom and 'deliberate' right above it, both coming under the larger category of 'informal', while 'normal' and 'quotative' are listed on top of them, both under a bigger category of 'formal'. Modaresi later simplifies the Persian styles to three levels: Formal, Deliberate and Colloquial (Modaresi 1978:63-64).

In the case of each variable, Modaresi discusses the linguistic environments and non-linguistic factors as well. He takes four linguistic features, of which the first is pre-nasal vowel raising (e.g., *xane* "house" to *xune*) under the rule shown in Figure 5.3.:

$$\begin{bmatrix} V \\ +low \\ +back \end{bmatrix} \longrightarrow (+high) / \text{---} \begin{bmatrix} +cons \\ +nasal \end{bmatrix} \Big|_{\beta}^{\alpha}$$

α and β indicate the promoting linguistic and nonlinguistic factors respectively.

Figure 3.3—Pre-Nasal Rule (Modaresi 1978:75)

⁶ Labov, W. (1966). *The Social Stratification of English in New York City*. Washington D.C.: Center for Applied Linguistics.

As far as vowel height is concerned, he also looks at non-prenasal raising in the third person singular possessive suffix of /æf/ raised to /ɛf/ as well as the raising of the word-final /æ/ to [e], although the bulk of his analysis is focused on pre-nasal raising. According to Modaressi, pre-nasal vowel raising is a rule that may be activated in informal speech, but speech informality cannot explain the entirety of prenasal vowel variation, as it is a complicated process and is affected by both linguistic and nonlinguistic factors.

Modaressi's sample consists of "around 800 lexical items", all having the low back vowel /a/ immediately preceding a nasal stop, 50.5% of which favor raising and of which 49.5% do not favor raising with varying probabilities, despite the fact that they are structurally qualified to trigger raising, which is the very definition of variation. In Modaressi's analysis, the probability of a word favoring raising is affected by lexical frequency and whether the word in question is a purely Persian word (favoring), if it is a proper noun or a loanword from Arabic or a non-Arabic language (not favoring). According to Modaressi, there are other situations determined by the morphophonemic environment that reduce the probability of raising, as follows:

- Word-initial low back vowel, e.g., *amar* 'statistics' or *amade* 'ready' not raising to **umar* or **umade*).
- Morphological blocking: a morpheme-initial nasal stop preceded by morpheme-final low back vowel is not raised, e.g., *ja-nefin* 'successor' and *dærya-næværd* 'sailor' are not raised to **ju-nefin* or **dæryu-næværd*.
- Nasal stop followed by high back vowel blocks pre-nasal raising, i.e., *kanun* 'center' and *zanu* 'knee' are not raised to **kunun* or **zunu*.
- Among monosyllabic words ((C)VC(C), but most commonly CVC)), only 21.4% favor the rule, e.g., *gam* 'step', *vam* 'loan' and *bang* 'cry' are not raised to **gum*, **vum*, or **bung*.
- There is a one-percent exception to the rule that cannot be linguistically explained. There are words such as *daneſgah* 'university' or *særvan* 'captain' (of Persian origin), which are not raised to **duneſgah* or **særvun*. These are words used frequently and across all styles but are not yet accepted by native speakers and are still treated as non-native words. Some are words that contain two pre-nasal vowels, such as *amiane* 'colloquial' and *saman* 'order', in which none of the vowels are raised.

- Iranian-origin words favor pre-nasal vowel raising, which means that the feature [+foreign] disfavors the rule. (The ‘Iranian’ category includes non-Persian Iranian languages as well.)

Pre-nasal vowel raising correlates with varying degrees of probability across the social factors. In terms of style, formality of situation affects [u] realization (as a variant of /a/). The realization of [u] in Tehran Persian corresponds to linguistic styles (C (Reading style), D (word list), D’ (minimal pair), A (casual) or B (careful)). Style stratification is observed in different social groups. Pre-nasal raising becomes more probable as style becomes less formal. Age has an inverse relationship with raising. Among the four educational levels (C for college, H for high school with 10-12 years of education, J for junior high with 7-9 years of education and U for under 6 years of school), a lower education level increases the probability of pre-nasal [u] realization. Even though Modaressi’s research did not have much data on gender, his data actually turned out to reveal some gender-related patterns, i.e., that pre-nasal [u] realization is more likely in the speech of females than males. Such [u] realization is considered an important distinguishing feature of the more prestigious Tehran Persian as compared to other regional spoken variants of Iranian Persian.

As far as the raising of the third person singular possessive suffix /æʃ/ to [eʃ] is concerned, it is affected by linguistic as well as nonlinguistic factors, with the most significant linguistic constraint being preceding consonant, i.e., it is more likely to be raised if it attaches to a word ending in a consonant. Socially speaking, the raised form [eʃ] is associated with less formal styles. In terms of age, younger people favor raising to [eʃ] more as do females as compared to males.

According to Modaressi, prenasal raising of /a/ to [u] is the most common in style A (casual), as shown in Figure 5.4:

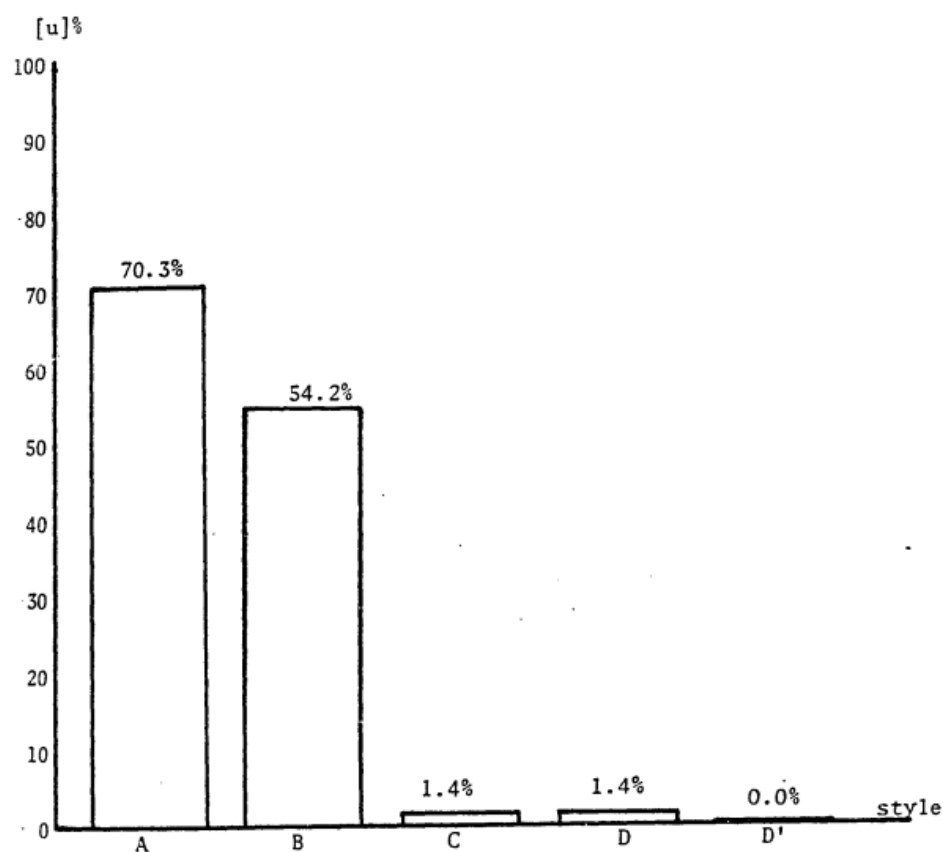


Figure 3.4—Results for prenasal raising of /a/ to [u] by style (Modaressi 1978:88)

A (casual); B (careful); C (reading); D(word list); D' (minimal pairs)

VARIATION IN THE HORIZONTAL DIMENSION: As far as vowel raising is concerned, in addition to the above linguistic factors, Qazvin Persian (QP) has a non-TP feature, which is raised word-final [æ] instead of [e], e.g., VTP *xane* ‘house, home’ but QP *xanæ*, which is a feature associated with several other non-TP regional dialects as well. In fact, the Middle Persian form of such words contained the non-raised version of the vowel, as in *xānag* (MacKenzie 1971:94), which later evolved into *xanæ*. However, the process of change of /æ/ to [e] has been completed in TP, while it is still ongoing in some other dialects. Yet, in terms of linguistic factors, QP favors raising of word-final /æ/ to /e/ if the word is followed in context by the genitive /e/ ‘of’ (also surfacing as ‘ye’ with ‘y’ as intervocalic glide), such as /xanæ e mæn/ ‘house of me, my house’ → [xæne e mæn / xanæ ye mæn].

In terms of non-linguistic factors, QP shows an inversely proportional relationship between /æ/-raising and formality, i.e., /æ/ is more likely to be retained in a less formal style while it is more likely to be raised as the style becomes more formal. In terms of age, younger people are more aware of and sensitive to the status of final /æ/ raising to the TP [e] as prestigious and are more likely to raise it. Higher levels of education favor final /æ/ raising to /e/ (Modaressi 1978:183).

Since my own study is only vertical and not geographical and horizontal, although this part of Modaressi's research is insightful, it is not something that I will replicate. However, viewed merely in terms of raising, it indicates that the raising of [æ] to [e] (in the word-final position) in QP may be favored by education and formality and disfavored by age, while it is sensitive to contiguous regressive assimilation.

Another interesting observation in Modaressi's study is that QP speakers have an intermediary level of raising of [a] to [o] instead of to [u], particularly in style C, which is rarely observed among TP speakers of older generations. Older generations of QP speakers, or younger speakers with no college education, are more likely to render intermediary raising of /a/ to [o] instead of to [u], particularly in formal styles. Attention to speech (formality) is inversely related to [u] realization in all social groups. As stated by Modaressi (*ibid.*, p. 167), comparison of TP and QP reveals that QP lags behind TP in terms of vowel raising and can thus be said to be more conservative in preserving the older linguistic forms. Overall, [u]-realization is more common among younger QP speakers as it is among the less educated. The more educated among QP speakers seem to be aware of [u] realization as a prestige feature and render it more often.

Under the discussion of vowel raising, Modaressi provides examples of the raising of /e/ to [i] as well as [o] to [u] in the Deliberate and Colloquial styles, by providing the examples shown in Figure 3.5.

| | | |
|--|----------|------------------|
| $\left[\begin{array}{c} V \\ -\text{low} \end{array} \right]$ | → | $[+\text{high}]$ |
| As in: | F | D,C |
| 'defeat' | /šəkæst/ | → /šikæst/ |
| 'six' | /šeš/ | → /šiš/ |
| 'liver' | /ʃegær/ | → /ʃigær/ |
| 'small' | /xord/ | → /xurd/ |
| 'lady' | /xanom/ | → /xanum/ |
| 'louse' | /šepeš/ | → /šipiš/ |

Figure 3.5—Examples for Vowel Raising (Modaressi 1978:65)

Note: š = ʃ

Later on in his study, Modaressi mentions the above raisings in passing and, without going into greater detail, writes, “another part of the general process of raising which is a very productive process in Tehran Persian” (ibid.: 65).

However, he does make a distinction between regular vowel raising on one hand and vowel raising that can be viewed as vowel harmony (i.e., vowel harmony by raising) achieved through regressive assimilation at a distance (non-contiguous regressive assimilation), on the other hand, as shown below in Figure 3.6.

| | | | | | | |
|--|---|--|---|---|-------|---|
| $\left[\begin{array}{c} V \\ -\text{low} \end{array} \right]$ | → | $\left[\begin{array}{c} + \text{high} \\ \alpha \text{ back} \end{array} \right]$ | / | → | C (C) | $\left[\begin{array}{c} V \\ + \text{high} \\ \alpha \text{ back} \end{array} \right]$ |
| As in: | | F | | | D,C | |
| 'start' | | /šoru?/ | | → | | /šuru?/ |
| 'lie' | | /dorug/ | | → | | /duruq/ |
| 'limits' | | /hodud/ | | → | | /hudud/ |
| 'moustache' | | /sebil/ | | → | | /sibil/ |
| 'two hundred' | | /devist/ | | → | | /divist/ |

Figure 3.6—Modaressi's Examples for Vowel Harmony by Raising (1978:65)

The examples in Figure 3.6 are not explained at all and are excluded from his study of the more general process of raising, albeit not pre-nasally. The examples in Figure 3.6 are explained by assimilation through vowel harmony (Modaressi 1978:65). Thus, Modaressi presents three kinds of raising: pre-nasal raising, vowel-harmony raising and raising (with no explanation).

3.5.5. Jahangiri (1980)

Rather shortly after Modaressi's dissertation (1978) at the University of Kansas, another PhD dissertation was successfully defended by Nader Jahangiri in 1980 across the Atlantic at the University of London. Since there is no mention of Modaressi in Jahangiri's work, one can assume that he was unaware of it. In fact, regarding pre-nasal raising in the variable context of [v] ~ [u], Jahangiri says that it "has been mentioned here and there, by some scholars such as Ivanow (1930) and Hodge (1957), yet no systematic study has been made of this very frequent aspect of Persian language, and its co-variation with social and stylistic parameters." (p. 76). This further confirms that Jahangiri was not aware of Modaressi's work at the time of composing his dissertation and that the most recent material on such raising in Persian that he had accessed had been Hodge's 1957 paper.

Jahangiri's (1980) research is dedicated solely to the study of Tehran Persian (or 'Tehrani Persian', as he refers to it). He looks at how 14 phonological, morphological and syntactic variables relate to social parameters (class, gender, age and style). His style array consists of free speech and reading style, with the latter consisting of three tasks: reading a sentence, reading a word list with pauses, and reading a word list quickly. Sixty individuals of both genders were interviewed from among those born in Tehran with Persian-speaking parents. Those studied fall into two age groups, children (14-16 years) and adults (28+), in four social tiers based on education: G1 (highest degree, by which he seems to mean university education), G2 (high school completion), G3 (elementary school completion) and G4 (no education). Jahangiri makes note of the north-south divide in the city of Tehran, which is a literal as well as a figurative class line, with G1 individuals normally living in the northern areas, G2 in the east and west, and G3 and G4 in the southern parts of the city. This is why, in Persian, the literal translation of 'downtown', which is *payinshæhr*, refers

to the poorer neighborhoods, while the idiomatic translation of ‘downtown’ is ‘city center’ (*mærkæz-e-shæhr*).

In terms of vowel variation, Jahangiri makes certain observations regarding assimilation and vowel harmony. For example, he says that the vowel /e/ in the imperative/subjunctive prefix *be-* undergoes variation as a result of total noncontiguous assimilation (full assimilation at a distance) to the next vowel (hence, regressive assimilation). The assimilation can be total such as to [i] (as in [beʃin] ~ [biʃin] “Sit!”) or partial to [ɛ] (as in /bexær/ ~ /bɛxær/ “Buy!”) (ibid.:47). The idea of partial vocalic assimilation is a fine distinction by Jahangiri, which he makes between [e] to [ɛ]. He does not clarify, however, whether he conducted any instrumental analysis on his data to tell the two vowels apart, as the distinction is not easy to make impressionistically.

Raising of /e/ to [i] in words such as *kucæk*⁷ “small” to *kucik*, *fekær* “sugar” to *fikær*, *fekæst* “It broke.” to *fikæst*, *nega* “Look!” to *niga*, *fekar* “sugar” to *fikær*, *atæf* “fire” to *atif* are cases of contiguous regressive assimilation of a vowel under the influence of a following +high consonant /k, g, f/ (ibid.). The rate of assimilation rises from word list to free speech continuously as the formality of reading gradually changes to a more or less relaxed free speech (=casual speech) (ibid.:70). Vowel harmony by assimilation “in Persian is essentially a “lower” class dialect marker.” (ibid.)

Having analyzed six thousand occurrences of potential assimilation, Jahangiri concludes that vowel assimilation is one of the defining characteristics of non-standard lower social class TP. Such assimilation is determined by the phonological environment (following vowel or consonant) and lexical item on the linguistic side and social class on the social side. If /e/ is followed by a back consonant, it is more likely to undergo raising by assimilation than it is if it is followed by a front consonant, with /x/, /k, g/, /s, z, r/, /d/ and /b/, respectively, having a decreasing likelihood of triggering assimilation. He states, “It seems that back consonants create a better phonetic environment for the change process than front ones” (Jahangiri 1980:61) but does not elaborate further.

Such assimilation in Persian resulting in raising is essentially a marker of the lower class dialect. However, Jahangiri clarifies that “the comparison between two age groups from the two extreme social

⁷ ‘c’ is shorthand for /tʃ/.

classes, G1 and G4 adults with youngsters, reveals that a competing pressure is directing the change [...] although the pressure from below (Labov, 1966) is more powerful. The pressure from above seems to be the direct effect of education, as youngsters from G4 families score 14 percent (male) and 28 per cent (female) ‘less than their illiterate parents. Yet youngsters from G1 families show a dramatic increase of three times (males) and four times (females) in comparison to their adults. As a result, it seems that the two extreme groups are getting closer to each other, and G1 are moving much faster.” (Jahangiri 1980:70). This can, perhaps, be interpreted as age as a factor that overrides education considering that the youngsters from the lowest and highest social classes are behaving very similarly as far as the raising is concerned.

Jahangiri looks at pre-nasal raising in the variable context of [p] ~ [u]. Considering that all words in Persian begin with a consonant (those written with a vowel in the beginning are considered to have a word-initial glottal stop inserted, e.g. [ʔab] for *ab* ‘water’), he looks at pre-nasal raising (before /m/ or /n/) only in word-medial (*xandæn* “to read”) and word-final position (*zemestan* “winter”), concluding his discussion of vowel raising in TP by stating that /an/ is more probable to be raised to [un] than /am/ to [um]. (No explanation is provided by Jahangiri as to why this is the case.). Syllable-final *aN*-raising is occurs 14% more than syllable-medial, which he attributes to syllabification and stress patterning. More importantly on the morphological side, however, is the fact that morpheme boundary blocks raising, i.e., if *a* and *N* are in two separate morphemes, e.g., *dust-ha-m* ‘friend-PLURAL-my; my friends’ is not raised to **dust-hum*.

Newly coined lexical items, learned items, items “not so common in informal speech”, certain proper nouns, formal titles and nouns, items with a formal source and loanwords disfavor raising. Different lexical items with the same phonological environment are differently affected by the rule, e.g., while [a] ~ [u] raising is possible in /bam/ (to render [bum]), the prenasal *a* in words such as /kam/, /xam/ and /ʃam/, /dam/, [ʔæɪʔan] ‘now’ are not raised at all. (Jahangiri does not provide an explanation why this is the case.) Words such as *dæbestan* ‘elementary school’, *dæbirestan* ‘high school’, and *bimarestan* ‘hospital’ (being recent coinages) show raising occurrences of 9%, 25% and 60% respectively, which suggests lexical diffusion hypothesis.

Sociolinguistically speaking according to Jahangiri, raising is sensitive to class and style, which is a conclusion similar to Modaresi’s. Except for G3 males (those with elementary education) in reading

styles, there is no significant gender difference. There is a high range of irregularity in reading styles, which may be due to the Persian writing system, in which, although some vowels are usually not written, the vowels /a/ and /u/ are always written and distinguished in writing. Raising of /a/ to [u] shows a high sensitivity to style, with a decreasing probability of raising from the four styles of free speech (=casual speech), reading sentences, fast word list and word list, respectively. In free speech, there is an incredible homogeneity among the individuals of each group.

All of the above conclusions are up for re-examination, especially considering that more than 40 years have passed since Jahangiri's (and Modarresi's) research. This will be interesting particularly in relation to words that were recent coinages back then in the time of their research, while now those words (*danešgah* 'university', *særvan* 'captain') are still in use. If anything, it will be possible to more finely define the concept of 'recent' in such variationist studies.

3.5.6. Kahn and Bernstein (1981)

In a 1981 paper on *aN* raising, Kahn and Bernstein (1981) examine the following phonological rule in TP:

$$/a/ \rightarrow [u] / \text{---} \left[\begin{array}{l} +\text{nasal} \\ +\text{consonant} \end{array} \right]$$

Figure 3.7—Kahn & Bernstein’s Rule for *aN* raising in Persian

Similarly to Jahangiri, Kahn and Bernstein emphasize that stress pattern and syllabification can account for pre-nasal raising, stating that “a preponderance of the lexical items and tokens of lexical items where *aN* goes to *uN* either have *aN* in a stressed syllable in final or penultimate position.” (Kahn & Bernstein 1981:135) By saying that it “is rare to find a word, even a commonly used word, where /*a*/ → [un] in the antepenult.”, they imply that pre-nasal raising functions on a range of probabilities, decreasing the further the syllable gets from the end of the word, as depicted in Table 3.9 below.

| | Underlying Form | Surface Form | | English Gloss |
|----|-----------------|--------------|-------------------|--|
| a. | hamele | hamele | *humele | ‘pregnant’ |
| b. | daneʃkæde | daneʃkæde | *duneʃkæde | ‘college, faculty’ |
| c. | ranændegi | ranændegi | *runændegi | ‘driving’ |
| d. | ranænde | runænde | | ‘driver’ |
| e. | danest | dunest | | [3 RD P. SG.] ‘knew’ |
| f. | amæd | umæd | | [3 RD P. SG.] ‘came’ |
| g. | xaband | xabund | | [3 RD P. SG. PAST] ‘put to sleep’ |
| h. | -ʃan | -ʃun | | 3 RD PLURAL POSSESSIVE |
| i. | -tan | -tun | | 2 ND PLURAL POSSESSIVE |
| j. | an | un | | ‘that’ (DEMONSTRATIVE) |
| k. | kamel | kamel | *kumel | ‘perfect’ |
| l. | tæmam | tæmum | | ‘all, finished’ |
| m. | soltan | soltan | *soltun | ‘sultan, king’ |
| n. | emtehan | emtehan | *emtehun | ‘examination’ |
| o. | daneʃju | daneʃju | *daneʃju | ‘university student’ |
| p. | Golestan | Golestan | *Golestun | ‘Sa’di’s literary masterpiece’ |
| q. | golestan | golestan | | ‘rose garden’ |
| r. | maman | maman | *mamun, *mumun | ‘mom’ |

Table 3.9—List of *aN*-raised and *aN*-non-raised based on words from Kahn & Bernstein (1981)

Regarding the factors that trigger or block *aN* raising, Kahn and Bernstein conclude that a pre-nasal syllable far from word-final position does not undergo raising (e.g., (a, b, c) in Table 3.9 above do not but (e) does; however, (d) is a rare form). They observe that *daneʃju* does not undergo raising to become **duneʃju* but they do not provide any clear explanation and they also do not compare it to (e), which does undergo raising. Similarly to Jahangiri, Kahn and Bernstein offer lexical reasons, stating that verb stems undergo raising as morphological units before being conjugated (e.g. (e, f, g)), as do the attachable pronominal suffixes⁸, which are highly frequently used in TP, undergo raising (e.g. (h,j)), as do the highly frequent deictics (e.g., (j)).

In terms of morphology, the animate plural suffix */-an/*, which is not commonly used in spoken Persian, rarely undergoes raising. While repeating Jahangiri's result that morpheme boundary is a raising-blocker, they also state that raising is blocked (or 'prohibited', as Kahn & Bernstein put it) if the resulting word will create ambiguity. They make similar points to Jahangiri's regarding proper names (e.g. (p)) and the foreign origin of words reducing the raising probability (e.g. (a, k, m, n) being Arabic- and (r) being French-origin), stating that the word *maman* 'mom', which is of French origin, does not undergo raising despite its high frequency. They mention that this falls under the foreign-origin blocker, but so does *tæmam* of Arabic origin, which in fact is raised to *tæmum*. While lexical frequency overrides the Arabic-origin word, it does not do so for the French-origin word.

In terms of sociolinguistic factors, Kahn and Bernstein state that style formality is inversely proportional to prenasal vowel raising. The more informal the style, the more likely it is for the speaker to raise a prenasal *a* to *u* (ibid.:138).

3.5.7. Sadeghi (2001)

While reviewing and in a direct response to Kahn and Bernstein (1981), Ali-Ashraf Sadeghi points out to their broad division of Persian words into VTP and BP (or spoken and written Persian, according to him)

⁸ These suffixes, which are traditionally referred to as 'the connected pronouns' as opposed to 'the standalone pronouns', are often possessive but may also function for a different case such as dative. Technically, they should be called them 'person-number suffixes', 'clitic case markers', etc., but I will use 'pronominal suffix' as a cover term.

and that any attempt to explain aN raising, or lack thereof, is met with so many exceptions (Sadeghi 2001:77-80).

According to Sadeghi, *aN* raising to *uN* dates from as early as the 9th century A.D. (the 3rd Islamic-Hegiraic century). An example he gives is a line of verse from the poet Abulhasan Aghaji, in which the word that is originally *Baghestan* ‘MOUNTAIN NAME’ appears as *Bistun*, a form repeated by other poets of the same period as well and common to date. The pronunciation ending in *-un* had been recorded in Arabic sources one century earlier. Earlier than that, the forms *Bēhistūn* and *Vēhsutūn* were recorded in late (pre-Islamic) Middle Persian texts. A variant of another place in the same region (western Azerbaijan) by the name of *Majerdan* has been recorded in the 4th century A.D. as pre-nasally vowel-raised. Other examples include those shown in Table 3.10 (ibid.:81-82) below.

| | Non-Raised Variant | Raised Variant | English Gloss | Date |
|----|--------------------|----------------|---------------------------|-----------------|
| a. | Jeyhan | Jeyhun | PROPER NAME | 11th cent. A.D. |
| b. | [Tehran] | Teyrun | PROPER NAME | 11th cent. A.D. |
| c. | [xane] | xune | ‘house’ | 14th cent. A.D. |
| d. | [daneʃ] | duneʃ | ‘knowledge’ | 14th cent. A.D. |
| e. | [kardan] | kardu | ‘skillful, expert’ | 14th cent. A.D. |
| f. | [abadani] | abaduni | ‘development’ | 14th cent. A.D. |
| g. | [gusfændan] | gusfændun | ‘sheep (pl.)’ | 14th cent. A.D. |
| h. | tærxan | [tærxun] | ‘tarragon’ | 15th cent. A.D. |
| i. | [dana] | dona | ‘knowledgeable’ | 17th cent. A.D. |
| j. | [asmanha] | asmonha | ‘skies’ | 17th cent. A.D. |
| k. | [aram] | arom | ‘calm’ | 17th cent. A.D. |
| l. | [asani] | asoni | ‘ease’ | 17th cent. A.D. |
| m. | [zindan] | zindon | ‘prison’ | 17th cent. A.D. |
| n. | [nikan] | nikun | ‘the good ones’ | 17th cent. A.D. |
| o. | [æmanæti] | æmunæti | ‘the thing held in trust’ | 17th cent. A.D. |
| p. | [name] | nome, nume | ‘letter’ | 17th cent. A.D. |

Table 3.10—Oldest Records of aN raising in Persian (Sadeghi 2001)

Words in square brackets [] are the variants that did not appear in the mentioned text but are otherwise recorded and can be used for comparison.

According to Sadeghi, the change of *aN* to *uN* dates back from the pre-Islamic era in the Pahlavi (Middle Persian) language. The vowel change in /aN/ was from /a/ to [o] and then to [u]. The tendency in Persian meter but also in standard Persian to shorten vowels /a/ (IPA [ɒ]) to [æ] is well recorded (e.g. see Kambuziya et al. (2017)) by the scholars on the topic but since [ɒ] was rounded, in most cases it changed to [o] and [u] rather than being shortened to [æ], which is commonly the case in literary verse and prose, rendering words such as [kæh] ‘straw’ for [kah], [ræh] ‘way, road’ for [rah], etc.

Sadeghi then proceeds to set forth the theory that the change of /a/ to [u] has been completely stopped in New Persian. New words that meet the conditions for such raising do not undergo it anymore. It is not known when the change was stopped, but it is likely to have been some time prior to the Mongol invasion and probably around the 12th century A.D. because Mongol and Turkic loanwords used in Persian, such as *ærsælan*, *ærmæghan*, *xaqan*, *xan*, *xanom*, etc., have not undergone the change. Arabic loanwords borrowed prior to this time underwent the change, as evident in the variants *tæmam* ~ *tæmum* ‘completed’, *hæmmam* ~ *hæmum* ‘bath’, *qorban* ~ *qorbun* ‘lord; sacrifice’, *heyvan* ~ *heyvun* ‘animal’, *æzun* ~ *æzun* ‘call to prayer’, while those borrowed afterwards did not, as evidenced in words *qane* ‘content’, *mæqam* ‘position’, *æn’am* ‘tip’, *eqdam* ‘action’, *mækan* ‘place’, *xianæt* ‘betrayal’, *eqamaæt* ‘settlement; residence’, etc. These words entered Persian very likely in the 12th century A.D. or later. According to Sadeghi, although the language of the masses contains such words as *æmuncæti*, *dowrun* and *folun*, the alternatives *æmanæti*, *dowran* and *folan* are more common, as the influence of the written language is changing the spoken language.

The words *dang* and *xance* are pronounced in Tehran as *dong* and *xonce*. According to Sadeghi, this is due to the phonotactics, or phonological environment, which has resulted in raising /a/ to the intermediate level [o] rather than all the way to the high vowel [u]. He does not, however, elaborate any further what phonotactic elements or aspects of the phonological environment contribute to such half-raising to [o] instead of the potential full-raising to [u].

As put by Sadeghi, the reason why the raising was triggered in the first place can be explained by the functionalist theory that the change would not result in many homophonic conflicts. Words like *tabestan* ‘summer’ were raised, in this case to *tabestun*, in the active era of raising prior to 12th century A.D. This is why new coinages or archaisms revived in a new sense, such as *dæbestan* ‘elementary school’, do not

undergo raising, as Sadeghi explains. The generative-phonological rule for prenasal vowel raising, according to Sadeghi, can be written based on the three features, as shown in Figure 5.8:

$$a \rightarrow u / _ \left\{ \begin{array}{l} +\text{consonant} \\ +\text{nasal} \\ +\text{archaic} \end{array} \right\}$$

Figure 3.8—The Phonological Rule for aN raising in Persian; adapted from Sadeghi (2001:101)

Sadeghi’s study takes a diachronic approach, which may not be directly relevant to my current synchronic study here. However, it puts the whole situation of vowel height variation into a new perspective by giving it some historical context. While his hypothesis needs to be further verified against data, there is also the fact that he misses such details as the raising of the Mongol-origin word *xanum* ‘lady; Ms.’ to *xanum*, which is the common VTP form. If the Mongol period puts a stop to raising, why is it that a Mongol word itself undergoes raising?

3.5.8. Mahmoodi-Bakhtiari (2008)

In an encyclopedic article on the “Tehrani Dialect”, Mahmoodi-Bakhtiari (2008) briefly examines vowel raising, pre-nasal or non-pre-nasal, and some other features of TP. I have listed below in Table 3.11 the words that Bakhtiari examines in his paper:

| | Underlying Form | Surface Form | | English Gloss |
|----|-----------------|--------------|---------|----------------|
| a. | Abadan | Abadan | *Abadun | CITY NAME |
| b. | ehsan | ehsan | *ehsun | ‘kindness’ |
| c. | peyman | peyman | *peymun | ‘treaty, pact’ |
| d. | toman | tomæn | *tomun | CURRENCY UNIT |
| e. | dæhan | dæhæn | *dæhun | ‘mouth’ |
| f. | ʃekæm | ʃikæm | | ‘belly’ |
| g. | nega | niga | | ‘look!’ |
| h. | tekan | tekan | *tikan | ‘shake’ |

Table 3.11—List of vowel-raised words examined in Bakhtiari (2008)

Mahmoodi-Bakhtiari points out the exceptions to the *aN* raising as in (a-c). He notes the raising of /e/ to [i] in (f-g), pointing to the exception (h). Bakhtiari’s article is a descriptive piece on certain features of Tehran Persian but does not provide any in-depth analysis of those features or list the phonological environments, constraints or rules that account for these features as compared to Bookish Persian.

3.5.9. Rees (2008)

In his PhD dissertation “Towards Proto-Persian”, Rees (2008) examines diachronic data all the way back to Middle Persian and provides a step-by-step raising model for the front vowels. As part of his analysis, he mentions the following examples of vowel raising in Iranian Persian:

| | Underlying Form | Surface Form | | English Gloss |
|----|------------------------|---------------------|--------------------|----------------------|
| a. | ʃeʃ | ʃiʃ | | ‘six’ |
| b. | kæs | kes | | ‘someone, person’ |
| c. | kucæk | kucik | | ‘small’ |
| d. | ræsidæn | residæn | | ‘to arrive’ |
| e. | xane | xune | | ‘house’ |
| f. | nan | nun | | ‘bread’ |
| g. | Qorʔan | Qorʔan | *Qorʔun | ‘the Quran’ |
| h. | mærdan | mærdan | *mærdun | ‘men’ |
| i. | Irani | Iruni | | ‘Iranian’ |
| j. | Iraniha | Iruniha | | ‘Iranians’ |
| k. | Iranian | Iranian | *Irunian, *Iruniun | ‘Iranians’ |

Table 3.12—List of vowel-raised words examined in Rees (2008)

Rees speaks of the likelihood of adjacency to a palatal segment having resulted in vowel raising in the examples (a-d), stating that in Middle Persian the “short low vowel /a/” (IPA /a/) is a front vowel, “it may be claimed that” a “shift began” in Iranian Persian “as the raising of a front vowel”, initially raising (IPA symbols:) /a/ to [æ] and later shifting the latter to the more raised [i] when “adjacent to a palatal”, which explains (b-d) in Table 3.12 above. Prenasal raising as in (e-f, i-j) and lack thereof as in (g-h, k) are accounted for, as confirmed by Rees, by the lexical frequency and/or register. The interesting example of

(i) whose informal plural is raised but whose formal plural is not raised is a clear indication of register in action as a factor determining prenasal raising or lack thereof in TP, as suggested by Rees.

Rees's observations do not add much to the other studies that I have already reviewed, except that other than using 'register' instead of 'style', he puts raising (or at least that of /æ/ to [i]) in perspective by bringing in the feature 'palatal' into the analysis. Moreover, he provides the explanation that the raising is the continuation of a vowel shift from low central ([a]) to low front ([æ]) and then high front ([e]). This implies a clockwise vowel shift in Persian throughout the centuries and gives a bigger historical context to the problem.

3.5.10. Miller (2011)

Speaking of TP, Miller (2011) says that "the fact that [u] appears in informal situations as a reflex of /ɒ/ is in the context of vowel reduction." (Miller 2011, p. 1387). He goes on to compare this to similar phonological variations in other languages, stating that "[u] has been found to be a reduction target for /ɒ/ in both Catalan and Brazilian Portuguese." (ibid.) He suggests that another way to look at the shift in VTP from [ɒ] to [u] could be "in the context of vowel reduction" (ibid.)

According to Miller (2011) in the above paper, which he appropriately entitles "A Holistic Treatment of /ān/ to [un] in Persian" considering that it is a broadly written paper, "One of the most commonly mentioned features of informal spoken Iranian Persian in contrast to its formal or written form is the pronunciation of /ān/ as [un], as in [tehrun] 'Tehran', and [iruni] 'Iranian'". In a section of his paper entitled 'HOMOGLOSSIA OR DIGLOSSIA', Miller (2011:1386) points out to the existence in Persian of a "systematic divergence between its written/formal and spoken/informal forms in pronunciation, morphology and grammar.", but expresses doubts as to whether such differences, albeit much greater than those found in English, "approach the canonical examples of diglossia, as has been observed in Arabic-speaking countries or among German speakers in Switzerland".

Miller clarifies that pre-nasal vowel raising does not include vowels before the velar nasal [ŋ]. For example, neither *bang* [bɒŋ] 'shout' nor *dang* [dɒŋ] 'ONE-SIXTH OF A PROPERTY' is raised to *[buŋ] or *[duŋ]. "This exclusion of the velar nasal from the raising environments is similar to the behavior of /æ/ in the English of New York City and Philadelphia", in which "following /m, n/ lead to tensing and raising

of /æ/ in both cities, while following /ŋ/ does not”, while contrasting it to “the dialect of Milwaukee, where following /ŋ/ is very much at the forefront of raising environments for /æ/” (ibid.:1387).

While reviewing the literature on vowel raising in TP (which he refers to as Iranian Persian (or even Iranian)), he notes Kahn and Bernstein’s (1981) observation that deictics and person-number suffixes (or simply pronominal suffixes), despite being closed-class forms and highly frequent, undergo vowel raising. He concludes that the raising of /ān/ ‘that’ to [un] is a change from below that began long ago but never reached completion. Change from below is “the basic form of linguistic change that operates within the system, below the level of social awareness” (Labov 1990:215).

He suggests that we could “turn the problem around: perhaps the underlying forms contain /u/, and these are optionally changed to [ɒ] in higher registers” (Miller 2011:1389), influenced by the orthography. I will take up Miller’s hypothesis and clarify which, among [ɒ] and [u] is to be taken as the underlying form, and which as the surface form. In his conclusion that the pre-[ŋ] [ɒ] is not raised to [u], Miller (2011:1387) misses the intermediary raising of /dang/ to [dong]. Therefore, his statements, in order to be properly verified, need to be examined against further examples.

3.5.11. Rohany-Rahbar (2012)

In her 2012 PhD dissertation at the University of Toronto, Rohany-Rahbar sets out, among other things, to “examine the structure of the Persian vowel system” and the “interactions of vowels and consonants at a morpheme boundary” (Rohany-Rahbar 2012:ii) and to do so synchronically. She recognizes that, while providing insight into some linguistic aspects, her study leaves out the sociolinguistic factors (ibid.:56, footnote).

| | Underlying Form | Surface Form | | English Gloss |
|-----|------------------------|---------------------|--|----------------------|
| a. | begu | bugu | | ‘say!’ |
| b. | bexun | boxun, bexun | | ‘Read!’ |
| c. | begir | bigir | | ‘Get!’ |
| d. | beĴin | biĴin | | ‘Sit!’ |
| | | | | |
| e. | be+ændiĴ | biyændiĴ | | ‘Think!’ |
| f. | be+a | biya | | ‘Come!’ |
| g. | be-avær | biyavær | | ‘Bring!’ |
| h. | be+oft | biyoft | | ‘Fall down!’ |
| | | | | |
| i. | soqut | suqut | | ‘fall’ |
| j. | sotun | sutun | | ‘column’ |
| k. | xorus | xurus | | ‘rooster’ |
| l. | holu | hulu | | ‘peach’ |
| m. | koluce | kuluce | | ‘a type of cookie’ |
| | | | | |
| n. | kelid | kilid | | ‘key’ |
| o. | sebil | sibil | | ‘mustache’ |
| p. | gelim | ġilim | | ‘a kind of rug’ |
| q. | zegil | zigil | | ‘wart’ |
| r. | fetile | fitile | | ‘wick’ |
| | | | | |
| s. | kuku | kuku | | ‘frittata’ |
| t. | juju | juju | | ‘birdie’ |
| u. | susul | susul | | ‘dandy’ |
| v. | tutun | tutun | | ‘tobacco’ |
| w. | kuculu | kuculu | | ‘small’ |
| x. | | | | |
| | | | | |
| y. | ġiti | ġiti | | ‘universe’ |
| z. | bini | bini | | ‘nose’ |
| aa. | Ĵirin | Ĵirin | | ‘sweet’ |

Table 3.13—List of vowel-raised Words examined in Rohany-Rahbar (2012:59)

Rohany-Rahbar (2012) speaks of non-contiguous height assimilation in the context of (a-d) in Table 3.13 above from a mid to a high vowel across morpheme boundaries (with ‘be-’ being the imperative prefix), while attributing the raising of /e/ to [i] in (e-h) to assimilation to the intervocalic epenthetic *y* (IPA: [j]) that sits in between two morphemes, i.e., between the vowel of the imperative prefix ‘be-’ and the verb stem that begins with a vowel in each case. Examples (i-r) are raised due to vowel harmony within the same lexical stem, with (i-m) under the rule $o \rightarrow u / \text{---} Cu$ and (n-r) under $e \rightarrow i / \text{---} Ci$.

The fact that examples (s-x) do not have any underlying form with a CoCu syllable structure and those in (y-aa) no underlying forms with a CeCi syllable suggests that words in (a-s) do indeed undergo raising in TP (or Modern Persian as Rohany-Rahbar refers to it) from their respective underlying forms. This is also supported by “the orthography of the language”, in which the vowels /æ, e, o/ are typically not written and, if written, they are written as diacritics, while the vowels /a, i, u/ are written (Rohany-Rahbar:59-60).

The raising of the second vowel in *digæ* ‘else’ to *dige* and *mægæ* ‘unless’ to *mæge* is, according to Rohany-Rahbar (2012:102-103) a secondary process after the deletion of the final /r/, which renders the words *digæ* and *mægæ*. As words in TP do not ending in *æ*, the word-final vowel rises from *æ* to *e*. (Final *r* deletion is a common process in Tehran Persian that is not included in my current study.) The same secondary process applies to the 3rd-person singular verb ending ‘-æd’ that primarily undergoes final consonant deletion and then raising of *æ* to *e* (e.g. *mikonæd* ‘[3P.SG.] does’ → *mikone*).

In her section on ‘pre-nasal raising’, Rohany-Rahbar points out to “a process of vowel raising in informal speech in which /a/ is raised to [u] before nasal consonants (/m/ and /n/)” (ibid.:110).

| | Underlying Form | Surface Form | | English Gloss |
|----|------------------------|---------------------|-------------|----------------------|
| a. | baran | barun | | ‘rain’ |
| b. | aseman | asemun | | ‘sky’ |
| c. | jan | jun | | ‘soul’ |
| d. | aram | arum | | ‘calm’ |
| e. | tæmam | tæmum | | ‘finished’ |
| f. | dævam | dævum | | ‘persistence’ |
| g. | amæd | umæd | | ‘came-3SG’ |
| h. | xane | xune | | ‘house, home’ |
| i. | lane | lune | | ‘nest’ |
| | | | | |
| j. | qanun | qanun | | ‘law’ |
| k. | hælæzun | hælæzun | | ‘snail’ |
| l. | pune | pune | | ‘spearmint’ |
| m. | tumar | tumar | | ‘scroll’ |
| n. | holqum | holqum | | ‘throat’ |
| | | | | |
| o. | kond | kond | *kund | ‘slow’ |
| p. | dom | dom | *dum | ‘tail’ |
| | | | | |
| q. | Tehran | Tehrūn | | CITY NAME |
| r. | Lahijan | Lahijan | *Lahijun | CITY NAME |
| s. | Tajikestan | Tajikestan | *Tajikestun | |
| t. | Baran | Baran | *Baran | GIRL NAME |
| u. | baran | barun | | ‘rain’ |

Table 3.14—Vowel-raised vs. Non-vowel-raised Words examined in Rohany-Rahbar (2012)

The words listed in Table 3.14 above are based on Rohany-Rahbar’s examples, who states that the existence of *Cum/Cun* words in Persian with no corresponding non-raised *Cam/Can* equivalents is evidence of raising of the underlying /a/ to [u] (ibid.:111). Rohany-Rahbar refers to words in which *aN* rises to *uN* while skipping the possible intermediary *oN*, considering that there are words with *oN* structure that are not raised to *uN* (such as (o-p)). I will examine both of these statements later in my analysis.

The existence of exceptions (some proper nouns undergoing raising (Tehran ~ Tehrun) while others not (Lahijan ~ *Lahijun) (both being city names)) and that the fact that sometimes the same word that undergoes raising (as in (u) above) does not undergo raising if it is a proper name (as in (t)) “suggest that” prenasal raising “is not a phonetic or post-lexical change and thus provides support for the process being phonological, which requires a phonological explanation, as shown through a rule such as the following:” (Rohany-Rahbar 2012:117)

[low, tense, peripheral] → [tense, peripheral] /— [nasal]

Figure 3.9—The Phonological Rule for aN Raising in Persian according to Rohany-Rahbar (2012:117)

According to the rule in Figure 3.9 above, the feature [low] is lost before a nasal rather than any raising taking place. Rohany-Rahbar argues for a Persian vowel system based on a tense/lax distinction. Therefore, according to Rohany-Rahbar, this is not a pre-nasal raising process but a loss of the +low feature. “The fact that *o* does not rise to *u* before nasal consonants in Persian”, says Rohany-Rahbar, “supports the idea that the process is not phonetic”, i.e., raising, “since phonetically *o* is in the path of *a* to *u* and if the raising is a phonetic process, one might expect to observe raising of *o* to *u* as well. Phonologically, however, *o* is not on the way of *a* to *u*”.

One of the distinguishing features of Rohany-Rahbar's (2012) work is her emphasis on providing phonological explanations for observed patterns and emphasizing the distinction between the phonological and the phonetic. While this approach contributes to a deeper and more theoretical understanding of the Persian sound system, she explicitly excludes sociolinguistic factors from her analysis.

3.5.12. Ariyae (2018)

The most recent study that I could discover on *aN* raising in TP is a 2018 Master of Arts thesis at the University of Toronto, in which Koorosh Ariyae looks at “Pre-Nasal Vowel Raising in Tehrani Persian” from a non-variationist perspective. He “tries to explain why pre-nasal raising does not always occur” in

his research, which he calls a “multidimensional analysis” involving “phonological, morphological and lexical factors that block raising in different lexical items”.

| BP | VTP | | GLOSS |
|--------|--------|--|------------|
| aram | arum | | ‘peaceful’ |
| xane | xune | | ‘home’ |
| penhan | penhun | | ‘hidden’ |
| badam | badum | | ‘almond’ |

Table 3.15—Examples of Prenasal Vowel-Raising in Ariyae (2018)

| BP | | VTP | | GLOSS |
|------------|---|------------|-------------|-------------------|
| /ʃam/ | → | [ʃam] | *[ʃum] | ‘supper’ |
| /rajgan/ | → | [rajgan] | *[rajgun] | ‘free of charges’ |
| /damæn/ | → | [damæn] | *[dumæn] | ‘skirt’ |
| /zanu/ | → | [zanu] | *[zunu] | ‘knee’ |
| /emkan/ | → | [emkan] | *[emkun] | ‘possibility’ |
| /ævamel/ | → | [ævamel] | *[ævumel] | ‘factors’ |
| /tulani/ | → | [tulani] | *[tuluni] | ‘lengthy’ |
| /edame/ | → | [edame] | *[edume] | ‘continuation’ |
| /sazman/ | → | [sazman] | *[sazmun] | ‘system’ |
| /damdar/ | → | [damdar] | *[dumdar] | ‘stockbreeder’ |
| /mobleman/ | → | [mobleman] | *[moblemun] | ‘sofa’ |
| /livan/ | → | [livan] | *[livun] | ‘glass’ |

Table 3.16—Examples of Prenasal Vowel-Non-Raising in Ariyae (2018)

Ariyae uses ‘formal Persian’ for what I term Bookish Persian and provides examples of raising and non-raising as provided in the two Table 3.15 and Table 3.16 above. He introduces a set of ‘blockers’ that he categorizes “into three classes of” nine “phonological, morphological and lexical factors”. Other than new terminology, Ariyae fundamentally confirms the same conclusions that the earlier scholars have reached. However, he adds some insight into the literature. For example, the fact that *aN* is raised in some highly frequent proper names in TP, as in *Esfehan* ~ *Esfehun* ‘CITY NAME’ or *fæʔban* ~ *fæʔbun* ‘MALE NAME’). Under a discussion of affixation, Ariyae notes that although *heyvan* ~ *heyvun* ‘animal’ and *an* ~ *un* ‘that’ are acceptable, variations such as *heyvani* ~ **heyvuni* ‘animal-like’ or *angah* ~ **ungah* ‘then’, words that contain affixes, are not. In other words, affixes can be blockers. According to Ariyae,

derivational or inflectional “affixes do not play a role in triggering or blocking pre-nasal raising” (p.111) except for *-ef* and *-ani*. He does not explain though, why these are exceptions. I will examine some of the examples that Ariyae has listed and analyze them, explaining how this might not be the case in the examples he presents, although it is worth considering whether affixation can block raising.

Ariyae (2018) notes that raising does not occur when *a* and *N* in the *aN* sequence are not in the same morpheme. More importantly, however, he makes the phonological observation that syllable boundary is a blocker for the *am*-sequence. For example, if ‘*a*’ and ‘*m*’ of the *am* sequence are not in the same syllable, there will be no raising. Examples are *amar* ‘statistic’, which is not raised to **umar*, because the syllabic structure is *a.mar* rather than *am.ar*. This helps explain some of what earlier scholars were complacent with simply considering as exceptions. For example, he counters Rohany-Rahbar (2012:116) that *xame* ‘cream’ not being raised to **xume* is an exception, since the syllable structure is *xa.me*. This blocker does not work in multisyllable words with an *an* sequence. Therefore, *xane* ‘home’ or *æs.ra.ne* ‘afternoon snack’ can be raised to *xu.ne* and *æs.ru.ne*. An exception to this is “[m]onomorphemic native Persian words with *am.Cu* sequence like *gam.bu* ‘fat’ and *bam.bul* ‘deceit’ whose *am* sequence is in the same syllable and is followed by *u*. However, they still resist raising and do not undergo vowel harmony” (Ariyae 2018:46). Phonologically speaking, according to Ariyae, dissimilating /a/ (e.g. *qanun* ‘law’ not rising to **qunun*) is another blocker.

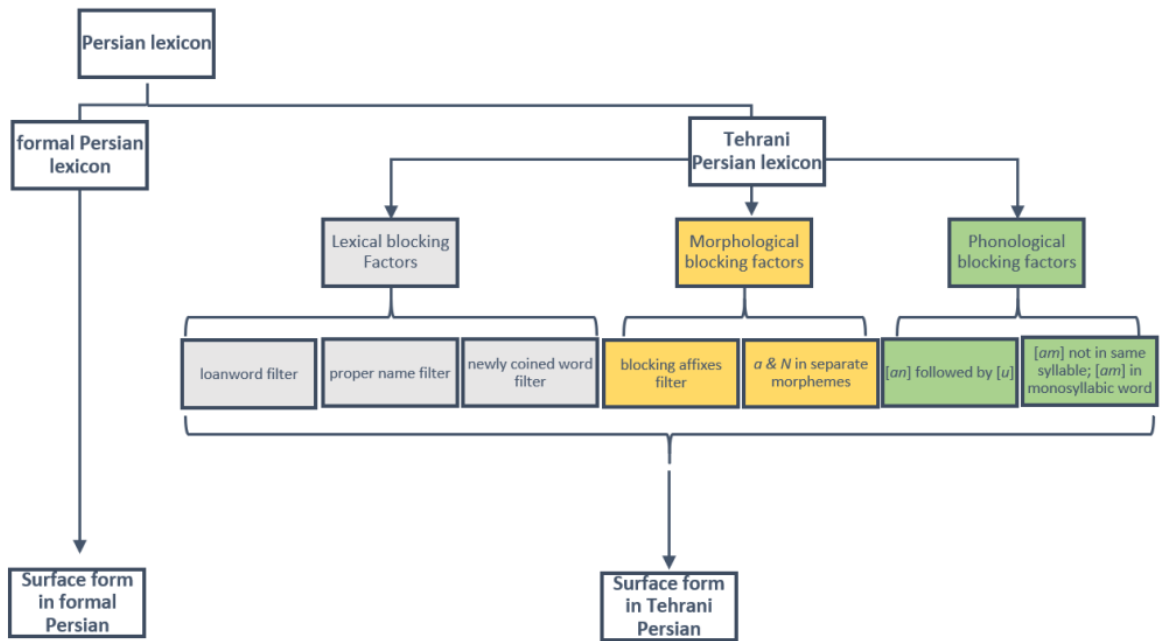


Figure 3.10—Ariyae (2018:93)'s Schematic Model of the Persian Lexicon for *aN* Raising

According to Ariyae (2018), the Persian lexicon is divided along the binary line of TP versus FP (Formal Persian). Once a word is in FP territory, raising is blocked even if the raising conditions are met. “Only those lexical items that are in the Tehrani Persian lexicon are subject to raising.” (ibid.:93). This seems to be a circular argument, if not a self-fulfilling definition, because he does not provide a clear standard with which one can divide the lexicon in such a binary way. Ariyae disagrees with Kahn and Bernstein (1981) on the hypothesis of the underlying *u* on the ground that “there are actively used lexical items in formal and Tehrani Persian which contain *uN* sequence, but the pre-nasal *u* in these words never lowers to *a*.” (ibid.:38) for which he gives the examples shown in Table 3.17.

| UNDERLYING FORM | SURFACE FORM | | GLOSS |
|-----------------|--------------|-------------|---------------|
| /mærhum/ | [mærhum] | *[mærham] | ‘departed’ |
| /niʃgun/ | [niʃgun] | *[niʃgan] | ‘pinch’ |
| /sotun/ | [sotun] | *[sotan] | ‘pillar’ |
| /xun/ | [xun] | *[xan] | ‘blood’ |
| /mæskuni/ | [mæskuni] | *[mæskani] | ‘residential’ |
| /birun/ | [birun] | *[biran] | ‘outside’ |
| /bedune/ | [bedune] | *[bedane] | ‘without’ |
| /bum/ | [bum] | *[bam] | ‘canvas’ |
| /mum/ | [mum] | *[mam] | ‘wax’ |
| /mæhkum/ | [mæhkum] | *[mæhkam] | ‘convict’ |
| /abrumænd/ | [abrumænd] | *[abramænd] | ‘honorable’ |
| /pune/ | [pune] | *[pane] | ‘spearmint’ |
| /mæʔlum/ | [mæʔlum] | *[mæʔlam] | ‘obvious’ |

Table 3.17—Words with underlying [uN] in Ariyae (2018)

Ariyae counters Miller (2011) and Kahn and Bernstein (1981) in that the position of *aN* has any bearing on raising and states that “the position of the *aN* sequence in a (derived) word does not influence pre-nasal raising” (Ariyae 2018:65). He provides a hierarchy of blocking factors (shown in Figure 5.10), in which the top-ranking factors are morpheme boundary, non-Arabic loanwords, and recent coinages, respectively, and blocking factors with exceptions being lower along the hierarchy.

At the end of his thesis, Ariyae lists some of the words in the TP lexicon that do not undergo *aN* raising despite meeting all the raising conditions, which he calls ‘patternless exceptions’, shown in Table 5.18:

| UNDERLYING FORM | SURFACE FORM | | GLOSS |
|-----------------|--------------|-------------|-----------------------|
| /æɪʔan/ | [æɪʔan] | *[æɪʔan] | ‘now’ |
| /ændʒam/ | [ændʒam] | *[ændʒam] | ‘do (something)’ |
| /buran/ | [buran] | *[buran] | ‘thunderstorm’ |
| /bambul/ | [bambul] | *[bambul] | ‘deceit’ |
| /dang/ | [dang] | *[dang] | ‘sixth of a property’ |
| /xijanæt/ | [xijanæt] | *[xijanæt] | ‘betrayal’ |
| /xandan/ | [xandan] | *[xandan] | ‘household’ |
| /sowhan/ | [sowhan] | *[sowhan] | ‘file, rasp’ |
| /sælam/ | [sælam] | *[sælam] | ‘hello’ |
| /qaneʔ/ | [qaneʔ] | *[qaneʔ] | ‘convinced’ |
| /gambu/ | [gambu] | *[gambu] | ‘fat’ |
| /ostovane/ | [ostovane] | *[ostovane] | ‘cylinder’ |
| /maneʔ/ | [maneʔ] | *[maneʔ] | ‘obstacle’ |
| /mæsane/ | [mæsane] | *[mæsane] | ‘bladder’ |
| /mæram/ | [mæram] | *[mæram] | ‘creed’ |
| /mæqam/ | [mæqam] | *[mæqam] | ‘rank’ |
| /kowhan/ | [kowhan] | *[kowhan] | ‘hump’ |
| /dastan/ | [dastan] | *[dastan] | ‘story’ |
| /mædʒani/ | [mædʒani] | *[mædʒani] | ‘free of charge’ |

Table 3.18—Ariyae (2018:107)’s *Patternless Exceptions to aN-Raising*

3.6. Significance of the Present Research

A characteristic of the current research is its exclusive focus on vowel height variation, by which I do not mean merely vowel raising. Vowel height variation, theoretically and in this research actually, includes vowel lowering as well. Nevertheless, I will still initially define the variable contexts for vowel variation in TP in general, which will include any vowel variation other than height variation. I will then proceed to limit my data purely to height variation.

Wherever I refer to Tehran Persian, I take into consideration Persian spoken by the natives of the province of Tehran in its pre-2010 sense before Alborz Province was carved out of it. I still will code my data for ‘Karaj’ and ‘Tehran’ for any possible patterns of variation between the speakers of these two provincial capitals. I am yet to see any study on the difference between these two varieties.

Considering that more than 40 years have passed since Modaresi's research, I am in a unique position to reexamine some of the words that were, at the time, considered recent coinages. This is significant considering that recency of coinage has been cited as an explanatory factor for vowel height variation in TP.

3.7. Chapter Summary

I have, in this chapter, while briefly discussing intra- and inter-linguistic variation, provided definitions of variation and change, the difference between the two and the scope of variation in the current research. I reviewed the literature on vowel height variation in Persian and provided, in chronological order, summaries of the major studies that provided an account of variation in Persian. that included aspects other than vowel height as well.

The concepts of 'vertical' and 'horizontal' were introduced, the former being the SE (socioeconomic) hierarchy while the latter having to do with the geography of language. It was shown how some variation is vertical and some, horizontal.

The next chapter will introduce the data and the methodology of this dissertation. The research questions will be set forth and it will be clarified how those questions are going to be approached with the variationist method.

4. Chapter Four: Method and Data

4.1. Chapter Introduction

It was so far made clear that Tehran Persian (TP) exhibits variation in various aspects on a continuum of VTP (Vernacular Tehran Persian) to BP (Bookish Persian), of which vowel height variation is a locus. This means that certain words may be pronounced in VTP with different vowels than BP and still mean, or apparently mean, the same thing. The first example that typically comes to mind, when speaking of vowel height variation in TP (Tehran Persian), is the word /xane/ ‘home’, which is pronounced as [xune], and yet sometimes [xane]. In other words, the word that is pronounced [xane] in BP may be pronounced either as [xune] or [xane] in TP, with the former being the VTP form and the latter the BP form. Now the question is, how, or with what method, do we approach the question? Why is it possible for the vowel in such words to vary in height to be pronounced either as [a] or [u] and for the word to still mean the same thing? Or does it? In other words, do such variants of the same word mean the same thing? Why is it that a TP speaker usually says the word as [xune] but still sometimes as [xane]⁹? Is it a random process or is there a pattern? If the BP form of the word is [xane], why call it the BP form while TP considers that as a variant as well?

These and similar questions have all been formed under the Research Questions under 1.2. This chapter presents the variationist method, which is the method to analyze the data, while also discussing the data as well.

4.2. The Variationist Method

It is known with reasonable certainty that languages have been spoken for 40,000 years and probably more (Janson 2002:5). The written representations of language, however, do not go farther back than 5,000 years ago, from which time the languages of Sumerian and Egyptian have the earliest written records (ibid.:3). One can only imagine that variation has been occurring in the speech of our earliest ancestors from the very beginning. However, this is not verifiable by any evidence. For one, there were no sound-recording devices

⁹ /a/ is used as shorthand for the IPA [ɒ]. Therefore, all instances of [a] here are indeed rounded unless otherwise indicated.

back then. The phonograph was invented in 1877, which is very recent in historical memory. Technically speaking, one can record spoken-language variation by taking written notes. The “first dialect survey that can properly be called dialect geography was begun in Germany by Georg Wenker in 1876.”, which “involved sending a list of sentences written in standard German to schoolmasters in the north of Germany and asking them to return the list transcribed into the local dialect” (Chambers et al 2004:15). Nevertheless, written language was historically the exclusive subject of all studies of language and grammarians, prescriptively and exclusively favored an idealized form of language. As Tagliamonte (2012:74) notes, variation in most earlier grammatical traditions was thus considered “decay and laziness” (but cf. Kiparsky [1979], who notes that Panini’s grammar contains ‘optional’ rules that recognized variability in Sanskrit).

Variationist linguistics (VL) was developed through the foundational work of William Labov in the early 1960s against a background of traditional dialectology. “[M]ost sociolinguistic work has been heavily dependent on linguistic information supplied by large-scale studies of the dialectologists, and in fact much work carried out on the general principles explained by Labov (1972a) may be seen as an explicit modification of dialectological methods” (Milroy 1987:2). However, it is also the case that VL came around at an era dominated by the paradigm of Transformational-Generative Grammar, and as a reaction to the latter, when “Labov developed the notion of the variable rule” (Walker 2010:18) to account for variation as structured rather than dismissing it as deviation from the “ideal speaker-listener” (Chomsky 1965:3) and errors in linguistic performance.

Later, Labov’s variationist innovations returned the favor to dialectology by heavily influencing contemporary dialectology (Milroy et al. 2003:11-12). The now well-known annually held NWAV (New Ways of Analyzing Variation) conferences first began with “the Colloquium on New Ways of analysing Variation in English held at Georgetown University in the USA in October 1972” (Tagliamonte 2012:xii). This was Peter Trudgill’s first encounter with variationist linguistics, which was “at that time still without a name”, as Trudgill clarifies in his preface to Tagliamonte’s book (ibid.). The naming of this new paradigm in linguistic methodology is a hot topic of discussion to date. Labov himself, as recently as in the eleventh print in 1991 of his 1972 book *Sociolinguistic Patterns*, still discusses what the proper title would be for the discipline, writing that he has “resisted the term sociolinguistics for many years, since it implies that there can be a successful linguistic theory or practice which is not social” (Labov 1972:xiii). However, he

does use the word ‘sociolinguistic’ in the title of his book. I will use the term variationist linguistics instead of sociolinguistics, or variationist sociolinguistics, while emphasizing the centrality of speech in the definition and understanding of language, since “the basis of intersubjective knowledge in linguistics must be found in speech—language as it is used in everyday life” (ibid.), which is also what constitutes the body of data for the current research.

Setting the discussion of nomenclature aside, the variationist literature has been cumulatively developing since the 1960’s. James Walker talks about his “graduate student days at the University of Ottawa in the mid-1990s, when” he “was frustrated at having to piece the principles of variationist linguistics together from reading packages and word of mouth” (Walker 2010), as a result of which in 2010 he wrote his *Variation in Linguistic Systems*. This book presents the quantitative research paradigm as known to us today, with powerful software tools at our disposal that make possible the analysis of linguistic variation as a quantifiable scientific pursuit and the understanding of language in its social context, where it belongs. This paradigm, which may by some be referred to as ‘sociolinguistics’, but I, like James Walker, will call ‘variationist linguistics’, is different from the “other research paradigms described as sociolinguistics (the sociology of language, the ethnography of communication, discourse analysis, language policy and planning, and so on) that are not quantitative and/or that address rather different types of research questions” (Walker 2010:1). Considering that the tokens were distinguished impressionistically and only tokens were collected that were clearly distinguishable as the vowels they were represented to be, no phonetic analysis was conducted on the vowels. The use of the latest software was made at the level of analysis.

4.2.1. Linguistic Variation

Variationist linguistics is a two-pronged approach, “a “Janus-like” concern with both the social and linguistic aspects of variation” (Walker 2010:2). In cases where there are differences in form that can be explained linguistically, or intralinguistically, although technically speaking there is variation, it is not the kind of variation that is the subject of variationist linguistics. For example, the plural suffix /s/ in English has the three allophones of [s], [z] and [əz], for which *bats* [bæts], *dogs* [dɒ:gz] and *watches* [ˈwɒ:tʃəz] are

examples. This phonologically interesting situation can be explained away by a purely linguistic phonological analysis, stating that the plural /s/ in English appears as [s] if it preceded by a voiceless consonant, as [əz] if preceded by a sibilant consonant and [z] in every other environment. Another example of purely linguistic variation is Brazilian Portuguese in which /o/ is sometimes pronounced as [o] (as in *boca* ['boka]) and sometimes as [u] (as in *baço* ['basu]) (ibid.:7). This too can be accounted for by the phonological rule that says /o/ becomes [u] when occurring in an unstressed syllable.

In the stated examples from English and Portuguese, one can, by stating a rule, accurately predict, i.e., make deterministic statements about, how a particular phoneme or a syntactic word order is going to surface depending on the linguistic context.

Sometimes, the search for a deterministic linguistic rule remains unfulfilled. For example, there is no rule that can explain whether *singing* in English will be pronounced as ['sɪŋɪŋ] or ['sɪŋɪn]. Similarly, there is no phonological rule that can explain why the Spanish word *costeño* 'coastal dweller' is sometimes pronounced [koh'teŋo] instead of [kos'teŋo]. The easy answer is that these are cases of *free variation*, which means that the variation is random and unpredictable. This answer is known in variationist linguistics as the *null hypothesis* and, if true, would mean that there is no way to predict, even probabilistically, when /s/ surfaces as [h] instead of [s] (a clear case of lenition) in the example Spanish word. Variationist linguistics, however, time and time again, has revealed systematic patterns that provide insightful explanations for such cases of variation in Spanish or any other language. These are patterns revealed by elements that are external to the linguistic context and exist in the social context, constituting what is termed as *social meaning*. It is this kind of *linguistic variation* that is the subject of variationist linguistics, not change in lexical or grammatical meaning.

Now the question in this research becomes whether the surfacing of a low vowel in BP as a high vowel in VTP, e.g. /a/ in BP as opposed to [u] in VTP, is similar to the Portuguese scenario that can be explained by a deterministic and purely phonological rule or whether it is similar to the Spanish example of *costeño* or the English example of *singing* vs. *singin'*, which will enter the territory of social meaning. In this research, I am attempting, based on the tokens extracted from the collected data, to explain the patterns of variation between low and high vowels in Persian. There are plenty of studies of Persian that

provide linguistic explanations for variation. “Most of the linguistic descriptions such as Nye (1955), Ferguson (1957), Hodge (1957), Jazayeri (1958), Rastorgueva (1964), Scott (1964), Yannohannadi (1965), Samareh (1968), Towhidi (1974) have been done in the item-and-arrangement framework. However, a few recent works, such as Henderson (1972 and 1975) 2, Tabaian (1975), Scheili (1976), Hajati (1977), Yarmohammadi and Cowan (1978) have been done in the item-and-process framework. In none of these works have non-linguistic factors been taken into consideration.” (Modaressi 1978:9-10). Here, by “non-linguistic”, Modaressi is also referring to ‘social meaning’, as his work is a variationist study in the sense defined above.¹⁰

Modaressi’s work followed Labov’s early 1960’s foundational work by more than a decade. Labov’s work is foundational in the sense that he equipped us with the methodological paradigm that explained what had up until then been dismissed as ‘free variation’. Variation had been observed by many prior to Labov but not methodologically accurately accounted for. Labov, however, unveiled systematic patterns of correlation between a variety of phonological forms on one hand and differences among speakers and stylistic differences, on the other hand. Parallel to Labov’s work in developing his paradigm, there were other approaches that accounted for variation as a mix of various lects (i.e., internally invariant linguistic systems) at the community level, or as code-switching between various linguistic systems at the individual level. Variationist studies since then, however, also indicate variation at individual speaker level (Walker 2010), or intraspeaker variation (Bell 2014). In variationist linguistics, non-linguistic categories that are often correlated to linguistic variation are age, gender (or sex), style and register, education, social class, social network, ethnicity and so on.

4.2.2. Variable and Variants

Similarly to phonology, in which the smallest unit in the analysis is the phoneme, the *variable* is the minimal unit of analysis with which linguistic variation can be operationalized. “As with the phoneme, the variable

¹⁰ In fact, when as a volunteer in the NWAV44 conference (held jointly by the University of Toronto and York University in Toronto in October 2015) I met and had a conversation with Labov and told him about my research on Persian, Labov’s response started by referring to Modaressi’s 1978 research as an example of a variationist study of Persian, which, other than attesting to Labov’s vast knowledge of the variationist literature on languages other than English, confirms the unique status of Modaressi’s research in the variationist literature on Persian.

is an abstract construct, not something that we ever actually hear. Rather, what we hear are its overt manifestations: with phonemes, we hear *allophones*; with variables, we hear *variants*” (Walker 2010:9). In terms of notation, variables are indicated in parentheses, such as (x), while the variants are shown in brackets, e.g. [x₁], [x₂], etc. For example, the variable (s) in Spanish for words such as *costeño* has variants [s] and [h]. Deletion, or the null variant, is shown with [∅]. In other words, the variants are different ways of saying “the same thing” (variable).

4.2.3. The Variable Context

Determining the *variable context* (or *envelope of variation*) is at the heart of variationist analysis. This basically means determining where it is that the speaker has choices between variants, or which variants there are of a particular variable. Determining which forms there are that alternate with each other is known as the *principle of accountability* (see Tagliamonte 2012:10). Even though one may be interested only in one particular variant, one still has to consider all the other possible variants of the appropriate variable. This would make it possible to know what percentage, or rate, of occurrence the variable of interest has within the entire variable context. Once the variable context is defined, one can proceed to extract tokens (i.e., actual occurrences) of the variable in question from the data.

In my data, vowel variation appears with the following variants. In each case, the leftmost vowel is the BP or underlying form with the subsequent form or forms being the additional possible VTP form or forms. While the BP form, or variant, is only the first one, the TP variants include but are not limited to the BP form. In other words, TP is either BP or VTP. It may, at first glance, seem that the variable context is a prenasal vowel. However, here I will only list the variants with examples (shown in Table 6.1) and will leave the discussion of the variable context to Chapter 6 (Chapter Six: Results I: The Linguistic Factors).

(The numbering in the table below does not correspond to the VC numbers.)

| | |
|-----|---|
| 1. | [a]~[o]~[u] Examples: <i>mandæŋ~mundæŋ</i> ‘to stay’, <i>xanæ~xunæ</i> ‘home’ [a] may be partially raised to [o] rather than to [u], rendering <i>mondæŋ</i> . |
| 2. | [a]~[o]~[Ø] The object particle /ra/ in BP, which can in VTP be raised to [ro]. [a] in /ra/ may be entirely deleted, rendering [r]. |
| 3. | [æ] ~ [e] Examples: Verb ending: <i>mikonæd~mikone</i> ‘he/she/it does’ Copular /æst/ ‘is’ is reduced to [e]. Word-final [-ær] ~ [e] in adverbs, e.g. ‘digær’ vs. ‘dige’ (‘anymore’) Unstressed word-final [-ær] ~ [e] (i.e., conjunction ‘ægær’ vs. ‘æge’ (‘if’)) |
| 4. | [e] ~ [æ] Examples: vowel height variation in the opposite direction to the previous ones It occurs in between two words, with the first ending in [e] followed by the copular /æst/ ‘is’ or a raised form of the object particle /ra/ BP: Ranænde æst. [rɔnæn'de æst] driver is He/She is a driver. VTP: Ranændæ 'st. [rɔnæn'dæ st] BP: Ranænde ra didæm. driver saw-I I saw the driver. VTP: Ranændæ ro. [rɔnæn'dæ ro 'didæm] |
| 5. | [e]~[i] Examples: <i>hefdæh ~ hivdæh</i> ‘seventeen’; <i>hejdæh ~ hizhdæh</i> ‘seventeen’ <i>fej~fij</i> ‘six’; <i>kejmej~kijmij</i> ‘raisin’ |
| 6. | [e]~[o] Example: <i>bekon~ bokon</i> ‘Do!’ |
| 7. | [o]~[u] Example: <i>hodudæn~hududæn</i> ‘approximately’ |
| 8. | [æ/e]~[i] Example: <i>kucæk/kucek~kucik</i> ‘small’ |
| 9. | [æ/e]~[e/æ] Example: <i>motæqabel/moteqabel~moteqabel/motæqabel</i> |
| 10. | [æ]~[a] Example: <i>cæhar~ cahar</i> ‘four’ |
| 11. | [e]~[a] Example: <i>saheb~sahab</i> ‘owner’ |
| 12. | [a]~[e] Example: <i>bæra~bære</i> ‘for’ |
| 13. | NO VARIATION (0) Example: words such as <i>æl'an</i> [æ'l'ʔɔn] ‘now’, in which the pre-nasal <i>a</i> is never raised |
| 14. | DELETION (0II), as in <i>hævapeyma~hævpeyma~hæwpeyma</i> ‘airplane’ |

Table 4.1—The Variable Contexts with Examples

The above variable contexts are summarized in Table 4.2.

| # | Variable Context |
|-----|-----------------------|
| 1. | [ɒ] ~ [o] ~ [u] |
| 2. | [ɒ] ~ [o] ~ Ø |
| 3. | [e] ~ [æ] |
| 4. | [æ] ~ [e] |
| 5. | [e] ~ [i] |
| 6. | [e] ~ [o] |
| 7. | [o] ~ [u] |
| 8. | [æ] / [e] ~ [i] |
| 9. | [æ] / [e] ~ [æ] / [e] |
| 10. | [æ] ~ [ɒ] |
| 11. | [e] ~ [ɒ] |
| 12. | [ɒ] ~ [e] |
| 13. | 0 |
| 14. | 0II |

Table 4.2—The Initial Variable Contexts

For example, the word with the underlying form /xɒne/ ‘home’ in Persian is subject to VC#1 (Variable Context No. 1), which means that it may surface either as [xɒne], [xone] or [xune]¹¹.

After excluding processes that do not involve vowel height variation (raising or lowering) at all (such as deletion in VC13) or involve a process in addition to height variation (such as VC6 that involves backing as well as lowering), it seems that all the processes should be simplified to the following two processes, shown in Table 4.3:

| VC1 | Variable Context |
|-----|------------------|
| 1 | [ɒ] ~ [o] ~ [u] |
| 2 | [æ] ~ [e] ~ [i] |

Table 4.3—Potential Simplified Variable Contexts

However, it will be clarified that the situation is not this clear and a list of the VCs will be provided later.

¹¹ For the purposes of simplicity, the character /ɒ/ may be written as /a/ and /æ/ as /ae/.

4.3. The Methodology

In the previous section I reviewed the literature on what constitutes linguistic variation and what the variationist-linguistic method is. Here I focus specifically on the methodology of the current research.

4.3.1. Purpose and Hypothesis

The research question here is, ‘What factors cause the vowels in Vernacular Persian spoken in Tehran to vary compared to the underlying Bookish Persian forms?’ To answer this question, linguistic as well non-linguistic factors will be examined to determine their co-variation with vowel height and to verify the hypothesis that ‘Vowel height variation in Persian is not random but co-varies with a combination and linguistic and non-linguistic factors.’

4.3.2. The Linguistic and Non-Linguistic Factors

The linguistic factors are those that predict rules with which vowel height variation can be predicted. These may include, for example, the immediate phonological environment of the vowel in question (previous and following segments, syllable distance, stress position, etc.).

The non-linguistic, or extra-linguistic, factors, on the other hand, are to be sought in the social relations among the speakers (Labov 1963). They include such categories as follows:

- *Style*: Style determined based on the topic of the interview;
- *Age Group*: The interviewee’s age (in any one of the three groups of ‘youths’, young adults’ or ‘mature adults’).
- *Gender*: The interviewee’s gender (male or female);
- *Education*: The education level of the interviewee;
- *Occupation*: The occupation of the interviewee;
- *SES*: The socioeconomic status of the interviewee: The SES was determined based on a combination of factors such as home ownership, residential neighborhood, car ownership and

type, and own, parents' or spouse's income (including being able to afford to send child to study overseas).

For the univariate analysis of categorical factors, Chi-squared tests were employed to assess the statistical significance of associations between factor categories and vowel variation across Variable Contexts.

4.3.3. The Independent and Dependent Variables

Conventionally, variables are divided into 'dependent' and 'independent' variables, although the terms in variationist linguistics differ slightly, as will be clarified in the appropriate section below.

4.3.3.1. *The Dependent Variable*

The dependent variable (or simply the variable) in any research is the element whose behavior we are interested in. The variable in this research is variation in vowel height. To this end, any vowel in TP that varies in height from the underlying BP form will be examined. Although it is commonly thought that TP raises vowels in VTP compared to BP, vowel height variation should potentially also include lowering in VTP compared to BP. In other words, a vowel in VTP could be a raised or lowered variant of the BP one, or it could indeed remain the same, which is zero variation. Vowel height variation is a, if not the most, prominent feature of VTP, as examined earlier here in the literature review as well. The data analysis in this research will reveal whether any VTP vowel, if not the same as the BP form, is raised or lowered compared to the latter.

4.3.3.2. *The Independent Variables*

The independent variables are those elements that one hypothesizes to affect the behavior of the dependent variable. The more common equivalent for the 'independent variables' in variationist linguistics is 'factor groups', which, consist, in this research, of all the linguistic factors as well as the non-linguistic factors in

correlation to which the variables may surface in one or any other of the variants. The linguistic factors explored in this research consist of ‘following segment, syllable distance, stress position, syntactic category, morphological status, and origin’. The nonlinguistic factors are ‘age group, gender, education, hometown, occupation group, SES (socioeconomic status) and style.

4.4. The Data

The data for this research comprises interviews with native speakers of Tehran Persian, which I conducted in the cities of Tehran and Karaj during a trip to Iran in the months of July and August of the year 2017.

4.4.1. Stratified Random Sampling in the Interviews

In order to collect the kind of data that is required for variation analysis, ‘stratified random sampling’ (SRS) (also known as ‘quasi-random’ or ‘judgment sampling’ (Tagliamonte 2006:23)) was used. SRS has been developed as a more useful tool to achieve representativeness. It does not require the sample to be a miniature version of the population, but to make it possible to make inferences about the population based on the sample (Tagliamonte 2006:23).

My goal was to collect a representative sample of speakers, balanced for age, gender, education and socioeconomic status. There are, however, gaps between what I ended up collecting with what I would have ideally collected had there not been limitations due to unavailability of people in certain target categories, which would have otherwise rendered, for example, a balanced number of males and females across each age group, gender, education level and socioeconomic status. The topics of the interviews were carefully selected to evoke a variety of styles, as discussed in the literature.

| Age Group (Years of Age) | Number of Conducted Interviews: Divided by Gender | Total Number of Conducted Interviews |
|--------------------------|---|--------------------------------------|
| Y(young) (16-25) | F(emale): 7 M(ale): 2 | 9 |
| A(dult) (26-35) | F: 8 M: 4 | 12 |
| M(ature Adult) (36-45) | F: 1 M: 9 | 10 |
| All Age Groups | F: 16 M: 15 | 31 |

Table 4.4—Stratification of Speakers in the Sample by Age-Group and Gender.

The average interview duration is 01:24:26 hours (about 85 minutes each), very close to the intended 90 minutes per interview. The interviewees (speakers) were asked to sign a written consent form prior to the interview, in line with protocols approved by the ethics committee of York University.

I have a network of friends in Tehran, from among whom I recruited several interview candidates, almost all of whom I interviewed. In addition, I expanded my network to the “second order network zone”, i.e., “friends of friends” (Milroy 1987) to access other age groups.

Although with 15 males and 16 females there seems to be an overall gender balance, the numbers of females and males in each age group is skewed.

The ‘Y’ (‘youth’, 16-25) age group, includes adolescents and youths. The term ‘mature adults’ (‘M’) representing the group of 36 to 45 years of age, was adopted after the Persian term *ja-oftade*, literally meaning ‘settled in place’, which describes a more aged and experienced group of adults. Three age groups can be said to have been arbitrarily selected in a way best fitting the interviewees’ ages and the age groups commonly used in similar studies.

Interviews with five speakers (nos. 14, 18, 22, 23, 28) were conducted in two sessions rather than in one and were recorded in two sound files.

A Zoom H6 Handy Recorder device was used for recording the interviews.

In terms of education, I divided the speakers into four educational groups as listed in Table 4.5 below. The distribution is reasonably comparable, as broken down in Table 6.5:

| <i>Gender</i> | <i>Female</i> <i>Total: 16</i> | | | | | <i>Male</i> <i>Total: 15</i> | | | | |
|------------------|-----------------------------------|------------------|-------------------|-----------------|-----|---------------------------------|------------------|-------------------|-----------------|-----|
| <i>Education</i> | High School | Associate Degree | Bachelor's Degree | Master's Degree | PhD | High School | Associate Degree | Bachelor's Degree | Master's Degree | PhD |
| | 3 | 1 | 8 | 4 | 0 | 6 | 1 | 2 | 5 | 1 |

Table 4.5—Education by Gender

The questionnaire, which is available as APPENDIX A: INTERVIEW QUESTIONNAIRE, was organized so as to structure all the interviews similarly and make comparison possible, especially in terms of topic. However, they were by no means meant to give an air of formality to the interview. In fact, I structured my “sociolinguistic interview” based on that provided in Labov (1984), according to which each interview aimed at providing one to two hours of recording, obtaining the “full range of demographic data necessary for the analysis of sociolinguistic patterns (age; residential, school, occupation, and language history; family location and relations: income, rent or house values; group memberships and associations), eliciting “narratives of personal experience, where community norms and styles of personal interaction”, isolating “from a range of topics those of greatest interest to the speaker, and allow him or her to lead in defining the topic of conversation”, and obtaining “a record of overt attitudes towards language, linguistic features and linguistic stereotypes”. The interview questionnaire was structured into sections with the topics of demography, neighborhood, childhood, rapid oral translation, school (and education), work, fear and danger of death, social life, religion, safety in life, and language.

In the rapid oral translation section, I tried to elicit spoken forms as rapidly as possible with two aims in mind. The first aim was to make the activity playful, thus distracting from any formality possibly induced by holding the question sheets in my hand or placed on the desk in front of me. Secondly, I aimed at eliciting spoken forms that are as fluid and natural as possible on the part of the interviewee. The rapid oral translation section contained words, phrases or sentences in English whose Persian translation contained a raisable vowel. For example, I would say ‘bread’, to which they could say the BP form ‘nan’ or the VTP

form ‘nun’. The rapid oral translation task was an idea that I came up with myself, as it is a way of eliciting speaker performance and whether they will raise the vowel. I later gave the same task as a written translation task, which is a different framework to observe speaker behavior regarding raisable vowels. (For a complete list of these words, see Appendix B: Written Translation Questionnaire.)

4.4.2. Transcription

Data were entered into an Excel spreadsheet. Transliteration was done by using a standardized form of the Latin alphabet as listed below in the next section (below under Transliteration 4.4.3). I extracted 50 tokens per speaker, spread across topics.

4.4.3. Transliteration

Transcription in Persian using the Persian alphabet poses many technical challenges. For example, when one copies files across computer applications, the Persian letters or texts might be replaced by lower-level characters that are not part of the Persian alphabet, rendering the text illegible and meaningless. Other than this, there is no standardized way of writing VTP in the Persian alphabet that would be comprehensible to speakers of Persian. In order to avoid these and similar problems and to make the text samples available to a broader audience that is more likely to be familiar with the Latin alphabet than Persian, I chose to transliterate the excerpts using the Latin alphabet rather than the standard Persian alphabet.

My Latinized transliteration of Persian is based on the English keyboard with no diacritics required. This would make it possible to transliterate Persian in any computerized environment and to safely store the transcriptions for future use without loss of data, especially in the case of data transfer across various computer applications. Loss of data written in non-Latin alphabets has always been a common threat for such data, and a Latin-based transliteration seems to be the safest solution, at least until such times when these problems are eliminated for good.

Table 4.6 below lists the graphemes of the Persian alphabet with their Latin equivalents as I have used for transcription, while next to them the IPA equivalents are provided for clarify. The Latin alphabet used here is as close to the IPA as possible:

| <i>Grapheme #</i> | <i>Persian</i> | <i>Latin</i> | <i>IPA</i> |
|-------------------|----------------|--------------|------------|
| 1. | ا، آ | a | ɒ |
| a. | آ، آ | a | a |
| b. | آ، آ | æ, ae | æ |
| c. | آ، آ | e | e |
| d. | آ، آ | o | o |
| e. | آ، آ | ' | ʔ |
| 2. | ب، به، بی، ب | b | b |
| 3. | پ، په، پی، پ | p | p |
| 4. | ت، ته، تی، ت | t | t |
| 5. | ث، ثه، ثی، ث | s | s |
| 6. | ج، جه، جی، ج | j | ḍʒ |
| 7. | چ، چه، چی، چ | c | tʃ |
| 8. | ح، حه، حی، ح | h | h |
| 9. | خ، خه، خی، خ | x | x |
| 10. | د، ده، دی، د | d | d |
| 11. | ذ، ذه، ذی، ذ | dh | z |
| 12. | ر، ره، ری، ر | r | r |
| 13. | ز، زه، زی، ز | z | z |
| 14. | ژ، زه، زی، ژ | zh, ž, ʒ | ʒ |
| 15. | س، سه، سی، س | s | s |
| 16. | ش، شه، شی، ش | sh, š, ʃ | ʃ |
| 17. | ص، صه، صی، ص | s | s |
| 18. | ض، ضه، ضی، ض | z | z |
| 19. | ط، طه، طی، ط | t | t |
| 20. | ظ، ظه، ظی، ظ | z | z |
| 21. | ع، عه، عی، ع | ' | ʔ |
| 22. | غ، غه، غی، غ | gh | g, ɣ |
| 23. | ف، فه، فی، ف | f | f |

| <i>Grapheme #</i> | <i>Persian</i> | <i>Latin</i> | <i>IPA</i> |
|-------------------|----------------|--------------|------------|
| 24. | ق، ق، ق، ق | q | ɢ, ʁ |
| 25. | ک، ک، ک، ک | k | k |
| 26. | گ، گ، گ، گ | g | g |
| 27. | ل، ل، ل، ل | l | l |
| 28. | م، م، م، م | m | m |
| 29. | ن، ن، ن، ن | n | n |
| 30. | و، و | o, u, v, Ø | o, u, v, Ø |
| 31. | ه، ه، ه، ه | h | h |
| 32. | ی، ی، ی، ی | i, y | i, j |

Table 4.6—Transliteration Symbols

The symbol {a} is a useful umbrella symbol to cover [ɒ] and [a]. Although the latter is not part of TP’s phonological inventory, it seems to have been a phoneme in Middle Persian and is, therefore, useful for any diachronic transliteration of Persian. Nevertheless, I will make sure to clarify in each case what {a} refers to by providing the IPA equivalent if necessary and/or by mentioning the articulatory features.

4.4.4. Sample Acoustic Vowel Plots

While the primary analysis in this dissertation relies on impressionistic coding, a limited acoustic analysis was conducted using F1 and F2 formant frequencies for selected male and female speakers from each—BP and VTP in order to visually illustrate the vowel spaces of Bookish Persian and Vernacular Tehran Persian. Two representative F1/F2 vowel plots are included: one for a female and one for a male speaker. Each plot displays both BP and VTP vowels for that speaker, allowing comparison across the two speech styles.

The plots are presented in raw F1/F2 space (Hz) without normalization, in order to reflect speaker-specific vowel realizations. These visualizations are not intended to highlight vowel raising or other phonological shifts, but rather to provide a general acoustic profile of the vowel inventories used in each variety. This supplementary analysis, while not the primary focus of the impressionistic coding employed in the main study (as detailed in Chapter 4) provides a concrete depiction of the acoustic properties of the

vowels discussed, allowing for a comparison of the general positions of the vowels in the acoustic space for both BP and VTP. This visualization can help contextualize the discussion of vowel variation in subsequent chapters.

Vowel tokens were drawn from BP or VTP segments of the interviews and were chosen to be as phonetically comparable as possible. In selecting these, attempt was made to minimize the presence of surrounding sonorants (e.g., /m/, /n/, /l/, /j/) and fricatives (e.g., /f/, /v/, /s/, /z/, /ʃ/, /ʒ/, /h/) as much as possible, as these contexts can distort the acoustic signature of the target vowel. Where ideal phonetic contexts were unavailable, the best possible approximations were used.

Measurements were taken at the midpoint of the vowel, and the plots were generated using the **phonR** package in R. Each point is labeled with its corresponding phonemic symbol, facilitating direct visual comparison.



Figure 4.1— Female BP and VTP Vowels

In the female speaker’s plot (above), BP vowels consistently appear higher in the vowel space than their VTP counterparts, with the partial exception of /ɒ/. The male speaker’s plot (below) reflects a similar pattern, with BP vowels generally occupying more fronted positions than their VTP equivalents.

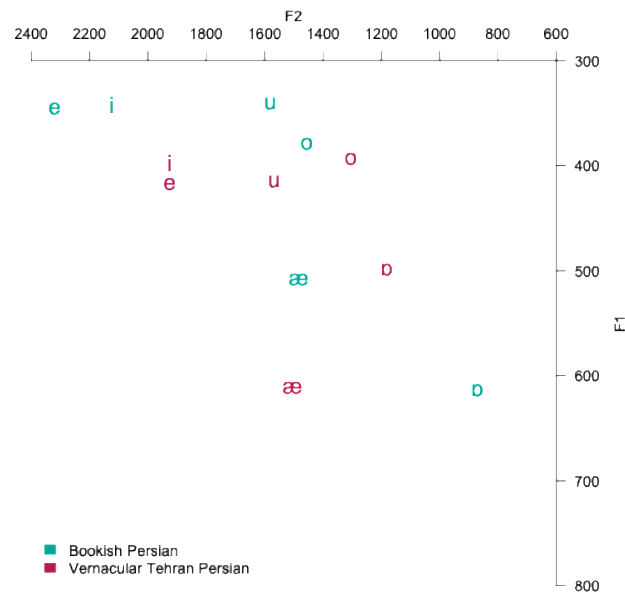


Figure 4.2— Male BP and VTP Vowels

Given that the data in this study were impressionistically coded, the plots are not intended to represent exhaustive acoustic detail. Accordingly, sampling was not pursued to perfection and the plots were not optimized for precision, as they are intended merely as illustrative complements to the impressionistic coding.

4.4.5. Coding Instructions

In each interview, I started extracting tokens at a point in the audio after the interviewee (speaker) had started answering the first question.

The common practice in interview transcription is to skip the first 10 minutes of each interview session, and initially I meant to do this regardless of whether the interview was conducted in one session or two. The reason for skipping the first ten minutes and to exclude it from coding is that it is the warm-up period, during which there would still be some ice to break. However, I later changed my mind about this, thinking that the ‘icy’ or ‘warm-up’ period could contain valuable data if it were in any way less casual or more formal than the rest of the interview. As vowel height, according to the literature, is in certain ways

related to formality, an initial period of higher formality might have given rise to certain vowel heights that I may otherwise not have gotten in the remainder of the interview.

From all the 31 interviews, a total of 1,666 tokens, an average of 54 tokens per speaker (or interviewee), were coded. In common practice, 30 tokens per person is considered to be an acceptable sample size (Tagliamonte 2012:136), but I decided to have at least 50 tokens per interviewee to improve sampling. The 50 tokens are spread across the 6 VCs.

4.5. Chapter Summary

This chapter provided a brief history of the studies of spoken language variation and variationist linguistics (VL) and a history of VL itself. I clarified the definitions of the linguistic rule versus the variationist rule, the null hypothesis and how patterns external to language and in the social context can account for variation in language.

I introduced the methodology of the current research and how it fits within Labov's variationist paradigm aimed at explaining the so-called 'free variation'. I introduced the notions of variable, variant, variable context (envelope of variation), variationist method, principle of accountability, my use of BP, TP and VTP, and the purpose and hypothesis of the research.

To complement the impressionistic analysis of Persian vowels, this chapter also presented illustrative F1/F2 plots from one male and one female speaker, comparing vowel realizations in BP and VTP. These plots, based on carefully selected tokens from similar phonetic contexts, visually demonstrate the acoustic vowel space of each variety. They offer a phonetic backdrop to the variationist analysis that follows in subsequent chapters, reinforcing the distinct articulatory profiles of BP and VTP vowels.

5. Chapter Five: More on Style

5.1. Chapter Introduction

In Chapter 3, I provided a glimpse into the intricate landscape of variationist linguistics by delving into its relatively brief historical background. It is crucial, however, to recognize that exploring the historical development of variationist linguistics inevitably involves an exploration of the evolution of style studies as well. This is because the history of variationist linguistics is to a great extent a history of studies on stylistic variation. While I dedicated Chapter 3 to reviewing the history of variationist studies in Persian and Chapter 4 reviewed the variationist method, I now focus on providing a definition of the concept of style itself, particularly within the broader framework that allows for its differentiation from genre and register. This calls for a careful examination of what constitutes style and how it operates in linguistic contexts. By distinguishing style from genre and register, I will shed light on the unique characteristics that define style as a distinct linguistic phenomenon.

In summary, Chapter 55 delves into the history of variationist linguistics and its connection to style studies. The chapter highlights the importance of defining style within the larger context of genre and register, emphasizing its role in shaping linguistic expression and contributing to the overall impact of communication. Through this exploration, the author aims to provide readers with a comprehensive understanding of style as a dynamic and essential component of linguistic analysis.

5.2. Style in Context

While the term ‘formality’ has been commonly used to account for variation in spoken Persian, approaches to the study of language in its social context have used a variety of other terms describing various forms of speech, such as ‘style’, ‘register’ and ‘genre’. Genre is often studied in contrast with register and style, but also in a bigger context, in comparison with such other terms as ‘dialect’, ‘text type’, ‘sublanguage’ and ‘discourse’ (Biber et al. 1994:vii). The literature reveals that style, register and genre are defined more tightly in relation to each other than to any other term, but especially close to each other among the three are the concepts of ‘style’ and ‘register’, so close that they may sometimes be difficult to distinguish from each other or they may even be used interchangeably in certain theoretical frameworks. For such reasons,

it becomes imperative to meticulously define the term ‘style’ in a way that clarifies it in contrast to the other two terms (namely, register and genre), as the meaning of each of the terms is determined in part in the way it is distinguished from the other two terms and the way the other two concepts are understood as well.

The study of style by far predates the foundation of variationist linguistics (VL) with its origins rooted in the domain of literary studies. The literary study of styles, initially known as “stylistics” or “literary stylistics,” involved a broader perspective on style as a particular way of using language and was applied to the study of literary texts. It “has its roots in the formalist school of literary criticism that emerged in Russia in the early years of the twentieth century.” The “term ‘style’”, however, “goes back to classical rhetoric and poetics.” (Jeffries & McIntyre, 2010:1). Literary stylistics is predominantly about literary texts (ibid.:2) and has almost nothing to do with spoken language or speech styles that are investigated in variationist linguistics. Style in literary stylistics was a “characteristic of particular genres, particular periods, particular authors, and even particular texts” (Biber et al 1994:23), while style in VL is understood differently in ways that will be clarified later on.

Part III of Biber & Finegan’s (1994) book, *Sociolinguistic perspectives on register*, is dedicated entirely to a review of the analytic frameworks for ‘Register Variation’. However, variationist literature on register is scarce, or, to say the least, in no way as common as the studies of style have been. “The word register appears in the titles of very few books now listed in library catalogues” (Biber et al 1994:vi). Yet, in contrast, studies of styles are very abundant in sociolinguistics in general and in variationist linguistics in particular. In fact, the entire variationist enterprise began with the study of styles. William Labov’s first major work on the island of Martha’s Vineyard, which was in turn almost immediately followed in 1966 by his second foundational work *The Social Stratification of English in New York City*, both explore variation in speaking styles.

5.2.1. Register, Genre, and Style

Speech has been the subject of research in communication studies and ethnography of communication as well as in linguistics. The perspective on speech in these disciplines sheds light on the key concepts in question here and on distinguishing ‘style’ from similar concepts. The speech event, for example, is defined

as part of the bigger context, i.e., a communicative event. Numerous linguistic and nonlinguistic features are provided for a context in which a speech event occurs. The speech event is, therefore, defined by a co-occurrence (Biber et al 1994) of topic, setting and audience. What matters first and foremost, however, is to figure out which elements of the context are relevant to the analysis of the speech event.

Among other contextual features proposed as relevant to the production and interpretation of speech are shared knowledge, beliefs, intentions, presuppositions, and inferences, which may be socially or culturally based. Similarly relevant to the analysis of the speech event are meaningful nonverbal action preceding, accompanying or following the speech, the relations between speaker and hearer and their characteristics as members of the community (Newmeyer 1989:8-9). In these ethnographic approaches, ‘self’, ‘other’ and ‘situation’ are social contexts that have symbolic meanings for the participants.

The communicative situation can be looked at from a variety of perspectives. For example, in a further discussion of his travel agency study, Nikolas Coupland (2007:70) draws on Dell Hymes’s (1964, 1972) checklist of the components of the speech event, mnemonically referred to as SPEAKING, which are as follows:

- S Situation (Setting and Scene)
- P Participants (Speaker, Addressor, Hearer and Addressee)
- E Ends (Outcomes and Goals)
- A Act Sequences (Message form and Message content)
- K Key
- I Instrumentalities (Channel and Forms of speech)
- N Norms (Norms of Interaction and Norms of Interpretation)
- G Genre

The first three categories of Hymes’s SPEAKING determine the ‘situation’. (The concept of ‘topic’ in the above model is subsumed under ‘goals’ or ends.) According to Fishman (1972:4), ‘a situation is defined by the co-occurrence of two (or more) interlocutors related to each other in a particular way, communicating about a particular topic, in a particular setting.’ Some of the above elements, such as setting,

may be thought of as more prominent in the understanding of language varieties than the others. Generally, 'setting' is key in defining register.

A variety of other different concepts can also be defined depending on the various combinations of the above components. Each of these possible combinations of features may help define a concept. This method of defining the terms (style, register, genre) is based on what is referred to as 'co-occurrence'. A context, for example, can be defined as the intersection of setting and purpose (ends, goals), and is a concept that can contribute to the analysis of the levels of formality. In the same fashion, a situation can be defined as comprising the context plus the participants (Brown et al 1979:34).

Any of the three concepts (style, register, genre) can be defined based on the co-occurrence of linguistic features. The importance of linguistic co-occurrence was recognized early on by linguists. For example, Brown and Fraser (1979:38–39) observe that it can be “misleading to concentrate on specific, isolated [linguistic] markers without taking into account systematic variations which involve the co-occurrence of sets of markers.” Ervin-Tripp (1972) and Hymes (1974) identify “speech styles” as varieties that are defined by a shared set of co-occurring linguistic features. Halliday (1988: 162) defines a register as “a cluster of associated features having a greater-than-random ... tendency to co-occur.” (Biber et al 1994:35, 223). The notion of linguistic co-occurrence has been given formal status in the multidimensional approach to register variation, where different co-occurrence patterns are analyzed as underlying dimensions of register variation.

As regards the participants, it is not just the participant him-/herself that matters, but both the speaker and hearer's position in society will have an impact on the kind of speech produced. For example, a student speaks to a teacher differently than to a fellow student. If a student-teacher and a student-student speech interaction both take place in the same setting, say the classroom, the difference in the two situations is not that the speaker or setting has changed, but that there are different addressees. In other words, there is a different co-occurrence in 'student, teacher, classroom' as compared to 'student, fellow student, classroom'.

There are other approaches to the study of a speech event as well. According to Hymes, a 'speech event' consists of a single speech act or, often, of more than one speech act. In the same way that a noun

can consist simply of a word that functions as a noun or alternatively of a noun phrase or even an entire sentence (e.g. “Fire!”), a speech act may constitute the entirety of a speech event, and of a speech situation. There is, however, often a difference in magnitude. Think of a party as a speech situation, during which a conversation can occur, which is a speech event. A joke, which is a speech act, may be embedded within the speech event (i.e., the conversation) (Hymes 1972:56).

Formal rules are written for the occurrence and characteristics of speech events and of speech acts. The same speech act may recur in different types of speech event, and the same speech event in different contexts of situation. Thus, a joke (speech act) may occur in a private conversation, a lecture, or a formal introduction. A private conversation may take place in the context of a party, a memorial service, or during a pause in changing sides in a tennis match (Hymes 1972:56).

One can find out how style, register and genre are defined or approached, while also taking into consideration the components (or elements) of the speech event to achieve an understanding of the speech event as it relates to the three terms.

5.2.1.1. Register

Register differs from style in that register is often associated with particular settings and situations (and the latter include particular communicative goals). “The description of a register covers three major components: the situational context, the linguistic features, and the functional relationships between the first two components” (Biber et al 1994:6). As mentioned earlier, the components which a ‘situation’ consists of are ‘the interlocutors, a topic and a setting’ (Fishman 1972:4).

Register, according to Ferguson, is a “*communication situation that recurs regularly in a society (in terms of participants, setting, communicative functions, and so forth) will tend over time to develop identifying markers of language structure and language use, different from the language of other communication situations*” (Ferguson 1994:20, original italics).

A register, which can also be referred to as a kind of sublanguage, is gradually developed as the participants experience the same situation containing recurrent linguistic needs. This will result in the same participants frequently experiencing the same shared sublanguage, which will then result in the desire for a

speedier form of communication. As a result, certain registral features begin to develop, such as names for recurrent objects and events, formulaic sequences, and the like in order to facilitate communication. Other features may appear that may only mark, rather than facilitate, the sublanguage (register), help establish feelings of rapport or serve other purposes. The register will, thus, become an added dimension to the language.

Every register has certain core lexical and grammatical features that serve as indicators of the differences between registers by virtue of frequency of distribution. These features may come from a variety of linguistic categories, including phonology, tense and aspect, nominal forms, passives, speech acts, etc. To fully identify a register, one needs to analyze the relative distribution of these linguistic features, which in turn indicate distinctions in terms of communicative purposes and situations. Setting needs to be taken into account in the collection of data in order to capture registral variation.

In the same way that a dialect is a language variety associated with a group of speakers, a register is a variety of language associated with social situations. It seems, therefore, possible to study situational variation and its relation to register. Sometimes *register* is used as a term to include all situational varieties, regardless of the level of generality. There are scholars, however, who use *register* for a language variety defined based on the occupational purpose, such as computer programming register, car mechanic register, legal register. Crystal and Davy (1969:61) reject using the term *register* altogether, because it has been “applied to varieties of language in an almost indiscriminate manner, as if it could be usefully applied to situationally distinctive pieces of language of any kind,” such as, for example, registers of newspaper, church service, sports broadcast, etc. To them, it is “inconsistent, unrealistic, and confusing” to classify such a wide range of language varieties under the same rubric, because these language varieties differ significantly in terms of their situational characteristics (*ibid.*). They prefer, instead, to use the term *style* for everything from legalese to conversation and advertising and provide a different framework that will not be discussed here (see Biber et al 1994:52 for more).

There are, however, scholars who view the versatility inherent in the concept of linguistic register as a favorable characteristic. Ferguson (1983:154), for example, notes that “register variation, in which language structure varies in accordance with the occasions of use, is all-pervasive in human language,”

and, since the term *register* comfortably encompasses the entirety of this diverse range of variation, it serves as an exceedingly practical and beneficial conceptual framework.

5.2.1.2. *Genre*

Although genre was a term originally applied in literary studies for the analysis and classification of literary text types, the use of the term has been extended to the analysis of nonliterary language types as well. In his *Poetics*, Aristotle defined as genre such ‘kinds’ of language as tragedy, comedy, and epic (Biber 1994:17). However, Bakhtin (1986), in the chapter on ‘The Problem of Speech Genres,’ applies the term ‘genre’ to the analysis of spoken language. According to Bakhtin, language is realized in the form of individual concrete utterances (oral, written or signed) produced by participants in different domains of human activity. These utterances are directed towards specific goals, which is reflected in their thematic content and linguistic style (selection of lexical and grammatical resources) as well as in the compositional structure. These arrangements make possible stable utterance types that Bakhtin calls speech genres (Bakhtin 1986:60).

“The genre perspective is similar to the register perspective in that it includes description of the purposes and situational context of a text variety, but its linguistic analysis contrasts with the register perspective by focusing on the conventional structures used to construct a complete text within the variety” (Biber et al 1994:2). A genre is a speech or text type that is not marked by pervasive features. It may be the case that a genre is marked with very few genre markers in the beginning or the end. These markers are often of a conventional character rather than functional. The focus of the genre approach is to analyze the general linguistic characteristics that identify whole texts, or text types. Genre markers are few and occur in certain places in the structural space of the speech event (or text). In an analysis of the genre of service encounters, Biber (2009) mentions the frequent use of ‘can I’ in this genre, as in:

- (1) a. **Can I** help you?
- b. **Can I** help who’s next?
- c. What **can I** do for you?

The expression *Can I help you?* occurs only once in a service encounter and predictably at the beginning and often right after the greeting. It can, therefore, be considered as a genre marker. Similarly, *there we go* is a likely genre marker that is likely to occur towards the end of the service encounter.

In rhetoric, the term *genre* has often been used in lieu of *register*. However, in literary studies, genres often refer to language varieties with medium generality, such as novels, essays, and letters. Others (e.g., Faigley and Meyer 1983) have referred to these as *text types*. “Several researchers working within Halliday’s systemic-functional framework attempt to make a theoretical distinction between register and genre, reflecting two different levels of abstraction.” (Biber & Finegan 1994:51).

5.2.1.3. *Style*

Style seems to cover a much wider range of concepts than register or genre. Many use it synonymously with *register*. Joos (1961) uses style to refer to registers with a level of generality. Labov’s (1972) style refers to language produced under various conditions with differing amounts of attention paid to speech. Style is also commonly understood as a ‘way of speaking or using language.’ This usage may be loaded with evaluative connotations, such as ‘speaking with style’ (implying that other people may speak without style). Style in literary studies has been used as a characteristic of genres, literary periods, authors or even texts (Biber et al 1994:51-53).

William Labov’s first two major works on the island of Martha’s Vineyard and in New York City investigate speaking style variation. The variation studied in the latter research was analyzed by Labov in the form of his theory of stylistic variation. According to Labov, “Styles can be ranged along a single dimension, measured by the amount of attention paid to speech” (Labov 1972:208). This is a very specific and narrow perspective on style, yet quite comparable to the literature on Persian.

To speak a language, one needs to know what, as in what word, to say to name a particular thing or to describe a quality, but speaking a language is also about how to say things. When you are learning a second or foreign language, a good dictionary does not just give you the equivalent, but it also tells you how an equivalent is used, by providing such usage labels as *fml* (formal), *infml* (informal), *slang* or *taboo*, which point one to the context in which the word is likely to appear. How one says something is what

constitutes 'style'. "'Style' refers to a way of doing something" (Coupland 2007:1), and in language the "doing" is saying, thus 'Style in language is a way of saying something'.

Certainly, the presence of style extends beyond the realm of language, mirroring the existence of linguistic styles. It is conceivable to discuss various manifestations of style within domains such as fashion design, where differing esthetics and approaches are discernible, or even within the realm of architecture, where distinct architectural styles emerge, each characterized by unique elements and principles. Nevertheless, style outside language is not what this research is concerned with.

One can locate style in time and space. A style belongs to some place and some time. In other words, there is a temporal and a spatial dimension to style. In addition, a style has a social meaning. "The same is true for styles in all other life-domains that are not linguistic. Cultural resonances of time, place and people attach to styles of dress and personal appearance in general, to styles in the making of material goods, to styles of social and institutional practice, perhaps even to styles of thinking" (*ibid.*). Style is created, however, by how things are put together and is not defined necessarily by what is put there. Simply put, style is a how, not a what.

Styles can also be identified for their purpose. Style-shifting can be employed for certain purposes, such as for indicating convergence (accommodation) or divergence (distancing). "The two forces acting in language in general can also account for variation in style. These are the forces of divergence (distinction) and convergence (solidarity, grouping together)" (Eckert 2004:1). Divergence or convergence can be expressed in relation to a variety of domains. Styles can be loaded with meanings that mark the speaker's position or stance within, or in relation to, a social space (position, class, ethnicity, network), region, affiliation (institutional, ideological), solidarity (familiar, formal), power (politeness, respect, deference), gender (binary, nonbinary), personae (cosmopolitan, local), biology (age, gender), identity (independence, coolness, chicano, etc.), and a host of other features.

Although Eckert (2012:87) divides variationist linguistics (VL) literature into three periods, or 'three waves', VL theories and models of style and style-shifting can be looked at roughly in two groups. The first period or approach begins with Labov's 1966 study entitled '*The Social Stratification of English in New York City*', in which Labov accounts for variation in style-shifting based on the amount of attention

the speaker pays to their speech. According to Labov, styles are stratified along a hierarchical continuum and ‘stylistic stratification’ is a reflection of ‘social stratification’, the latter, in turn, being organized along a socioeconomic hierarchy (ibid.).

In this perspective of variationist linguistics, style-shifting is ‘intraspeaker variation’ which is a reflection of interspeaker variation in society. This view of style-shifting persisted through much of subsequent work, including that in 1984 by Allan Bell in his ‘audience design’ theory (inspired by Howard Giles’s communication accommodation theory) (Allan Bell 1984:164). According to Allan Bell (1984:145), “Stylistic or intraspeaker variation derives from and mirrors interspeaker variation.” Also, according to Bell, “Style is essentially speakers’ response to their audience” (ibid.). In audience design, speakers accommodate to their present or imagined audiences. Speakers style their speech primarily to accommodate their addressee, but also in relation to third persons – auditors and overhearers – whose perceived presence affects style to a lesser degree.

In audience design, factors that have apparently nothing to do with audience, such as topic and setting, are also understood by virtue of their association with certain audience or addressee types. Generally speaking, as explained by Schilling-Estes (2004:328), audience design as an approach to account for style-shifting looks at the speaker as recipient of, or responsive to, audience rather than being an agent of style-shifting or style construction. Despite the fact that ‘initiative style’ is also introduced as part of the audience design theory, referring to a kind of style that the speaker actively initiates as an agent of redefining the existing situation, audience design still has to be grouped together with Labov’s approach, in which style-shifting mirrors structural variation in society, rather than with subsequent and more recent approaches in VL, in which style is a dynamic process constructed by the speaker.

The main characteristics of the second phase of VL studies of style is the active role that is recognized for the speaker as the agent of constructing identity through style. This second phase is the era of speaker agency and the era of style as process rather than product. Ingrained in these later VL approaches to style is an idea of agency for the speaker (Eckert 2012:91). One can go so far as to state that studies on style within variationist linguistics (VL) have generally developed in a direction that has been assigning a gradually increasing degree of agency to the speaker.

According to Coupland (2007:80), audience design has “weighted the scales too heavily in favour of reciprocity.”, which is why Coupland’s research has moved towards what Schilling-Estes (2013:328) distinguishes as ‘speaker design’, although Coupland prefers to refer to his own work with “the phrase ‘the relational self’”, as he would rather “approach style as the deploying and making of social meaning in evolving discursive contexts” (Coupland 2007:80-81).

Studies such as those by Coupland ushered in an era of ‘agency and process in style studies’, with ‘agency and process’ being the main characteristics of the second phase. In general, the concept of ‘style’ itself has a central role in recent VL studies. Penelope Eckert’s (2000) study of the Jocks and Burnouts in Belten High, Robert Podesva’s (2007) study of variation in voice quality and its relation to the expression of gender, and Qing Zhang’s (2005) studies of linguistic practice in the context of a socioeconomically rapidly transforming People’s Republic of China are examples of VL in this recent period. These studies emphasize how stylistic variation is employed by the speaker for the construction of individual identity.

Style as “different ways of saying the same thing” (Eckert 2012:98 citing Labov 1972b:323), which is a characteristic of the first phase, is no more an approach in the second phase. In this latter phase, style becomes more like a means of expression, while linguistic forms are deemed as part of the meaning. The approach in this phase, “locates ideology in language itself, in the construction of meaning, with potentially important consequences for linguistic theory more generally” (Eckert 2012:98).

There generally seems to be an air of static passivity about genre and register while style is the outcome of a more dynamic process of participation and creation via the speaker’s agency.

5.2.1.3.1. The Style Array

Various arrays have been presented since the early attempts at visualizing and/or quantifying the understanding of style. Ferguson’s (1959) H and L diglossic dichotomy, mirrored subsequently by Hodge (1957) as Formal vs. Informal, emphasizes topic and setting. Hodge breaks down his dichotomy further by creating Colloquial and Deliberate under Informal and Normal and Quotative under Formal, effectively going beyond a diglossic dichotomy. Henderson (1975), in turn, has a three-tier style array that distinguishes between Formal, Deliberative and Colloquial. Modaresi draws parallels between Labov and Hodge in a four-tier continuum from style A (casual) to style D (word list and minimal pair) while having

style B (careful) and style C (reading) in between (see Figure 3.2—Modaressi’s Stylistic Array (1978:24)). However, he later simplifies his style continuum into three levels of Formal, Deliberate and Colloquial for the purposes of his research (Modaressi 1978:63-64).

Jahangiri (1980) works with a two-tier style array of ‘free speech’ and ‘reading style’, while subdividing ‘reading style’ into three tasks, i.e., reading a sentence, reading a word list with pauses, and reading a word list fast, effectively stratifying style in Persian into four tiers.

5.2.1.3.1.1. The Adapted Style Array

I will work with the most elaborate of the style arrays so far, i.e., the four-tier style array, following Hodge (1957), Labov (1966) and Modaressi (1978). As far as the terminology is concerned, style A will be casual, style B careful, style C formal and style D quotative.

Considering that the interviewer (myself) and the setting (the interview) remain constant throughout the interviews, topic is the only element that varies throughout the interviews. The interviews were designed so that all the four styles would be elicited by introducing the appropriate topics (after Labov 1972:89-107). Table 5.1 below lists the topics of the various sections of each interview, which total 19, and matches them to the four styles along the stylistic continuum.

| Style | Topic |
|---------------------|---------------------------------|
| A: Casual | danger or near-death experience |
| | demography |
| | housing |
| | introduction |
| | leisure |
| | pet |
| | safety |
| | social networks |
| | sport |
| | travel |
| B: Careful | language |
| | OT (Oral Translation) |
| | relationship |
| | transportation |
| | work |
| C: Formal | education |
| | school |
| D: Quotative | textbook |
| | WT |

Table 5.1—Medwin Azadi’s Four-Tier Style Array

The above style spectrum is one of formality, i.e., attention paid to speech (setting aside, at least for now, the exact definition of ‘attention to speech’). Therefore, style A is the least and D the most formal of all the four. It is a model that is, strictly speaking, based on interactional considerations. My model above, however, which is based on topic, follows the same logic but can be said to be one step further removed from Labov’s, in the sense that it is primarily associated with the topic but then each topic is associated with a degree of attention paid to speech.

Under the topic of ‘textbook’, for example, I explicitly asked the speaker (interviewee) whether he/she remembered and could cite a particular subject discussed in a particular textbook. I put OT (Oral Translation) under the ‘careful’ style because, in this part of the interview, I said an English word to the speaker and asked him/her to provide its English translation. WT (Written Translation), on the other hand, was designed to be a task eliciting the ‘quotative’ style, similarly to the ‘textbook’ topic.

What potentially gives the stylistic analysis of the current research a bit of imbalance and may potentially skew the results is that, of the 19 topics spoken in the interviews, each topic is not equally represented in the tokenization and, perhaps more importantly, that some styles are assigned to fewer topics. Style A is represented by 10 topics, B by 5 topics, C by only two topics and D also by only two topics. However, this intrinsic bias in the tokenization can be compensated for, at least partly, by coding in more tokens of the less frequently represented styles.

5.3. Style in Persian

Scholars have been aware of the gap between the way the Persian language as it exists today in writing and the way it is spoken (Jahani 2005:79). In reality, Tehran Persian (TP)¹², being the spoken variety in the capital city, Tehran, occupies the position of the *de facto* standard spoken Persian throughout Iran. TP, on the other hand, does not have a standardized written form, or orthography, which is a typical feature of the L variety in situations of diglossia (Ferguson 1959). Yet, whether VTP (Vernacular Tehran Persian) is the L variety and BP the H variety, making Persian a diglossic language, is another question.

The written-spoken dichotomy is generally a valid broad distinction that is applicable in any language, since the written and spoken language forms, to say the least, are differently conveyed by the very mediums in which they are produced and, hence, shaped. Whether Persian would better be called diglossic or one would be better off to more conservatively adhere to the broader dichotomy of written versus spoken, one thing is certain and that is the fact that scholars indeed confirm the existence of a binary split that is significant enough to merit some terminology.

What scholars often imply by ‘written Persian’ is that which I will term ‘Bookish Persian’ (Azadi 2011), a layperson’s colloquial term, which, in my estimation, better captures the various aspects of this variety. ‘Spoken’ versus ‘written’ do not seem to be very helpful terms to conceptualize these varieties, since what is commonly referred to as ‘written Persian’ is not restricted to writing. It can be, and actually is, used as a variety of ‘spoken’ Persian. It is a register, or still better, a style, of spoken Persian. While Ferguson’s (1959) H seems to be what other scholars have referred to as ‘written Persian’, ‘formal Persian’ or ‘standard Persian’, my first significant step in this research will be using the dichotomy of BP and VTP (Vernacular Tehran Persian), as the two ends of the spoken Persian spectrum, since both BP and VTP can be either written or spoken. In this conceptualization, BP and VTP are the two ends of the TP spectrum. While speaking Tehran Persian, one may lean towards the B(ookish) or the V(ernacular), as the case may be. In other words, Speakers of TP, although typically speak VTP, sometimes use BP as well.

Whether BP is the same as formal or not is itself a question to be answered. BP is basically when written Persian is read out loud or spoken. Students at school are taught to read texts in that variety and to

¹² Tehran Persian refers to the variety of Persian spoken by the majority of people nowadays living in Tehran. The original inhabitants of Tehran spoke a different variety of Persian.

quote written texts as such. However, BP is spoken by TP speakers for other purposes as well. The dichotomy is of BP versus VTP along the VTP continuum. Along this continuum, there is, among other things, phonological and grammatical variation (Azadi 2011)

The analysis in Section 3.5 (Persian Vowel Variation) examines the chronological progression of the Persian language in terms of studies on linguistic variation, which has also been referenced further back in the present section. While certain among these inquiries may not have been conducted within the variationist paradigm—such as the works of Ferguson, Henderson, and Hodge—collectively, they contribute to a comprehensive overview of the evolving conceptualizations of style within the Persian language. It is important to acknowledge the relatively limited expanse of available literature on spoken Persian variation, which, in turn, underscores the need to cite the aforementioned studies.

5.4. Chapter Summary

This chapter offered a historical account of the concept of ‘style’ through a variationist lens, in contradistinction to the closely related notions of genre and register. Prior to looking at style in the context of Persian linguistics, I examined through the various approaches to the understanding of style with without putting a particular focus on Persian. While going through the history of style in modern linguistics, I specifically focused on the variationist approaches to style and showed how style was a pillar of variationist studies.

I later narrowed down my review to style in linguistic analyses and variationist studies of the Persian language. These, at various points in time, were accompanied by an array of some sort that gradually evolved from a simplistic Fergusonian dichotomy of L versus H to an ultimately more elaborate array with four tiers. While presenting a four-tier array of A (casual), B (careful), C (formal) and D (quotative) as a comprehensive one, I identified the topics that the various sections of my interviews could be associated with and then related these topics with the four tiers of the stylistic array.

I will, in the subsequent chapters, put the data into the framework of this four-tier array and provide an analysis that is hoped to shed new light on the understanding of styles in spoken Persian.

6. Chapter Six: Results I: The Linguistic Factors

6.1. Chapter Introduction

My goal in this study has been to answer my childhood question, ‘Why does the school teach us to say *xane* ‘home’ while we actually say *xune* each and every day?’ I have now come to learn that the answer to this and other kinds of vowel difference between Vernacular Tehran Persian and the mostly written but sometimes spoken Bookish Persian is to be sought in two sets of factors: those within the language, or the ‘linguistic’ factors, and those outside the language, or the ‘extralinguistic’, or nonlinguistic factors.

This analysis is carried out on data collected from more than 30 speakers of Tehran Persian who were given the opportunity to speak or write Bookish Persian as well, data that is carefully examined using the methods of variationist linguistics and the latest computerized tools available. The data is analyzed univariately and multivariately for the linguistic as well as the extralinguistic factor groups, in which it will be clarified what factors or set of factors condition vowel variation in TP.

“Variationist sociolinguistics [...] integrates social and linguistic aspects of language.”, studies “the various ways in which social and linguistic structure come together”, “takes as a starting point the rules of grammar and then studies the points at which these rules make contact with society” (Tagliamonte 2006:4, 3), hence the need to clarify the way linguistic factors interact with linguistic form, because, “while attempting to synthesize both internal and external aspects of language, the challenge will always be to fully explore both” (ibid.:4), hence the analysis of both linguistic as well as nonlinguistic factors here. In fact, in variation analysis, the dependent variable is the choice of one variant over another or others while the independent variables consist of several linguistic as well as nonlinguistic features of the context that influence the choice of one variant over the others (ibid.:131).

Earlier in Chapter 3 (Chapter Three: Variation and the Literature Review), I documented examples of vowel height variation that have been examined since Hodge (1957), be it within the variationist paradigm or not. According to the literature, most studies have been dedicated to the pre-N (pre-nasal) raising of /a/ (or (a)) to [u], or aN-raising, with sporadic mentions of examples outside of this context. In this chapter,

I begin by listing all the variable contexts (VCs) in which any kind of vowel variation occurs in the data before I proceed to analyze them. Once it comes to the analysis, each VC will undergo a univariate analysis with two sets of factor groups, i.e., the linguistic and the extralinguistic factor groups before proceeding to the multivariate analysis. The statistical significance of the association between each linguistic factor group and the vowel variants within each VC was tested using Chi-squared tests.

While as an educated native speaker of Persian I am familiar with the BP forms, I did not trust my native speaker intuition as the arbiter of what the BP forms are. The BP forms are typically provided in any standard Persian-Persian dictionary where words are transliterated in a phoneticized version of the Latin alphabet. The 8-volume comprehensive Great Sokhan Persian-Persian Dictionary (2002) was used as the reference for the BP forms. This dictionary uses a phonetic Latin alphabet to transcribe the pronunciations, yet, like any other Persian-Persian dictionary, only provides the BP pronunciations. The TP forms are the tokens extracted from the interviews. From all the 31 interviews, a total of 1,666 tokens, an average of 54 tokens per speaker (or interviewee), were coded.

6.2. Height Variation in the Data

Regardless of the direction of height variation (i.e., be it raising or lowering), the initial overview of the 1,666 tokens revealed the patterns of vowel height variation as demonstrated in Table 6.1 below.

| VC# | Underlying Vowel | Surface Vowel | Token Count out of Total | Token Percentage out of Total |
|-----------|------------------|---------------|--------------------------|-------------------------------|
| 1. | /a/ | | 805 | 48% |
| 1.1. | | [a] | 362 | |
| 1.2. | | [u] | 312 | |
| 1.3. | | [o] | 129 | |
| 1.4. | | [∅] | 1 | |
| 1.5. | | [e] | 1 | |
| 2. | /o/ | | 305 | 18% |
| 2.1. | | [u] | 157 | |
| 2.2. | | [o] | 148 | |
| 3. | /e/ | | 257 | 15% |
| 3.1. | | [æ] | 95 | |
| 3.2. | | [i] | 87 | |
| 3.3. | | [e] | 75 | |
| 4. | /æ/ | | 226 | 14% |
| 4.1. | | [e] | 202 | |
| 4.2. | | [æ] | 24 | |
| 5. | /æ~e/ | | 41 | 2% |
| 5.1. | | [e] | 22 | |
| 5.2. | | [æ] | 11 | |
| 5.3. | | [i] | 8 | |
| 6. | /i/ | | 25 | 2% |
| 6.1. | | [e] | 25 | |
| 7. | /u/ | | 7 | 0% |
| 7.1. | | [u] | 3 | |
| 7.2. | | [o] | 3 | |
| 7.3. | | [∅] | 1 | |
| | Total | | 1,666 | 100% |

Table 6.1—Initial Probe into TP Vowel Variation

Table 6.1 shows variation in the surface forms in VTP, as compared to the underlying BP forms, for all six vowels and the total and a binary underlying vowel combination indicated by numerals in bold. Persian has only six vowel phonemes, yet there are words whose underlying BP forms show variation as well, as

listed under 5 above, i.e., more than one BP form. I based my extraction on an impressionistic basis of the vowels that I noticed underwent variation.

Among the tokens extracted from the data, the tokens with an underlying /a/ (IPA /ɒ/) account for 48% out of the total number of tokens extracted, /o/ for 18%, /e/ for 15% and /æ/ for 14%. These percentages indicate the proportion of the total number of extracted tokens that each underlying vowel (variable context) constitutes, but they do not necessarily represent the tendency of each vowel to vary in height, which would require an exhaustive extraction of all vowels.

The variation consists mainly of raising but there is enough lowering to warrant an analysis of the latter. There are rare instances of deletion (marked with ∅ or simply 0) that will be briefly discussed before they are set aside from the analysis. These percentages of distribution are not important in terms of expressing how likely the raising (or lowering) tendency of a variable vowel is. However, they do provide a perspective on how likely it is in a given body of data to encounter a particular variable vowel than the others.

In order to determine in percentages the tendency of a vowel to vary in height (be raised or lowered), one would need to extract the total number of tokens a vowel could vary and then calculate the actual instances of variation in proportion to the total. These latter percentages will be provided separately for each variable context later throughout the analysis. This is why I extracted all the variable instances of the same vowel (to the exclusion of its repeated instances) in very similar contexts. For example, *xane* ‘home’ (likely to surface as ‘xune’) was coded across topics within the coded part of the same speaker’s speech. Instances of *xane* as well as *xune* were coded as tokens.

The vowels /a/, /o/ and /æ/ may only be raised. The vowel /e/, however, may be raised to [i] or lowered to [æ]. The underlying vowel /u/ in the 7 instances that it has been coded may be lowered to [o]. Other than these, there is one instance of the BP vowel /a/ and one instance of /u/ being deleted in the TP data.

A small part (2%) of the data consists of words in whose underlying BP form either /æ/ or /e/ are similarly acceptable (underlying vowel no. 5, i.e., /æ~e/). In other words, there is variation in the underlying BP forms of these words, as both forms are acceptable and are provided by the *Great Sokhan Dictionary* as

standard BP. In these cases, the vowel may surface either in its higher form, i.e., [e], or in its lower form [æ], or in 8 instances be raised to [i]. This is a unique situation in that, whether the surface form is [e] or [æ], one cannot state that there has been any variation from the underlying form. However, one could research whether a specific speaker may tend to prefer one form than the other. This could indeed be an interesting but separate kind of research that is not part of the one undertaken here and will be left out here.

It is also clear that, looking at Table 6.1, the underlying vowels /æ~e/, /i/ and /u/ do not present enough tokens to warrant an analysis. The analysis, therefore, will be limited to the underlying vowels 1 through 4 (Table 6.1), i.e., the underlying /a/, /o/, /e/ and /æ/, comprising 48%, 18%, 15% and 14% of the total tokens in the data, respectively. The total of these will still account for 95% of the data.

“A linguistic variable in its most basic definition is two or more ways of saying the same thing.” (Tagliamonte 2021:4), but the 7 underlying vowel possibilities listed in Table 6.1 do not define 7 variables here.

6.2.1. Excluded Variants of (a)

The underlying vowel /a/ (vowel no. 1) has one instance in the data, surfacing as [e] (Table 6.1, vowel no. 1.5) in the third vowel of the word *nemidenæm* ‘I do not know.’ The BP form of the word is *nemidancæm*, which typically surfaces as *nemiduncæm*, by raising /a/, a low vowel, two levels (mid and high) to [u] in a pre-Nasal position. *Nemidenæm* is an outlier pronunciation that will be left out of the subsequent analysis. The vowel /e/ can be seen as the unrounded, fronted version of [o]. Even if this were a common process, i.e., raising of /a/ one level to [o] and then fronting it to [e], it would still fall outside the purview of this research, which is limited only to variation in height. Therefore, *nemidenæm* is excluded from the analysis because, firstly, it involves factors in addition to height variation and, secondly, it is the only token in this category and, therefore, does not provide sufficient variation for analysis.

In one other instance, the underlying vowel /a/ has been deleted in the underlying word *hævapeyma* ‘airplane’, which has surfaced by deletion of the second vowel as *hævpeyma*. Again, since deletion is not covered by the current research, this word will be excluded from the analysis, despite the fact that *hævpeyma*

may be commonly produced in TP. It is also, again, limited to one token and provides no room for variationist analysis.

The likely TP variants of (a) to be analyzed are, therefore, limited to [a], [o] or [u].

6.2.2. The Excluded Binary Underlying Vowels

There are words in Persian containing a vowel with two underlying possibilities. In these words, the underlying vowel in BP is either /æ/ or /e/, i.e., both /æ/ and /e/ are equally acceptable. For example, the underlying form of the Persian equivalent of the English word ‘direction’ is equally *jehæt* as it is *jæhæt*. They may surface as either of those, i.e., *jehæt* or *jæhæt*. There are 41 instances (tokens) of these words in the data, with only 19 unique words (types). (See Table 14.3, Appendix C for a complete list of all the words with /æ~e/ as underlying variant.)

The significance of coding for these words is that the speaker’s tendency to use either the higher [e] or the lower vowel [æ] may potentially be relevant to how frequently the speaker raises his/her vowels in other variable contexts. Yet, these vowels are excluded from the remainder of the analysis here, as they do not occur frequently enough in the data.

The underlying word *kuc*<æ~e>*k* ‘small, tiny’ is an exception in the sense that it has an additional possible surface form with the vowel [i]. This word may surface either as *kucæk*, *kucek* or *kucik*. However, in 100% of the instances in the data (8 tokens), the word has surfaced as *kucik*. With sufficient data, one could examine whether this is a case of a completed change (/kucæk~kucek/ → [kucik]). This raising is also consistent with Jahangiri (1980:61) that a back (non-anterior) consonant in the following segment, which in this case is the velar /k/, can cause the preceding vowel, here /æ/ or /e/, to be raised, here to [i], as formulated in the rule in Figure 8.1:

$$V_{+low} \longrightarrow V_{+mid} / _ C_{+back}$$

Figure 6.1—Phonological Rule No. 1: Raising before Back Consonants

See Table 14.3, Appendix 14.3 (Appendix C: Additional Tables) for a complete list of all the lexical items in VC's /æ~e/→[æ]~[e] and /æ~e/→[æ]~[e]~[i].

6.2.3. The Lowering of /i/

The bulk of the variationist literature on vowel height variation in Persian, at least as far as I have come to examine, is limited to vowel raising. However, my data reveals a certain amount of vowel lowering in TP (Tehran Persian, as defined in Section 1.1.3) as well. Other than the lowering of /e/ to [æ] (Vowel 3.1, Table 6.1), which will be dealt with more extensively in the following three chapters, 25 out of my 1,666 tokens are instances of /i/ being lowered to [e]. After ignoring repeated counts of the same lexical item (types), there are four unique types that contain the vowel /i/ in their underlying BP forms being lowered to [e] in their surface TP forms, as provided in Table 6.2 below:

| Underlying TP (i.e., BP) | Surface TP (i.e., VTP) | Gloss |
|--------------------------|------------------------|-------------|
| ari | are | 'yes, yeah' |
| bæli | bæle | 'yes' |
| in | en | 'this' |
| milyard | melyard | 'billion' |

Table 6.2—Words with /i/ lowered to [e]

These tokens are excluded from the final analysis due to their small number, not providing enough material for a variation analysis.

6.2.4. The Lowering and Deletion of /u/

Having examined the most front and high vowel in Persian, i.e., the unrounded /i/, which can in certain contexts be lowered one level to the mid vowel [e], a similar thing is happening in the back vowel, i.e., the rounded high back vowel /u/, which is lowered in some words one level to [o]. Table 6.3 below lists (with the variable vowels in bold) all such instances of /u/ in the data. Of these, some have and some have not been lowered to [o], and there is an instance of /u/ being deleted:

| Underlying TP (i.e., BP) | Surface TP (i.e., VTP) | Gloss |
|--------------------------|------------------------|-------------|
| bulvar | bulvar | 'boulevard' |
| Bulvar | Bolvar | |
| forudgah | fur'dgah | 'airport' |
| tuman | tomaen | CURRENCY |
| bedun | bedun | 'without' |

Table 6.3—Words with /u/ lowered to [o]

The word /bulvar/ has been coded three times in the data, of which one is lowered to [bolvar]. The one instance with the capitalized first letter, which has occurred as part of a proper noun phrase, does not stay raised and is lowered to [o]. According to the literature, proper nouns are less likely to be raised (Modaressi 1978:82). In this case, the only possible variation is lowering, not raising. Yet, the vowel has not remained raised and has been lowed to [o] (undergone variation).

The /u/ in the currency unit /tuman/ is lowered to [o] in both coded instances of the word. The word /bedun/, having an /u/ before the nasal /n/, does not undergo any lowering to become [bedon] or [bedan] and remains in its raised [u] form.

'Raising' refers to tongue height during articulation. However, raising is inversely proportionate to the opening of the mouth, with the low vowels being 'open' and the high ones 'close'. One can ask whether deletion is the next level beyond raising, because deletion renders no vowel and requires no opening of the mouth. In other words, if we view raising as a reduction, the only possible reduction from the highest vowel would be deletion. This is evidenced in other languages as well. For example, Japanese vowel reduction occurs in the form of shortening, devoicing, but most tangibly deletion, which occurs "regularly for the high vowels, /i/ and /u/" (Kilpatrick et al 2016). In the examples in Table 6.3—Words with /u/ lowered to [o], the /u/, which is a vowel at the highest vowel possible in the vowel chart and can undergo no further raising, is deleted in the word /forudgah/ in TP as recorded in the data, rendering [furdgah]. Such deletion is further confirmed as evidenced in the case of high vowels in Portuguese in São Paulo, Brazil (Walker & Mendes 2019).

In conclusion, as interesting as these tokens may be for future research, their numbers are too few to provide sufficient variation room for a meaningful analysis. Therefore, they are removed from the remainder of the analysis.

6.3. Exclusions

Variants that are not systematic alternatives to each other are not part of the structured heterogeneity of the same variable. If the variants “are part of a linguistic variable, they will be members of a structured set” (Tagliamonte 2012:4). Accordingly, vowel no. 3 in Table 6.1 represents two different variables, one with an underlying /e/ surfacing as [e] or [i], and another as an underlying /e/ surfacing as [e] or [æ], which presents two different variable contexts, one, of raising and the other, of lowering. These two VCs define two different variables. Some words have an underlying /e/ that can potentially be raised to [i], such as *hefdæh~hifdæh* ‘seventeen’, but never to **hæfdæh*, while the set of words in which /e/ can be lowered to [æ], but not raised to [i], are different, hence defining a different variable context.

Vowel no. 1, in turn, needs to be broken down into two variables, one being [a]~[o] and the other, [a]~[u], for reasons that will be justified by Table 6.4 below.

The ‘phonological environment’ refers to the consonant and vowel that precede and follow the vowel in question. The literature documents the effect of the following segment (consonant) on the height variation of a vowel in Persian (Jahangiri 1980:61, etc.), showing that following back consonants trigger raising in their previous vowel, which is why the following consonant is looked at as a linguistic factor potentially correlating with vowel height variation. The literature also looks at ‘vowel harmony’ (e.g. Modaresi 1978:65) in the form of the following vowel influencing the variable vowel, i.e., noncontiguous regressive assimilation.

The following segment (consonant) is coded by its degree of backness. It can, thus, be either ‘anterior’ (for labial and alveolar consonants) or ‘non-anterior’ (for postalveolar, palatal, velar, uvular, glottal consonants). If they happen to be the final sound in the word, their ‘following segment will be # (word

boundary). The nasal stops (Labial or Alveolar), however, although both being anterior, they are grouped separately for reasons that will be clarified below.

6.3.1. VC1: aN-Raising (/a/→[a]~[u])

According to the Principle of Accountability, it is important to know the total count of contexts in which a variable variant could have occurred but did not. Table 6.4 shows the frequency of raising for each vowel variable by following phonological context. The table is organized based on the following segment, which helps the underlying vowels provided in Table 6.1 into more VCs based on the following segment.

| FOLLOWING SEGMENT | % (total N) | | | | | |
|-------------------|-------------------------|---------------------------|------------------------------|--------------------------------|--------------------------------|------------------------------|
| | VC1: %[u] aN-raising | VC2: %[o] /ra/-raising | VC3: %[u] harmony raising | VC4: %[e] low-front raising | VC5: %[i] mid-front raising | VC6: %[æ] sandhi lowering |
| Labial Nasal | 48% (77) | 0 | 50% (10) | 100% (4) | 100% (1) | 100% (27) |
| Alveolar Nasal | 48% (571) | 0 | 100% (7) | 0 | 75% (4) | 100% (9) |
| Anterior | 0 | 0 | 50% (285) | 47% (34) | 64% (42) | 100% (2) |
| Non-Anterior | 0 | 0 | 67% (3) | 88% (52) | 61% (77) | 100% (9) |
| # | 0 | 83% (152) | 0 | 100% (136) | 82% (11) | 64% (75) |

Table 6.4—Vowel Height Variation (Raising and Lowering) by Following Segment

VC1 (aN-raising): $\chi^2=287.4$, $df=4$, $p<0.001$

VC3 (harmony): $\chi^2=39.8$, $df=4$, $p<0.001$

VC4 (low-front): $\chi^2=102.6$, $df=4$, $p<0.001$

VC6 (sandhi): $\chi^2=18.2$, $df=4$, $p=0.001$

All following segments significantly predict vowel variation ($p<0.01$). Labial/Alveolar nasals dominate VC1 raising (48% each). Non-anterior segments drive VC3 harmony (67%). Small counts in VC4 (Labial N=4) and VC5 (Anterior N=1) warrant caution. VC2 is excluded (0% raising in all cells).

The entirety of VC1 (/a/→[a]~[u]), which makes up the majority of raising in the data, is pre-N (preceding a nasal stop). The nasal stops (/m/ and /n/) are ‘anterior’. However, raising is occurring before them in this context. Therefore, in the hierarchy of raising triggers, or height variation triggers, nasality supersedes non-anteriority. In aN-raising, out of the total N (number of tokens) of 77 that occur before the labial nasal /m/, 48% were raised, and the remaining 52% could be raised but were not. The exact same percentage applies to the alveolar nasal but out of 570 tokens, which gives this ‘following segment’ a bigger weight.

The numbers show that [a]~[u] is exclusively pre-N. They also reveal that, although pre-[m] raising is as probable as pre-[n] raising, the latter is much more frequent than the former.

6.3.2. VC2: /ra/-raising (/a/→[a]~[o])

Table 6.4 justifies breaking the first underlying vowel in Table 6.1, i.e., /a/, and all its surface forms, i.e., [a], [o] and [u], into more VCs in addition to VC1 (aN-raising), the second of which is VC2 (/a/→[a]~[o]). This is justified because of the ‘following segment’ as well. Although the variable vowel is raised only 83% of the time out a total number (N) of 152, yet 100% of the time when it is raised, it is word-final. A closer look at the data reveals that this VC is only applicable to the object marker (or objective particle) /ra/, in which the vowel, if not surfacing as [a], can be raised only to [o] but never to [u]. Therefore, all the instances of /a/ to [o] in the data (except for three outlier tokens that will be explained below) are instances of /ra/. Table 6.4 shows an 83% raising of (a) to [o]. The remaining 17% are instances of /ra/ not undergoing raising and surfacing as [ra], yet they are still word-final.

VC1 (aN-raising) has three outlier tokens, in which the underlying /a/ appears as [o] on the surface. Two of these are the surface forms of the word *xane* ‘home’, which in all other instances is raised to [xune]. Here in one instance, it surfaces as *xone* and the other as *xowane* ([w] is intervocalic epenthesis.). The latter is produced during the ‘oral translation’ task, in which the speaker shows signs of hesitation, which is why she switches mid-word from [o] to [a]. This was excluded from the data. It seems as if she means to raise /a/ to [u] to say [xune], which is the typical raised form of /xane/ in TP, but decides to go for the more formal surface form [xane] as the topic is ‘oral translation’, a rather formal task. She delays a bit and starts at [o], but still has enough time to switch to [a] halfway through the word. Therefore, ultimately she renders the non-raised form [xane] if we remove [o] from [xowane]. The third instance is the word /xiaban/ raised to /xiabon/ as part of a proper noun phrase.

Sadeghi (2001) examines some words in Persian that are exclusively raised from /a/ to [o], such as /daŋ/ ‘one-sixth of a property’ to *dong* [doŋ] and *xance* ‘wedding ornament set’ to [xonce], but never to *[duŋ] or *[xunce]. The variation in these is similar to that of the object marker /ra/ in which the vowel may

be raised to [o] but not to [u]. The difference, however, is that the variable vowel in /ra/ is always word-final while word-medial in the former.

The word *xonce* and *dong* are similar to [xone] and [xiabon] in that the variable vowel in all of them is word-medial and pre-N, while being outcomes of a one-level pre-N raising of /a/ to [o]. The difference is that *xance* and *dang* cannot be two-level-raised to *[duŋ] or *[xunce] while the two-level-raised form of /xane/ to [xune] and /xiaban/ to [xiabun] are not just acceptable but in fact the primary raised forms. One could argue that the three outlier tokens are diachronic remnants of a gradient process of pre-N raising with three choices of [a]~[o]~[u] along the way. Yet, my synchronic data overwhelmingly favors a binary conceptualization of pre-N raising with a choice between [a] and [u].

6.3.3. VC3: Vowel-Harmony Raising (/o/ → [o]~[u])

VC3 (Table 6.4) is a third variable context that has an underlying BP form of /o/ that may surface either as [o] or [u]. Within this variable context, the vowel /o/ in the data is followed by either of the consonants /b, m, f, t, d, n, r, s, l, j¹/, all of which are anterior consonants (-velar, -palatal), including the nasal stops. One would expect these anterior consonants not to trigger the raising of the preceding consonant (as stated by Jahangiri 1980). However, the data clearly shows that /o/, even though preceding said anterior consonants, may be raised to [u]. The way such raising can be accounted for is by stating that there is another factor at work here that supersedes assimilation to the following consonant, and that factor is assimilation to the following vowel, or vowel harmony, as shown in Table 6.5 below:

¹ /j/ here is used in the non-IPA way and stands for the affricate [dʒ], not the IPA palatal [j].

| /o/→[o]~[u] | % [u] | Total N |
|-------------|-------|---------|
| # | 100% | 3 |
| [æ] | 100% | 1 |
| [a] | 82% | 11 |
| [u] | 63% | 227 |
| [e] | 50% | 2 |
| [o] | 0% | 61 |

Table 6.5—Harmony with Following Vowel in VC2 (/ra/-Raising)

VC1 (aN-raising or /a/→[a]~[u]), VC2 (/ra/-raising or /a/→[a]~[o]) and VC3 (harmony raising or /a/→[o]~[u]) are, therefore, three separate processes, not a single, gradient process with three degrees of raising ([a], [o] and [u]). Lexical items, or lexemes, that are subject to aN-raising are not subject to /ra/-raising or harmony raising, and so on and so forth. There are three different sets of words, each being subject to each of these variable contexts.

Table 6.5 shows 0% raising when the vowel following the variable vowel /o/ is [o] while 63% raising when it is [u]. The remaining 37% non-raising here must be explained by other linguistic or nonlinguistic factors. There are few tokens when there is no following vowel in the same word (#), or when the following vowel is [æ], [a] or [e]. What is at work is total vowel harmony through total noncontiguous regressive assimilation, under the rule in Figure 8.2:

$$V_{+mid+back} \longrightarrow V_{+high+back} / _ (C) \$ CV_{+high+back}$$

Figure 6.2—Phonological Rule No. 2: Harmony Raising

‘\$’ indicates syllable boundary. The rule shows how a (rounded) mid-back vowel in a syllable that may or may not have a consonant as the coda will assimilate to the non-contiguous vowel in the next syllable. The vowel harmony occurs, with a few exceptions, in words like *ghorub* ‘sunset’ that may or may not raise their first vowel, likely rendering *ghurub*. Other examples are *formul~furmul* ‘formula’ or

forudgah~furudgah ‘airport’. These words undergo total vowel harmony by total regressive noncontiguous assimilation (also confirmed by Modaressi (1978), Jahangiri (1980), and Rohany-Rahbar (2012)). (See Table 14.6, Appendix C: Additional Tables for a complete list of all the lexical items in harmony raising (/o/→[o]~[u]).

It is to be noted that there are a few exceptions to the rule in words like *xord~xurd*, *xorde~xurde*, *milyon~milyun*, *kodam~kudum* and *xanom~xanum* that are explained below.

Kodam has an intermediary-raised form *kodum* (not occurring in my data), which is the steppingstone to raising it to *kudum*, at which point it becomes subject to the rule in Figure 6.2 above.

Xorde~xurde is explained by the same process as in Figure 6.2 but only a partial one, i.e., partial vowel harmony, in which a mid-back vowel /o/ can be raised through partial noncontiguous regressive assimilation to the high vowel [e] in the following syllable.

One can account for *xord~xurd* as the clipped form of *xurde*, but not in any other way.

Milyon~milyun as well as *xanom~xanum* can be accounted for as a different type of pre-N raising to [u], unlike VC1, which starts from and underlying /a/ yet ending in the same place, i.e., [u]. These two lexical items indicate cases of pre-N raising that was discussed in the context of harmony raising (/o/→[o]~[u]). However, there is no harmony-raising context here as the variant in both cases is the last vowel of the word and is now followed by any subsequent vowel. Therefore, the, or one, likely viable explanation for *milyon~milyun* is partial noncontiguous progressive assimilation of (o) to [u] under the influence of the preceding vowel [i]. *Xanom~xanum*, however, can be accounted for under a separate process of raising in the context of /o/→[o]~[u], which will not be further discussed due to insufficient data. Pre-N raising in the data is overwhelmingly in the context of aN-raising (/a/→[a]~[u]). These two words, however, are clearly exceptions that can be better analyzed with more data.

The underlying /otobus/ ‘bus’ may vary to [utubus], as /otoban/ ‘highway’ may vary to [utuban]. In these cases, both of the first two vowels have been raised, i.e., double-vowel raising. There are instances of [otuban] in the data, which is single-vowel raising. The single-vowel raising in these cases is much more rare,

which means that the primary variant forms of the words are [otobus]~[utubus] and [otoban]~[utuban]. One could argue that in /otobus/, there is vowel harmony with the last vowel, but such an argument cannot be made for /otoban/.

Two possible explanations can be speculated for the raisings in [utuban] from /otoban/. Both explanations follow a two-step process.

The first one is that there is dissimilation from the last vowel, i.e., the second /o/ dissimilates away from the final vowel /a/ and shifts one level in height, rendering [u], hence [otuban], which is a common and more formal pronunciation. The second step will be explained by the harmony-raising phonological rule in Figure 6.2.

The other and second possible explanation can be that the second /o/ in /otoban/ is triggered noncontiguously by the final /n/ to be raised to [u] in the first step, rendering [otuban]. Again, the second step will be explained by the harmony-raising phonological rule in Figure 6.2. (See Table 14.6, Appendix C: Additional Tables for a complete list of all the words in my data in the harmony raising (/o/→[o]~[u]). This explanation, however, remains to be merely a speculation as long as there is not sufficient data to systematically analyze it.

6.3.4. VC4: Low-Front Raising (/æ/→[æ]~[e])

There are 226 tokens with 23 unique types in the data that fall under VC4 (/æ/→[æ]~[e]), as listed in Table 6.6. (See Table 14.7, Appendix C: Additional Tables for a complete list of all the words under VC4 (/æ/→[æ]~[e].) The type-to-token ratio is because of the large number of various nouns or adjectives appearing in the data attached to pronominal suffixes.

| | Underlying | Surface |
|-------------|--|--------------|
| 1. | PRONOMINAL SUFFIXES¹ | |
| 1.1. | -æf ‘his/her/its’ | -eʃ, -æʃ |
| 1.2. | -æt ‘your (sg.)’ | -et, -æt |
| 2. | NON-NOUNS ENDING IN /-ær/: | |
| 2.1 | ægær ‘if’ | ægeʃ, ægær |
| 2.2. | axær ‘you know, by the way, then’ | axær, axeʃ |
| 2.3. | digær ‘otherwise’ | digær, digeʃ |
| 2.4. | mægær ‘unless’ | mægær, mægeʃ |
| 3.1. | NOUNS ENDING IN /-ær/: | |
| 3.2. | bæradær ‘brother’ | bæradær |
| 3.3. | doxtær ‘daughter’ | doxtær |
| 3.4. | pesær ‘boy; son’ | pesær |
| 3.5. | xæbær ‘news’ | xæbær |
| 3.6. | xahær ‘sister’ | xahær |
| 4. | VERB SUFFIXES AND STEMS: | |
| 4.1. | æst ‘is’ | eʃ |
| 4.2. | -æd ‘-s’ (3sg) | -eʃ |
| 4.3. | cæsban ‘stick’ (vt.) | cesbun |
| 4.4. | dæh ‘give’ | bedʃeʃ |
| 4.5. | neʃæste ‘sat’ (past stem) | neʃeste |
| 5. | VERB PREFIX: | |
| 5.1. | næ- (e.g. næmidanæm) not | ne-, næ- |
| 6. | OTHER NOUNS: | |
| 6.1. | dæqiqe ‘minute’ | deʃqe |
| 6.2. | kæs ‘(some)one’ | kes, kæš |
| 6.3. | Mæhdi ‘PERSON NAME’ | Mæhdi |
| 6.4. | ʃah ^Abdol ^Ælæzim ‘PERSON NAME’ | ʃabdelezim |

Table 6.6—The Types in Low-Front Raising

¹ Traditional Persian grammar divides pronouns into the two groups based on whether they are ‘متصل’ or ‘پیوسته’ (‘mottæsel’ or ‘peyvæste’, i.e. ‘connected, clitic’) or ‘منفصل’ or ‘گسسته’ (‘monfæsel’ or ‘gosæste’, i.e. ‘disconnected, discrete, stand-alone’). Clitic vowels in Modern Persian are mostly possessive, but occasionally dative. However, they are all suffixes. Based on both form and function, ‘pronominal suffix’ was the best term I could think of.

According to Table 6.6, nouns ending in /-ær/ are never raised to [-e]. However, non-nouns (in this data, only conjunctions and adverbs) ending in /-ær/ can be raised after their final /r/ is deleted. This formula of raising after word-final consonant deletion, or simply put ‘post-deletion raising’, applies to verb ending /-æd/ and the copula /æst/ (both of which can be raised to [e]) as well. In these words, raising is a secondary process following final-/r/ deletion. Final-/r/ deletion occurs in nouns such as *fekr* ‘thought’ or *sæbr* ‘patience’ as well, reducing them to *fek*’ and *sæb*’, but final-/r/ deletion in such words does not result in the word being left with a final vowel and then undergoing raising in the second step. Nevertheless, in the words in Table 6.6, when /r/ is deleted and the word is left with a final /-æ/, the word undergoes vowel-neutralization to turn the final vowel to /e/, which is the “least marked vowel” in Persian (Rohany-Rahbar 2012:102). Other than *næ* ‘no’ and *væ* ‘and’, which are the only two words in Persian that end in [æ] (ibid.), the final vowel in words ending in [æ] is raised to [e], which is the case for the non-nouns ending in /-ær/, verb ending /-æd/ and the copular /æst/ as listed in Table 6.6. The verb stem in (4.4 in Table 6.6) is raised under a similar secondary process of post-deletion raising. One is tempted to ask why such deletion occurs in the first place, but that would be a topic for another research on deletion in Persian, not on height variation, which is the topic of this research.

In the data, the /-ær/-words that can be raised are either conjunctions or adverbs. /-ær/-nouns never undergo deletion of word-final consonant and then raising.

The negative verb prefix *næ-* ‘not’, of which 3 instances are coded as listed in Table 6.7 below is raised in harmony with the following vowel (partial noncontiguous regressive assimilation) only when the following vowel is a higher vowel (in this data, /i/).

| Underlying | Surface | Gloss |
|----------------|-----------------|---|
| næmidanæm | ne midunaem | ‘I do not know’ |
| næmitævanestæm | ne mit'unestaem | ‘I cannot’ |
| næmiʃævæd | ne mish'e' | ‘it is not possible to/does not become’ |

Table 6.7—Types in Low-Front Raising

The raising in (1.1), (6.1) (Table 6.6) and potential raising in (6.3) (common in TP but not occurring in my data) can be accounted for with the Raising before Back Consonants rule (Figure 6.1—Phonological Rule No. 1: Raising before Back Consonants), but not (1.2), (4.3), (4.5), (6.2) or (6.4).

6.3.5. VC5: Mid-Front Raising (/e/→[e]~[i])

The underlying /e/ is shown in Table 6.1 to have three possible surface forms, i.e., [æ], [i] and [e]. This is to be broken down further into two VC's, i.e., /e/→[e]~[i] (mid-front raising) and /e/→[e]~[æ] (mid-front lowering, or sandhi lowering, as will be described in the next section). The evidence for this comes from the fact that /e/→[e]~[æ] is exclusively word-final and at the same time there is no instance of /e/→[e]~[i] being word-final. In other words, there is no overlap between the two environments or the lexemes in which they occur.

Raising in a sizeable chunk (77 tokens equal to 57%) of all the tokens in VC5 can be accounted for under Phonological Rule No. 1 (Figure 6.1), i.e., $V_{+low} \longrightarrow V_{+mid} / _ C_{+back}$ (also in Jahangiri (1980:61)), in which a vowel is raised by virtue of assimilating to the following non-anterior (back) consonant, as in *ʃef~ʃif* 'six'. Variation in such words as *Engelisi~Engilisi~Ingilisi* 'English' can be accounted for by harmony with the following vowel (total noncontiguous regressive assimilation as described in Phonological Rule No. 1 in Figure 6.2). In this case, the second vowel, which is /e/, assimilates to the third vowel in Step 1, to render *Engilisi*. Then, in Step 2, the first vowel, which is an /i/ again, assimilates to the second vowel, which already been assimilated to /i/, to render *Ingilisi*.

The word *benefin~bifin* 'Sit! (sg.)', after the deletion of the syllable /ne/, can be seen as having undergone either or both of these rules, i.e., assimilation to the following consonant, to the following vowel or to both at the same time. Raising in the remaining 32% of the tokens, however, cannot be accounted for by the phonological environment.

There are 11 tokens of *ce* ‘what’, of which 9 are raised to *ci*. The variable vowel in these words is followed by a word-boundary. There is not sufficient data to be able to account for the raising of /e/ to [i] in this word, which seems to be a near-completed change.

6.3.6. VC6: Sandhi Lowering (/e/→[e]~[æ])

Of the total 122 tokens falling under VC6, i.e., /e/→[e]~[æ], the majority (75 tokens, i.e., 61%) are shown in Table 6.4 to be word-final. A closer look at the data reveals that the remaining 47 tokens, which are shown to be followed either by a nasal stop or another anterior or non-anterior sound, occur entirely word-finally as well, only mediated by a clitic pronoun, verb ending, adverb suffix, definite article ending, or object marker that is appended to them clitically, examples of which are presented in Figure 6.3 below. ‘WT’ stands for ‘Written Translation’, hence no timestamp as it took place outside and after the interview was completed.

| | <i>Style</i> <i>Translation</i> | <i>Example</i> | <i>Speaker No./ Timestamp</i> |
|-----|------------------------------------|--|-------------------------------|
| 1. | BP Literal | Esm e kucæk-æm tu e fenasname Fáteme æst. name CONNECTIVE small-my in CONNECTIVE birth-ID Fateme is. | |
| | VTP Idiomatic | Esm e kucik-aem tu ye fenasname Fatemæ 'st. My first name in my birth certificate is Fateme. | 001 / 00:01:31 |
| 2. | BP Literal | xane-æf house-his/her/its | |
| | VTP Idiomatic | xunæ-'f his/her/its house | 001 / 00:06:50 |
| 3. | BP Literal | Bedeh be maen an ruzname ra. give to me that newspaper OBJ-MARK | |
| | VTP Idiomatic | Bede be maen un ruznamæ ro. Give me that newspaper. | 001 / 00:22:34 |
| 4. | BP Literal | Bedeh be maen an ruzname ra. give to me that newspaper OBJ-MARK | |
| | VTP Idiomatic | Bede be mæn an ruzname ra. Give me that newspaper. | 002 / WT |
| 5. | BP Literal | Maen bozorg-e æm. I big-the æm. | |
| | VTP Idiomatic | Maen bozorg-e æm. I am the big one. | 004 / 00:01:18 |
| 6. | BP Literal | Amade æm. ready am | |
| | VTP Idiomatic | Amadæ 'm. I am ready. | 009 / 00:00:15 |
| 7. | BP Literal | Hæme hæm dær tælash ænd ke an ra yad begirænd all also in effort are that it OBJ-MARK LEARN | |
| | VTP Idiomatic | Hæmæ 'm dær tælaf æn' ke un 'o yad begiræn'. All are also trying to learn it. | 018 / 00:13:22 |
| 8. | BP Literal | xahær kucæk-e-æm sister little-the-my | |
| | VTP Idiomatic | xahær kucik-æ-'m my little sister | 004 / 00:01:49 |
| 9. | BP Literal | Afeq e teras e xane-æf æm. lover of terrace of house-its/the am | |
| | VTP Idiomatic | Afeq e teras e xunæ-'f æm. I love its/the house's terrace. | 001 / 00:06:50 |
| 10. | BP Literal | Ari, væli fohær-æm ... infekli ænd xanevade-eʃan. yes, but husband-my ... this-way are family-their. | |
| | VTP Idiomatic | Are, væli fohær-æm infek..., infekli [y]æn' xanevadæ-'jun yeah, but my husband... their family is this way. | 003 / 00:02:04 |

Figure 6.3—Examples of Sandhi Lowering

The above are actual examples from my data. The row in each example indicating the VTP form is the exact words that were uttered. BP is the enunciated BP forms that could have been uttered in a BP style.

As can be seen in the above figure by comparing the BP vs. VTP forms in each case, all the word-final instances of /e/ are lowered to /æ/ morphophonologically. Most cases (before pronominal suffixes and

verb endings) precede deletion but raising before the object marker /ra/ occurs only if the vowel in the latter is raised to [o]. Having word-final /e/ being lowered on condition that the vowel in its following /ra/ is raised or that its following vowel is deleted (if one sees deletion as the step beyond raising by virtue of full closing of the mouth) presents a seesawing relation, or dissimilation, between the two vowels, with the raising of one inevitably lowering the other, and vice versa. When /ra/ is not raised, as shown in Example 4, or when the vowel is not deleted, as in Example 5, word-final lowering does not occur. This is a situation that goes in a direction to harmony. This being the case, one can see both processes of harmony and counter-harmony at work in TP affecting vowel height, one increasing height and the other one decreasing it.

The only exception is *xanevadæ-t-æn* ‘in terms of family, family-wise’, in which the adverb suffix *-æn* is added to a noun, with an intervocalic *-t-* being epenthesized. Here the raising is subject to Rule No. 2 (Vowel Harmony Raising).

This VC is unique among all the 6 VC’s in that it can be explained in its entirety under the process of sandhi. ‘Sandhi’ is a term taken from Sanskrit referring to phonological “processes which operate across morphological and syntactic boundaries” (Carr 2008:153) or even “across word boundaries”, in which case it will be external sandhi.

Now the final VCs that account for all vowel height variation in Tehran Persian can be listed and labeled with some descriptive titles, as provided in Figure 6.4:

- BACK-VOWEL: VC1: (a)-raising (/a/→[a]~[u]) (aN-raising)
 VC2: (a)-raising (/a/→[a]~[o]) (/ra/-raising)
 VC3: (o)-raising (/o/→[o]~[u]) (harmony raising)
 FRONT-VOWEL: VC4: (æ)-raising (/æ/→[æ]~[e]) (low-front raising)
 VC5: (e)-raising (/e/→[e]~[i]) (mid-front raising)
 VC6: (e)-lowering (/e/→[e]~[æ]) (sandhi lowering)

Figure 6.4—List of the Variable Contexts accounting for All Vowel Height Variation in Tehran Persian

6.4. The Remaining Linguistic Factors

In the previous section, the phonological environment was used as a basis to define the variable contexts. In this section I will explore other linguistic factors that, in the literature, have been explored and correlated with vowel height variation.

6.4.1. Syllable Distance

The factor group of ‘syllable distance from word end’ or simply ‘syllable distance’ is examined in order to observe the relevance of syllabification to vowel raising as set forth in Kahn and Bernstein (1981), as also pointed out by Jahangiri (1980). Kahn and Bernstein (1981), for example, state that “a preponderance of the lexical items and tokens of lexical items where aN goes to uN either have aN in a stressed syllable in final or penultimate position.” (Kahn & Bernstein 1981:135) This implies, firstly, that the variable vowel occurs in a stressed syllable. Secondly, the variable vowel occurs at or towards the end of the word. According to Kahn and Bernstein (1981), the more distant a syllable is from the end of the word, the less likely its vowel is to undergo raising.

While coding for ‘syllable distance’, as an example, the word *otobus* ‘bus’ will be assigned number 2, since the first syllable (marked in bold type) is variable, which is 2 syllables behind the last syllable, with the total number of syllables being 3. Therefore, the variable syllable is 2 syllables removed from the final syllable. ‘0’ means that the variable syllable is the same as the final syllable, ‘1’ indicates the variable syllable as penultimate. For the sake of simplicity, I have created only three groups of 0 (ultimate), 1 (penultimate) and ‘2+’ (antepenultimate or farther from the word-final syllable). Initially, I did create separate groups for syllables 3, 4, etc. However, the data favored grouping all those along with 2 into one group of 2+.

| | % (total N) | | | | |
|--------------------------|-----------------------|----------------------------|------------------------------|------------------------------|----------------------------|
| SYLLABLE DISTANCE | VC1: % [u] aN-raising | VC3: % [u] harmony raising | VC4: % [e] low-front raising | VC5: % [i] mid-front raising | VC6: % [æ] sandhi lowering |
| 0 | 43% (305) | 100% (3) | 92% (199) | 82% (34) | 76% (111) |
| 1 | 54% (245) | 53% (164) | 70% (20) | 55% (89) | 100% (11) |
| 2+ | 50% (98) | 49% (138) | 71% (7) | 83% (12) | |

Table 6.8—VCs by Syllable Distance

VC1: $\chi^2=12.7$, $df=2$, $p=0.002$

VC3: $\chi^2=24.9$, $df=2$, $p<0.001$

VC4: $\chi^2=14.3$, $df=2$, $p=0.001$

VC5: $\chi^2=9.8$, $df=2$, $p=0.007$

Syllable distance significantly affects all VCs ($p<0.01$). >1 distance favors VC1 raising (54%), while >0 distance dominates VC3/VC4. VC5 shows a U-shaped pattern (high raising at >0 and $>2+$).

VC2 (/ra/-raising) is excluded from the analysis of syllable distance due to invariance as /ra/ is only one syllable. VC6 could be excluded on similar grounds, except for the 11 instances of syllable distance 1, in which the variable syllable is followed by a clitic pronominal suffix. Again, VC6 depicts sandhi in syllables interacting with the following morpheme or word.

In order for Kahn & Bernstein's (1981) generalization to hold true in my data, most raised tokens in the remaining VCs must occur in a syllable distance of 0 or 1. The data as presented in Table 6.8 overall shows a general trend towards this, with most of the tokens in each VC being under 0 and 1. This cannot be considered to be a hard and fast rule, as there is plenty of tokens, especially in VC1 and VC3, that go against it.

6.4.2. Stress Position

Before analyzing the 'stress position', I began looking at the stress pattern using the term 'stress distance', referring to the distance between the stressed syllable and the variable syllable in the word. Stress distance was examined in order to observe the relevance of stress patterning to raising, so as to revisit the literature (Kahn & Bernstein 1981 and by Jahangiri (1980)) on the topic, which states that aN-raising is more likely to occur in a stressed syllable word-finally or penultimately. Kahn and Bernstein (1981:135, footnote) further

clarify that the “aN→uN change does not seem to be stress related in that both stressed and unstressed syllables undergo the change.”

First, I calculated the stress distance by subtracting the ordinal number of the stressed syllable from the ordinal number of the token’s syllable, with a negative value indicating that the token occurs after the stressed syllable. For example, a three-syllable word that is stressed on the last syllable but whose token is the first syllable will show a stress position of 2, e.g. *hodudæ̃n~hududæ̃n* ‘approximately’. On the other hand, the three-syllable word *mikone~mikonæ̃d* ‘(he/she/it) does’ whose token is in the last syllable but whose stress is on the first syllable was given a stress distance of -2. The one-syllable word *an* ‘that’ was given a stress distance of 0.

Based on the patterns revealed throughout the analysis, it seemed to be more fitting to use the term ‘stress position’ instead of ‘stress distance’, which I began the analysis with. By ‘stress position’ I mean whether the token is same-stressed (is the same as the stressed syllable), pre-stressed (the stress syllable is before the variable syllable) or post-stressed (the stress syllable is after the variable syllable), as indicated in Table 6.9 below.

| STRESS POSITION | % (total N) | | | | |
|-----------------|--------------------------|-------------------------------|---------------------------------|---------------------------------|-------------------------------|
| | VC1: % [u] aN-raising | VC3: % [u] harmony raising | VC4: % [e] low-front raising | VC5: % [i] mid-front raising | VC6: % [æ] sandhi lowering |
| PRE | 97% (78) | 0% (1) | 97% (97) | 0 | 100% (1) |
| SAME | 37% (285) | 100% (3) | 84% (120) | 83% (35) | 78% (120) |
| POST | 46% (285) | 51% (301) | 78% (9) | 58% (100) | 100% (1) |

Table 6.9—VCs by Stress Position

VC1: $\chi^2=201.5$, $df=2$, $p<0.001$

VC3: $\chi^2=48.3$, $df=2$, $p<0.001$

VC4: $\chi^2=32.1$, $df=2$, $p<0.001$

VC1 (aN-raising) favors raising in pre-stressed followed by post-stressed syllables, which is contrary to Kahn & Bernstein’s same-stressed pattern.

VC2 is excluded from the stress position analysis because it shows no variation per se, as it consists only of the single-syllable object marker /ra/. The object marker /ra/ is always preceded by a noun phrase and the last word in the phrase, taking the phrase stress. After all, /ra/ is also occasionally written as attached to its preceding word in traditional Persian orthography.

VC3 (harmony raising) is almost entirely post-stressed, because of the nature of the variation, which is harmony with the following vowel. VC4 (low-front raising) favors pre-stressed vowel raising while VC5 (mid-front raising) favors post-stressed vowel raising.

VC6 (sandhi lowering), with the exception of two tokens, is exclusively same-stressed lowering. The two exceptions are the words *pif-eman*~*pif-æman* ‘with/before us’ and *xanevade-t-æn*~*xanevadæ-t-æn* ‘family-wise, in terms of family’. The first one is an outlier case of lowering that is produced by one individual in this one case only. The latter word follows the sandhi structure of lowering though, in that the lowering occurs at morpheme-boundary, although not at word-boundary

The data overwhelmingly favors the raising of vowels that are pre-stressed, such as *nemitævanæm*~*nemitunæm* ‘I don’t know.’, *hæman*~*hæmun* ‘(the) same’ or *mixanæm*~*mixunæm* ‘I read.’ (The variable vowel is marked in bold and the stressed vowel with an underline). This provides a more solid foundation to justify the recoding of ‘stress distance’ into ‘stress position’ (pre, same or post) by proving to be descriptively more accurate. More importantly, however, it gives more meat to the theorization of vowel raising as a process of reduction both by itself by virtue of raising (closing the mouth) and approximating deletion and by virtue of the fact that raised vowels are more likely to have already undergone reduction by stress loss. Gordon (2011:5) also discussed that not just raising, but also lowering, are both processes of reduction since both raising and lowering can be considered “increase in peripherality”.

6.4.3. Syntactic Category

‘Syntactic category’ refers to the category of the word in which the variable vowel occurs.¹ This section examines whether the syntactic category in any way correlates with vowel height variation (raising or lowering).

| SYNTACTIC CATEGORY | % (total N) | | | | |
|--------------------|-------------------------|------------------------------|--------------------------------|--------------------------------|------------------------------|
| | VC1: %[u] aN-raising | VC3: %[u] harmony raising | VC4: %[e] low-front raising | VC5: %[i] mid-front raising | VC6: %[æ] sandhi lowering |
| Adjective | 31% (29) | 100% (8) | 60% (10) | 0% (1) | 50% (8) |
| Adverb | 33% (6) | 100% (4) | 100% (32) | 0 | 100% (1) |
| Conjunction | 0 | 0 | 85% (13) | 0 | 0 |
| Pronominal Suffix | 100% (25) | 0 | 94% (53) | 0 | 100% (1) |
| Determiner | 98% (43) | 0 | 0 | 50% (2) | 67% (3) |
| Noun | 28% (409) | 49% (288) | 21% (14) | 55% (22) | 73% (79) |
| Number | 100% (4) | 100% (1) | 0 | 65% (99) | 0 |
| Preposition | 0% (1) | 0 | 0 | 0 | 0 |
| Pronoun | 79% (48) | 100% (1) | 57% (7) | 89% (9) | 100% (2) |
| Verb | 95% (83) | 33% (3) | 99% (97) | 100% (2) | 96% (28) |

Table 6.10—VCs by Syntactic Category

VC1: $\chi^2=225.1$, $df=9$, $p<0.001$

VC3: $\chi^2=145.7$, $df=9$, $p<0.001$

VC4: $\chi^2=203.8$, $df=9$, $p<0.001$

Verbs/determiners lead VC1 raising (95–98%), Nouns show mixed patterns (VC4: 21%, VC6: 73%).
Conjunctions/prepositions excluded ($N \leq 1$).

VC2 was excluded due to lack of variation, as it is limited only to variation in the single-syllable object marker /ra/.

‘Number’ is either an ordinal or cardinal number. The two categories were merged because of the small number of tokens in each category.

¹ It is common in Persian for a syntactic category to have a syntactic function different than the category. For example, an adjective may be used as an adverb (e.g. *‘I study good.’ for ‘I study well.’), a noun may be used as an adverb (e.g. *‘I go summer.’ for ‘I will go in summer.’) or a noun as a prepositional phrase (i.e., saying *‘I am Tehran’ instead of ‘I am in Tehran.’). Syntactic function is not analyzed here, although it would be interesting in a larger data set to explore whether the category-vs.-function has any bearing on variation.

The pronominal suffixes for the six persons in Persian are:

| Variants (Singular) | Gloss | Variants (Plural) | Gloss |
|--------------------------------|-------------|-----------------------|------------|
| <i>-æm~m</i> | ‘my’ | <i>-eman~emun~mun</i> | ‘our’ |
| <i>-æt~et~t</i> | ‘your (SG)’ | <i>-etab~etun~tun</i> | ‘your(PL)’ |
| <i>-æf~ef~f</i> ‘his/her/its’; | | <i>-efan~efun~fun</i> | ‘their’ |

Table 6.11— Variants of the Clitic Possessive Pronouns in Tehran Persian

The first variant in each case is the underlying BP form and the second (and third), the additional possible VTP forms. ‘Connected pronoun’ (pronominal suffix), or pronominal clitics (Mahootian 2006:149) is the term common in Persian grammar for these possessive pronouns, which are pronominal suffixes. As is clear, any variation in all of these is in the form of raising or deletion of the final vowel. The one pronominal suffix that appears in lowering (VC6) is *pif-eman~ pif-æman* ‘with/before us’, which is an outlier and uttered most likely due to slip of the tongue. Therefore, this outlier instance is excluded from the data.

The three instances of determiner in VC6 are that of the word-final clitic VTP definite article *-e* that can be lowered to *-æ* in sandhi interaction with the following syllable.¹

One would tend to think that raising in pronominal suffixes is a completed change in Persian as it takes place 100% of the time, but VC4 would dissuade one from such thinking, as it is capped at 94%. The same applies to numbers. Verb variation in VC5, which is always word-final, is 100% raised, hence no variation. However, it is not a significant revelation due to having too few tokens (merely 2). (See Table 6.10—VCs by Syntactic Category).

Variation by syntactic category differs across VCs but is mainly clustered around Noun, Pronominal Suffix and Number, except in VC4, where variation is skewed in favor of Verb.

¹ Standard New Persian does not have a definite article. However, VTP uses a clitic *-e* at the end of only singular pronouns to mark definiteness.

6.4.4. Morphological Status

This section examines the effect of the morphological status of the word in which the token occurs on vowel raising (or lowering), to test the hypothesis that certain factors (affix, proper noun, affix of a proper noun, and verb stem) have any bearing on vowel variation, i.e., whether they inhibit or trigger height variation.

These categories are made the object of focus here because of their significance in the literature, in which affixes (Ariyaee 2018) and proper nouns (Modaressi 1978, Jahangiri 1980, etc.) are introduced as raising-blockers. As far as verb stems are concerned, they are examined not as blockers, but to reveal whether raising (or potentially lowering) occurs at the verb-stem level or at a higher level. Hodge (1957) analyzes verb stem reduction separately from other kinds of variation that distinguish spoken Persian styles.

Nouns that are not proper nouns are included in the factor ‘Other’ in ‘Morphological Status’, as are other syntactic categories. See Section 6.4.3 (Syntactic Category) for a discussion of the effect of syntactic category.

A token was coded as ‘affix’ if it occurred as a prefix, suffix or interfix, regardless of the class of the stem or the word it was part of. For example, the verb *mikonæd* (mi-kon-æd) ‘does’ has the inflectional third-person singular present affix *-æd*, that can be reduced to *-e* (final consonant deletion and vowel raising). Another example of potential vowel raising in affix is an adjective like *deræxshan* (deræxsh-an) ‘shining’, with the adjective suffix *-an* ‘-ing’.

Affixes were initially coded as ‘inflectional’ and ‘derivational’. However, considering that almost all the affixes were derivational, I collapsed both categories into ‘affix’ regardless of their inflectional/derivational status.

The morphological status of words or word-parts in which raising/lowering occurs reveals the following results in interaction with vowel height variation:

| MORPHOLOGICAL STATUS | % (total N) | | | | |
|----------------------|--------------------------|-------------------------------|---------------------------------|---------------------------------|-------------------------------|
| | VC1: % [u] aN-raising | VC3: % [u] harmony raising | VC4: % [e] low-front raising | VC5: % [i] mid-front raising | VC6: % [æ] sandhi lowering |
| Affix | 38% (91) | 44% (195) | 96% (112) | 100% (1) | 77% (78) |
| Affix of Proper Noun | 10% (59) | 0 | 100% (1) | 0 | 0 |
| Proper Noun | 67% (9) | 75% (4) | 33% (3) | 88% (8) | 75% (4) |
| Verb Stem | 69% (112) | 0% (1) | 100% (37) | 0 | 0 |
| Other | 50% (377) | 66% (105) | 75% (73) | 63% (126) | 80% (40) |

Table 6.12—VCs by Morphological Status

VC1: $\chi^2=31.2$, $df=4$, $p<0.001$

VC3: $\chi^2=15.7$, $df=4$, $p=0.003$

VC4: $\chi^2=25.1$, $df=4$, $p<0.001$

Affixes dominate VC4 raising (96%), proper nouns lead VC6 lowering (75%). Verb stems (VC4 N=37) show unexpected 100% raising.

The darker cells indicate fewer than five tokens, thus providing insufficient evidence to reveal any variation. In these cases, the percentage, if mentioned, does not mean anything, because too few tokens by definition are an indication of insufficient data to reveal any variation.

If the variable vowel in the morpheme is not in an affix, affix of proper noun, proper noun or verb stem, it is labeled as ‘Other’. This is done in order to separate the words that do not fall under any of the three categories that are expected to be raising (or lowering) blockers, which are ‘Affix’, ‘Affix of Proper Noun’ and ‘Proper Noun’.

The category ‘Verb Stem’ reveals whether vowel variation occurs at the ‘Verb Stem’ level or not.

Words under ‘Other’ can be seen as the control group, as they contain none of the blocking categories.

‘Affix of PN’ (proper noun) is a category separate from ‘Affix’ in order to find out whether the simultaneous presence of two potential blockers, i.e., ‘affix’ and ‘proper noun’, would have a cumulative double effect in vowel variation.

In VC1 (pre-N raising), variant vowels in affixes are only 38% likely to be raised and they are even less likely to be raised (10%) if they are part of an ‘Affix of Proper Noun’. This is consistent with the literature as two blockers (affix and proper noun) are at work in the latter situation.

Verb stems are the most likely (69%) to be raised, even more so than the ‘Other’ category, both of which do not contain any of the top three rows of variation blockers. This is consistent with the fact that most of the data is spoken interview, in which verb stems are likely to be reduced and/or undergo vowel variation. An example of a reduced verb (stem) is *æst* ‘is’ reduced to *e* and an example of a raised-vowel stem is *mande* ‘has stayed’ raised to *munde*.

However, the few proper nouns (9 tokens) are 67% likely to be raised. The hierarchy of blockers here is ‘Affix of PN’, ‘Affix’ and ‘Proper Noun’, respectively in descending order. This is in line with the expectations created by the literature, with ‘Affix of Proper Noun’ having a cumulatively increased blocking effect, while ‘Affix’ has a stronger blocking effect than ‘Proper Noun’.

VC2 (/ra/-raising) has not been listed because it is invariant.

VCs 3 (harmony raising) and 4 (low-front raising) show a similar trend to VC1 in the cells with sufficient tokens. VCs 5 (mid-front raising) and 6 (sandhi lowering) do not contain enough tokens to make variation analysis possible.

(See Table 14.4, Appendix C: Additional Tables for a complete list of all tokens of ‘affix’ and ‘affix of PN’.)

6.4.5. Etymological Origin

According to the literature, the etymological origins of words impact the probability of vowel raising in Persian (Modaressi 1978, Jahangiri 1980, etc.), with words of Persian origin being the most likely to undergo raising. When a word is of a non-Persian origin, it also matters whether the origin of the word is Arabic or a language other than Arabic. This is due to more than a millennium of contact between Arabic and Persian, which makes Arabic loanwords more internalized, and likely to trigger height variation, while European languages such as French or English have only in recent historical memory been lending words into Persian.

| ORIGIN | % (total N) | | | | |
|--------------------|-------------------------|------------------------------|--------------------------------|--------------------------------|------------------------------|
| | VC1: %[u] aN-raising | VC3: %[u] harmony raising | VC4: %[e] low-front raising | VC5: %[i] mid-front raising | VC6: %[æ] sandhi lowering |
| Arabic | 41% (27) | 76% (33) | 40% (10) | | 90% (20) |
| Non-Arabic Foreign | 12% (8) | 46% (215) | | 88% (8) | |
| Persian | 49% (613) | 58% (57) | 92% (216) | 63% (127) | 75% (102) |

Table 6.13—VCs by Origin

VC1: $\chi^2=15.3$, $df=2$, $p<0.001$

VC3: $\chi^2=20.5$, $df=2$, $p<0.001$

VC6: $\chi^2=8.9$, $df=1$, $p=0.003$

PERSIAN favors VC1 raising (49%), ARABIC leads VC6 lowering (90%). Words of NON-ARABIC FOREIGN (N=8) show limited patterns.

There are words in the data that are a mix of Persian and another language in terms of etymological origin. These were treated based on the origin of the stem. For example, only the suffix *-i* in the word *vorudi~vurudi* ‘entrance’ is Persian, with the stem being Arabic. This word was coded ‘Arabic’.

Table 6.13 above neatly fits the literature in VCs 1 and 4. VC3 shows more raising for Arabic-origin than Persian-origin words, although non-Arabic-origin foreign words are still the least varying.

VCs 5 and 6 have too few or no tokens in some cells and cannot be the basis of any solid analysis.

Overall, my data goes along with the literature that words of Persian, Arabic and non-Arabic foreign origins, respectively, are increasingly less likely to undergo raising except in the case of harmony raising, in which case Arabic-origin words are more likely to undergo raising than Persian-origin words, but foreign non-Arabic words are still the least likely.

Words such as *daneſgah* ‘university’, *særvan* ‘captain’ that were recent coinages more than 40 years ago (at the time of Jahangiri’s and Modarressi’s) research did not appear in my tokens. The similar word *daneſju* ‘university student’ appeared in the data without undergoing any raising.

6.5. Chapter Summary

The six variable contexts (VC) in which vowel height variation occurs were defined early in the chapter, which are up and down along the vertical front and back lines of the vowel chart (/i~/e~/æ/ and /a~/o~/u/). This was done while setting aside instances that could not be properly profiled as variation due to lack of sufficient data.

The linguistic environments in which variation is likely were presented. This, by itself, provides a linguistic explanation for the VCs, as they are constrained by their phonological context. In some cases, such as the variation of /æ~/i/ before back consonants, although the linguistic context can be well profiled, there is not sufficient variation in the data to include the VC for variationist analysis.

After profiling the VCs, the univariate correlation of vowel height variation on one hand and the linguistic factor groups of syllable distance, stress position, syntactic category, morphological status and etymological origin on the other hand were explored.

Syllable distance (from word end) in most of the data shows a trend towards syllables 0 and 1 (final or penultimate syllable).

In terms of stress position, the data overwhelmingly favors raising of vowels in pre-stressed syllables.

As far as syntactic category is concerned, most variation is clustered around the categories of noun, pronominal suffix and number, with VC4 being skewed in favor of verb.

Under morphological status, the categories of affix of proper noun, affix, proper noun, in descending order, block height variation the most.

There is insufficient overall data across VCs to make a definitive statement on how the etymological origin of a word or its stem may affect vowel height variation.

Only so much can be explained by the linguistic factor groups. Patterns likely to be revealed by the extralinguistic factor groups may shed more light on the variation in the data.

7. Chapter Seven: Results II: The Extralinguistic Factors

7.1. Chapter Introduction

Having completed an analysis of the data with linguistic factors, this chapter will shift the locus of analysis into the extralinguistic space by looking at any relationship between variation in the data and the factors outside of language.

7.2. The Extralinguistic Factors

Variation “studies began with the correlation of linguistic variables with major demographic categories.” (Tagliamonte 2012:25), such as social class, or socioeconomic status (SES). Age, gender, education, occupation and style are the other go-to nonlinguistic categories typically studied in any sociolinguistic research. “Different phonological variables are differently affected by the factors of age, gender, class, and rural versus urban origin, as well as being differently involved in stylistic marking.” (Sankoff 1980:73).

In this section, I will look at any possible effects of these extralinguistic, or non-linguistic, factors, as listed below, with the six variable contexts (VCs) examined already in correlation with linguistic factors:

- Age group
- Gender
- Education
- Occupational Group
- SES
- Style

7.2.1. Age Group

“Language use is intrinsically correlated with speaker age.” (Tagliamonte 2012:43). The exact mechanics can be examined in great detail by examining and comparing to each other the speech of various age groups.

In Persian, the word *ja-oftade*, which literally means ‘settled, established’ is commonly used to describe physiologically and/or mentally mature individuals. I have used this term to distinguish the age group of 36 to 45 years from the young adults 26 through 35 years of age, thus labeling the latter as ‘adult’ or ‘young adult’ and the former as ‘mature adult’ (*ja-oftade*). The youngest individuals among the interviewees, however, were 16 to 25 years of age, grouped as ‘youths’. This covers the speakers in their late teens as well as youths 20 through 25 years of age as provided below in tabular format both in terms of token count and percentage and in graph form by percentage.

| AGE GROUP | % (total N) | | | | | |
|---------------|------------------------|--------------------------|-----------------------------|-------------------------------|-------------------------------|-----------------------------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering |
| Youths | 54% (189) | 84% (45) | 48% (87) | 89% (81) | 69% (45) | 80% (35) |
| Young Adults | 43% (272) | 81% (63) | 51% (135) | 86% (83) | 59% (54) | 68% (50) |
| Mature Adults | 50% (187) | 84% (44) | 55% (83) | 95% (62) | 67% (36) | 89% (37) |

Table 7.1—VCs by Age Group

VC1: $\chi^2=6.5$, $df=2$, $p=0.039$

VC6: $\chi^2=7.9$, $df=2$, $p=0.019$

Youths lead VC1 raising (54%, $p=0.039$), mature adults favor VC6 lowering (89%). Other VCs show no age differences ($p>0.05$).

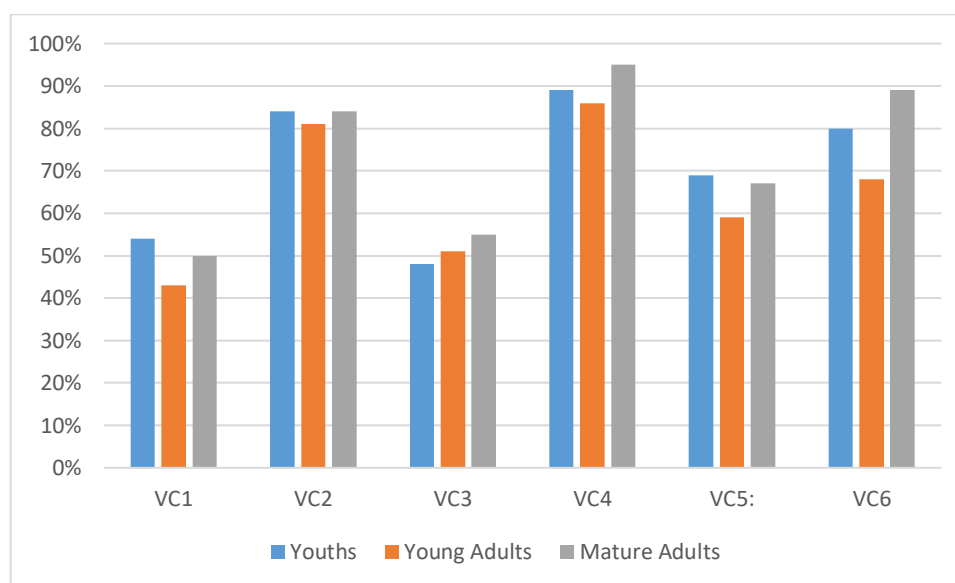


Figure 7.1—VCs by Age Group

As shown in Table 7.1, Youths are ahead of the older age groups in raising their vowels in the contexts of VC1, VC2, and VC5. However, Mature Adults lead the other groups in lowering their vowels under VC6 as well as raising their vowels in VC3 and VC4. Young Adults do the least raising or lowering. Variation, at least in this dataset, is not neatly ranked by age whether in the ascending or descending order, because Young Adults, being younger than Mature Adults, are behind the latter (except for VC3).

7.2.2. Gender

Gender is a one of the main categories researched and is perceived as a “fundamental” category “to any system of social categorization.” (Eckert 2000:55). Sociolinguistic studies have in fact, given rise to two “general principles of sexual differentiation” (Labov 1990:205), “that men use a higher frequency of nonstandard forms than women in stable situations, and that women are generally the innovators in linguistic change” (ibid.).

Moreover, the literature on variation in spoken Persian makes references to gender as a social factor group (Modaressi 1978, Jahangiri 1980, etc.). This will make it possible to compare any possible effect of the data presented here with the conclusions provided in the literature.

Having a proportionate male-to-female ratio in my data, in Table 7.2 I below have tabulated raising and lowering by gender.

| GENDER | % (total N) | | | | | | |
|--------|------------------------|--------------------------|-----------------------------|-------------------------------|-------------------------------|-----------------------------|---------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering | VCs 1-6 |
| Female | 49% (332) | 85% (86) | 51% (156) | 86% (114) | 59% (75) | 73% (64) | 67.12% |
| Male | 47% (316) | 80% (66) | 52% (149) | 93% (112) | 72% (60) | 83% (58) | 71.12% |

Table 7.2—VCs by Gender

VC4: $\chi^2=4.1$, $df=1$, $p=0.043$

VC6: $\chi^2=3.8$, $df=1$, $p=0.051$

Males show slightly higher VC4 raising (93%, $p=0.043$) and marginal VC6 lowering (83%, $p=0.051$). Gender effects are minimal overall.

Table 7.2 above provides, in each row, what percentage of the time females raise their vowels as compared to males. For example, in VC1, females raise their vowels 49% of the time but males, 47% of the time.

Although the percentages are close in some instances, one would overall expect to see males vary their vowels more than females in the data, which is in fact the case in VC3 through VC6, where the difference has gone up to 13% (in VC5). In VC1 and VC2, however, where the percentages are close, the females raise their vowels more than the males. Overall, however, the male speakers lead the female speakers by 4% in terms of vowel height variation.

7.2.3. Education

Of the factor groups external to language that can explain linguistic variation is “membership in different social groups, such as [...] level of education [...]” (Walker 2010:53). Considering that the institution of education itself is mainly language-based in the sense of highly focusing on the formal use of language, it is no surprise that it affects language, while it can be used to “evaluate social status” (Modaressi 1978:11).

Education is a very important category for the additional reason that BP is a variety of Persian, the active use of which requires education. Although the uneducated ear can process, say, national news that is spoken on TV in BP, the active use of BP requires education that is mostly received in public schools throughout the nation.

There were no interviewees with less education than high school. Those with a university degree mostly held a bachelor’s degree followed by those with a master’s degree. There is a single associate degree holder under each gender, no PhD holder under female and a single PhD holder under male. It would make sense to merge associate and bachelor’s degrees into ‘undergraduate’, and master’s and PhD into ‘graduate’. This is something I have done in Chapter 11.3 (where I conduct a multivariate analysis of ‘The Extralinguistic Factors’). However, the data from the single PhD-holding interviewee is worth examining separately here, which is why the categories have not yet been merged here for the univariate analysis. However, they have been highlighted in darker gray to distinguish it from the rest of the data.

Table 7.3 tabulates vowel variation in correlation with education:

| EDUCATION | % (total N) | | | | | |
|-------------|------------------------|--------------------------|-----------------------------|-------------------------------|-------------------------------|-----------------------------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering |
| High School | 63% (177) | 86% (35) | 65% (51) | 96% (94) | 82% (33) | 82% (39) |
| Associate | 49% (41) | 80% (15) | 59% (27) | 70% (10) | 67% (9) | 80% (5) |
| Bachelor's | 47% (230) | 91% (44) | 52% (116) | 77% (62) | 56% (48) | 74% (42) |
| Master's | 37% (174) | 77% (52) | 40% (102) | 95% (57) | 57% (42) | 76% (33) |
| PhD | 38% (26) | 67% (6) | 78% (9) | 100% (3) | 100% (3) | 100% (3) |

Table 7.3—VCs by Education

VC1: $\chi^2=16.8$, $df=4$, $p=0.002$

VC3: $\chi^2=13.9$, $df=4$, $p=0.008$

High schoolers favor VC1 raising (63%), PhD person favors VC3 harmony (78%). VC6 is unaffected ($p=0.486$).

Considering that BP is promulgated through the education system, one would expect a higher level of education to correlate with greater use of BP and less height variation. In other words, one would expect the most raising (or lowering) from those with the least education, as increasing education exposes one to more BP. This would ideally sort the highest numbers on the top row for 'High School' and the lowest numbers at the bottom for the only PhD-holding speaker.

The individual with the highest degree of education is showing a linguistic performance in VCs 3, 4, 5 and 6 counter to the expectation. Yet, the small number of tokens makes any such evaluation at best hypothetical, pending collection of more data. This further justifies collapsing the data from the only PhD holder with those with a master's degree under a broader category of 'graduate'.

Setting aside the only PhD holder, the remainder of the data in each VC sits well with the pattern of more vowel height variation being inversely proportional to the degree of education, with high school graduates showing overall more vowel variation (raising and lowering) than the more highly educated.

7.2.4. Occupation Group

In order to achieve the largest understanding of what is going on in terms of variation, the method of investigation should be so that it allows accurate alignment and comparison of the results with those in other communities. "This aim is best achieved by a controlled study of the speech production of a random sample of individuals stratified by objective measures" of which "occupation" is one (Labov 1990:208).

Occupation, along with education and a combination of other factors (such as income, residence, etc.) determine social class (ibid.:209), which is where the social correlates of variation can be sought. Studies of “socioeconomic and stylistic stratification of variables over large populations” (Eckert 2000:17) bring to light the dynamic between language and class. Class stratification is manifested between the opposing forces at the two extremes of the vernacular, on one hand, and the standard language, on the other hand. In these competing linguistic markets, the vernacular is “the source of regular sound change” and the standard “a locus of resistance to change” (ibid.)

VTP is the vernacular and BP the underlying standard Persian form. The numbers will hopefully clarify how precisely this alignment fits the data.

The occupations of the speakers in this research are listed below in Table 7.4.

| OccGroup | Occupation |
|--------------------------|---------------------|
| S(elf-employed) | businessperson |
| | homemaker |
| W(hite Collar) | accountant |
| | computer programmer |
| | engineer |
| | law grad |
| | office worker |
| | student |
| T(eaching or text-based) | musician |
| | psychologist |
| | teacher |
| | translator |

Table 7.4—Occupation and Groups

Based on how much a person in an occupation interacts with written texts and/or language in general and the way the occupations are perceived in Iran, the occupations were grouped together based on whether an occupation is text-based, non-text-based self-employed or white-collar in general. The single interviewee who is a ‘musician’ was also a music teacher and was treated as T; homemakers also as self-employed. The psychologist was put in ‘text-based’, because she mainly taught counseling courses to parents and families. In other words, the persons under ‘text-based’ have a direct conscious focus on

language by virtue of their careers. This is in line with the concept of the ‘linguistic market’ or ‘linguistic marketplace’ (Bourdieu 1977, Sankoff and Laberge 1978).

| OCCUPATION GROUP | % (total N) | | | | | | |
|------------------|------------------------|--------------------------|--------------------------------|----------------------------------|----------------------------------|--------------------------------|----------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering | VCs 1-6s |
| Self-Employed | 61% (109) | 87% (15) | 72% (25) | 94% (48) | 69% (91) | 72% (213) | 75.83% |
| White Collar | 44% (390) | 83% (98) | 50% (216) | 90% (136) | 62% (16) | 59% (931) | 64.67% |
| Text-based | 49% (149) | 82% (39) | 50% (64) | 83% (42) | 50% (28) | 58% (322) | 62.00% |

Table 7.5—VCs by Occupation Group

VC1: $\chi^2=11.5$, $df=2$, $p=0.003$

VC4: $\chi^2=13.8$, $df=2$, $p=0.001$

SELF-EMPLOYED lead VC1 raising (61%), white-collar workers dominate VC4 (90%).

One would expect the least height variation from BP in the T category and the most in S. This is a pattern supported by the data in VC2, VC3, VC4, and VC6. In VC1, T and W have switched places, and in VC5, W and S but with only a slight difference. Overall, however, the SE group being the least text-based leads the other two groups with a 75.83% vowel height variation rate.

7.2.5. SES

The speakers fell into 4 SES (socioeconomic status) categories, being W (working), LM (lower middle), M (middle) and UM (upper middle) classes, as detailed in Table 7.6 below:

| Gender | Female Total: 16 | | | | Male Total: 15 | | | |
|--------|---------------------|----|----|----|-------------------|----|---|----|
| | W | LM | M | UM | W | LM | M | UM |
| SES | 1 | 4 | 10 | 1 | 0 | 4 | 8 | 3 |

Table 7.6—The Genders by Education

The interviewee’s SES was determined based on a combination of factors such as home ownership and neighborhood, car ownership and car make, and own, parents’ or spouse’s income (including being

able to afford to send child abroad to study on one’s own dime). This method was an adaptation based on similar studies, e.g. Eckert (2000:107), where “socioeconomic index was constructed for fathers, based on a combination of home value and father’s education and occupation.”

Such information is not necessarily acquired directly throughout the interview and may have been obtained outside of the interview based on conversations, indirect information or in-person interaction between the interviewer (myself) and the interviewee.

Variation by SES is tabulated below in Table 7.7:

| SES | % (total N) | | | | | | |
|--------------------|------------------------|--------------------------|--------------------------------|----------------------------------|----------------------------------|--------------------------------|----------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering | VCs 1-6s |
| Working Class | 65% (46) | 75% (8) | 88% (8) | 100% (22) | 100% (3) | 77% (13) | 84.00% |
| Lower Middle Class | 52% (133) | 77% (30) | 45% (62) | 85% (54) | 53% (30) | 67% (24) | 63.17% |
| Middle Class | 45% (379) | 86% (94) | 53% (191) | 88% (133) | 67% (79) | 79% (73) | 69.67% |
| Upper Middle Class | 47% (90) | 80% (20) | 48% (44) | 100% (17) | 65% (23) | 92% (12) | 72.00% |

Table 7.7—VCs by Socioeconomic Status

VC1: $\chi^2=10.9$, $df=3$, $p=0.012$

VC4: $\chi^2=16.3$, $df=3$, $p=0.001$

Working class favors VC1 raising (65%), upper-middle class leads VC4 (100%).

VC1 (pre-N raising), comprising 48% of the data, seems to neatly confirm the expected class stratification of variation inversely proportionately relating with social class, i.e., the higher the social class, the less the vowel height variation, with an insignificant discrepancy at the higher end of the stratification, as the UM speakers show a 2% more variation than the M speakers. There is a similar trend in VC3 and VC5, with the W speakers having the most variation, with small bumps upward along the SES strata. However, VC2, VC4 and VC6 do not conform even loosely to the expected trend.

The conclusion is that, despite the overall trend of less variation with higher SES, the data is not solid on the relationship between SES and vowel height variation in TP.

7.2.6. Style

Throughout each interview, there was a series of words, phrases and sentences in English that were read out loud to the interviewees for them to orally translate into Persian (‘Oral Translation’). The same list was given to each interviewee as a ‘Written Translation’ section after the interview was over. The oral and written translations make it possible to compare the linguistic responses of the speakers (interviewees) in

spoken and written activities and to keep an eye for any differences between their performance in spoken versus written language forms. This also makes it possible to specifically focus on answering the question, ‘Do speakers behave linguistically differently in speaking as opposed to writing?’, which is significant considering that BP is tightly tied to written Persian while VTP is the farthest one can get from written Persian on the style continuum.

Speakers 24, 29 and 30 were blue-collar individuals and were not asked any oral translation questions or given the written translation list to translate, as they seemed unlikely to know sufficient English to engage in said oral or written translation. Moreover, culturally speaking, expecting knowledge of the English language and having asked them the translation questions orally or given them the written translation list to translate in writing would have come across as inappropriate, unaccommodating or snobbish if not outright condescending or humiliating.

Speaker 18 was not asked for education level or job. However, he was schoolmates with Speaker 5, who was a master’s degree student. Therefore, I listed him as a master’s degree student as well because it was in the conversations outside the interview in the presence of both of them that they were classmates.

The results are provided below in tabular format both in terms of token count and percentage and in graph form by token count.

| STYLE | % (total N) | | | | | |
|--------------|------------------------|--------------------------|-----------------------------|-------------------------------|-------------------------------|-----------------------------|
| | VC1:%[u] aN-raising | VC2:%[o] /ra/-raising | VC3:%[u] harmony raising | VC4:%[e] low-front raising | VC5:%[i] mid-front raising | VC6:%[æ] sandhi lowering |
| A: Casual | 65% (233) | 100% (31) | 97% (31) | 86% (118) | 90% (29) | 81% (57) |
| B: Careful | 52% (236) | 100% (68) | 77% (154) | 96% (79) | 85% (60) | 86% (36) |
| C: Formal | 45% (33) | 100% (3) | 100% (3) | 92% (13) | 100% (7) | 100% (5) |
| D: Quotative | 16% (146) | 48% (50) | 4% (117) | 81% (16) | 8% (39) | 54% (24) |

Table 7.8—Style: (a)- raising (/a/→[a]~[u])

VC1: $\chi^2=48.2$, $df=3$, $p<0.001$

VC3: $\chi^2=125.7$, $df=3$, $p<0.001$

Casual speech favors VC1 raising (65%), formal contexts maximize VC3 harmony (100%).
Quotative style diverges sharply (VC1: 16%).

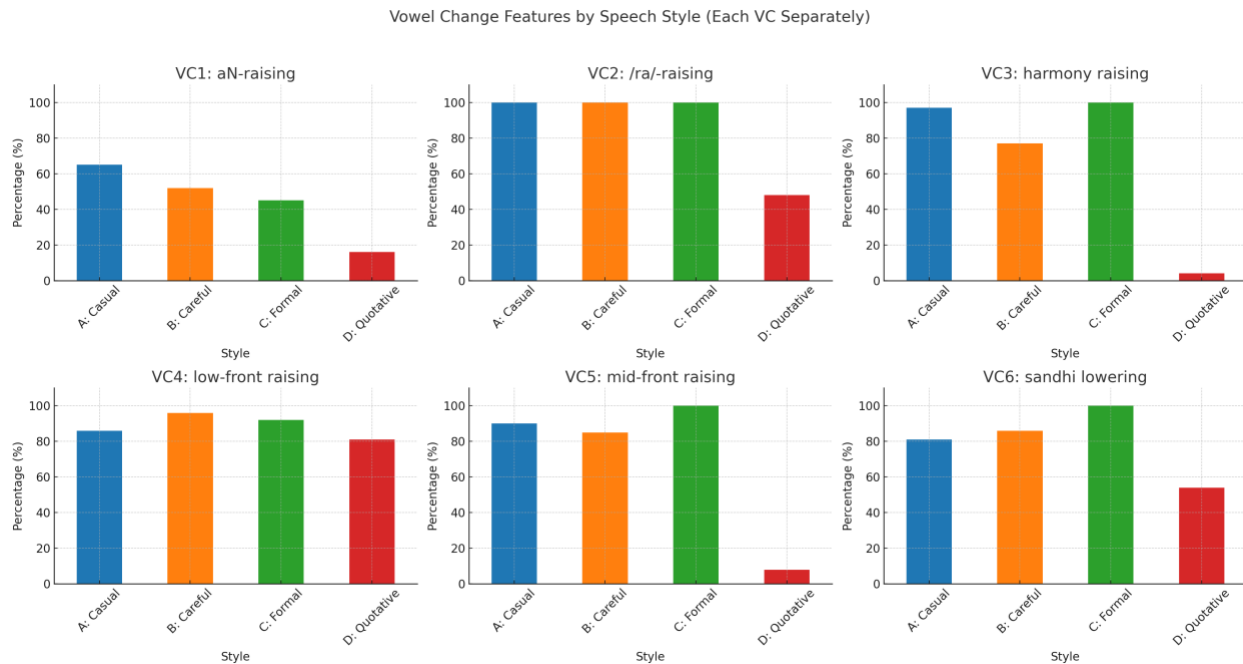


Figure 7.2—VCs by Style

The style continuum increases in formality from A to D, with A being the most casual and D the least casual, or A being the least formal and D the most formal.

VCs 1 and 2 reveal a pattern of variation that is neatly in conformity with the literature, as most variation occurs in A and the least in D. The same can be said about VC3 if the 3 tokens of C (too few tokens) are taken out of the equation. VCs 5 and 6 still show the highest rate of raising in A and the least

under D with bumps along the spectrum. VC4 still shows the least variation on the D end of the spectrum although A through C are slightly erratic.

In VC2, which is about the object particle /ra/, it is 100% of the time raised in styles A, B and C and rarely not raised in style D. This seems to indicate a process of near-completed change.

Overall, the data sits well with the expectation that an increasing degree of formality in style is associated with a decreasing degree of vowel height variation in TP.

7.3. Chapter Summary

This chapter analyzed the correlation of vowel height variation in Tehran Persian and the extralinguistic factors of age group, gender, education, occupational group, SES (Socio-Economic Status) and style.

Under the age group, the youths are ahead of the older age groups in raising their vowels in certain VCs but not the other VCs. Therefore, in a univariate analysis, age cannot consistently account for rates of height variation across all the tokens.

When comparing the rates of vowel height variation between male and female speakers, male speakers demonstrate a marginally higher rate, exceeding female speakers by a negligible 4%, a difference that is not statistically significant.

In terms of education, setting aside the only PhD holder, the remainder of the data in each VC sits well with the pattern of more vowel height variation being inversely proportional to the degree of education, with high school graduates leading the other more highly educated speakers in terms of vowel raising or lowering.

Among the occupation groups studied in the categories of Self-Employed, White Collar and Text-based, one would expect the least height variation from BP in the T category and the most in S. The 75.83% vowel height variation rate in the S group fulfills this expectation. The S speakers vary their vowel heights 10% more than the W or T groups.

In terms of SES, the data is not solid across all VCs and one cannot make a definitive statement of the correlation of SES and vowel height variation in this univariate analysis.

In terms of style, overall, the data sits well with the expectation that an increasing degree of formality in style is associated with a decreasing degree of vowel height variation in TP even in a univariate analysis.

8. Chapter Eight: Results III: Multivariate Modeling of VHV

8.1. Chapter Introduction

In the previous chapters, I analyzed vowel variation in correlation with single linguistic or extralinguistic variables, with which I could examine the distribution of variants within each factor group. However, factor-by-factor analysis does not take into consideration the possible interaction of each factor group with other factor groups. Therefore, in this chapter I will examine the effect of each factor group when considered along with other factor groups, using multivariate analysis. As valuable as univariate analysis is, the ultimate goal of quantitative analysis is to arrive at a picture of vowel variation that takes into consideration multiple correlations, be it intra-or extra-linguistic. We need to know which factor groups are affecting the data more than the others. It may be the case that the weight of certain factors is too insignificant and the variation overall can be explained by the contribution of certain factors, and not all, or could potentially be the case that each factor group contributes proportionately to the overall variation.

In order to achieve this goal, we need to conduct a multivariate analysis, “which assesses the individual relative contribution of each factor to the observed variation when all factors are considered simultaneously” (Walker 2010:38)

There are various types of multivariate analysis. Nevertheless, for more than three decades, the variable rule program has been the predominant analytical tool in linguistics to analyze the impact of multiple factors on linguistic variables. The most popular version of the program has been GoldVarb (Johnson 2019:359). Yet, a new version of the variable rule program, called Rbrul, is now available, which provides more flexibility and is in line with the wider community of quantitative linguistics. (Johnson 2009:359) GoldVarb and Rbrul make use of binomial stepwise logistic regression. The Rbrul program (of which I used the more user-friendly version of the program that is called ‘Shiny Rbrul’, version 2019) is used in this research to conduct the analysis to determine the best-fitted multivariate model.

8.2. The Linguistic Factors

In my data, each variable context (VC) is distinguished from the other VCs by linguistic context. For example, VC1 is pre-N raising while VC2 is only /ra/-raising. Therefore, running them together would

result in collinearity effects that would impact the models deleteriously. Consequently, a separate linguistic multivariate model needs to be built for each VC.

In multivariate analysis, multiple variables are analyzed together in a statistical model of logistic regression which calculates the relative contribution of each factor to the observed variation as factor weight values that range from 0 to 1 and are centered on 0.5. A factor weight that is closer to 1 is interpreted as ‘favoring’ the application value while, if closer to 0, it is considered as ‘disfavoring’ the value. According to analysts, anything over .50 favors and anything under .50 disfavors the application of the rule. (Tagliamonte 2006:145)

Nowadays it is more common to use mixed-effects models of regression, which include random effects such as speakers. “One statistical critique of regression models without random effects is that outliers can affect reported trends. In contrast to simple regression models, mixed effects modeling allows individual speakers to vary in the model as ‘random effects’.” (Drager et al (2012:59) This allows us to test to find out whether the ways groups differ is robustly supported by the dataset and not carried merely by one or two individuals in the sample population. However, the second and perhaps more important reason to use mixed effects modeling is that such ways of modeling “provide a way of studying group patterns, while also investigating variation at the individual level.” (Ibid.) The mixed effects model implemented in Rbrul “allow for multiple predicting factors (called ‘fixed effects’ in a mixed effects model).” (Drager et al 2012:62)

The speaker is included as a random effect in this and all the subsequent multivariate models. “Including a speaker random effect takes into account that some individuals might favor a linguistic outcome while others might disfavor it, over and above (or ‘under and below’) what their gender, age, social class, etc. would predict.” (Johnson 2009:365). The multivariate models here were done first without speaker as random effect but were repeated by including speaker as random effect, which resulted in observing a slight improvement in the goodness of fit of the model. This is due to the fact that individual variation can inflate the appearance of external effects, which is prevented by including speaker as random effect in the model (ibid.). What is presented here is the latter, i.e., the multivariate models with speaker as random effect.

The fixed effects consist of the independent variables (IVs) included in the model. Ideally, they have some sort of generalizable predictive effect on the dependent variable (DV) and there is sound theoretical reason to include them as distinct variables in the first place. Speaker or lexical item-as-random-effect are not truly ‘random’ in the sense that the information was stochastically generated. The speakers said what they said, and that information exists in the dataset, but fixed effects models have no way to represent that information other than binning it inside the IV’s that I define. Let’s say I identify gender as a variable for analysis and find that it has a high significance in my model (say in the $p=1e-60$ range) and a strong effect (factor weight of approximately 0.68). In a fixed effects model, this predictor gets applied across the entire dataset, ignoring intra-speaker variation and has no way to model that information.

With random-effects modeling, I am running the analysis with those variables not across my entire population sample, but within each level of my population sample. So, if I have 50 speakers in a dataset and build a mixed-effects model, I am running it against the entire dataset, and then 50 more times within the data provided by each speaker, in order to represent the idea that something like gender will not necessarily have a statistical effect on the speech of every member of the population, but there can be differences. This will generate 51 different regression lines and, when combined (averaged), it is more complicated than just finding the mean of the slopes of every line. This will generally output smaller, more conservative numbers than a fixed-effects model alone. That p-value might decrease by several orders of magnitude to $1e-45$ (well below $p<0.0001$), the effect size might decrease from a 0.68 to 0.65 but still significant and worth reporting.

More marginal variables might be rendered insignificant or shown to lack any real effect or explanatory power, but those are typically the ones that were very weak to begin with. By introducing some ‘noise’ in the form of intraspeaker variation into the inherently classical logic of the fixed effects model, we report the effects of variables a little more conservatively, we are much less likely to report a false positive (identifying a cause and effect where none actually exists) at a slightly higher risk of reporting a false negative (missing a legitimate cause and effect).

8.2.1. VC1 (aN-Raising) Multivariate Analysis: Linguistic

There are 25 pronominal suffixes and 4 numbers in VC1 (aN-raising) in the data. The ordinal and cardinal numbers were coded separately in the beginning but were later merged due to the small number of tokens in each category. All the 25 pronominal suffixes and the 4 numbers are raised 100% of the time. There is also a single token of a preposition that is not raised. These were excluded from the model as they showed no variation.

The results, after making the above adjustments, indicated that in VC1, defined phonologically as aN-raising, syntactic category and syllable distance, in the same order, are the only two categories that can predict raising as depicted in the best-fitted model.

In stepwise regression, the order of selection can tell you the relative importance of each significant factor group in the model. Rbrul provides an estimate of the probabilities of the factor groups to the model, which also gives an indication of relative importance. Rbrul no longer supports stepwise analysis. However, adding the variables manually one at a time in order of statistical significance allowed me to check what effect adding a new IV to the model had on the other variables, and the relative goodness-of-fit versus other potential models (via AIC¹⁷) and explanatory power (via R²) of the model as a whole. It is also to be noted that, at every step of the analysis, I was able to quickly identify interaction effects between variables. IVs that looked promising at first were ruled out when I checked them against each other for collinearity. It is also to be noted that, at every step of the analysis, I was able to quickly identify interaction effects between variables. IVs that looked promising at first were ruled out when I checked them against each other for collinearity. Crossing all variables can create many cells with minimal or no data, which leads to unreliable statistical analyses. This is a common issue when examining many linguistic and extralinguistic factors. For example, the cross-tabulation of various factor groups revealed too many empty cells for the analysis of lowering.

I would probably have obtained the same or similar results from doing the analysis this way as opposed to doing an automated stepwise analysis, but it does mean that there is no ‘best stepping-

¹⁷ AIC, or Akaike Information Criterion, is a metric to select and evaluate a model relative to other models by balancing goodness-of-fit and model complexity, with lower AIC values indicating a better model fit (Larski 2020).

up/stepping-down' run to report, and no real order of selection beyond predictor strength in potential predictors, which is reflected in the p-values of each variable.

Model Basics

| Total N | df | Intercept | Input Probability | Grand Proportion |
|---------|----|-----------|-------------------|------------------|
| 618 | 8 | 0.983 | 0.728 | 0.46 |

Current Predictors

| deviance | AIC | AICc | Somers.Dxy | R ² |
|----------|---------|---------|------------|----------------|
| 599.639 | 615.639 | 615.876 | 0.628 | 0.5 |

| Syntactic Category | Logodds ¹⁸ | N | Proportion | Factor Weight |
|----------------------|-----------------------|-----|------------|---------------|
| Determiner | 2.881 | 43 | 0.977 | 0.947 |
| Verb | 1.862 | 83 | 0.952 | 0.866 |
| Pronoun | 0.608 | 48 | 0.792 | 0.647 |
| Adverb | -1.367 | 6 | 0.333 | 0.203 |
| Adjective | -1.949 | 29 | 0.31 | 0.125 |
| Noun | -2.035 | 409 | 0.279 | 0.116 |
| <i>p < 0.0001</i> | | | | |

| Syllable Distance | Logodds | N | Proportion | Factor Weight |
|----------------------|---------|-----|------------|---------------|
| 1 | 0.594 | 244 | 0.541 | 0.644 |
| 2+ | -0.279 | 95 | 0.484 | 0.431 |
| 0 | -0.315 | 279 | 0.38 | 0.422 |
| <i>p < 0.0001</i> | | | | |

Notes: Not selected as significant: stress position, morphological status, etymological origin
 Table 8.1—Best Fitted Multivariate Model of Linguistic Factors contributing to Vowel Raising in VC

According to the multivariate model shown in Table 8.1, SD (syllable distance) and SC (syntactic category) are selected as significant to raising in aN-raising. Among the syntactic categories, determiners and verbs, respectively, are the most favoring category to trigger raising and nouns, the least. Adverbs do not seem to favor raising. Yet, considering the small adverb token count, one would need to collect more data on this category to make a more definitive statement regarding the status of adverbs and raising in aN-raising in VTP.

In terms of syllable distance (from word-end), words with a SD of 1 (words whose variable syllable is 1 syllable before the final syllable, i.e., words with penultimate variable syllable) are the most probable

¹⁸ **Logodds** are a transformation of probabilities (natural logarithm of the odds of an event occurring) that makes them easier to use in statistical modeling, i.e. the ratio of the probability of an event happening to the probability of it not happening. Positive log odds indicate that the category is associated with an increased likelihood of the outcome (vowel height variation), while negative log odds indicate a decreased likelihood.

to be aN-raised. Interestingly, $SD = 0$, i.e., words whose aN syllable is the same as the final syllable, are the least probable to be raised while words with a SD of 2 are in between.

Both SD and SC are clearly shown to be significant in the model due to their P values being well below the cut-off point of 0.05. The log-odds of both of these independent variables in the model indicate large effect sizes as well.

Morphological status is collinear with syntactic category (SC) in many ways for obvious reasons, which explains why it could not contribute significantly to the model and did not become part of the best-fitted model. For example, a ‘proper noun’ under morphological status corresponds with ‘noun’ under SC, and so on. This is why ‘morphological status’ was left out of the multivariate analysis model.

The invariant categories, i.e., those showing 0 or 100% in cross-tabulation, were removed from the model because of the very fact that they did not show variation. Despite the reasonably large number of tokens, certain categories did not show much variation in the cross-tabulation of SC and SD. For example, ‘pronominal suffixes’ always attach to the end of the word and are often reduced to one syllable. Therefore, their SD will always be 0, e.g. *ba-fun* ‘with them’.

8.2.2. Multivariate Analysis of the Remaining VCs: Linguistic

VC2 (/ra/-raising) is the variable context limited to the raising or non-raising of the object marker /ra/, and, therefore, linguistically invariant. Consequently, it cannot be analyzed for linguistic variation. However, this VC will be examined in correlation with the extralinguistic factors in the next chapter.

Vcs 3 through 6 each have too few tokens to register sufficient variation. This is clearly revealed in the cross-tabulations of the various factors, in which there are too many cells with the value of 0. The value 0 in a cross-tabulation cell indicates that there is no token for the two factors involved. For example:

| <i>Syntactic Category</i> | <i>Syllable Distance</i> | | | <i>Total</i> |
|---------------------------|--------------------------|----------|-----------|--------------|
| | <i>0</i> | <i>1</i> | <i>2+</i> | |
| Adjective | 1 | 2 | 5 | 8 |
| Adverb | 0 | 1 | 3 | 4 |
| Noun | 1 | 158 | 129 | 288 |
| Number | 1 | 0 | 0 | 1 |
| Pronoun | 0 | 0 | 1 | 1 |
| Verb | 0 | 3 | 0 | 3 |
| <i>Total</i> | 3 | 164 | 138 | 305 |

Table 8.2—Cross-Tabulation of Syllable Distance and Syntactic Category

As presented in Table 8.2 above, there are too few tokens in several cells and many zeros in several other cells in the cross-tabulation of syllable distance and syntactic category. There are almost no tokens for Adjective, Adverb, Number, Pronoun or Verb for any syllable distance (0, 1 or 2+). Consequently, these three factors cannot be used to generate separate regression models due to lack of sufficient data to support robust statistical analyses.

Vcs 1 through 5 (raising) or 1 through 6 (raising as well as lowering) cannot be grouped together to render enough tokens in the various cells in order to build a multivariate linguistic model because of the very fact that each of them is distinguished from the others by linguistic environment in the first place. Therefore, their distinctions cannot be the basis for putting them together in a model that assumes similarity in linguistic environment. However, they can be put together for building a model of the extralinguistic factors, as it will be clarified in Section 11.3.

11.3. The Extralinguistic Factors

In the multivariate models under the linguistic factors in the previous section, the variable contexts were looked at separately, since the analysis, by definition, was based on the linguistic distinction between the various VCs. Under the extralinguistic multivariate models, the variable contexts are grouped together by their shared feature of raising, lowering or both raising and lowering and the analysis is conducted based on the correlation of any of these with extralinguistic, or nonlinguistic, factors.

To this end, the analysis will be divided into two parts. each based on a separate model. The first one will consist only of raising (VCs 1 through 5) and the second one will include raising as well as lowering (VCs 1 through 6). In other words, the first model will be of vowel raising and the second, of vowel height variation (both raising and lowering). One would think that a separate multivariate model for lowering would be in order. However, the cross-tabulation of the various factor groups revealed too many empty cells. In other words, there is not enough lowering tokens to fill most of the cross-tabulated cells to provide a fitting model for lowering only.

In the Education factor group among the extralinguistic factors, I merged the ‘PhD’ and ‘Master’s degree’ into ‘graduate’ and ‘associate degree’ and ‘bachelor’s degree’ into ‘undergraduate’ because of the low token numbers in PhD and associate degree.

11.3.1. Multivariate Analysis of the Nonlinguistic Factors: Raising VCs 1 through 5, which indicate raising, were put together in this model, to the exclusion of VC6, which is lowering.

Model Basics

| Total N | df | Intercept | Input Prob | Grand Proportion |
|---------|----|-----------|------------|------------------|
| 1466 | 6 | 0.411 | 0.601 | 0.604 |

Current Predictors

| Deviance | AIC | AICc | Somers.Dxy | R2 |
|----------|----------|----------|------------|-------|
| 1583.404 | 1595.404 | 1595.462 | 0.506 | 0.288 |

Style

| | Logodds | N | Proportion | Factor Weight |
|----------------------|---------|-----|------------|---------------|
| A | 0.749 | 442 | 0.769 | 0.679 |
| B | 0.669 | 597 | 0.73 | 0.661 |
| C | 0.368 | 59 | 0.678 | 0.591 |
| D | -1.786 | 368 | 0.188 | 0.144 |
| <i>p < 0.0001</i> | | | | |

Education

| | Logodds | N | Proportion | Factor Weight |
|----------------------|---------|-----|------------|---------------|
| High School | 0.42 | 390 | 0.746 | 0.603 |
| Undergraduate | -0.115 | 602 | 0.57 | 0.471 |
| Graduate | -0.305 | 474 | 0.53 | 0.424 |
| <i>p < 0.0001</i> | | | | |

Table 8.3—Best Fitted Multivariate Model for Vowel Raising (VCs 1 through 5) in TP by Extralinguistic Factors

Style and education, in the same order, are the two predictors of raising. Higher education level is strongly correlated with less raising. The same applies to Style, in the sense that most raising occurs in Style A, which is the most casual, and the least raising in Style D, which is the least casual. (The style array is fully explained in ‘The Methodology’ (4.3) in Chapter 4 (Chapter Four: Method and Data) under section ‘Chapter Five: More on Style’ (5’).)

The education categories were collapsed into three, including the only PhD holder under the category ‘Graduate’. The resulting table for education neatly fits the expectation that increasing education is proportionately inverse to the degree of raising.

The factor group ‘Occupation Group’ does not include a sufficient variety of occupations to reveal any patterns of correlation. The result could have been different had I interviewed people from more various occupations.

11.3.2. Multivariate Analysis of the Extralinguistic Factors: Raising and Lowering

The following multivariate model was built for the correlation of the extralinguistic factors on one hand and both raising and lowering, i.e., all vowel variation, in the TP data, on the other hand.

Model Basics

| Total N | df | Intercept | Input Prob | Grand Proportion |
|---------|----|-----------|------------|------------------|
| 1588 | 6 | 0.487 | 0.619 | 0.617 |

Current Predictors

| Deviance | AIC | AICc | Somers.Dxy | R ² |
|----------|----------|----------|------------|----------------|
| 1722.543 | 1734.543 | 1734.596 | 0.493 | 0.27 |

Style

| | Logodds | N | Proportion | Factor Weight |
|----------------|---------|-----|------------|---------------|
| A | 0.702 | 499 | 0.774 | 0.669 |
| B | 0.628 | 633 | 0.738 | 0.652 |
| C | 0.399 | 64 | 0.703 | 0.598 |
| D | -1.729 | 392 | 0.209 | 0.151 |
| $p = 9.62e-74$ | | | | |

Education

| | Logodds | N | Proportion | Factor Weight |
|----------------|---------|-----|------------|---------------|
| High School | 0.406 | 429 | 0.753 | 0.6 |
| Undergraduate | -0.12 | 649 | 0.582 | 0.47 |
| Graduate | -0.286 | 510 | 0.547 | 0.429 |
| $p = 5.20e-05$ | | | | |

Table 8.4—Best Fitted Multivariate Model for Raising and Lowering (VCs 1 through 6) by Extralinguistic Factors

Therefore, according to the multivariate model, style and education are, respectively, the most important predictors of VHV.

The model turned out to be as expected. Higher education level attained is strongly correlated with less height variation. The same applies to style, in the sense that most vowel height variation (raising and lowering) occurs in Style A, which is the most casual, and the least raising in Style D, which is the least casual.

The table for education (now with ‘graduate’ including ‘PhD’) clearly shows that increasing education and vowel height variation are inversely related.

The significant observation from comparing the last two models is that lowering does not change the way vowel height variation interacts with extralinguistic factors. In other words, lowering follows the

same sociolinguistic (extralinguistic) trend that raising does in Tehran Persian. This means that speakers of Persian raise their vowels for similar reasons that they lower their vowels.

11.4. Chapter Summary

Using mixed-effects logistic regression models in this chapter, I conducted multivariate analyses of the linguistic as well as the extralinguistic factors on vowel height in Tehran Persian. At first, I created a model focused on raising, while the second model added lowering as another outcome variable. Here I summarize the main findings of the models, first focusing on the linguistic factors and then the extra-linguistic factors.

11.4.1. Linguistic Factors:

In VC1, both syllable distance and syntactic category are the only significant predictors of aN-raising. Determiners and verbs significantly favor raising, whereas nouns do not. Words with a penultimate variable syllable are the most likely to be raised, while those ending in the variable syllable are the least likely. The exclusion of morphological status from the model is justified by its collinearity with syntactic category, and invariant categories were removed due to their lack of variation. This analysis provides a robust understanding of the factors influencing aN-raising, although further data, especially on adverbs, is needed for more comprehensive insights.

For VC3 through VC6, the data is limited due to low frequency and zero counts of some factors. Separate regression models for these factors are not possible due to lack of statistical support. VCs 1-5 (raising) or 1-6 (raising and lowering) cannot be grouped together for a linguistic model, as they have different linguistic environments. However, they can be grouped for an extralinguistic model, as explained in Section 10.3.

11.4.2. Extra-Linguistic Factors

The multivariate analysis of extra-linguistic factors only for raising shows that style and education are the two key predictors of pre-N raising. Higher education levels correlate strongly with less raising, while style influences the degree of raising, with Style A (most casual) showing the most raising and Style D (least casual) showing the least.

With lowering added to raising in the multivariate model, style and education continue to remain the most significant predictors of vowel height variation (VHV). Higher education levels correlate with less height variation, while style influences VHV, with the most variation in Style A (most casual) and the least in Style D (least casual). By collapsing education categories and categorizing the sole PhD holder as 'Graduate,' the data confirms that higher education inversely relates to VHV.

A key finding of this analysis is that lowering does not change how VHV interacts with extralinguistic factors. Both raising and lowering follow the same sociolinguistic trends in Tehran Persian, indicating consistent language-external conditioning of vowel variation, regardless of the direction of shift.

12. Chapter Nine: Summary and Conclusions

This chapter provides a short summary of the dissertation and the results it has provided, pulling all the results together in one place to interpret them, returning to the questions that motivated this research.

The research reported in this thesis represents an attempt to understand the linguistic and extra-linguistic factors that condition vowel height variation (VHV), both raising and lowering, in Tehran Persian (TP), the *de facto* standard form of spoken Persian in Iran. TP can be seen as representing a continuum, ranging from Vernacular Tehran Persian (VTP) on one end, and Bookish Persian (BP), on the other end, the latter being a variety the active command of which is acquired mostly through education. The characterization of BP as such rather than as written or formal Persian is a conceptual and terminological contribution of this research. Although I borrowed the term ‘Bookish Persian’ from colloquial Persian rather than coining it, as far as I know I am the first to introduce this term to academic discourse. BP is not merely a written form of language but a form that is spoken as well, as represented by the data collected for this research.

The research focused on the following broad questions:

1. In what ways do vowels in Vernacular Tehran Persian differ from those in Bookish Persian?
2. What causes vowels in Vernacular Tehran Persian to differ from those in Bookish Persian?
 - a. Are these reasons linguistic, nonlinguistic or both?

12.1. Compilation of the Results

A representative sample of tokens of vowel height variation was extracted from sociolinguistic interviews with 31 residents of Tehran, stratified by age, gender, social class and level of education. After eliminating contexts where there were too few tokens or no variation (that is, categorical contexts), I classified vowel height variation in TP into six different variable contexts (VCs), of which five are raising (VC1-VC5) and one (VC6) lowering. Three contexts involved back vowels, while three involved front vowels, as shown in (1):

- (1)
- | | |
|--------------|--|
| BACK-VOWEL: | VC1: (a)-raising (/a/ → [a]~[u]) (aN-raising) |
| | VC2: (a)-raising (/a/ → [a]~[o]) (/ra/-raising) |
| | VC3: (o)-raising (/o/ → [o]~[u]) (harmony raising) |
| FRONT-VOWEL: | VC4: (æ)-raising (/æ/ → [æ]~[e]) (low-front raising) |
| | VC5: (e)-raising (/e/ → [e]~[i]) (mid-front raising) |
| | VC6: (e)-lowering (/e/ → [e]~[æ]) (sandhi lowering) |

While the literature on variation in the Persian vowel system has focused almost entirely on raising, a contribution of this research is the discovery of a process of lowering as well. Out of the six vowels of Persian, three are rounded back (/ɒ, o, u/) and the other three are unrounded front (/æ, e, i/). **Raising occurs among the back vowels as well as the front vowels, but lowering only occurs with front vowels. In other words, raising can be rounded or unrounded but lowering is only unrounded.**

An interesting question is whether the linguistic and extra-linguistic factors hypothesized to condition variation in vowel height applies across all variable contexts (that is, we can collapse the six VCs into one) or whether each VC represents a separate variable.

Two types of analysis were carried out on the data. The data was first analyzed by examining the distribution of variants in each of the six VCs for each of the linguistic and extra-linguistic factor groups (univariate analysis). I subsequently proceeded to conduct a multivariate analysis by building a multivariate model using Rbrul.

The **UNIVARIATE ANALYSIS** was conducted separately for each linguistic as well as extralinguistic factor group. In addition to and separately from phonological environment, I investigated and analyzed syllable distance, stress position, syntactic category, morphological status and etymological origin as well.

The majority of raising in the data is aN-raising. The nasal stop can be the bilabial /m/, as in *tæmam~tæmum* ‘finished’ or the alveolar /n/, as in *xane~xune* ‘home’. Despite *N* being anterior, in the hierarchy of raising triggers, or height variation triggers, nasality supersedes non-anteriority. This is significant because some raising throughout the data is triggered by non-anterior segments (back consonants) (Phonological Rule No. 1 (Figure 6.1), i.e., $V_{+low} \rightarrow V_{+mid} / _ _ C_{+back}$ (also in Jahangiri (1980:61))), yet, the behavior of the nasal consonants is contrary to that, which can only be explained by their nasality. Therefore, one can say that, in the hierarchy of height variation triggers, nasality supersedes backness (non-anteriority).

In aN-raising, 48% were raised both pre-/m/ as well as pre-/n/, and the remaining 52% could be raised but were not. There are more tokens pre-/n/ than pre-/m/, giving the former a bigger weight as

‘following segment’ than the latter. The results show that [a]~[u] is exclusively pre-N while also revealing that, although pre-[m] raising is as probable as pre-[n] raising, the latter is much more frequent than the former.

VC1 was examined for possible post-N raising. There is no evidence of post-nasal vowel raising (or lowering, for that matter).

VC2 is exclusive to the object marker /ra/, whose vowel may be raised to [o], but never to [u]. The vowel in this variable context is raised 83% of the time. The following segment in all the instances is the same, i.e., null, hence revealing no patterns of variation. Therefore, one cannot make any statement about probable vowel raising in /ra/ based on the following segment.

In VC3 (vowel-harmony raising: /o/→[o]~[u]), the vowel /o/ in the data in all instances is followed by either of the consonants /b, m, f, t, d, n, r, s, l, j/, all of which are anterior consonants (-velar, -palatal), including the nasal stops. Following the literature, one would expect these anterior consonants not to trigger the raising of the preceding vowel (as stated by Jahangiri 1980). However, the data clearly shows that /o/, even if preceding said anterior consonants, may still be raised to [u]. Raising here can be accounted for by another factor at work that overrides assimilation to the following consonant, and that factor is assimilation to the following vowel, or vowel harmony. The data shows 0% raising when the vowel that follows the variable vowel is [o] while 63% raising when it is [u]. The remaining 37% non-raising here must be explained by other linguistic or nonlinguistic factors. At work here is total vowel harmony through total noncontiguous regressive assimilation as described by the phonological rule in Figure 6.2— Phonological Rule No. 2: Harmony Raising, i.e., $V_{+mid +back} \longrightarrow V_{+high +back} / _ (C) \$ CV_{+high +back}$. In other words, assimilation to following vowel overrides assimilation to following consonant.

Falling under VC4 (/æ/→[æ]~[e]) in the data are 226 tokens with 23 unique types. There are nouns and verbs ending in æC(C) (/æ/ followed by one or two consonants), in which the /æ/ is raised to [e] when the final consonant(s) is/are deleted. Raising in these words is a secondary process to final-/r/ deletion, which can also be called ‘post-deletion raising’. When /r/ is deleted, the word will be left with a final /-æ/, which then undergoes vowel-neutralization to turn the final vowel to /e/, which is the “least marked vowel” in Persian (Rohany-Rahbar 2012:102). Other than *næ* ‘no’ and *væ* ‘and’, which are the only two words in

Persian that end in [æ] (ibid.), the final vowel in words ending in [æ] is raised to [e]. There are words of other classes such as [ˈæɣær]~[ˈæge] ‘if’, [ˈmæɣær]~[ˈmæge] ‘unless’, and [diˈgær]~[diˈge] ‘other; after all’ undergoing final /r/ deletion and then neutralization of the final vowel by raising [æ] to [e].

The question was raised in Section 3.4 as to why the BP forms are taken as the underlying forms and the VTP forms as the surface forms varying from the former, rather than the other way round. For example, why *xane* ‘home’ is the BP form and *xune* the surface VTP form in TP rather than *xune* being the underlying BP form and *xane* being derived from it? It is the existence of words with the raised form in similar phonological environments, that have no low form ([a]-form, in this case) that can be associated with BP (as also argued by Rohany-Rahbar (2012:59)), as expanded in subsection 3.5.11 above. For example, the word *tutun* ‘tobacco’ has no low-vowel counterpart **tutan*.

Mid-front raising in VC5 (/e/→ [e]~[i]) is never word-final. Raising in a sizeable portion (77 tokens equal to 57%) of all the tokens can be accounted for under Phonological Rule No. 1 (Figure 6.1), i.e., $V_{+low} \longrightarrow V_{+mid} / _ C_{+back}$ (also in Jahangiri (1980:61)), in which a vowel is raised by virtue of assimilating to the following non-anterior (back) consonant, as in *ʃef~ʃif* ‘six’. In other words, consonant backness triggers previous-vowel raising.

Of all sandhi lowering (/e/→ [e]~[æ]) in VC6, 61% (75 tokens) is shown to be word-final. A closer look at the data reveals that the remaining 47 tokens, which are shown to be followed either by a nasal stop or another anterior or non-anterior sound, occur entirely word-finally as well, only mediated by a clitic pronoun (pronominal suffix), verb ending, adverb suffix, definite article ending, or object marker that is appended to them clitically, examples of which are presented in Figure 6.3. In all of these cases, there is a morphophonological dissimilative interaction between the variable vowel and the following vowel either in the form of the variable vowel being lowered only if the following vowel is raised (the object marker /ra/ raised to [ro]) or if the deleted following vowel is a raised vowel (/æ/). In other words, morphophonological following-vowel raising or following-vowel raisedness-plus-deletion can result in previous-vowel lowering in what I would like to call **seesaw lowering**. This reveals a situation of dissimilation or counter-harmony at work in VC6 as opposed to assimilation or harmony in VC3, determined by the vowels involved as well as by whether the interplay of vowels is intersyllabic or intermorphemic.

SYLLABLE DISTANCE was examined in order to observe the relevance of syllabification to vowel raising as set forth in Kahn & Bernstein (1981), as also pointed out by Jahangiri (1980). Kahn & Bernstein (1981), for example, state that “a preponderance of the lexical items and tokens of lexical items where aN goes to uN either have aN in a stressed syllable in final or penultimate position.” (ibid:135), which means a stress distance of 0 or 1 from the word end. The data overall shows a general trend towards a syllable distance of 0 or 1. However, this is only a relative trend and cannot be considered a hard and fast rule, as there is plenty of tokens, especially in VC1 and VC3, that go against it.

STRESS POSITION was examined in order to revisit the literature (Kahn & Bernstein 1981 and Jahangiri (1980)) on the topic, which states that aN-raising is more likely to occur in a stressed syllable word-finally or penultimately. Kahn & Bernstein (1981:135, footnote) further clarify that the “aN→uN change does not seem to be stress-related in that both stressed and unstressed syllables undergo the change.” With the exception of only one token, the lowering tokens (VC6) are all same-stressed. However, the raising data overwhelmingly favors vowels that are pre-stressed, which does not confirm Kahn & Bernstein’s assertion of lack of connection between stress and height variation.

SYNTACTIC CATEGORY: Variation by syntactic category differs across VCs but is mainly clustered around Noun, Pronominal Suffix and Number (ordinal or cardinal), except in VC4, where variation is skewed in favor of Verb.

MORPHOLOGICAL STATUS: This category overlaps with and is a subset of Syntactic Category, yet the focus is justified because of the special role of Affix, Proper Noun, and Affix of Proper Noun in the literature, in which affixes (Ariyae 2018) and proper nouns (Modaressi 1978, Jahangiri 1980, etc.) are introduced as raising-blockers. In pre-N raising, variant vowels in affixes are only 38% likely to be raised and they are even less likely to be raised (10%) if they are part of an ‘Affix of Proper Noun’. This is consistent with the literature as two blockers (affix and proper noun) are cumulatively at work in the latter

situation. Verb stems are the most likely (69%) to be raised, even more so than the ‘Other’ category, both of which do not contain any of the top three rows of variation blockers. This is consistent with the fact that most of the data is spoken interview, in which verb stems are likely to be reduced and/or undergo vowel variation. The few proper nouns in the data (9 tokens) are 67% likely to be raised though. The hierarchy of blockers here is ‘Affix of PN’, ‘Affix’ and ‘Proper Noun’, respectively in a descending order. This is in line with the expectations created by the literature, with ‘Affix of Proper Noun’ having a cumulatively increased blocking effect, while ‘Affix’ has a stronger blocking effect than ‘Proper Noun’.

ETYMOLOGICAL ORIGIN: The etymological origin of words impact the probability of vowel raising in Persian (Modaressi 1978, Jahangiri 1980, etc.), with words of Persian origin being the most likely to be raised. When a word is of a non-Persian origin, Arabic-origin foreign words are more likely to trigger height variation than non-Arabic-origin loanwords. These predictions from the literature are confirmed in VCs 1 and 4, but not in VCs 3, 5 (raising) and 6 (lowering). However, some of this may not be explainable through linguistic factor groups but needs to be examined through language-external considerations.

For example, words such as *daneſgah* ‘university’, *særvan* ‘captain’ that were recent coinages more than 40 years ago (at the time of Jahangiri’s and Modaressi’s research) did not appear in my tokens. The similar word *daneſju* ‘university student’ appeared in the data without undergoing any raising. These are words of Persian origin, the non-variation in whose pre-N vowel could be attributed to being recent coinages at Modaressi’s time. However, the verb stem *dan* in the sense of ‘know’ that appears in *daneſju* or *daneſgah* does not undergo any raising even in my data despite having lost recency of coinage. On the other hand, the stem *dan* ‘know’ does undergo raising when used in the conjugated form of the verb in tokens such as *nemidunæm* ‘I don’t know’ which does appear in the data. This means that conjugation triggers raising in words that would otherwise not undergo raising, based on which one may propose conjugation as a raising or height variation trigger, although to for this proposition to be solidly supported by evidence, one would have to look at a larger body of data.

Of the non-linguistic, or **EXTRA-LINGUISTIC FACTORS**, those examined in the current research are style, age group, gender, education, occupation and SES (socioeconomic status).

Variation in my data is not neatly ranked by **AGE**, whether in ascending or descending order, which suggests that vowel height variation is not undergoing change or linked to a process of age-grading.

The literature on variation in spoken Persian makes references to **GENDER** as a social factor group (Modaressi 1978, Jahangiri 1980, etc.). With a proportionate male-to-female ratio in my data, there is an overall male lead in vowel height variation compared to the females.

One's "membership in different social groups, such as [...] level of education [...]" (Walker 2010:53) is among the factor groups external to language that can explain the effect of linguistic variation on language, while it can be used to "evaluate social status" (Modaressi 1978:11). **EDUCATION** is a very important category in this research for the additional reason that BP is a variety of Persian, the active use of which requires education, although an uneducated person would still have a passive understanding of BP. In the data, I divided the speakers into four educational groups: H(igh school diploma), A(ssociate degree), B(achelor's degree), M(aster's degree) and P(hD). One would expect increasing education to expose one to more BP. This would ideally sort the highest numbers of height variation on the top row for 'High School' and the lowest numbers at the bottom for the PhD-holding speaker. The individual with the highest degree of education is showing a linguistic performance in VCs 3, 4, 5 and 6 counter to the expectation. Yet, the small number of tokens makes any such evaluation at best hypothetical, pending collection of more data. Setting aside the PhD holder, the remainder of the data in each VC sits well with the pattern of more vowel variation being inversely proportional to the degree of education, with high school graduates showing an overall higher degree of vowel variation (raising and lowering) than the more highly educated.

To allow an accurate alignment and comparison of the results with those in other communities, one needs to conduct "a controlled study of the speech production of a random sample of individuals stratified by objective measures" of which "occupation" is one (Labov 1990:208). **OCCUPATION**, along with education and a combination of other factors (such as income, residence, etc.) determine social class

(ibid.:209), which is where the social correlates of variation can be sought. The occupations of the speakers in this research were S(elf-employed (such as businessperson, homemaker)), Non-text-based (office worker, student, etc.), W(hite-Collar) and T(eaching or Text-based), (such as translator, teacher, etc.) based generally on how occupations are socially perceived in Iran as well as on how much the person in the occupation interacts with written text, the latter having a very close association with Bookish Persian. One would expect the least variation, i.e., deviation from the writing-based variety, i.e., BP, in the T category and the most in S. This is a pattern supported by the data in VC2, VC3, VC4, and VC6. In VC1, T and W have switched places, and in VC5, W and S but with only a slight difference. Overall, the trend of the least variation in T occupations holds true, i.e., the more a person interacts through one's occupation with written texts, the less likely it is for one to show variation in one's spoken language from BP.

The speakers were in either of the four **SES** (socioeconomic status) categories of W (working), LM (lower middle), M (middle) or UM (upper middle) class. The interviewee's SES was determined based on a combination of factors such as home ownership, residential neighborhood, car ownership and type, and own, parents' or spouse's income (including being able to afford to send child to study overseas). VC1 neatly confirmed the expected class stratification of variation inversely proportionately relating with social class, i.e., the higher the social class, the less the variation, with an insignificant discrepancy at the higher end of the stratification, as the UM speakers show a 2% more variation than the M speakers. There is a similar trend in VC3 and VC5, with the W speakers having the most variation, with small bumps upward along the SES strata. However, VC2, VC4 and VC6 do not even conform to this loose trend. In conclusion, despite the overall trend of less variation with increasing rising SES, the data is not solid on the relationship between SES and vowel height variation in TP.

To elicit a BP **STYLE**, a written translation task was given to the interviewee during a break towards the end of the interview. Before that, somewhere closer to the beginning of the interview, the same translation task was used for each speaker orally, i.e., the same words were asked of each speaker to provide translations for orally. In addition to this, certain questions and interactions throughout the interviews were meant to elicit direct quotations from written texts. A style array was adopted that was a continuum of increasing formality from A to D, with A being the most casual and D the least casual, or A being the least formal and D the most formal. VCs 1 and 2 revealed a pattern of variation neatly in conformity with the

literature, as most variation occurs in A and the least in D. The same can be said about VC3 if the 3 tokens in the C category (too few tokens) are taken out of the equation. VC 5 still shows the most variation in A and the least under D with bumps along the spectrum. VC4 shows the least variation on the D end of the spectrum although A through C are slightly erratic. Overall, the data sits well with the expectation that an increasing degree of formality in style is associated with a decreasing degree of vowel height variation in TP.

The **MULTIVARIATE ANALYSIS** was carried out by building multivariate models, at first of the linguistic factor groups and subsequently, of the extralinguistic factor groups. Multivariate models are capable of accounting for variation in correlation with two or more factor groups. In the current analysis, this correlation was analyzed between vowel height variation (raising or lowering) on one hand and two or more linguistic or extralinguistic factor groups, on the other hand. In essence, the analysis aimed to elucidate the interplay between these factor groups and their collective impact on vowel height variation.

The variable rule program has been the predominant analytical tool to analyze the impact of multiple factors on linguistic variables for more than three decades now. The Rbrul program (in fact, the more user-friendly ‘Shiny Rbrul’ version 2019) (Johnson 2019) was used in this research to conduct the analysis to determine the best-fitted multivariate model.

Each variable context (VC) is distinguished from the other VCs by linguistic context. For example, VC1 is pre-N raising while VC2 is only /ra/-raising. Therefore, running them together would result in collinearity effects that would impact the models deleteriously. Consequently, a separate **LINGUISTIC MULTIVARIATE MODEL** was needed to be built for each VC. The speaker was included as a random effect in this and all the subsequent multivariate models.

VC1 (PRE-N) RAISING: *SYLLABLE DISTANCE* (SD) and *SYNTACTIC CATEGORY* (SC) are the relevant categories that can, together with each other, build a model that predicts aN-raising. Among the syntactic categories, determiners and verbs, respectively, are the most favoring category to trigger raising and nouns, the least. Adverbs do not seem to favor raising. Yet, considering the small adverb token count, one would need to collect more data on this category to make a more definitive statement regarding the status of adverbs and raising in aN-raising in VTP. *MORPHOLOGICAL STATUS* is collinear with

syntactic category (SC) in many ways for obvious reasons, which explains why it could not contribute significantly to the model and did not become part of the best-fitted model. For example, a ‘proper noun’ under morphological status corresponds with ‘noun’ under SC, and so on. The invariant categories, i.e., those showing 0 or 100% in cross-tabulation, were removed from the model because of the very same fact, i.e., not showing variation. Despite the reasonably large number of tokens, certain categories did not show much variation in the cross-tabulation of SC and SD. For example, ‘pronominal suffixes’ always attach to the end of the word and are often reduced to one syllable. Therefore, their SD will always be 0, e.g., *ba-fun* ‘with them’.

VCS 2 THROUGH 6: VC2 (/ra/-raising) is the variable context limited to the raising or non-raising of the object marker /ra/, and, therefore, linguistically invariant. Consequently, it cannot be analyzed for linguistic variation. VCs 3 through 6 each have too few tokens to register sufficient variation. This is clearly revealed in the cross-tabulations of the various factors, in which there are too many cells with the value of 0, indicating the absence of any token for the two factors involved. VCs 1 through 5 (raising) or 1 through 6 (raising as well as lowering) cannot be grouped together to render enough tokens in the various cells for building a multivariate linguistic model because of the very fact that each of them is distinguished from the others by linguistic environment in the first place. Therefore, their distinctions cannot be the basis for putting them together in a model that assumes similarity in linguistic environment. However, they can be put together for building a model of the extralinguistic factors, as it will be clarified below.

While, in the multivariate models based on the linguistic factors, the variable contexts were looked at separately, in the **EXTRALINGUISTIC MULTIVARIATE MODELS**, the variable contexts can be grouped together by their shared feature of raising, lowering or both raising and lowering of vowels. One would think that a separate multivariate model for lowering would be in order. However, the cross-tabulation of the various factor groups revealed too many empty cells when lowering tokens are taken alone. In other words, there are not enough lowering tokens to fill most of the cross-tabulated cells to provide a fitting model for lowering only. Nevertheless, there are enough raising tokens to put all of them together in the model, separately from the tokens of lowering. This is why the analysis will be conducted first on raising alone and then on raising and lowering together, but not on lowering alone.

In the education factor group among the extralinguistic factors, I merged the ‘PhD’ and ‘Master’s degree’ into ‘graduate’ and ‘associate degree’ and ‘bachelor’s degree’ into ‘undergraduate’ because of the low token counts in PhD and associate degree if taken separately. These categories were not collapsed under the analysis of the linguistic factors though.

While putting together VCs 1 through 5 in the **MULTIVARIATE MODEL OF RAISING**, style and education, in the same order, are the two predictors of pre-N raising. Higher education level strongly correlates with less raising. The same applies to Style, in the sense that most raising occurs in Style A, which is the most casual, and the least raising in Style D, which is the least casual. Increasing *EDUCATION* is proportionately inverse to the degree of raising. The factor group ‘Occupation Group’ does not include a sufficient variety of occupations to reveal any patterns of correlation. The result could have been different had I interviewed people from more various occupations.

In a **MULTIVARIATE MODEL OF RAISING AND LOWERING**, all VC6 (lowering) tokens were added to the mix. Even after adding the tokens from lowering to those of raising, the model surprisingly turned out to retain the same patterns, with *STYLE* and *EDUCATION* predicting all vowel height variation (raising or lowering). Higher education is tightly correlated with less raising. The same applies to style, i.e., most vowel height variation occurs in Style A, which is the most casual, and the least raising in Style D, which is the most formal.

The significant observation from comparing the last two models is that lowering does not change the way vowel variation interacts with extralinguistic factors. In other words, **lowering follows the same sociolinguistic (extralinguistic) trend that raising does in Tehran Persian. This means that speakers of Persian raise their vowels for the same reasons that they lower their vowels.**

12.2. Register and Style

Register refers to a variety of language that is associated with a particular situational context. According to Ferguson, a register is a communication situation that recurs regularly in a society, developing unique linguistic markers over time that distinguish it from other communication situations (Ferguson 1994:20). These markers arise due to the recurrent linguistic needs of the participants, facilitating faster and more efficient communication within that specific context. Register is characterized by the situational context, linguistic features, and the functional relationships between them (Biber et al 1994:6). It often includes core lexical and grammatical features indicative of the differences between registers based on frequency of distribution and situational variation.

Style encompasses a broader range of concepts compared to register. It is often used to refer to the way of speaking or using language, sometimes synonymously with register. In variationist linguistics, style can be defined as language produced under various conditions with differing amounts of attention paid to speech (Labov 1972). Labov's theory of stylistic variation posits that styles can be measured along a single dimension based on the amount of attention paid to speech (Labov 1972:208).

This dissertation does not use 'register' as a conceptual tool or, one could say, it collapses both register and style into a single concept of style. Therefore, the results can be potentially applicable to 'register' as defined by other scholars.

12.3. Social Awareness of VHV in TP and Labov's Sociolinguistic Typology

Although the present study did not explicitly elicit speakers' attitudes toward vowel height variation (VHV) during the sociolinguistic interviews, Labov's (1972) typology of sociolinguistic variables—**indicators**, **markers**, and **stereotypes**—offers a useful framework for interpreting the broader social perception of the vowel patterns observed. Labov defines **indicators** as unconscious linguistic features that correlate with social group but do not vary by style; **markers** as features

that vary with both social group and style and are above the level of awareness; and **stereotypes** as socially salient features that attract overt commentary, often subject to evaluation, imitation, or parody.

In this light, **aN-raising (VC1)** functions as a **stereotype** within Tehran Persian. This phenomenon is broadly recognized by speakers of Persian as a salient feature of the Tehrani accent, and is often commented on or imitated—particularly by speakers from other regions. While no metalinguistic commentary was offered by participants during the interviews, this conclusion is supported by informal discussions outside the interviews with Persian language professionals, including teachers and translators, who consistently identified aN-raising as a recognizable and socially meaningful feature of the Tehran variety.

By contrast, the other vowel height patterns studied in this dissertation—namely **VC2 through VC5** (other raising environments) and **VC6** (lowering)—appear to function at the level of **indicators**. These patterns show regular phonological conditioning and social stratification (especially by education and style), but there is little to no evidence of conscious awareness among speakers. Based on conversations with language professionals, these variants are not typically noticed, commented on, or evaluated, suggesting that they operate below the level of sociolinguistic awareness.

This distinction strengthens the interpretation of VHV in Tehran Persian as occupying different positions on Labov’s scale of social awareness. It also suggests fruitful directions for future research—particularly through explicitly eliciting speaker perceptions and attitudes toward different vowel variants to clarify how these features are socially evaluated across speech communities.

12.4. Hierarchy of VHV Triggers

Now that we have established that VTP raises certain vowels of BP, one wonders whether such raising is always to be expected or not. In other words, in the very likely scenario of someone

learning Persian from the book and, hence, acquiring BP, can he or she successfully speak Vernacular Tehran Persian (VTP) by systematically raising (or lowering as the case may be) his/her BP vowels, at least in the Variable Contexts 1 through 6?

We already know that raising (or lowering) in VCs 1 through 6 is probabilistically triggered, or, as has already been discussed in the literature, blocked. Jahangiri (1980), for example, mentioned morpheme boundary as a blocker and Aryayee (2018) provides a list of blockers arranged in a hierarchy. Some blockers like morpheme boundary seem to be hard and fast and not probabilistic, in the sense that there is no VHV across morpheme boundary while some others, like morphological origin seem to be less strict and be only probabilistic.

In this study, the results of a multivariate analyses already provide some sort of hierarchy, in the sense that style and education, in the same order, are the top two predictors of all VHV, i.e., not only of raising but of all height variation, i.e. raising and lowering put together as well. This must, therefore, answer the question of a hierarchy of raising triggers. However, it does not make any prediction as to the blockers, as the presence research was not conducted with the aim of determining what ‘blocks’ VHV but rather what favors or disfavors it.

12.5. Diglossia

One central question this research touches on—though it was not originally framed to resolve—is whether Persian, particularly as spoken in Tehran, fits the classical model of diglossia. Although the question constantly raised in the literature of where raising versus non-raising can and does take place already implies a dichotomy, this dichotomy may not fit the technical definition of diglossia. The concept of *diglossia*, as introduced by Ferguson (1959), delineates a sociolinguistic situation in which two functionally differentiated varieties of the same language coexist within a speech community: a “High” (H) variety used in formal domains, and a “Low” (L) variety used in everyday informal contexts.

Applying this framework to the Persian language, the dichotomy between Bookish Persian (BP) and Vernacular Tehran Persian (VTP) seems to conform to a diglossic arrangement on the surface. However, the data presented in this dissertation complicate this picture. Rather than aligning with a static H/L opposition in which the two varieties remain strictly compartmentalized, BP and VTP interact dynamically across multiple domains. This undermines one of Ferguson's key assumptions: that the H and L varieties are mutually exclusive in both form and function and are learned and used differently.

In Tehran Persian, as this study shows, the lines between BP and VTP are considerably blurred. Instances of BP-like phonological features appear in informal conversation, while VTP features can emerge in public discourse, such as university lectures or political speeches. Furthermore, individuals frequently shift along a continuum between BP and VTP, a behavior that aligns more closely with a continuum than with a model of binary diglossia. This supports Hudson's (2002) reconceptualization of diglossia not as a fixed binary but as a gradient system with overlapping linguistic repertoires or conceptualization of diglossia as "fluid" rather than "rigid" (Pauwels (1986)).

This study builds on these ideas by showing that the alternation between BP and VTP is not merely a product of domain separation, but of sociolinguistic negotiation. Speakers engage in stylistic shifts across a continuum, which undermines the static boundaries presumed in traditional diglossia models. In this way, the findings resonate with any model or theory that conceptualizes diglossia as a typologically diverse and context-sensitive phenomenon and what emerges in the data is what I would term a **bimodal diglossia**. The introduction of "Bookish Persian" as a distinct yet socially embedded speaking style, not merely a formal or literary construct, positions BP and VTP at opposite ends of the usage continuum that is bimodal, gradient, and speaker-centered. This reframing contributes to sociolinguistic theory by demonstrating how diglossia may manifest in flexible, overlapping forms in real-life speech, challenging both Ferguson's compartmentalized binary and Fishman's functionally strict categories.

This conception of BP and VTP as co-existent systems, with features of the former often being used in formal settings such as literature, media, and education and characterized by a more complex grammar and vocabulary, while, in contrast, features of the latter used in everyday conversation and informal communication, featuring simplified grammatical structures and a more contemporary lexicon, does not detract from features that characterize each system but show that speakers can maintain a continuum of forms that they can draw on for various purposes, such as stylistic reasons. This conception of a ‘bimodal diglossia’ for Persian highlights the dynamic nature of language use within different societal spheres and the adaptability of speakers to use the language bimodally depending on the context.

In sum, Tehran Persian exemplifies a continuum-based bimodal diglossia wherein speakers can actively and regularly cross boundaries between BP and VTP in response to shifting variables. This may have implications for the study of diglossia in other multilingual, urbanized contexts.

12.6. Theoretical Propositions and Future Research

While this dissertation has focused on examining the linguistic and extra-linguistic factors conditioning variation in vowel height in VTP, there are a couple of considerations that have not been touched on but would constitute areas of future research.

12.6.1. Raising as Reduction

One consideration is whether vowel raising can be viewed as a form of reduction (or weakening via increasing mouth closure ultimately resulting in deletion). Although proposed by Miller (2011:1387) for Persian, vowel raising seems to be a cross-linguistically common process in unstressed syllables and informal varieties, such as Greek, Catalan and Brazilian Portuguese (ibid.). Raising may also co-occur with devoicing or even deletion, the ultimate point of reduction. For example, Japanese vowel reduction occurs in the form of shortening, devoicing, but most tangibly deletion, which occurs “regularly for the high vowels, /i/ and /u/” (Kilpatrick et al 2016) – see also Walker and Mendes (2019) for Brazilian Portuguese. Therefore, a future area of research

on VTP would be to investigate raising as a form of reduction and determine whether devoicing or even deletion is present in some speakers.

12.6.2. Translation Tasks

Introducing a rapid oral translation task in the second half of the interview and later giving the same task to the interviewee as written translation task after the interview was an idea that I came up with myself and seemed to fit the Persian context. It proved effective and helped me extract more BP tokens (both in written translation and in oral translation). Now proven effective, it can be replicated in the future for similar purposes.

12.6.3. Distance Design Theory

A more general area of future research is to link vowel raising to what I will call ‘DISTANCE DESIGN THEORY’. I earlier quoted Eckert (2004:1) as accounting for variation in style by purpose, which can be convergence (accommodation, solidarity, grouping together) or divergence (distancing, distinction) expressed in relation to a variety of domains in the social space (position, class, ethnicity, network), region, affiliation (institutional, ideological), solidarity (familiar, formal), power (politeness, respect, deference), gender (binary, nonbinary), personae (cosmopolitan, local), biology (age, gender), identity (independence, coolness, chicano, etc.), and a host of other features. In Allan Bell’s audience design theory, style-shifting by an individual is seen as intraspeaker variation that derives from and mirrors interspeaker variation in society (Allan Bell 1984:145) and individuals vary their style to accommodate their address (as we as auditors and overhearers. In my estimation, convergence and divergence can be put under the umbrella of ‘distancing’ and the latter can be envisaged in a cognitive space that includes but is not limited to social space. Cognitive distance can be seen as our mental representation of all kinds of distance, some of which may be merely or primarily only cognitive. Cognitive distance, in this sense, is perceived to be already existing or may be distance that we would like to will into existence. For example, the fact that etymological origin can affect raising in VTP is a matter of cognitive distance as Persian words are perceived as closer to the (native) self than Arabic words, and the latter, due to hundreds of years of contact with Persian, are more closely internalized than more

recent loanwords from European languages. In other words, lengthened diachronic contact can reduce cognitive distance and the latter directly increases the likelihood of raising. Indeed, in order for a cognitive design theory to be properly developed, a more intensive and better focus is required with more data and research. Nevertheless, the data in this research can serve as a worthwhile blueprint for such a theory, which would represent a ‘theory of everything’ for style.

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14. Appendices

14.1. Appendix A: Interview Questionnaire

The interview questionnaire used for the research is provided below. The questions were asked in Persian. However, a precise translation into English is provided.

| DEMOGRAPHY | اطلاعات جمعیتی |
|--|---|
| What year were you born? | چه سال-ی به دنیا اومدید؟ |
| So that makes you ... years old? | پس ... ساله هستید؟ |
| How many kids were you in the family? Which number child are you? | تو خانواده چند تا بچه بودید؟ بچه چندم اید شما؟ |
| Where in Iran are you guys from? | مال کجای ایرانی ئید؟ |
| Where was the first place you ever lived? | اولین جا-یی که زندگی کردید، کجا بود؟ |
| And where did you live after that? | بعدهش کجاها زندگی کردید؟ |
| Are you married? Do you have kids? | ازدواج کرد-ئید؟ بچه دارید؟ |
| Where do you live now? Which neighborhood? | الآن کجا زندگی می کنید؟ کدوم محله؟ |
| What kind of place is it; an apartment, a house or ... ? | چه جور ساختمون-پی ئه؟ آپارتمان، خونه، یا ... ؟ |
| Who do you live with? | با کی زندگی می کنید؟ |
| How long have you been living around here? | چه مدت ئه این ورها زندگی می کنید؟ |
| Where in Iran are your parents from? And raised? | پدر-مادرتون مال کجای ایران اند؟ کجا بزرگ شدن؟ |
| Your father? Your mother? | پدرتون؟ مادرتون چه طور؟ |
| How about your maternal/paternal grandfather/grandmother? | پدربزرگ/مادربزرگ مادری/پدری تون؟ قبلش چی؟ |
| NEIGHBORHOOD | محله |
| What is the name of the neighborhood where you are living? Where are most people originally from? Or from which ethnicities? | این محله که می شینید، اسمش چی ئه؟ بیش تر اصالتن از کجای ایران ئن؟ یا از قومیتها ی دیگه؟ |
| How long have you been living in this neighborhood? Are the people in this neighborhood mostly long-time residents? | چند وقتئه تو این محله می شینید؟ آدمها ی این محله اکثرن قدیمی ئن؟ |
| CHILDHOOD | کودکی |

What was your childhood like?

دوران کودکی ت چه جور بود؟

What do you think about physical punishment?

نظرت درباره تنبیه بدنی چی نه؟

Can it be helpful to the child's upbringing under certain conditions? If yes, under what conditions?

به نظرت می‌تونه تحت شرایطی به تربیت بچه کمک کنه؟ اگر آری، چه شرایطی؟

Some people say you can raise a kid without laying a hand on him/her. What do you think about that?

بعضی‌ها می‌گن بچه رو می‌شه بدون هیچ تنبیه بدنی بزرگ کرد. نظرت چی نه؟

What do you generally think about being strict with children?

نظرت کن درباره سخت‌گیری به بچه چی نه؟

How has life changed for children in Iran nowadays in conditions similar to those of your childhood compared to your childhood?

زندگی بچه‌ها ی امروزی در ایران با دوران کودکی خودت چه فرق‌ی داره؟

Rapid Interpreting Game

ترجمه شفاهی سریع

I am going to read some words or sentences rapidly. What you should do is to translate them back to me rapidly. (For example: XYZ)

من یه سری واژه یا جمله رو به سرعت می‌خونم، کار-ی که از شما می‌خوام این نه که به سرعت ترجمه-شون کنی. (مثال: ایکس/ایگرگ/زد).

You may think in some cases you can provide more than one translation. This does not matter. Please just tell me the first translation that comes to your mind.

ممکن نه فکر کنی بعضی موارد بیش از یه ترجمه می‌تونی بگی. مهم نیست. اولین ترجمه که به ذهنت می‌رسه رو بده.

car; house; bread; thirsty; hungry; child; happy; sad; upset; city; afternoon; noon; evening; New Year; high speed; highway; kidnap; airplane; shark; sharp; talk; speech; automobile; kite; insult; biology; university; Give me the newspaper!; a box of matches; bus stop; bus driver; eighteen; seventeen; I should go home.; I want that.; theater; Tell me the truth!; time; association; academic; biophysics; biochemical; rapidly; to shine; multiplication; addition; division; fox; rooster; candle; raisin

SCHOOL

تحصیل

What is the highest level of education you have completed or studied?

آخرین مقطع تحصیلی که خوندی یا تکمیل کرده‌ای، چی نه؟

Do you have plans to study further?

برنامه‌ای واسه ادامه تحصیلی داری؟

What has been the most memorable part of your education? What good memories do you have of that?

شیرین‌ترین دوران تحصیل واسه ت کی بوده؟ چه خاطره ی خوب‌ی از-ش داری؟

WORK (ADULTS)**شغل (فقط برای بزرگسالان)**

| | |
|--|---|
| Are you working now? | شاغل ئی؟ |
| What do you do? | کار-ت چی ئه؟ |
| What was the first job you ever got? How old you then? | اولین شغل-ی که داشتی، چی بود؟ اون موقع چه سن-ی داشتی؟ |
| How long did you stay in the job? | چه مدت در این کار بودی؟ |
| What is your dream job? | شغل رویایی-ت چی ئه؟ |
| What did your parents wanted you to be? | پدر-مادر-ت دوست داشتن چه کاره شی؟ |

FEAR**ترس**

| | |
|---|--|
| Have you ever been really afraid of something? | تا حالا از چیزی-ی ترسید-ئی؟ |
| When was that? What happened? | کی بود؟ چی شد؟ |
| How did you feel afterwards? | بعد-ش چه احساس-ی داشتی؟ |
| Is there anything you're really afraid of? | چیز-ی هست که واقعن از-ش بترسی؟ |
| Did you ever know somebody who wasn't afraid of anything? What kind of a person was he/she? | هیچ وقت کس-ی رو می شناخت-ئی که از چیز-ی نترسه؟ یه کم از-ش بگو. |

DANGER OF DEATH**خطر مرگ**

| | |
|--|---|
| Have you ever been in a situation where you were in serious danger of getting killed; where you said to yourself 'This is it. I'm going to die'? | هیچ وقت در وضعیت-ی بود-ئی که واقعن در معرض مرگ قرار بگیری و به خود-ت بگی «دیگه کار-م تموم ئه!»؟ |
| Tell me what happened? | تعریف کن چی بود. |
| Have you ever been in a severe car crash or something like that? | آیا هیچ وقت تو تصادف شدید خودرو یا هم چین چیز-ی بود-ئی؟ |
| Was there ever anything that happened when you were growing up that you remained mysteriously unexplained? | هیچ وقت تو سنّ رشد-ت اتفاق-ی افتاده که دلیل-اش و هیچ وقت نفهمی؟ (عجیب غریب و غیرقابل توضیح باشه؟) |
| Have you ever spent the night at a spooky place? | هیچ وقت موقع شب جا ی ترسناک بود-ئی؟ |
| Does it bother you when people talk about ghosts? Have you ever seen a ghost? | هیچ وقت صحبت از روح تو رو به شدت ترسونده؟ خودت اصلن روح دید-ئی؟ |
| Have you ever been somewhere for the first time that gave you a sense of deja-vu (of having been there before)? | هیچ وقت جا ی جدید-ی رفت-ئی که احساس کنی قبلن اون جا بود-ئی؟ |
| What was the longest streak of luck you ever had? | هیچ وقت خوش شانسی اساسی آورد-ئی؟ |

| | |
|---|---|
| What about bad luck? | بدشانسی چه طور؟ |
| Is there something that you think will bring you good luck? | به نظرت کار خاصّی هست که اگر بکنی، برات خوششانسی بیاره؟ |
| What? | چی؟ |
| Are you lucky at games (such as in cards)? | تو بازی خوششانس ئی (مثلن تو پاسور)؟ |
| Do you believe in fate? | به سرنوشت اعتقاد داری؟ |

SOCIAL LIFE

زندگی اجتماعی

| | |
|--|---|
| Do you attend any arts; language or similar class or do you go to the gym? | کلاس زبان، هنر یا مشابه یا باشگاه می‌ری/قبلن می‌رفتی؟ |
| Are you part of any organization; association; etc.? | جزو هیچ انجمن یا گروهی هستی؟ |
| Do you do any community or volunteer activities? | هیچ فعالیت داوطلبانه یا اجتماعی می‌کنی؟ |
| Do you think you are a religious person? | خودت و مذهبی می‌دونی؟ |

RELIGION

دین

| | |
|--|---|
| Do you have any close friend or any friend at all from a different faith? | دوست نزدیک یا کلن دوستی با دین‌ی متفاوت داری؟ |
| Do you think faith can result in conflict in friendship? | فکر می‌کنی دین می‌تونه باعث تضاد در دوستی بشه؟ |
| If there is a person that seems to be a good person in every respect but has a different faith or no faith at all; do you think he/she can be a good friend? | اگه آدم‌ی پیدا شه که از هر نظر آدم خوب‌ی به نظر برسه ولی دین دیگه‌ای داشته باشه یا دین نداشته باشه، به نظرت می‌تونه دوست خوب‌ی برات باشه؟ |
| Do you think spirituality without religion is possible? | آیا معنویت بدون دین امکان‌پذیر نه؟ |
| Do you think an atheist can be a moral person? | به نظرت یه آدم بی‌خدا می‌تونی آدم بااخلاق‌ی باشه؟ |

SAFETY IN LIFE

امنیت در زندگی

| | |
|---|---|
| Can you walk around the city safely late at night? Do you find Tehran/Karaj to be a generally safe place? For example; can it be compared it to another city in Iran or abroad? | آیا شب دیروقت می‌تونی با امنیت در شهر تردد کنی؟ به نظرت کلن تهران/کرج شهر امن‌ی نه یا ناامن؟ مثلن می‌شه با یه شهر دیگه در داخل یا خارج از ایران مقایسه‌ش کرد؟ |
| Have you ever come home very late at night? (Did you have any incident?) | آیا هیچ وقت خیل‌ی دیروقت اومدئی خونه؟ (هیچ اتفاق‌ی نیفتاد؟) |
| What areas of the city are more dangerous? Why? | کدوم محله‌ها ی شهر خطرناک‌ترن؟ چرا؟ |
| Are there places that you would be scared to walk in at night? Why? | آیا جایی از شهر هست که بترسی شب دیروقت پری؟ چرا؟ |

Do you know anybody that got attacked or anything like that in such conditions or was harassed or harmed in a way by a not-good person?

آیا کسی و شخص می‌شناسی که در چنین موارد یا شرایط-
ی بهش حمله شده باشه یا آدم-ی ناجور به نحو-ی بهش
آزار یا آسیب رسونده باشه؟

Have you ever been robbed or had something stolen from you?

هیچ وقت چیزی از-ت دزدیده شده؟

What did they take?

چی بوده؟

Were you ever in a condition where you had to call the police or in a way interact with the police? Can you talk about it?

آیا تا به حال مجبور شد-ئی به پلیس زنگ بزنی یا به نحو-ی
با پلیس تعامل کنی؟ می‌شه تعریف کنی؟

Is there something that can be done to make Tehran/Karaj a safer place?

آیا کاری هست که بشه کرد تا تهران/کرج جای امن‌تر-ی
بشه؟

LANGUAGE

زبان

Do you speak any language other than Persian?

غیر از فارسی زبان دیگه-ای هم صحبت می‌کنی؟

Where and with whom do you speak the language(s)?

کجا و با کی‌ها به هر یک از این زبان‌ها صحبت می‌کنی؟

Do you speak English or any language not spoken in Iran?

کدام یک از زبان‌ها ی انگلیسی یا خارج از ایران را بلد ئید،
کلاس رفته‌اید یا می‌روید؟

Where and how did you learn it/them?

کجا؟ چه جور؟

What level do you think your English is?

انگلیسی-ت و در چه حدّ می‌دونی؟

What does bilingual/multilingual mean in the first place?

اصلن دو/چندزبانه یعنی چه؟

How important is it to know English?

فکر می‌کنی انگلیسی دونستن چقدر اهمیت داره؟

Do you think it's true that a lot of English words have been borrowed into Persian in recent years?

تو با این حرف موافق ئی که در سال‌ها ی اخیر لغات
انگلیسی-زیاد-ی وارد فارسی شده؟

What do you think correct Persian is?

به نظرت، فارسی درست چه فارسی-ی ئه؟

Do you always speak correct Persian?

آیا تو همیشه فارسی درست صحبت می‌کنی؟

Did your father/mother/(paternal/maternal) grandfather/-mother speak any language other than Persian?

پدر/مادر/پدر/مادر-بزرگ (پدری/مادری)-ت به چه زبان‌ها
دیگر-ی جز فارسی صحبت می‌کردند؟

14.2. Appendix B: Written Translation Questionnaire

The same words and sentences that were used in the rapid oral translation as part of the interview were later provided to the interviewee for written translation in the form of a hard copy print-out as follows.

| | | | |
|------------------------|--|--------------------|--|
| car | | house | |
| bread | | thirsty | |
| child | | happy | |
| sad | | upset | |
| city | | afternoon | |
| noon | | evening | |
| New Year | | highway | |
| kidnap | | airplane | |
| shark | | talk | |
| speech | | automobile | |
| kite | | insult | |
| biology | | university | |
| Give me the newspaper! | | a box of matches | |
| bus stop | | bus driver | |
| eighteen | | seventeen | |
| I should go home | | I want that. | |
| theater | | Tell me the truth! | |
| time | | association | |
| academic | | biophysics | |
| biochemical | | rapidly | |
| to shine | | multiplication | |
| addition | | fox | |
| rooster | | candle | |
| raisin | | | |

14.3. Appendix C: Additional Tables

The following tables lists all the words in the data that have Alveolar Nasal /n/ as Following Segment.

Number 1 in any table follows the variable vowel.

| Underlying Form (BP) | Surface Form (TP) |
|----------------------|-------------------|
| ^ami[y]a1ne | ^ami[y]a1ne |
| ^Erfal1n | ^Erfal1n |
| a1n | ^a1n |
| a1n | ^u1~ |
| a1n | u1n |
| a1n | u1n |
| a1nha | ^a1nha |
| a1nha | ^U1n'a |
| a1n-ja | ^u1n-ja |
| a1n-ja | u1n-ja |
| a1n-mowqe^ | u1n-mowqe' |
| a1n-mowqe^ | ^u1n-mo'qe' |
| a1n-taeraef | ^u1n-taeraef |
| a1n-towri | ^u1n-to'ri |
| a1n-vaer | u1n-vaer |
| a1n-vaer | ^u1n-vaer |
| a1n-vaerha | ^u1n-vaer'a |
| Abada1ni | ^Abada1ni |
| aeksaer-eshal1n | ^Aeksaer-eshu1n |
| ael^a1n | ^ael'a1n |
| apartema1n | apartema1n |
| apartema1ni | apartema1ni |
| apartema1ni | ^apartema1ni |
| aqaya1n-i | ^aqayu1n |
| Azaerbaeyja1n | ^Azaerbaeyja1n |
| bae^zi-ha-eshal1n | -shu1n |
| Baeraeghal1n | Baeraeghal1n |
| baera-ema1n | baera-'mu1n |
| ba-eshal1n | ba-'shu1n |
| baeya1n | Baeya1n |
| bala-ema1n | -'mu1n |
| becaesba1n | becesbu1n |
| befahma1naem | befahmu1naem |
| bema1naed | bemu1ne' |
| Bimaresta1n | Bimaresta1n |
| bioshima1ne | Bioshima1ne |

| Underlying Form (BP) | Surface Form (TP) |
|----------------------|---------------------|
| bozorgtaerin-eshaln | bozorgtaerin-eshuln |
| caendaln | caendaln |
| caendgalnesazi | Caendgalnesazi |
| dalne | dulne |
| dalneshjuyi | dalneshjuyi-'m |
| daebestaln | daebestaln |
| daebirestaln | daebirestaln |
| dastaln | dastaln |
| deraexshaln | deraexshaln |
| emtehaln-i | emte'aln-i |
| ensalni | Ensalni |
| Esfachalni | ^Esfalni'a |
| GalaInt | GalaInt |
| goftaen-emaIn | goftaen-emuln |
| Golpayegaln | Golpayegaln |
| haemaIn | haemuln |
| haemaIn | haemuln |
| HaemedaIn | HaemedaIn |
| haeme-eshaln | Haemae-'shuln |
| HeraqaIn | HeraqaIn |
| heyvaIn | heyvuln |
| heyvaIn | heyvuln' |
| honaerestaIn | honaerestaIn |
| in-vaer-aIn-vaer | ^in-vaer-^uln-vaer |
| IraIn | ^IraIn |
| IraIni | ^IraIni |
| ishaIn | ^Ishuln |
| jaeri[y]aIn | jaeri[y]aIn |
| kaelaemat-eshaln | kaelaemat-eshuln |
| karha-emaIn | kar'a-'muln |
| karxaIneha | karxulneha |
| KermaInshahiha | KermuInshahi'a |
| KordestaIn | KordestaIn |
| lachje-eshaln | lachjae-'shuln |
| LorestaIn | LorestaIn |
| maInde | mulnde |
| maekaIn | maekaIn |
| maenzur-etaIn | maenzur-etuln |
| mehaelle-emaIn | Mehaellae-'muln |
| MeydaIn | Meyduln |
| mi[y]aIn | mi[y]aIn |

| Underlying Form (BP) | Surface Form (TP) |
|------------------------------|------------------------------|
| mi[y]a lyaend | Mi[y]a l'n' |
| mida lnaem | midu lnaem |
| mida lni | midu lni |
| mima lnaem | mimu lnaem |
| mima lndaem | mimu lndaem |
| mitaeva lnaem | mit'u lnaem |
| mitaeva lnaend | mit'u lnaen' |
| mitaeva lnestaem | mit'u lnestaem |
| mitaeva lnestaend | mit'u lnestaen' |
| mixa lnaed | mixu lne' |
| mixa lnaem | mixu lnaem |
| mixa lnid | mixu lnin' |
| mixa lnim | mixu lnim |
| mo^aven-ema l n | mo^aven-emu l n |
| na l n | Nu l n |
| na l n | Na l n |
| na l n | Na l ~ |
| naeda l ni | naedu l ni |
| naemida l naem | Nemidu l naem |
| naemida l naem | nemidu l nae |
| naemida l naem | Nemedu l naem |
| naemitaeva l naend | nemit'u l naen' |
| naemitaeva l nestaem | nemit'u l nestaem |
| naetaeva l naem | naet'u l naem |
| nemida l naem | Nemidu l naem |
| nemida l naem | nemidu l nae~ |
| nemitaeva l naem | nemit'u l naen' |
| nemitaeva l nim | nemit'u l nim |
| neshal n | neshu l n |
| ostal n | ostal n |
| otoba l n | ^Otuba l n |
| pa l nsaed | pu l nsaed |
| pa l nzdach-shanzdach-salegi | pu l nzdae'-shunzdae'-salegi |
| panzdaeh-sha l nzdach-salegi | punzdae'-shu l nzdae'-salegi |
| pishdaebesta l ni | pishdaebesta l ni |
| pish-ema l n | pish-aemu l n |
| qera l n | qeru l n |
| ra l naende | Ra l naende |
| ra l ndaen | Ra l ndaen |
| raeva l nshenasi | raeva l nshenasi |
| rudxa l ne | Rudxa l ne |
| rudxa l ne | rudxu l ne |

| Underlying Form (BP) | Surface Form (TP) |
|-----------------------------|--------------------------|
| Saergaerda ln | Saergaerdu ln |
| sama lndehi | sama lndehi |
| saxtema ln | saxtemu ln |
| sha lnzdaeh-hefdach | shu lnzdae' |
| shachresta ln | shachresta ln |
| shachresta ln | shachresta lnha |
| Sheyta lni | Sheyta lni |
| soxaenra lni | Soxaenra lni |
| tabesta lnha | Tabestu ln'a |
| ta-ema ln | 'muln |
| taertib-asha ln | taertib-eshu ln |
| Taleqa ln | Taleqa ln |
| Taleqa lni | Taleqa lni |
| tayefe-ema ln | tayefae-'muln |
| Tehra ln | Tehra ln |
| Tehra ln | Te'ra ln |
| Tehra ln | Tehruln |
| Tehra lni | Tehrulni |
| Tehra lni | Te'ra lni |
| Tehra ln-Kaeraej | Tehra ln-Kaeraej |
| xalndaem | xulndaem |
| xalndaen | xulndaen |
| xalnde-aem | xulndae-'m |
| xalnde-i | Xulnd'-i |
| xalndim | xulndim |
| xalne | xulnae |
| xalne | Xulne |
| xalne | Xalne |
| xalne | Xo(w)alne |
| xalnevade | xalnevadae |
| xalnevade | xulnevade |
| xalnevade | xalnevade |
| xalnevade-eman | xulnevadae-'mun |
| xalnevadegi | xalnevadegi |
| xalnevade-t-aen | xalnevadae-t-aen |
| xabalnde-budaend | xabulnde-budaen' |
| xaenda ln | xaendu ln |
| xanel | Xulne |
| xanel | xalne |

| Underlying Form (BP) | Surface Form (TP) |
|-----------------------------|--------------------------|
| xanevade-ema1n | xunevadae-'mu1n |
| xanevade-esha1n | xanevadae-'shu1n |
| xedmaet-eta1n | xedmaet-etu1n |
| xiaba1n | Xiabu1n |
| xiaba1n | Xiabo1n |
| xiaba1n-i | Xiabu1n-i |
| xod-ema1n | xod-emu1n |
| Xorasa1n | Xorasa1n |
| Xorasa1n | Xorasu1n |
| Xorasa1ni | Xorasa1ni |
| zaeba1n | Zaeba1n |
| zaeba1n | zaebu1n |
| zaeba1n-i | zaeba1n-i |
| zaema1n | Zaema1n |
| zaema1ni | zaema1ni |
| zaema1n-i | zaema1n-i |
| Zaenja1n | Zaenja1n |
| Zaenja1niha | Zaenja1niha |
| zur-esha1n | zur-eshu1n |

Table 14.1—List of Words having Alveolar Nasal /n/ as Following Segment

| Underlying Form (BP) | Surface Form (TP) |
|-----------------------------|--------------------------|
| ^a l miane | ^a l miane |
| a l madaem | ^u l maedaem |
| a l made-aem | ^u l maedae-'m |
| a l madegi | ^a l madegi |
| a l maed | ^u l maed |
| a l maedaem | ^u l maedaem |
| a l maede | ^u l maede |
| a l maede-aem | ^u l maedae-'m |
| a l maede-aend | ^u l maedae-'n' |
| a l maede-bud | ^u l maede-bud |
| a l maedim | ^u l maedim |
| a l n | ^u l m |
| ara l m-i | ^aru l m-i |
| baera l -aem | baera l -'m |
| Delara l m | Delara l m |
| dust'ha l -aem | dust'al -'m |
| karha l -aem | kar'al -'m |
| koda l m-eshan | kudu l m-eshan |
| mi[y]a l maedim | Mi[y]u l maedim |
| mixa l haem | mixa l 'm |
| naeya l maed | naeyu l maed |
| naeya l maede-budim | naeyu l maede-budim |
| nemi[y]a l maed | nemi[y]u l maed |
| Qabusna l me | Qabusna l me |
| ruzna l me | Ruzna l mae |
| ruzna l me | Ruzna l me |
| sedal -aem | sedal -'m |
| shenasna l me | shenasna l me |
| shenasna l me | shenasna l mae |
| taema l m | taemu l m |
| taema l m | taema l m |

Table 14.2—List of Words having Bilabial Nasal /n/ as Following Segment

There is a total of 41 instances in the data of the following forms, with 19 unique values.

| Underlying (BP) | Surface (BP) | Gloss |
|------------------|--------------|---------------------------|
| daestr<æ~e>s | daes'res | 'reach' |
| j<æ~e>haet | jhaet | 'direction' |
| kael<æ~e>mat | kaelaemat | 'words' |
| kuc<æ~e>k | kucik | 'small' |
| m<æ~e>haell | mehael' | 'location' |
| m<æ~e>haelle | Mehaelle | 'neighborhood' |
| mont<æ~e>ha | monteha | 'yet, however, but' |
| mot<æ~e>favet | motaefavet | 'different' |
| mot<æ~e>qaren | motaeqaren | 'symmetrical' |
| mot<æ~e>qabelaen | moteqabelaen | 'mutually' |
| mot<æ~e>vaejjeh | motevaejjeh | 'comprehending' |
| mot<æ~e>vaelled | motevaelled | 'born' |
| n<æ~e>hayaet | naehayaet | 'ultimate point' |
| n<æ~e>mayeshgah | naemayeshgah | 'showroom, exhibition' |
| r<æ~e>^ayaet | rae^ayaet | 'abidance' |
| rahn<æ~e>ma[y]i | rahnaema[y]i | 'middle school; guidance' |
| r<æ~e>fiq | refiq | 'pal' |
| sh<æ~e>rik | sherik | 'partner' |
| sin<æ~e>ma | Sinaema | 'cinema; movie theater' |

Table 14.3—Binary Underlying Vowels

I have listed below in the following Table 14.5, Table 14.6, Table 14.7 and Table 14.8 all the tokens of variation/non-variation in ‘affix’ or ‘affix of PN’. I have made an exception of the transitive verb suffix *-an* and included it as ‘affix’ rather than ‘verb stem’. For example, *caesbidæn* ‘(for something) to stick (intransitive)’ vs. *caesbandæn* ‘(for someone) to stick sth (transitive)’. Affixes have been merged by function (categories they create) to maximize the number of tokens.

| <i>Affix</i> | <i>Underlying Form</i> | <i>Surface Form</i> | <i>Gloss</i> | <i>Raised (Yes/No)</i> | <i>Morphological Status</i> |
|------------------------------|------------------------|---------------------|--------------------------|------------------------|-----------------------------|
| -an (location) | Abada1ni | Abada1ni | ‘from Abadan’ | N | Affix of PN |
| | Azaerbaeyja1n | Azaerbaeyja1n | PLACE NAME | N | Affix of PN |
| | Baeraegha1n | Baeraegha1n | PLACE NAME | N | Affix of PN |
| | Bimaresta1n | Bimaresta1n | ‘Hospital’ | N | Affix of PN |
| | Golpayega1n | Golpayega1n | PLACE NAME | N | Affix of PN |
| | Haemeda1n | Haemeda1n | PLACE NAME | N | Affix of PN |
| | Heraqa1n | Heraqa1n | PLACE NAME | N | Affix of PN |
| | Ira1n | Ira1n | PLACE NAME | N | Affix of PN |
| | Ira1ni | Ira1ni | ‘from Iran’ | N | Affix of PN |
| | Kerma1n1fahiha | Kermu1n1fahi’a | ‘people from Kermanshah’ | Y | Affix of PN |
| | Kordesta1n | Kordesta1n | PLACE NAME | N | Affix of PN |
| | Loresta1n | Loresta1n | PLACE NAME | N | Affix of PN |
| | Taleqa1n | Taleqa1n | PLACE NAME | N | Affix of PN |
| | Taleqa1ni | Taleqa1ni | PLACE NAME | N | Affix of PN |
| | Tehra1n | Tehra1n | PLACE NAME | N | Affix of PN |
| | Tehra1n-Kaeraej | Tehra1n-Kaeraej | PLACE NAME | N | Affix of PN |
| | Tehra1n | Tehru1n | PLACE NAME | Y | Affix of PN |
| | Tehra1ni | Tehru1ni | PLACE NAME | Y | Affix of PN |
| | Tehra1n | Te’ra1n | PLACE NAME | N | Affix of PN |
| | Tehra1ni | Te’ra1ni | PLACE NAME | N | Affix of PN |
| | Xorasa1n | Xorasa1n | PLACE NAME | N | Affix of PN |
| | Xorasa1ni | Xorasa1ni | ‘from Khorasan’ | N | Affix of PN |
| | Xorasa1n | Xorasu1n | PLACE NAME | Y | Affix of PN |
| | Zaenja1n | Zaenja1n | PLACE NAME | N | Affix of PN |
| | Zaenja1niha | Zaenja1niha | ‘those from Zanjan’ | N | Affix of PN |
| -an (adj) | deraexfa1n | deraexfa1n | ‘shining’ | N | Affix |
| | xaenda1n | xaendu1n | ‘smiling, laughing’ | Y | Affix |
| | Saergaerda1n | Saergaerdu1n | ‘Wondering’ | Y | Affix of PN |
| -an (transitive verb) | becaesba1n | becesbu1n | ‘Stick [it]!’ | Y | Affix |
| | xaba1nde-budaend | xabu1nde-budaen' | ‘[they] had laid’ | Y | Affix |
| -an (plural) | aqaya1n-i | aqayu1n-i | ‘some gentlemen’ | Y | Affix |

| <i>Affix</i> | <i>Underlying Form</i> | <i>Surface Form</i> | <i>Gloss</i> | <i>Raised (Yes/No)</i> | <i>Morphological Status</i> |
|------------------------------|------------------------|----------------------|---------------------------|------------------------|-----------------------------|
| -an (verbal noun) | ^Erfal n | ^Erfal n | PERSON'S NAME | N | Affix of PN |
| -an (adv.) | caenda l n | caenda l n | 'so' | N | Affix |
| -ane (adj) | ^amia l ne | ^amia l ne | 'colloquial' | N | Affix |
| | biofimy a l ne | Biofimy a l ne | 'biochemical' | N | Affix |
| | caendga l nesazi | caendga l nesazi | 'multiplication' | N | Affix |
| -eman (pronoun) | baera-ema l n | baera-'mu l n | 'for us' | Y | Affix |
| | baera-ema l n | baera-'mu l n | 'for us' | Y | Affix |
| | bala-ema l n | bala-'mu l n | 'above us' | Y | Affix |
| | goftaen-ema l n | goftaen-emu l n | 'our saying' | Y | Affix |
| | karha-ema l n | kar'a-'mu l n | 'our jobs' | Y | Affix |
| | ta-ema l n | ta-'mu l n | '[both] of us' | Y | Affix |
| | tayefe-ema l n | tayefae-'mu l n | 'our clan' | Y | Affix |
| | xod-ema l n | xod-emu l n | 'ourselves' | Y | Affix |
| | xanevade-emu l n | xunevadae-'mu l n | 'our family' | Y | Affix |
| | mehaelle-ema l n | mehaellae-'mu l n | 'our neighborhood' | Y | Affix |
| | mo^aven-ema l n | mo^aven-emu l n | 'our vice-principal' | Y | Affix |
| | pij-ema l n | pif-aemu l n | 'with us' | Y | Affix |
| -ejan (pronoun) | aeksaer-efa l n | aeksaer-efu l n | 'most of them' | Y | Affix |
| | bae^zi-ha-efa l n | bae'zi-ha-'fu l n | 'some of them' | Y | Affix |
| | ba-efa l n | ba-'fu l n | 'with them' | Y | Affix |
| | bozorgtaerin-efa l n | bozorgtaerin-efu l n | 'biggest of them' | Y | Affix |
| | haeme-efa l n | haemae-'fu l n | 'all of them' | Y | Affix |
| | kaelaemat-efa l n | kaelaemat-efu l n | 'their words' | Y | Affix |
| | laehje-efa l n | laehjae-'fu l n | 'their accent' | Y | Affix |
| | taertib-efa l n | taertib-efu l n | 'their order' | Y | Affix |
| | xanevade-efa l n | xanevadae-'fu l n | 'their family' | Y | Affix |
| | zur-efa l n | zur-efu l n | 'their force' | Y | Affix |
| -estan, -[e]stan (n.) | daebesta l n | daebesta l n | 'elementary school' | N | Affix |
| | daebiresta l n | daebiresta l n | 'high school' | N | Affix |
| | dasta l n | dasta l n | 'story' | N | Affix |
| | pifdaebesta l ni | pifdaebesta l ni | 'pre-school' | N | Affix |
| | faehresta l n | faehresta l n | 'county' | N | Affix |
| | faehresta l n | faehresta l n | 'County' | N | Affix of PN |
| | faehresta l n | faehresta l nha | 'counties' | N | Affix |
| | tabesta l nha | tabestu l n'a | 'summers' | Y | Affix |
| -etan (pronoun) | xedmaet-eta l n | xedmaet-etu l n | '[at] your service' | Y | Affix |
| | maenzur-eta l n | maenzur-etu l n | 'your intention/meantime' | Y | Affix |

| <i>Affix</i> | <i>Underlying Form</i> | <i>Surface Form</i> | <i>Gloss</i> | <i>Raised (Yes/No)</i> | <i>Morphological Status</i> |
|---------------------|------------------------|---------------------|---------------------|------------------------|-----------------------------|
| -ha (plural) | dust'ha l-aem | dust'a l-'m | 'my friends' | N | Affix |
| | karha l-aem | kar'a l-'m | 'my jobs' | N | Affix |
| | karxa lneha | karxu lneha | 'factories' | Y | Affix |
| -name (n.) | Qabusna lme | Qabusna lme | LITERARY WORK | N | Affix of PN |
| | ruzna lme | ruzna lmae | 'newspaper' | N | Affix |
| | ʃenasna lme | ʃenasna lmae | 'birth certificate' | N | Affix |
| -xane (n.) | rudxa lne | rudxa lne | 'river' | N | Affix |
| | rudxa lne | rudxu lne | 'river' | Y | Affix |
| -man (n.) | saxtema l n | saxtemu l n | 'building' | Y | Affix |

Table 14.4—Affix and Affix of PN: /a/-raising (/a/→[a]~[u])

| Underlying | Surface | Gloss |
|-------------------|----------------|-------------------|
| Delara l m | Delara l m | GIRL NAME |
| Esfacha l ni | Esfu l ni'a | NEIGHBORHOOD NAME |
| Gala l nt | Gala l nt | CAR MAKE |
| Meyda l n | Meydu l n | 'city square' |
| Meyda l n | Meydu l n | 'city square' |
| Meyda l n | Meydu l n | 'city square' |
| ʃeyta l ni | ʃeyta l ni | 'Satanic' |
| xiaba l n | Xiabu l n | 'street' |
| xiaba l n | Xiabu l n | 'street' |

Table 14.5—Proper Nouns: /a/-raising (/a/→[a]~[u])

There was a total of 305 tokens, with 59 unique values (types), as listed in the following table:

| Underlying (BP) | Surface (VTP) | Gloss |
|-----------------|----------------|---------------------------|
| ^o1bur | ^u1bur | 'passing' |
| ^o1mumaen | ^u1mumaen | 'generally' |
| ^o1mumi | ^u1mumi | 'public, general' |
| do1rud | du1rud | 'greeting' |
| do1rugh | du1rugh | 'lie' |
| fo1rmul | fu1rmul | 'formula' |
| fo1rudgah | fo1rudgah | 'airport' |
| fo1rudgah | fu1r'dgah | 'airport' |
| fo1rudgah | fu1rudgah | 'airport' |
| fo1ru'faendegi | fu1ru'faendegi | 'salesmanship' |
| fo1ru'fgah | fu1ru'fgah | 'store' |
| fo1ruxt | fu1ruxt | '(he/je/it) sold' |
| gho1rub | gho1rub | 'sunset' |
| gho1rub | ghu1rub | 'sunset' |
| go1ruh | gu1ruh | 'group' |
| ho1dud | hu1dud | 'limits' |
| ho1dudaen | hu1'daen | 'approximately' |
| ho1dudaen | hu1dudaen | 'approximately' |
| ho1ruf | hu1ruf | 'letters' |
| Jo1mhuri | Jo1mhuri | 'Republic' |
| jo1nub | ju1nub | 'south' |
| jo1nubi | Ju1nubi | 'southern' |
| ko1dam-efan | ku1dum-efun | 'which of them' |
| ko1lub | Ku1lub | 'club' |
| mifo1ruxt | mifo1ruxt | '(he/je/it) sold' |
| milyo1n | milyu1n | 'million' |
| no1fuz | nu1fuz | 'influence; 'penetration' |
| O1rumie | U1rumie | PLACE NAME |
| O1rupayi | U1rupayi | 'European' |
| o1sul | u1sul | 'principles' |
| o1toban | o1toban | 'highway' |
| o1toban | o1tuban | 'highway' |
| o1toban | u1tuban | 'highway' |
| o1tobus | o1tobus | 'bus' |
| o1tobus | u1tobus | 'bus' |
| o1tomobil' | o1tomobil' | 'automobile' |
| ro1ju^ | ru1ju^ | 'referring' |
| fo1lugh | fu1lugh | 'crowded' |
| fo1ru^ | fu1ru' | 'beginning' |
| fo1ru^ | fu1ru^ | 'beginning' |

| Underlying (BP) | Surface (VTP) | Gloss |
|-----------------|---------------|-------------|
| vo1jud | vo1jud | ‘existence’ |
| vo1jud | vu1jud | ‘existence’ |
| vo1rudi | vu1rudi | ‘entrance’ |
| xano1m | Xanu1m | ‘Ms.; lady’ |
| xo1rd | xu1rd | ‘crushed’ |
| xo1rde | xo1rde | ‘eaten’ |
| xo1rde | xu1rde | ‘eaten’ |
| xo1rus | xo1rus | ‘rooster’ |
| xo1rus | xu1rus | ‘rooster’ |

Table 14.6—Raising Types under VC3 /o/→[o]~[u])

| Underlying | Gloss | Surface |
|------------|--|------------|
| ^aʃeq-æ1ʃ | ‘loving him/her/it; his/her/its lover’ | ^aʃeq-e1ʃ |
| æ1da | ‘impression, imitation’ | e1da |
| æ1st | ‘is’ | e1ʹ |
| ægæ1r | ‘if’ | æge1ʹ |
| ægæ1r | | ægæ1r |
| ægæ1r | | æge1ʹ |
| ægæ1r | | æye1ʹ |
| æz-æ1ʃ | ‘from him/her/it’ | æz-æ1ʃ |
| axæ1r | ‘end’ | axæ1r |
| axæ1r | ‘end’ | axæ1r |
| axæ1r | ‘end’ | axelʹ |
| bæ^d-æ1ʃ | ‘afterwards’ | bæʹd-e1ʃ |
| bæradæ1r | ‘brother’ | bæradæ1r |
| baʃæ1d | ‘is’ (SUBJUNCTIVE) | baʃe1ʹ |
| becæ1sban | ‘stick it’ | becel1sbun |
| bedæ1h | ‘give’ | bedʹe1ʹ |
| begiræ1d | ‘take it’ (SUBJUNCTIVE) | begire1ʹ |
| be-h-æ1ʃ | ‘to him/her/it’ | be-h-e1ʃ |
| beʃ{æv}æ1d | ‘becomes’ (SUBJUNCTIVE) | beʃʹe1ʹ |
| bud-æ1ʃ | ‘he/she/it was’ | bude1ʃ |
| bud-æ1ʃ | | bud-e1ʃ |
| budæn-æ1ʃ | ‘its/his/her being’ | budæn-e1ʃ |
| dæ1qiqe | ‘minute’ | de1ʹqe |
| daræ1d | ‘has’ | dare1ʹ |
| digæ1r | ‘other; other than that’ | digelʹ |
| digæ1r-i | ‘(an)other’ | digæ1r-i |

| Underlying | Gloss | Surface |
|-----------------|----------------------------|----------------|
| digælr-i | | digel'-i |
| dorost-ælf | 'the right (one)' | Dorost-elʃ |
| doxtælr | 'daughter; girl' | doxtælr |
| entexab-ælt | 'your (SG) choice' | Entexab-elʃ |
| entexab-ælt | | donbal-elʃ |
| esm-ælf | 'his/her/its name' | ^esm-elʃ |
| fut-ælf | 'its/her/its blowing' | fut-elʃ |
| hæqiqæt-ælf | 'the truth' | Hæyiqæt-elʃ |
| kæls | 'someone' | keʃ |
| kæls | | kæʃ |
| kæls-i | 'someone' | kæʃ |
| kæls-i | | keʃ |
| kæls-i | | keʃ-i |
| komæk-ælf | 'his/her/its help' | komæk-elʃ |
| konæld | 'does it SUBJUNCTIVE' | koneʃ |
| Mælhdi | PERSON'S NAME | Mælhdi |
| mægælr | 'unless' | mægel' |
| mægælr | | mægælr |
| mænzur-ælf | 'his/her/its meaning' | mæ~zur-elʃ |
| mærahel-ælf | 'its/his/her stages' | mærahel-elʃ |
| midæhæld | 'gives it' | mid'eʃ |
| migoft-ælf | 'he/she/it was saying' | migoft-elʃ |
| miguyæld | 'says' (3SG) | mig'eʃ |
| mikonæld | 'does' (3SG) | mikoneʃ |
| mikonæld | | mikonæld |
| mineʃinæld | 'sits' (3SG) | mi'ʃineʃ |
| mirævæld | 'goes' (3SG) | mir'eʃ |
| mifævæld | 'becomes' (3SG) | mif'eʃ |
| mifævæld | | mifævæld |
| mifævæld | | mif'eʃ |
| mixahæm-ælf | 'I want him/her/it' | mixahæm-ælf |
| mixanæld | 'reads; sings' (3SG) | mixuneʃ |
| mixoræld | 'eats' (3SG) | mixoreʃ |
| mizænæld | 'hits; beats' (3SG) | mizæneʃ |
| moxærreb-ælf | '(the) destructive (one)' | moxærreb-elʃ |
| nælmidanæm | 'I do not know' | nælmidunæm |
| nælmifæved | 'does not become' (3SG) | neʃmif'eʃ |
| nælfodim | 'we did not become' | nælfodim |
| næbafæld | 'is not' (3SG SUNJUNCTIVE) | næbaf'eʃ |
| nelmitævanestæm | 'I could not' | nelmit'unestæm |
| nemikonæld | 'does not do' 3SG | nemikoneʃ |

| Underlying | Gloss | Surface |
|---------------------|--|------------------------|
| nemiʃævæld | ‘does not become; is not possible’ 3SG | Nemiʃ ^o e1’ |
| neʃæ1ste-ænd | ‘they are sitting; they have sat’ | neʃe1stæ-’nd |
| neʃæ1ste-budim | ‘we were sitting; we had sat’ | neʃe1ste-budim |
| neʃæ1stim | ‘we sat’ | neʃe1stim |
| pedær-madær-æ1ʃ | ‘his/her/its parents’ | pedær-madær-e1ʃ |
| pesæ1r | ‘boy; son’ | pesæ1r |
| qæbl-æ1ʃ | ‘before’ | qæbl-e1ʃ |
| qærardad-æ1t | ‘your contract’ | qærardad-e1t |
| rast-æ1ʃ | ‘(the) truth’ | rast-e1ʃ |
| rast-æ1ʃ | | Rast-æ1ʃ |
| sæmt-æ1ʃ | ‘towards it/him/her’ | sæmt-e1ʃ |
| særf-æ1ʃ | ‘its conjugation; its consumption’ | Særf-e1ʃ |
| ʃah ^Abdol ^Ælæ1zim | PROPER NAME | ʃabdele1zim |
| tæmam-æ1ʃ | ‘all of it/him/her’ | tæmum-e1ʃ |
| tæmam-æ1ʃ | ‘all of it/him/her’ | tæmam-e1ʃ |
| væqt-æ1ʃ | ‘the time’ | væxt-e1ʃ |
| xæbæ1r | ‘news’ | xæbæ1r |
| xahæ1r | ‘sister’ | xahæ1r |
| xahæ1r-bæradær | ‘siblings’ | xahæ1r-bæradær |
| xahær-bæradæ1r | ‘siblings’ | xahær-bæradæ1r |
| xod-æ1ʃ | ‘him-/her-/itself’ | xod-e1ʃ |
| xod-æ1t | ‘yourself’ 2SG | xod-e1t |
| yad-æ1t | ‘your (SG) memory’ | yad-e1t |

Table 14.7—List of Raising Types in VC4 /æ/→[æ]~[e]

| Underlying | Gloss | Surface |
|-----------------------|----------------------|-----------------------|
| be1neshin | ‘Sit! (SG.)’ | bi1shin |
| budel-im | ‘(we) have been’ | budi1-‘m |
| ce1 | ‘what’ | ce1 |
| ce1 | | ci1 |
| daest-o-pa-she1kaeste | ‘non-fluent’ | daest-o-pa-she1kaeste |
| de1vist | ‘two hundred’ | di1vist |
| E1ngelisi | ‘English’ | ^I1ngilisi |
| E1ngelisi | | ^E1ngilisi |
| Engel1isi | | ^Ingi1lisi |
| Engel1isi | | ^Engi1lisi |
| hashtad-o-she1sh | ‘eighty-six’ | shi1sh |
| he1fdaeh | ‘seventeen’ | hi1vdae' |
| he1fdaeh | | he1fdaeh |
| he1fdaeh | | hi1vdaeh |
| he1fdaeh | | hi1vdae |
| he1fdaeh | | he1vdaeh |
| he1fdaeh | | he1vdae' |
| he1fdaeh | | hi1fdaeh |
| he1jdaeh | ‘eighteen’ | hi1zhdae' |
| he1jdaeh | | he1jdaeh |
| he1jdaeh | | hi1zhdaeh |
| he1jdaeh | | hi1jdaeh |
| he1jdaeh | | hi1zhdae |
| he1jdaeh | | he1zhdaeh |
| he1jdaeh-salegi-aem | ‘my eighteenth year’ | hi1zhdaeh-salegi-m |
| ke1shmesh | ‘raising’ | ke1shmesh |
| ke1shmesh | | ki1shmish |
| keshme1sh | | keshme1sh |
| keshme1sh | | kishmi1sh |
| ne1gah | ‘look’ | ne1ga' |
| paenjah-o-she1sh | ‘fifty-six’ | paenjah-o-shi1sh |
| se1shom | ‘sixth’ | shi1shom |
| shaest-o-she1sh | ‘sixty-six’ | shaest-o-shi1sh |
| shanzdaeh-he1fdaeh | ‘sixteen, seventeen’ | hi1vdae' |
| she1kaer | ‘hunting’ | shi1kaer |
| she1sh | ‘six’ | shi1sh |
| she1shsalegi | ‘age of six years’ | shi1shsalegi |
| te1kkeha-i | ‘some pieces’ | ti1kkeha-i |

Table 14.8—List of Raising Types in VC5 /e/→[e]~[i]