Proceedings of the 31st Annual UCLA Indo-European Conference

Los Angeles
November 8th and 9th, 2019

Edited by

David M. Goldstein
Stephanie W. Jamison
Brent Vine

with the assistance of

Angelo Mercado

BUSKE

Contents

Preface vii

Miyu AKAO
Internal and External Factors behind the Development
of the Tocharian Secondary Cases 1

Milena ANFOSSO
The Phrygians from Βρίγες to Φρύγες:
Herodotus 7.73, or the Linguistic Problems of a Migration 17

Roberto BATISTI
On Greek Αἰθίοψ 'Ethiopian' and Αἴσωπος 'Aesop' from a PIE Perspective 37

James CLACKSON
The Latin and Oscan Imperfect Subjunctive in *-*sē*- 55

John CLAYTON
Rhinoglottophilia in Avestan: *h > [h̃]
and Its Orthographic and Phonological Consequences 79

Ashwini DEO
Copular Contrasts in Indo-Aryan Diachrony 95

Petra M. GOEDEGEBUURE
The Fat and the Furious: **w(o)rĝ*- 'fat, furious, strong' and Derivatives
in Hittite and Luwian 121

Ian HOLLENBAUGH
Inceptives in Ancient Greek 139

Ronald I. KIM
PIE Verbal Roots of the Shape **C(C)eH*- in Old Armenian 161

Jared S. KLEIN
Old Church Slavic *obače* and *tŭk(ŭ)mo* 181

Laura MASSETTI
"Hermes and Hestia" Revisited: Hermes ἀκάκητα and the Funerary Fire 197

Thomas MOTTER
Hittite Correlative Resumption as Discourse Anaphora 215

Domenico Giuseppe MUSCIANISI
Zeus Δέκτερος ‘Benevolent, Welcoming’ from Thera
and Proto-Indo-European ‘Right’ 229

Anthony D. YATES
The Phonology and Morphology of Anatolian *-*mon*-stems 245

List of Contributors 265

Index Verborum 269

Rhinoglottophilia in Avestan: *h > [h̃] and Its Orthographic and Phonological Consequences*

JOHN CLAYTON

University of California, Los Angeles

The phonetic interpretations of the signs ⟨ŋh⟩ and ⟨n̥gh⟩ have long been a point of contention in Avestan historical phonology, especially due to their surprising development from Proto-Iranian *h / *ă__ă*. Past theories that assigned ⟨ŋh⟩ the value [ŋ] have overlooked phonological and typological facts that help clarify many of Avestan's orthographic and phonological oddities. This paper proposes that Avestan ⟨ŋh⟩ transcribed a nasalized glottal fricative [h̃] that arose from the well-documented process of rhinoglottophilia. In addition, ⟨ŋh⟩ [h̃] contrasted with a cluster ⟨n̥gh⟩ [ŋh̃], but only in Old Avestan. Under this theory, the mechanisms of Avestan vowel nasalization are examined, clarified, and found consistent with typological generalizations from outside the Indo-European family. Furthermore, this article refutes the claim that each letter of the Avestan alphabet originally corresponded to a single phonetic sound—a tenet of Sasanian archetype theory (Hoffmann and Narten 1989:34–7).

1. Introduction

As the oldest and fullest witness of early Iranian religion and language, Avestan has had surprisingly contradictory interpretations of its phonology and orthography in the modern era. Despite the phonological complexity and specificity of its alphabet, two opposing views arose concerning the phonological accuracy of the Avestan manuscripts. The earlier view, known as "the Andreas Theory" (Andreas 1904), states that the vowels found in the Avestan manuscripts were inserted secondarily on the basis of Pahlavi exemplars, which did not accurately record the original phonological values. Andreas' interpretation provided him and others wide leeway to emend the text where they saw fit, potentially ignoring real phenomena in Avestan phonology. In response to this seemingly lawless approach to textual criticism, Hoffmann and Narten (1989) proposed an opposing view that consistent

* I would like to thank Stephanie Jamison, Tony Yates, Thomas Motter, Teigo Onishi, and Ian Hollenbaugh for their crucial advice on this paper. Without their aid, none of this could have come to fruition. Any errors that remain are mine.

David M. Goldstein, Stephanie W. Jamison, and Brent Vine (eds.). 2020.
Proceedings of the 31st Annual UCLA Indo-European Conference. Hamburg: Buske. 79–93.

errors found throughout Iranian and Indian manuscripts pointed to a single Sasanian archetype, which underwent further corruption over time. The theory of the Sasanian archetype stemmed from extensive manuscript criticism and has remained popular since its introduction. In contrast to the Andreas Theory, Hoffmann and Narten's theory holds as a precept that each sign of the Avestan alphabet corresponded to one discrete phonological output. One can see the immediate appeal of their "one-sign-one-sound" tenet when examining the painstaking way the redactors preserved every phonological idiosyncrasy of a liturgical language long dead by the time of its transcription. Yet Hoffmann and Narten's more conservative view of the Avestan alphabet has also impeded the search for a better understanding of the phonemic contrasts and phonological processes active in Avestan before its death and eventual recension. This paper argues that the development of Avestan nasals and nasality demonstrates that the orthography possessed both one-to-one relationships to phonetic values and one-to-many and indeed many-to-one relationships.

At issue are the interpretations of the symbols ⟨ŋ⟩, ⟨n̥⟩ and the process of rhinoglottophilia.[1] Unlike previous interpretations of these forms, this paper argues that neither ⟨ŋ⟩ nor ⟨n̥⟩ corresponded to single phonetic segments. Instead, ⟨ŋ⟩ functioned primarily as a suprasegmental nasalization diacritic to the phoneme /h/, arising by the cross-linguistically well-attested phenomenon known as "rhinoglottophilia," and not as a segmental velar nasal [ŋ]. Conversely, ⟨n̥⟩ represented a series of segmental nasals that were homorganic with their following consonants (e.g., ⟨n̥b⟩ = [mb], ⟨n̥d⟩ = [nd], ⟨n̥g⟩ = [ŋg], etc.). Providing different values for ⟨ŋ⟩ and ⟨n̥⟩ accomplishes more than counterexemplifying Hoffmann and Narten's one-sign-one-sound rule. By positing a strict distinction between segmental nasals and secondarily articulated suprasegmental nasalization of consonants, the environments for phonological processes like vowel raising, lengthening, and breaking receive unified descriptions. Furthermore, syllable structure and vowel height are shown to play crucial roles in vowel nasalization once the distinction between segmental nasals and nasalized consonants has been established. Examining these factors together, this study shows that Avestan nasal-induced sound changes parallel typological generalizations found in the linguistics literature.

1 In this article ⟨x⟩ represents standard transliterations of forms found in the Avestan manuscripts. /x/ and [x] have their traditional IPA interpretations: phonemic and phonetic transcriptions, respectively. Language abbreviations: Av. = Avestan, OAv. = Old Avestan, YAv. = Young(er) Avestan, Ved. = Vedic Sanskrit, Skt. = Sanskrit, PIE = Proto-Indo-European, PIIr. = Proto-Indo-Iranian, PIr. = Proto-Iranian, OI = Old Irish.

2. The problem of Av. ⟨ŋ⟩ as [ŋ]

Past scholars have long argued about the phonetic value of ⟨ŋ⟩, with the older opinion holding that it represented a true segmental velar nasal /ŋ/ (e.g., Morgenstierne 1942:64–8; Hoffmann and Narten 1989:49–50; Martínez and de Vaan 2014:25). A close examination of the primary sources of Av. ⟨ŋ⟩, however, will show that /ŋ/ is likely not its proper interpretation. Example (1) provides standard examples of the development of ⟨ŋ⟩ from PIr. *h. For most of these examples, the ⟨h⟩ is preserved in the Av. orthography.

(1) The primary sources of ⟨ŋ(h)⟩:

a. Av. ⟨ŋh⟩ < PIr. *h / *ă__ă*

- *aŋhaⁱti* ‘to be’ 3SG.PRS.ACT.SBJV < PIr. **Háh-a-ti* < PIE **h₁és-e-ti*
  (cf. Ved. *ásati* ‘id.’)

b. YAv. ⟨ŋh⟩, OAv. ⟨ŋgh⟩ < PIr. *-*Nh*- / *ă__ă*

- YAv. *maŋha*-, OAv. *māŋgha*- ‘to think’ < PIr. **mán-h*- S-AOR (WEAK STEM)
  (cf. Ved. *máṃs*- ‘id.’)

c. YAv. ⟨ŋ(h)r⟩, OAv. ⟨ŋgr⟩ < PIr. *-*hr*- / *ă__ă*

- YAv. *daŋ(h)ra*-, OAv. *daŋgra*- ‘masterful’ < PIr. **dahrá*- < PIE **dn̥s-ró*-
  (cf. Skt. *dasrá*- ‘id.’)

d. YAv. ⟨ŋ́h⟩, ⟨ŋᵛh⟩ < PIr. **hy*, **hw* / *ă__ă*

- YAv. *vaŋᵛhī*- ‘good’ F < PIr. **Hwáh-w-iH*- < PIE **h₁wés-w-ih₂*-
  (cf. Ved. *vásvī*- ‘id.’)

- YAv. *vaŋ́hō* ‘better’ < PIr. **Hwáh-yah*- < PIE **h₁wés-yes*-
  (cf. Ved. *vásyas*- ‘id.’)

As shown in (1a), the most common source for ⟨ŋh⟩ is an inherited *h between two PIr. *ă vowels. Unlike the other sound changes in (1), this first change had the same environment and outcome in both Old and Young Avestan so far as can be determined from the orthography. Example (1b) shows ⟨ŋh⟩ from PIr. *-*Nh*- between two *ă vowels but in this case only in Young Avestan. Old Avestan by contrast, consistently shows spellings with ⟨ŋgh⟩ and raising of a proceeding *a to ⟨ə̄⟩. As I will argue later, it is not accidental that the development in (1b) is the only example where YAv. ⟨ŋh⟩ comes from an original, underlying nasal and where

OAv. shows consistent raising to ⟨ə̄⟩ in these examples. Like (1b), the same orthographic distinction between Old and Young Avestan appears in (1c): The PIr. cluster *_hr_ between two *_ă̆_ vowels became YAv. ⟨ŋ(h)r⟩ but OAv. ⟨ṇgr⟩. Unlike (1b), however, OAv. reflexes of *-_ahră̆_- do not show raising of the pre-cluster vowel to ˣ-_āṇgră̆_-. Finally, there are two signs traditionally transcribed with an ⟨ŋ⟩, which appear in (1d) and seem to be limited to Young Avestan. These two signs come from original *-_hy_- and *-_hw_- clusters between inherited *_ă̆_ vowels. The signs appear in environments comparable to those in (1a) and (1c), except that Young Avestan has extended the environment to allow glides to intervene between the underlying *_h_ and the following *_ă̆_ vowel.

After examining the sound changes in (1), we see that only one of these types, the PIr. *-_nh_- cluster in (1b), even originated from an underlying nasal, much less speaks in favor of interpreting ⟨ŋ⟩ as [ŋ]. Yet if most of the evidence does not support ⟨ŋ⟩ as [ŋ], then why does this theory persist (besides the influence from transliteration using the sign ⟨ŋ⟩)? The *Paradebeispiel* for the ⟨ŋ⟩ = [ŋ] theory is the YAv. word *paŋtaŋ^{v}hum* 'fifth' < PIr. **panktohwam* < PIE **penk^{w}-to-*, which Hoffmann and Forssman (2004:88) and Martínez and de Vaan (2014:25) claim shows the development of PIr. *-_nkt_- > Av. [-ŋt-] by cluster reduction.[2] Yet this example does not point to ⟨ŋ⟩ = [ŋ] either. Before consonants PIr. **k* and **t* became the Avestan fricatives *x* and *ϑ* (e.g., Av. *xratu-* 'Wille, Absicht, etc.' < PIIr. **krátu-*; OAv. *vax^{ə}ðra-* 'speech' < PIIr. **waktra-*), even when preceded by a sonorant (e.g., Av. *mąϑra-* 'formula' < PIIr. **mántra-*; OAv. *haoząϑβāṯ* 'Wohlvertrauheit, Wissendheit' ABL.SG < pre-Av. **hāuzanϑβāt*, vr̥ddhi derivative to OAv. *huzāṇtu*, YAv. *huzaŋtu-*; OAv. *mar^{ə}xtārō* 'destroyers' < PIIr. **márktāras*). As such, we should expect that the development for PIr. **pankta-* would be **panxta-* > ˣ⟨pąxta-⟩ [pã:xta-] with nasalization of the preceding vowel. The best attested spelling ⟨paŋta-⟩ does not have either ⟨ą⟩ or ⟨x⟩, suggesting that the pre-Av. *-_nx_- may have

2 An examination of the manuscript evidence for this term provides little insight on the matter. Of the 55 manuscripts in the Avestan Digital Archive (Cantera 2007–) that contain the word *paŋtaŋ^{v}hum* in Y19.7, the stem orthography ⟨paŋta-⟩ appears 22 times (40%) and is the dominant form in Iranian manuscripts, with ⟨paŋŋta-⟩ appearing 3 times (~5%). The Indian manuscripts show more variation, with ⟨paŋgata-⟩ 8 times (~15%) and ⟨paŋgta-⟩ 7 times (~13%). Furthermore, the Indian manuscripts sometimes contain a morpheme divider ⟨.⟩ in the middle of the stem (⟨paŋ.ta-⟩ 2×, ⟨paŋga.ta-⟩ 1×, ⟨paŋhe.ta-⟩ 1×). Most other spellings occur only once or twice and are likely unique scribal errors. The Indian spellings with word dividers and epenthetic vowels point to scribal misunderstanding or mishearing of the unusual cluster ⟨-ŋt-⟩. Overall, the spelling ⟨paŋta-⟩ seems to be oldest.

coalesced into a single sound represented by ⟨ŋ⟩. This article argues that sound was a nasalized glottal fricative [h̃].[3]

2.1. The phonetic values of Av. ⟨ŋh⟩ and ⟨ṇgh⟩

Given the above considerations, I propose the following phonetic values for ⟨ŋh⟩ and ⟨ṇgh⟩: the digraph ⟨ŋh⟩ represented the nasalized glottal fricative [h̃], which acquired palatalized and labialized variants in Young Avestan, ⟨ńh⟩ [h̃ʲ] and ⟨ŋʷh⟩ [h̃ʷ]. ⟨ṇgh⟩, on the other hand, represented a true cluster [ŋh̃] < PIr. *-*Nh*-. This account agrees with Ferrer Losilla's (2016:159–60 n.7) astute observation that the signs ⟨ŋ⟩, ⟨ń⟩, and ⟨ŋʷ⟩ were only "a (velar) nasalization of the aspiration" and that in the OAv. ACC.PL ending ⟨-ə̄ŋg⟩ < PIIr. *-*ă̆ns* "the velarized pronunciation would be reinforced through the spelling of the final -*g*, a natural position of the tongue when pronouncing an uncontextualized nasalized glottal (i.e., in a final position or between *a_a*)." Like ⟨ŋh⟩, ⟨ṇg⟩ was also a digraph, representing [ŋ] in the majority of contexts (but see OAv. *hāṇgrabəm* [hə(ː)ŋgrabəm] 'to seize' 1SG.AOR.ACT.INJ < PIr. **ham-grabH-am*).

The distribution of ⟨ŋh⟩ and ⟨ṇgh⟩ differed between Old and Young Avestan: Old Avestan preserved a distinction between the cluster ⟨ṇgh⟩ [ŋh̃] < PIr. *-*Nh*- and the single segment ⟨ŋh⟩ [h̃], while Young Avestan had only ⟨ŋh⟩ [h̃], to which it innovated the palatalized and labialized variants ⟨ńh⟩ [h̃ʲ] and ⟨ŋʷh⟩ [h̃ʷ]. Thus, the original PIr. nasal in **mán-h-a*- surfaces as ⟨ngh⟩ [ŋh̃] in OAv. *məṇgha*- [mə(ː)ŋh̃a-]. Conversely, **h* between **ă̆*'s became ⟨ŋh⟩ [h̃], as in PIr. **Háh-a-ti* > OAv. *aŋhaⁱti* [ah̃atʲi]. Young Avestan, on the other hand, converted the cluster [ŋh̃] > [h̃], resulting in YAv. *maŋha*- [mah̃a-] instead of OAv. *məṇgha*-. The YAv. extension of the nasalization process to the clusters *-*hy*- > ⟨ńh⟩ [h̃ʲ] and *-*hw*- > ⟨ŋʷh⟩ [h̃ʷ] mirrors the coalescence of *#*hy*- > ⟨x́⟩ [hʲ] and *#*hw*- > ⟨xᵛ⟩ [hʷ] observed elsewhere in Avestan (e.g., OAv. *x́iiāṯ* 'to be' 3SG.PRS.ACT.OPT < PIE **h₁s-yéh₁-t*; Av. *xᵛafᵊna*- 'sleep' < PIE **swóp-no*-).[4] By assuming that YAv. lost the distinction between [ŋh̃] and [h̃], we may also provide an explanation for the unexpected shape

3 Hoffmann and Forssman (2004:88) provide another example of the environment *-*nkt*-, which they expected to give ⟨ŋt⟩ as [ŋt]: YAv. *mərᵊγᵊṇte* 'to destroy' 3SG.PRS.MID.IND < PIr. **mr̥nktay*. Of this form, they say "Erwartet wäre somit *mərᵊŋte** < **mr̥ŋ(k)-taj*; also steht *-γᵊṇ*- wohl für *-ṇg*- = *-ŋ*." Yet the spelling ⟨-əγəṇ-⟩ with fricative *-γ*- and orthographic metathesis of *-ṇ*- to after the *-γ*- again suggests that scribes were attempting to write a nasalized fricative and not [ŋ].

4 The reflexes of **hy* and **hw* have a notoriously complicated distribution (de Vaan 2003:563–76), but the fact that we find ⟨hii⟩ / ⟨x́⟩ / ⟨ńh⟩ < PIr. **hy* and ⟨huu⟩ / ⟨xᵛ⟩ / ⟨ŋʷh⟩ < PIr. **hw* indicates that Avestan contained a process for coalescing **hy* and **hw* into single segments.

of ⟨paŋta-⟩: the spelling ⟨-aŋta-⟩ is likely an attempt to spell the YAv. coalesced sound [x̃] or [h̃] < pre-Av. *-*nx*-. Only the OAv. spelling ⟨ŋgr⟩ < PIr. *-*hr*- seems to flout the rule that ⟨ŋg⟩ = [ŋ]. The sequence ⟨ŋgr⟩ is attested only in OAv. *aŋgra*- 'evil' < PIIr. **asra*- (cf. Skt. *asra*- 'id.') and the rhyming hapax OAv. *daŋgra*- 'masterful' < PIIr. **dasra*- (cf. Ved. *dasrá*- 'id.'). The lack of raising from *a* to *ə̄* before *-ŋgr*- suggests that neither word contained a true segmental nasal, unlike **mán-h-a*- > OAv. *məŋgha*-. Beekes (1988:19) has already suggested that OAv. *aŋgra*- and *daŋgra*- were merely hypergāthic spellings for the expected *aŋra*- and *daŋ(h)ra*- found in Young Avestan. I adopt this view and propose that these words were pronounced [ah̃ra-] and [dah̃ra-] (pace Martínez Porro 2015:159–60).[5] The contrast between [ŋh̃], which contained a segmental nasal, and [h̃], which had only suprasegmental nasalization, is crucial for the phonological effects discussed in Section 3.

2.2. Rhinoglottophilia

The notion that PIr. **h* would become Av. [h̃] may at first seem strange given the lack of similar changes in any other Iranian languages. Yet de Vaan (2013) has already identified the likely mechanism: rhinoglottophilia. Described by Matisoff (1975:265) as "an affinity between the feature of nasality and the articulatory involvement of the glottis," rhinoglottophilia describes the well-attested phenomenon whereby glottal segments sometimes spontaneously nasalize themselves or adjacent vowels. Ohala and Amador (1981) provide some dialectal English

5 If indeed YAv. ⟨ŋhr⟩ represented [h̃r], one might well wonder why ⟨ŋr⟩ appears so much more frequently in printed editions. Martínez Porro (2015) answered this question with an in-depth study of the reflexes PIr. *-*hr*-, in which he found that ⟨ŋhr⟩ appeared frequently and in the most conservative manuscripts in both the Iranian and Indian traditions. Based on these findings, he then proposed to emend the following spellings: ⟨aŋhra-⟩ 'evil' for ⟨aŋra-⟩ < PIIr. **asra*-, ⟨fraŋhrasiiānəm⟩ 'who advances slaughter' for ⟨fraŋrasiiānəm⟩ < PIIr. **pra-srać-yan*-, ⟨hazaŋhra-⟩ 'thousand' for ⟨hazaŋra-⟩ < PIIr. **saj^{h}ásram*. Martínez Porro notes that the spellings ⟨hazaŋra-⟩ (without ⟨h⟩) and ⟨fraŋharasiiānəm⟩ (with anaptyctic ⟨a⟩) seem to be common in the manuscripts. Both orthographic changes, he argues, must have occurred during recitation after YAv. ceased to be spoken. Specifically, ⟨hazaŋra-⟩ lost the [h] sound by dissimilation with the word-initial [h], and ⟨fraŋharasiiānəm⟩ gained an anaptyctic [a] via the sporadic anaptyxis that occurs in *-Fr*- clusters. De Vaan (2003:532–4) notes that *-Fr*-to-*FVr*- anaptyxis is peculiar in Avestan because it can produce the vowels *a*, *i*, *u*, and *ō* in addition to the normal anaptyctic *ə*. He also notes that there is not secure evidence of the process occurring in a *-Nr*- cluster. Therefore, both the dissimilatory loss of [h] in ⟨hazaŋra-⟩ and the anaptyxis in ⟨fraŋharasiiānəm⟩ may be explained by processes that target underlying fricatives, adding further evidence that PIr. *-*hr*- really did produce a cluster containing [h̃].

examples where [hɑ] sequences become unexpectedly nasalized (e.g., *Harvard* [hɑ̃.vəd], *half* [hɑ̃f], and *heart* [hɑ̃ːt]).[6] Likewise, English exclamations like *uh-huh* [ʔʌ̃.hʌ̃] and *uh-uh* [ʔʌ̃.ʔʌ̃] may derive their nasalized vowels from the presence of the glottal stop, a segment which is extralinguistic in English. As already discussed by de Vaan, the Ngwi languages Lahu and Lisu show progressive nasalization after glottals (de Vaan 2013; Chirkova and Chen 2013:76–7). Finally, the Argentinian language Wichi' shows nasalization of vowels following glottal sounds (Rogers 2011). Thus, rhinoglottophilia seems to provide a straightforward explanation for the sudden appearance of ⟨ŋh⟩ [h̃]. In particular, Matisoff (1975:272) already noted a strong tendency for low vowels to undergo rhinoglottophilia above all other vowels. Thus, the nasalization of PIr. **h* / *ă__ẵ* is typologically paralleled in the rhinoglottophilia literature. I know of no example of rhinoglottophilia where a full segmental nasal is produced; there do not seem to be attested examples where /h/ or /ʔ/ produce phonetic or phonemic nasal segments. Instead, glottal segments produce suprasegmental nasalization on themselves or the adjacent vowels. Thus, it is unlikely that Avestan rhinoglottophilia produced a full [ŋ] represented by ⟨ŋ⟩; instead, ⟨ŋh⟩ appears to be a digraph for a single sound [h̃].

2.3. On Av. ⟨ṇ⟩

Up to this point, I have argued that ⟨ŋh⟩ only represented a nasalized fricative [h̃] (or perhaps [x̃] in the case of *paŋtaŋʰhum* and *mərᵊγᵊṇte*). That leaves the question of how scribes wrote the phonetic sound [ŋ]. This section argues that ⟨ṇ⟩ may represent [ŋ] when preceding velar consonants: ⟨ṇk⟩, ⟨ṇg⟩, and ⟨ṇġ⟩. Scholars do not generally agree on the interpretation of ⟨ṇ⟩. The sign is limited to orthographically preconsonantal position, specifically in the clusters *ṇk*, *ṇg*, *ṇġ*, *ṇc*, *ṇj*, *ṇt*, *ṇd*, (*ṇp*),[7] and *ṇb*. Under the "one-sign-one-sound" doctrine of Avestan orthography, ⟨ṇ⟩ should not represent a typologically expected homorganic nasal; instead Hoffmann and others have suggested that ⟨ṇ⟩ only represented the uvular nasal [ɴ], to which all nasals were neutralized before consonants (Hoffmann and Narten 1989:67,

6 Ohala and Amador (1981) call this process "spontanteous nasalization" and expand the process to all "obstruents with high airflow […] e.g., voiceless fricatives," but for the purposes of this paper, I shall focus only on the narrower phenomenon of involving glottal elements.

7 Hoffmann and Forssman (2004:88) claim that only ⟨m⟩ appears before ⟨p⟩ and not ⟨ṇ⟩. Ferrer Losilla (2016:160 n.11) points out, however, that "[t]he Avestan grouping nasal + *p* appears only in compounds whose first element is *hąm*° (and its variants: *hą̇m*, *ham*, *hṇm*, *həm*), where *m* is retained." Because ⟨m.p⟩ was always written with a morpheme boundary, the absence of ⟨ṇp⟩ spellings is accidental.

Hoffmann and Forssman 2004:88, Kümmel 2017:11). The most explicit description is given by Hoffmann and Narten (ibid.) as "der merkmallose, postuvulare, d.h. nur durch Senkung des Gaumensegels artikulierte Nasal [ɴ], wie er etwa in der Gujarati verkommt." There are indeed some arguments in favor of this view: the Avestan sign transliterated as ⟨ṇ⟩ is more graphically complicated than any of the other nasals, suggesting that it was not a scribal convenience like the later Devanāgarī use of anusvāra before consonants to represent a homorganic nasal or the Western European use of a macron to show omission of a nasal in medieval manuscripts. Furthermore, Kümmel (ibid.) explains the absence of written preconsonantal nasals in Old Persian by positing that PIIr. **N* > PIr. *[ɴ] / __*T* and that Old Persian did not spell [ɴ]. None of these arguments for Av. ⟨ṇ⟩ as [ɴ] are very compelling, however. Ferrer Losilla (2016) has extensively argued that ⟨ṇ⟩ was merely a segmental nasal homorganic with the following stop. First, the manuscripts show morpheme-internal variation between ⟨ṇt⟩ ~ ⟨nt⟩, ⟨ṇb⟩ ~ ⟨mb⟩ (e.g., ⟨spəṇtąm⟩ [MS 4210] vs. ⟨spəntəm⟩ [MS 672] 'heilvoll' ACC.SG; Ferrer Losilla 2016:178), which would be unexpected if ⟨ṇ⟩ was [ɴ]. The orthographically difficult sign ⟨ṇ⟩ apparently came from the Pahlavi "universal" verbal ending ⟨x$_2$⟩ (= ⟨ynd⟩) < *-*nti* with coarticulatory ligature and originally had four variants in the Avestan alphabet. He finds the ⟨ṇ⟩ variants scattered across the Iranian and Indian manuscripts with varying distributions. Because of how little these ⟨ṇ⟩'s differed from one another, they mostly fell together into one or two variants. Thus, the complexity of the sign ⟨ṇ⟩ was merely a scribally inconvenient historical accident.

To Ferrer Losilla's paleographic arguments, we may add some further evidence. The neutralization pattern of **N* > *[ɴ] / __*T* described by Hoffmann and Narten is otherwise unattested. Gujarati does not have a (post)uvular nasal as Hoffmann and Narten (1989:67) describe; instead, it has an underspecified nasal /*N*/ that shows up as [ŋ], [ɲ], or [˜] before stops, but not as [ɴ]. Not only does this Gujarati /*N*/ not neutralize as Hoffmann and Narten suggest; it actually was homorganic with following stops (Mistry 1997:659). Furthermore, it is hard to imagine how Avestan neutralized nasals in word-internal codas but not in word-final codas (e.g., OAv. *dabən* 'to deceive' 3PL.AOR.ACT.INJ vs. Av. *mąm* 'me' ACC.SG). Consider the Tokyo dialect of Japanese, which has the opposite distribution to the one proposed by Hoffmann and Narten. Nasals become homorganic before stops (e.g., *sanpaku* [sãmpakɯ] 'three nights'), become nasalized approximants before fricatives (e.g., *yonfīto* [jõɰ̃ɸiːto] 'four feet'), and become uvular [ɴ] in utterance-final position (e.g., *kanban* [kãmbãɴ] 'signboard'; Vance 2008:96–104). Compared to Tokyo Japanese, a distribution where only preconsonantal nasals neutralize to [ɴ] seems very unlikely and would be difficult to model in any phonological

framework. Any phonology that neutralizes nasal place of articulation in medial codas despite following stops would certainly neutralize final nasals with no following segments. (See Lombardi 1999 for similar typological arguments on coda voicing neutralization.) Finally, the Middle and Modern Iranian languages frequently show homorganic nasals before stops (see for instance Morgenstierne 1929–38:I.40, II.56, II.317, II.460; Windfuhr 2009:201, 340, 597, 791; Nokák 2013:128; Soohani 2017:37–8). It is not parsimonious to assume that Proto-Iranian underwent a phonetic neutralization of these nasals only to have that collapse in the vast majority of the daughter languages. The fact that the Old Persian syllabary does not write coda nasals may simply be a flaw in the writing system like the omission of coda sonorants in Linear B.

Overall, the evidence indicates that the sign ⟨ṇ⟩ functioned as a homorganic nasal with the following stop. Yet the problem remains that ⟨ṇg⟩ played double duty as both [ŋ] and [ŋg]. Ferrer Losilla's (2016:159–60 n.7) claim that ⟨ng⟩ acted as a digraph for [ŋ] only makes sense if Avestan scribes did not have any other sign denoting [ŋ]. As I have argued, this is precisely the case, since ⟨ŋh⟩, ⟨ńh⟩, and ⟨ŋ^{v}h⟩ originally represented nasalized fricatives.[8]

3. The phonological effects of nasalization

Up to this point, I have focused primarily on narrow phonetic interpretations of ⟨ŋh⟩ and ⟨ṇgh⟩ without much reference to adjacent segments. By distinguishing ⟨ŋh⟩ [h̃] from ⟨ṇgh⟩ [ŋh̃], however, we may simplify the distribution of various nasal-induced phonological processes targeting vowels, namely raising, nasalization, lengthening, and breaking. Before launching into these effects, it will be

8 A further question remains about the phonetic value of the ACC.PL endings OAv. ⟨-ə̄ṇg⟩, ⟨-ə̄ṇġ⟩ vs. YAv. ⟨-ə̄⟩, ⟨-ą⟩ < PIIr. *-*ă̆ns#*. Building on Ferrer Losilla (2016:159–60 n.7), I believe the OAv. form ⟨-ə̄ṇg⟩ probably represented [-ə(ː)ŋh̃]. The rare letter ⟨ġ⟩, which appears only in this ending ⟨-ə̄ṇġ⟩ in certain manuscripts, has been interpreted as an unreleased [gˀ] similar to ⟨t̰⟩ [tˀ]. Yet if OAv. ⟨-ə̄ng⟩, ⟨-ə̄ṇġ⟩ did not contain a final [g], it seems more likely that ⟨ġ⟩ represented some type of nasalized glottal fricative [h̃] in final position. Indeed, the sign transliterated ⟨ġ⟩, 𐬛, looks strikingly like the sign transliterated ⟨s⟩, 𐬰, again suggesting that ⟨ġ⟩ was a fricative. Interpreting OAv. ⟨-ə̄ng⟩, ⟨-ə̄ṇġ⟩ as [-ə(ː)ŋh̃] has another advantage: if Young Avestan lost the distinction between [ŋh̃] and [h̃] as I have suggested, then the absence of an overt nasal in the YAv. ACC.PL endings ⟨-ə̄⟩, ⟨-ą⟩ would again be due to PIr. *-*ă̆nh* > pre-Av. *-*ă̆ŋh̃* > pre-YAv. *-*ă̆h̃* > -*ə̄* [ə(ː)], -*ą* [ãː]. Kümmel (2012:142–3) argues that Avestan continues the same PIIr. *-*āns* that produced Ved. -*āṃs*, though he admits that no other secure evidence exists for the development of PIr. **āNh* in Avestan. I can see no way to adjudicate between the PIr. *-*ānh* and *-*anh* from the available Avestan data.

useful to review when nasalization is most likely to happen. Example (2) gives hierarchies for likelihood of regressive vowel nasalization proposed by Schourup (1973) as part of a wide typological study of vowel nasalization.

(2) Likelihood of regressive vowel nasalization cross-linguistically (Schourup 1973):

a. Likelihood of nasalization by nasal position:

Most likely **Least likely**

$$__N\# \gg __\underset{[+\text{cont}]}{NC} \gg __\underset{[-\text{cont}]}{NC} \gg __.NV$$

b. Likelihood of nasalization by vowel type:

Most likely **Least likely**

$$\underset{[+\text{low}]}{V} \gg \underset{\left[\begin{smallmatrix}-\text{low}\\-\text{high}\end{smallmatrix}\right]}{V} \gg \underset{[+\text{high}]}{V}$$

The hierarchy under (2a) shows the likelihood of vowels to be nasalized on the basis of nasal position. He finds that absolute final nasals cause nasalization most frequently, followed by medial nasals before continuant consonants, then by medial nasals followed by non-continuants, and least likely to nasalize are the nasals that appear in the onset of the next syllable. Another metric by which regressive vowel nasalization may be predicted is vowel height. As shown in (2b), Schourup finds that low vowels are the most likely to nasalize, mid vowels second most likely, and high vowels least likely to nasalize. With these hierarchies in mind, I will examine the distribution of nasal-induced effects in Avestan.

3.1. Raising induced by nasalization

Avestan had a robust process that raised PIr. **a* > OAv. ⟨ə̄⟩, YAv. ⟨ə⟩ before tautosyllabic nasal segments, shown in (3).

(3) PIr. **a* > ⟨ə̆̄⟩ / __*N*.

a. OAv. *hə̆̄ṇtū* ‘to be’ 3PL.PRS.ACT.IMP < PIE **h₁s-éntu*
(cf. Ved. *sántu*)

b. YAv. *vazəṇti* ‘to lead’ 3PL.PRS.ACT.IND < PIE **wéǵʰ-o-nti*
(cf. Ved. *váhanti*)

c. OAv. *aniiə̆̄n* ‘other’ M.ACC.SG < PIIr. **Hanyám*
(cf. Ved. *anyám*)

d. YAv. *barən* ‘to bring’ 3PL.PRS.ACT.INJ < PIE **bʰér-o-nt* (cf. Ved. *bharan*)

The raising of a low vowel before a nasal is typologically very common, appearing also in Latin, Germanic, and Armenian, among others languages. From the perspective of the nasalization hierarchy in (2b), raising *[ã] to [ə(ː)] would be a type of repair to avoid nasalized vowels; the higher the vowel, the more it resists nasalization. But interestingly, **a* raises to ⟨ə̄⟩ before PIr. **-Nh-* only in OAv: PIr. **mánh-a-* S-AOR (WEAK STEM) > OAv. *māṇgha-* [mə(ː)ŋh̃a-] vs. YAv. *maŋha-* [mah̃a-]. Under the view that ⟨ṇgh⟩ = [ŋh̃] and ⟨ŋh⟩ = [h̃], this distribution becomes clear; PIr. **a* raised to ⟨ə̆̄⟩ only before segmental nasals and not before nasalized fricatives.[9] Recall also that in YAv. *paŋtaŋʸhum* [paxtah̃ʷum] ‘fifth’ < PIr. **panktohwam* < PIE **penkʷ-to-* the cluster *-ŋt-* [-xt-] does not raise the preceding vowel.

3.2. Marked nasalization of vowels

Raising was not the only way nasalization affected preceding vowels. The Avestan alphabet had two signs that could be used to show nasalized vowels: ⟨ą⟩ and ⟨ą̇⟩, thought to represent [ãː] and [ə̃], respectively (Hoffmann and Forssman 2004:66–7). The first of these, ⟨ą⟩, is very common and had two main sources. The first was an original PIr. **a* followed by a **NF* cluster (e.g. Av. *mąθra-* [mãːθra-] ‘formula’ < PIIr. **mantra-*; cf. Ved. *mántra-* ‘mantra’). This configuration undergoes the typologically common process of nasal loss with compensatory lengthening before a voiceless fricative found throughout Indo-European, as in Germanic, Greek, and Latin. Latin in particular shows this process synchronically within the history of the language, as in words like *cōnsul* [kõːsul] (Weiss 2020:140–2). The fact that Latin seems to have this process in its synchronic phonology implies that the same could have been true of Avestan while it was alive. Also note that, in this compensatory lengthening scenario, the underlying vowel does not seem to undergo raising to schwa. This aligns with the typological observation by Schourup (1973:214) that vowels lower in instances of nasal loss. The other source of ⟨ą⟩ is original **ā* followed by an absolute final nasal (e.g., *mąm* [mãːm] ‘me’ ACC.SG < PIIr. **mā́m*; cf. Ved. *mā́m* ‘id.’). Applying Schourup’s hierarchy of nasalization in (2) would predict that nasalization is most strongly perceived before word-final nasals and most

9 It is interesting to note that raising to ⟨ə̆̄⟩ does not reliably appear in **a.NV* sequences, particularly in Young Avestan. While some have claimed that the original **a* was “restored” (Martínez and de Vaan 2014:14–5), it seems more likely that raising happened sporadically before a heterosyllabic nasal. This is in line with (2a), which predicts that the effects of nasalization should be least prominent in this position.

likely to affect low vowels.[10] In either environment, only surface segmental nasals may cause these changes. If Young Avestan had not coalesced PIr. *-*nk*- > *-*nx*- > -*ŋ*- [x̃] in YAv. *paŋtaŋᵛhum*, we would expect ˣ*paxtaŋᵛhum* [pã:xtaʰ̃ʷum] instead.

The other overtly nasalized vowel was the rarely attested ⟨ą̇⟩. There is general agreement that this letter represented nasalized [ə̃] but quickly fell out of use. One source of ⟨ą̇⟩ was PIr. **a* before two nasals (e.g. Av. *ą̇nman*- [ə̃nman-] 'breath' < PIE **h₂énh₁-men*-; cf. OI *ainim(m)* 'soul; life'). As discussed in the preceding section, PIr. **a* should be expected to raise before a tautosyllabic nasal. Yet, in the word *ą̇nman*-, the short *a* not only raised to **ə* but was still felt to be heavily nasalized by the following double nasal cluster, resulting in a raised and nasalized vowel. The one other place ⟨ą̇⟩ appears is in OAv. sequences from PIr. **r̥NF* (e.g., OAv. *nərą̇š* [nr̃ʃ]? 'man' ACC.PL < PIIr. **Hnŕns*, cf. Ved. *nŕ̥n* 'id.'). I believe this odd spelling ⟨ərą̇⟩ probably represents a nasalized syllabic [r̥̃]. One might wonder why this did not compensatorily lengthen with the deletion of the nasal, but since Avestan otherwise seems to lack a long syllabic [r̥:], the fact that it would remain short here in this marginal environment is not surprising. The existence of ⟨ą⟩ and ⟨ą̇⟩ points to a second way in which Avestan dealt with the effects of nasalization. Unlike in the preceding section, where nasalization was "repaired" by raising, here the vowels were nasalized because raising was not a viable option.

3.3 Breaking and lengthening of nasalized vowels

Finally, the most extreme form of repair appears with the high vowels. Unlike **a*, which can raise under nasalization, and **ā*, which can be nasalized, high vowels cannot be raised and are generally resistant to nasalization. The result of high vowels' resistance to nasalization was either lengthening or breaking. Just as with PIr. **aNF* > Av. ⟨ąF⟩ [ã:F] and PIr. **r̥NF* > Av. ⟨ərąF⟩ [r̥̃F], PIr. **NF* also deleted the nasal with compensatory lengthening of the preceding high vowels (e.g., YAv.

10 In non-final syllables PIr. **ā* becomes ⟨å̄⟩ before both ⟨ṇT⟩ and ⟨ŋh⟩ (e.g., OAv. *dåṇtē* 'to give' 3PL.AOR.MID.SBJV < PIr. * *dáHantay*, YAv. *mazå̄ṇtəm* 'great' ACC.SG < PIr. **majǎ́Hántam*, OAv. *yå̄ŋhąm* REL.GEN.PL.F < PIr. **yáhaHam*, OAv. *dåŋ́hē* 'to give' 2SG.AOR.MID.SBJV < PIr. **dáHahay*). Because the Avestan sign ﬠ ⟨å̄⟩ looks like a ligature of ﬡ ⟨ā⟩ and ﬢ ⟨ə⟩, de Vaan (2003:383) claims that ⟨å̄⟩ "lay between [ā] and [ə]" and represented "a more retracted vowel [ɑ:]." I instead take ⟨å̄⟩ at face value as a rising diphthong [a:ə̯]. Unlike final PIr. **-āN*, which fully nasalized to *-ąN* [-ã:N], medial ⟨ṇT⟩ and ⟨ŋh⟩ only partially nasalized the preceding long vowel, causing the second mora of PIr. **ā* to raise, giving [a:ə̯]. The unexpected diphthongization before ⟨ŋh⟩ [h̃] likely stems from [h̃] having greater gestural overlap with a preceding bimoraic **ā* than a preceding monomoraic **a*, which remained unchanged in the same environment.

gaʸrīš [garʲiːʃ] ‘mountain’ ACC.PL < PIIr. **gr̥Híns*; cf. Ved. *girín* ‘id.’; OAv. *xratūš* [xratuːʃ] ‘spiritual force’ ACC.PL < PIIr. **krátuns*; cf. Ved. *krátūn* ‘power’ ACC.PL). In this case, however, the high vowels do not nasalize, which is in line with the prediction by Schourup that high vowels should resist nasalization.[11] Compare this to **r̥NF* > Av. ⟨ərąF⟩ [r̥̃F], which could be nasalized but could not be lengthened.

An even more extreme outcome, breaking or diphthongization, occurred when a high vowel preceded two nasals (e.g., OAv. *friiąnmahī* [frjə̃nmahiː] ‘to please’ 1PL.PRS.MID.IND < PIr. **frin(H)máhi*; cf. Ved. *prīṇā́-* ~ *prīṇ(ī)-* ‘id.’; OAv. *huuąnmahī* [hwə̃nmahiː] ‘to impel’ 1PL.PRS.MID.IND < PIr. **hun(H)máhi*). Just as with PIr. *aNN* > Av. ⟨ąNN⟩ [ə̃NN], the effect of two nasals was so strong that the preceding vowel must nasalize. Yet for high vowels, nasalization is not a licit repair, so instead the vowel breaks into the falling nasalized diphthongs [jə̃] and [wə̃].

In this section it has become clear that Avestan vowel nasalization was very sensitive to vowel height and nasal position. In agreement with Schourup’s hierarchies of nasalization in (2), Avestan shows this apparent hierarchy for nasalization by nasal position: *__NN* ≫ *__NF* ≫ *__N#* ≫ *__NC* ≫ *__.NV*. The environment *__NN* often nasalized any preceding vowel, even if that meant breaking a high vowel, whereas the environment *__.NV* only raised low vowels and even then only sporadically. Likewise, Avestan shows the expected hierarchy of nasalizability for vowels: high vowels could not be nasalized, [ə] and [r̥] could be nasalized under certain circumstances, and low vowels could often be nasalized or raised. Recall, however, that nasalized fricatives do not have the same regressive nasalization effects that the segmental nasals do.

4. Conclusions

A careful examination of the effects of nasalization with an eye towards typology has shown system-wide trends. The well-attested phenomenon of rhinoglottophilia can easily explain the appearance of ⟨ŋh⟩ [h̃] throughout Avestan, and by positing a distinction between segmental nasals and nasalized fricatives, we can write much simpler rules for when regressive vowel nasalization occurs. Furthermore, vowel height plays a crucial role not only in the environments for rhinoglottophilia but

11 Uncertainty remains concerning the etymological fidelity of vowel quantity in the Av. high vowels *ĭ* and *ŭ* given some prominent mismatches with Vedic (e.g., Av. *vīspa-* ‘all’ vs. Ved. *víśva-* ‘id.’). In an in-depth treatment of this material, de Vaan (2003:205–333) assigns *Lautgesetze* to many of the sporadic cases of PIr. **i*, **u* > Av. *ī*, *ū* and PIr. **ī*, **ū* > Av. *i*, *u*, but exceptions persist. Unless the remaining exceptions find convincing solutions, the status of PIr. **iN*, **uN* > Av. *ī*, *ū* / *__F* cannot be assured despite its phonological and typological attractiveness.

also in the vowels that can be nasalized. Most importantly for future Avestan phonological research, it is imperative that Iranicists abandon the doctrine of "one-sign-one-sound" for the interpretation of the Avestan alphabet. Assigning each grapheme a single interpretation has proven incorrect and detrimental to the study of Avestan synchronic and diachronic phonology.

References

Andreas, Friedrich Carl. 1904. Die Entstehung des Awesta-Alphabetes und sein ursprünglicher Lautwert. In *Verhandlungen des XIII. internationalen Orientalisten-Kongresses, Hamburg, September 1902*, 99–106. Leiden: Brill.

Beekes, Robert S.P. 1988. *A Grammar of Gatha-Avestan*. Leiden: Brill.

Cantera, Alberto. 2007–. Avestan Digital Archive. https://ada.geschkult.fu-berlin.de/ (13 July 2020).

Chirkova, Katia, and Yiya Chen. 2013. Lizu. *Journal of the International Phonetic Association* 41/1.75–86.

Ferrer Losilla, Juan José. 2016. Preconsonantal Nasals in the Avestan Alphabet. In Éric Pirart (ed.), *Études de linguistique iranienne in memoriam Xavier Tremblay*, 157–84. Leuven: Peeters.

Hoffmann, Karl, and Bernhard Forssman. 2004. *Avestische Laut- und Formenlehre*². Innsbruck: Institut für Sprachen und Literaturen der Universität Innsbruck.

Hoffmann, Karl, and Johanna Narten. 1989. *Der sasanidische Archetypus: Untersuchungen zu Schreibung und Lautgestalt des Avestischen*. Wiesbaden: Reichert.

Kümmel, Martin Joachim. 2012. The Iranian Reflexes of Proto-Iranian **ns*. *Orientalia Suecana* 61.138–45.

———. 2017. Einführung ins Altiranische. https://www.academia.edu/30130367/Einführung_ins_Altiranische_Introduction_to_Old_Iranian_ (12 January 2020).

Lombardi, Linda. 1999. Positional Faithfulness and Voicing Assimilation in Optimality Theory. *Natural Language and Linguistic Theory* 17/2.267–302.

Martínez Porro, Jaime. 2015. The Indo-Iranian Group *sr/a_a in the Avestan Manuscripts. In Alberto Cantera and Juan José Ferrer Losilla (eds.), *aŋciŋ bā nəmō haōmāi: Homenaje a Éric Pirart en su 65° aniversario*, 151–62. Girona: Sociedad de Estudios Iranios y Turanios.

Martínez, Javier, and Michiel de Vaan. 2014. *Introduction to Avestan*. Trans. by Ryan Sandell. Leiden: Brill.

Matisoff, James A. 1975. Rhinoglottophilia: The Mysterious Connection between Nasality and Glottality. In Charles A. Ferguson, Larry M. Hyman, and John J. Ohala (eds.), *Nasálfest: Papers from a Symposium on Nasals and Nasalization*, 265–87. Stanford: Language Universals Project.

Mistry, P. J. 1997. Gujarati Phonology. In Alan S. Kaye (ed.), *Phonologies of Asia and Africa (Including the Caucasus)*, II.653–73. Winona Lake, IN: Eisenbrauns.

Morgenstierne, Georg. 1929–38. Indo-Iranian Frontier Languages. 2 vols. Oslo: Aschehoug.

———. 1942. Orthography and Sound System of the Avesta. *Norsk Tidsskrift for Sprogvitenskap* 12.30–82.

Nokák, Ľubomír. 2013. Problem of Archaism and Innovation in the Eastern Iranian Languages. Ph.D. diss., Charles University.

Ohala, John J., and Mariscela Amador. 1981. Spontaneous Nasalization. *The Journal of the Acoustical Society of America* 68.54–5.

Rogers, Chris. 2011. Spontanteous Nasalization in Wichi'. Paper presented at the CUNY Conference on the Phonology of Endangered Languages. Abstract at http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.296.6023 (5 August 2020). Slide presentation at https://languageconservation.org/images/Spontaneous_nasalization_in_Wichi.pdf (5 August 2020).

Schourup, Lawrence C. 1973. A Cross-Language Study of Vowel Nasalization. *Ohio State University Working Papers in Linguistics* 15.190–221.

Soohani, Bahareh. 2017. The Phonology of Iranian-Balochi Dialects: Description and Analysis. Ph.D. diss., Leiden University.

de Vaan, Michiel. 2003. *The Avestan Vowels*. Amsterdam: Rudopi.

———. 2013. On the Nasalization of *h* to *ŋh* in Avestan. In Éric Pirart (ed.), *Le sort des Gâthâs et autres études iraniennes in memoriam Jacques Duchesne-Guillemin*, 49–51. Leuven: Peeters.

Vance, Timothy J. 2008. *The Sounds of Japanese*. Cambridge: Cambridge University Press.

Weiss, Michael. 2020. *Outline of the Historical and Comparative Grammar of Latin*². Ann Arbor: Beech Stave.

Windfuhr, Gernot (ed.). 2009. *The Iranian Languages*. New York: Routledge.