

Developments of nasals in early Indo-Aryan: *anunāsika* and *anusvāra*¹

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Keywords: Indo-Aryan, phonology and phonetics, nasals, metrics, timing and transitions

Abstract

The development of nasals in early Indo-Aryan has been the object of dispute. A major point of contention has been whether the distinction which Pāṇini and authors of *prātiśākhya*s and *śikṣā*s make between the entities referred to by *anunāsika* and *anusvāra* has to do with a difference in the language or is a difference regarding merely how various scholars viewed the same matter. Whitney maintained the second view. He was criticized by later scholars but his position has not been refuted definitively. In this paper, I establish that the distinction in question definitely reflects a difference in language, between nasalized vowels and nasal stops, referred to by *anunāsika*, and a post-vocalic nasal segment, referred to by *anusvāra*, which had different dialectal realizations. I consider also related questions concerning differences in timing, transitions and consonant doubling.

The paper is organized as follows: 1. Introduction. 2. Examples of statements in Pāṇini's *Aṣṭādhyāyī* and in *prātiśākhya* texts illustrating both differences of opinion with respect to the analysis of a single entity and differences of real usage. 3. Phonological rules from the *Aṣṭādhyāyī* and *prātiśākhya*s concerning word-final *-m* and related rules concerning *-n*. 4-6. These rules cannot be interpreted under Whitney's thesis. Nor is the evidence alleged by Whitney from the Devanāgarī script acceptable. Conclusion: The phonological rules in question concern real dialectal differences, which are reflected in various traditions of recitation. 7. Phonological and phonetic properties of *anusvāra*; metrical evidence. 8. Historical developments of *-m* involve differences in timing and transition. 9. Parallels for such differences, involving consonantal doubling and transitions between tonal segments. 10. Summary.

¹The main conclusions reached in this paper were presented at the 15th meeting of the East Coast Indo-European conference at Yale University on June 14, 1996. I thank Andrew Garret, Hans Henrich Hock, and Stanley Insler for comments at that time. Subsequently, Masato Kobayashi and Peter Scharf did me the great favor of reading through the full text, which originally dates from July, 1996, and pointing out corrections to be made, for which I am grateful. When citing partial Vedic examples, as also in transliterated examples, I omit accent marks. Due to font limitations, I also do not show the different svarita markings in Yajurveda citations. I use *m̃* and *m̄* as transliterations for symbols representing *anusvāra* (see note 50), *ṁ* to represent nasalization. Thus, *yṁ*, *lṁ*, *vṁ* are transliterations of यं लं वं representing nasalized *y*, *l*, and *v*, for which *ỹ*, *l̃*, *ṽ* would be transcriptions. Finally, I thank Masato Kobayashi for inviting me to publish this paper in the volume honoring Hiroshi Kumamoto, whom I first knew as a student and then have had the honor to know as a distinguished colleague.

1 The development of nasals in early Indo-Aryan has been the object of dispute. One of the major points of contention has been whether the distinction — made by Pāṇini and authors of prātiśākhya and śikṣā — between the entities referred to by *anunāsika* and *anusvāra* is to be accepted as having to do with a difference in the language or merely a difference regarding how various scholars viewed the same matter. The second view was maintained by W. D. Whitney. In his note on TPr. 2.30, Whitney (1868: 67-8) says the following concerning anusvāra:

Some held it to be a pervading nasalization of the preceding vowel; others, a nasal addition to that vowel. The former view is adopted and consistently maintained by the Atharva-Prātiśākhya, which acknowledges nasal consonants and nasalized vowels, but no *tertium quid*. The Prātiśākhya of the Rik and White Yajus are equally consistent in their recognition of an anusvāra as a nasal appendage to the vowel, and the latter of them gives ... detailed directions as to the quantity belonging to each element. The Taittirīya-Prātiśākhya adopts prevalingly the same view, but lets the other appear distinctly in some rules.

Subsequently, Whitney adds (1868: 68):

I very much doubt whether this difference of views is founded upon an actual difference in pronunciation; it is probably due rather to a discordant apprehension and analysis of a single mode of utterance.

He then goes on to say (1868: 68):

Without entering into any detailed discussion of the subject, I will simply say I incline to side with the Atharvan school, and to believe in nasal vowels rather than in *anusvāra*. No one of the Prātiśākhya gives an intelligible definition of the phonetic character of *anusvāra*, considered as an independent alphabetic element; if it is to be so considered, we shall hardly be able to make of it anything but a bit of neutral vowel (*u* of *but*) nasalized, or the sound of the French *un*, and shall have to regard it as attached to the vowel much in the same way as, by us who speak English, the same sound not nasalized is attached to most of our long vowels before an *r*—for example in *there, here, oar, cure, fire, sour*

In what was apparently his definitive statement on this topic, Whitney discusses varying statements on anusvāra and remarks (1889: 25 [§ 71g]):

It is evidently a fair question whether this discordance and uncertainty of the Hindu phoneticists is owing to a real difference of utterance in different classes of cases and in different localities, or whether to a different scholastic analysis of what is really everywhere the same utterance. If *anusvāra* is a nasal element following the vowel, it cannot well be any thing but either a prolongation of the same vowel-sound with nasality added, or a nasalized bit of neutral-vowel sound (in the latter case, however, the altering influence of an *i* or *u*-vowel on a following *s* ought to be prevented, which is not the case ...).

As a matter of convenience, Whitney also chose to distinguish graphically in transliteration between *m̄* and *n̄*, the former for instances involving original *m*, the latter for instances like *devāṁś ca* ‘and the gods’ (acc. pl.), where *-n* goes to anusvāra (see below, 3.1.1a, d-e, 3.1.2), which Whitney transliterates (1889: 70 [§ 208]) *devāṅṅ ca*.

He says (1889: 26 [§ 73c]):

It is convenient also in transliteration to distinguish the assimilated **m** by a special sign, **m̄**, from the **anusvāra** of more independent origin, **ṁ**; and this method will be followed in the present work.

Wackernagel (1896: 257 [§ 223 Remark]) simply declares that Whitney wrongly denies any distinction between *anunāsika* and *anusvāra*: ‘Unrichtig leugnet Whitney ... jeden Unterschied zwischen *Anunāsika* und *Anusvāra* und will mit APr. nur Nasalvokale als wirklich vorhanden anerkennen.’ W. S. Allen (1953: 42) too differs from Whitney, though he also notes points he considers to favor Whitney’s viewpoint:

On the basis of analogies in other languages it is therefore tempting to assume that the value of **m** was a nasalization and lengthening of the vowel (if not already long); this view was adopted by Whitney, and has support in the fact that the *TP* speaks of *anusvāra* as having precisely this value, whilst the *AP* makes no mention of it apart from *anunāsika*

But on the other hand some of our authorities quite certainly distinguished the terms *anunāsika* and *anusvāra*, as the following passage from the *VP* indicates²

Other discussions of *anusvāra* and related topics, though at times valuable in contributing insights about historical and theoretical points, have also confused some issues. Thus, in an otherwise extremely worthwhile contribution, Siddheshwar Varma starts his discussion of *anusvāra* saying (1929: 148):

As regards the nature of the *Anusvāra*, three different views may be mentioned:

1. According to the first view, represented by the *Atharvaveda Prāt.* and the *Siddhāntakaumudī*, the *Anusvāra* was a pure nasalized vowel. The former work describes the phenomenon as the elision of *n* or *m*, and the consequent nasalization of the preceding vowel. There is no doubt that the term *Anusvāra* does not occur in this *Prātiśākhya*, an omission which has led Whitney to the erroneous supposition that the *Atharvaveda Prāt.* does not acknowledge the *Anusvāra*. Whitney, in my opinion, is not right, because this *Prātiśākhya* distinctly describes the same phenomenon which is specified by other grammarians with the name *Anusvāra*. Thus, while Pāṇini specifically speaks of the *Anusvāra* as a sound into which “m” is changed before a consonant, and while his expounder Bhaṭṭoji Dīkṣita speaks of it as a pure nasal sound arising from the nose, the *Atharvaveda Prāt.* has described the same as the dropping of the *m* and the nasalization of the previous vowel. In both cases, it is the *m* that has led to a particular change; in both cases no original nasal vowel has been acknowledged.

To be sure, the *Śaunakīyā Caturādhyāyikā* describes changes for *-m* and *-n* which the *Aṣṭādhyāyī* and other *prātiśākhyas* describe (see 3) and none of these assumes an underlying nasal vowel. On the other hand, the evidence of the texts makes it undeniable that Pāṇini recognizes a distinction between two different outcomes — nasalized vowel and vowel plus *anusvāra* — also recognized in *prātiśākhyas* other than the *Śaunakīyā*

²Allen cites VP 3.130-132 (see 3.4.1.3a) and refers to the *Vyāsaśikṣā*. The support which Allen (1953: 42 n. 7) sees for the purported value of *anusvāra* is TPr 15.1. The rule itself does not lend support to the view in question; see 3.4.2.1g, 3.4.2.3c. Note that I have used **m** instead of a symbol Allen uses which is not available in my font.

Caturādhyāyikā, which knows only of nasalized vowels as results of the changes in question. In addition, it is not proper to say that the Siddhāntakaumudī views anusvāra as a nasalized vowel. What Bhaṭṭoji says (see 7.2.2c) is that the proper place of production for anusvāra is the nose, not that ‘the Anusvāra was a pure nasalized vowel.’

In what is, to my knowledge, the most recent treatment of anusvāra, Srivastava makes some important observations but, I think, also leaves some confusion. For example, he continues the tradition of attributing to early phoneticians, phonologists and grammarians ‘discord as to the use of the term anusvāra/anunāsika’ while saying (Srivastava 1972: 204-205):

Undoubtedly, there is a fair amount of discord as to the use of the term anusvāra/anunāsika in the earlier writing of Indian grammarians. Some confusion as regards its real character may perhaps be avoided if the different actualizations of /N/ are viewed partly as consequences of certain constraints on the application of the phonological rules and partly as dialectal variations. For example, as regards the phonetic nature of the actualized variant of anusvāra, we find three different views ...

1. Anusvāra as a pure nasalized vowel (Atharvaveda Prātiśākhya, Siddhāntakaumudī)
2. Anusvāra as entirely a nasal consonant (homorganic in nature). [Taittirīya school, Vaidikābharaṇa, Sarvasammata śikṣa, Yajuṣabhūṣaṇa]
3. Anusvāra as either a vowel or a consonant (Ṛgveda Prāt.)

This inconsistency in employing the term anusvāra is mainly due to the fact that the same term has been allowed to stand for the units of different levels of description i.e. categories of phonemic and phonetic levels have not been sharply maintained by attaching different labels to them. In other words, Indian grammarians have meant by the term anusvāra either a nasal archi-segment /N/ or nasal homorganic [N*]. Likewise, those who have accepted the realized variant of anusvāra as a nasalized vowel intend to refer by the term ‘anunāsika’ to both units — /N/ as well as one of its actualized variants namely, [Ń].

Srivastava repeats what Varma had said, then adds some claims which are not justified by the original sources. The confusion of levels which he attributes to these sources is in fact not found therein. Thus, rules of the Aṣṭādhyāyī providing for *m* and *n* to be replaced by anusvāra (see 3.1.1) are phonological rules, as are prātiśākhya rules that let -*m* and -*n* undergo changes, with possible consequences for vowels preceding these (see 3.2-3.5). On the other hand, prātiśākhya and śikṣā statements describing the places of production for Sanskrit sounds, including anusvāra (see 7.2.2) are clearly phonetic, and the two types are kept apart in prātiśākhyas. Moreover, *anunāsika* refers to any sound produced in the oral cavity and the nose simultaneously (see 7.2.2g-h and note 99).

Concerning Whitney’s position that anusvāra was a pervading nasality of a vowel, Srivastava has the following to say (1972: 204):

Whitney’s statement that *anunāsika* and *anusvāra* are originally and properly equivalent can be accepted only when it is taken as representative of phonemic representation. In other words, it

can be said that in underlying representation in the environment in which *anunāsika* and *anusvāra* occur there is a unique nasal archi-segment (unspecified in feature matrix except the feature nasality i.e. N [= + nas]) which depending either upon certain constraints within a single variety of a language or upon diatopic differences across varieties is realized sometimes as *anunāsika* (nasalization) and at time *anusvāra* (nasalized vocoid fragment).

Srivastava goes on (1972:205) to criticize Whitney as follows:

His insistence upon keeping *anusvāra* (vowel-variant of a nasal archi-segment) distinct as a separate category from the nasal homorganic (consonant-variant of a nasal archi-segment) or his further subdivision of *anusvāra* into *m* and *n* types, is directly opposed to the earlier more scientific description of *anusvāra* which was functionally considered as a single unit and was phonetically characterized as a ‘conditioned’ sound ‘dependent’ upon some other sound for its actualization. In fact, Whitney’s definition and classification of *anusvāra* is phonetically motivated.

This glosses over the fact that Whitney explicitly said he distinguished *m̄* and *n̄* in transliteration as a matter of convenience. Moreover, there was indeed a distinction between word-final *anusvāra* and nasal stop homogeneous with a following stop, as in *kaṭam̄ karoti* and *kaṭan̄ karoti* (see 3.1.1a-b, 3.1.2). In fact, as can be seen from Pāṇini’s rules, an archi-segment *N* is appropriate only for word-interior nasals before stops and spirants, where *anusvāra* before spirants and nasal stop homogeneous with a follow stop are in complementation. Srivastava was surely aware of this, yet he puts the archi-segment to use in an unjustified manner.

In addition to criticizing Whitney, Srivastava puts his archi-segment *N* to work in a series of rules intended to capture certain features of Sanskrit phonology associated with *anusvāra*, *n*, and *m*. His principal contribution, if I understand his arguments correctly, would be to generalize and account for aspects of Sanskrit nasal assimilation in a more principled manner than had been accomplished by earlier scholars. Srivastava refers (1972: 215) to W. S. Allen’s observation (1962: 83) that, although *n* and *m* are both nasals, the latter show more tendency to assimilate than the former. Allen simply gave *m* a greater potential for assimilation. Srivastava considers examples given by Allen and argues as follows:

But such explanations based on the articulatory process only beg the question. Allen is unable to explain why *m* has phonetically greater potentiality than *n* for assimilation. His classification of stops into interfering and non-interfering classes is nothing more than the feature [+ cor] and [- cor].

It is more logical to assume that both final *m* and *n* are basically the same, i.e. /N/ but while in the case of *mahān* and *tān* it is followed by dental archi-segment /S/ which is even attested by their alternative pronunciation as [mahānt] and [tānt], in items like *tam* and *uktam*, it is followed by pause. Thus, by MS-rule (1) /taN/ is realized as [tam] in isolation but later by P-rule (1) it is actualized as [taŋ] when followed by word [kavim], i.e. /tam#kaviN/ [taŋkavim].

But as /S/ exists finally in lexical items like [mahān] and [tān] and as P-rule (1) precedes the consonant deletion rule (rule 3), /mahāNS/ and /tāNS/ are realized first as mahānt and tānt and then by rule 3 take their final phonetic form as mahān and tān.

To appreciate what Srivastava claims, consider how he derives *pumān* (nom. sg.) ‘man’, *pumāmsam* (acc. sg.) and *mahān* of *mahān kaviḥ* ‘great poet’ (Srivastava 1972: 210, 216): (a) *pumānS+S#* → *pumānt+S#* (rule 5) → *pumān* (rule 3), (b) *pumānS+am#* → *pumāns+am#* (rule 5) → *pumās+am#* (rule 2), (c) *mahānS#:kaviḥ* → *mahānt#* ... (rule 5) → *mahān#* ... (rule 3). (a) and (c) are parallel. Accordingly, parallel to (b) and invoking the very same rules shown, as formulated by Srivastava and to which he himself refers, one should derive (d) *mahānS+am#* → *mahāns+am#* (rule 5) → *mahās+am#*. This is empirically wrong: the accusative corresponding to *mahān* is *mahāntam*. And the usual accusative singular corresponding to *pumān* is *pumāmsam*, with *anusvāra*. I therefore think Pāṇini and other early grammarians were right in recognizing different base forms: *mahat* and *pums*; see Cardona 1997: 469, 473. In addition, I do not think one should find strange the observation that *n* and *m* differ with respect to assimilation. It is undeniable that *-m* and *-n* differ phonologically: the former can occur preceded by a short vowel and immediately followed by another vowel; the latter cannot and one has instead *-n n-*; see 9.1.2.7. It is also true, and well known, that dental stops and labial stops differ in their historical developments later in Indo-Aryan: intervocalic voiceless dental stops are subject to voicing and ultimately to deletion, but *-p-* is replaced by a fricative *-v-*; *-n-* is retained, but *-m-* goes to a nasalized *-v-*. A similar disparity of development is seen in Romance.

2 It is fair to say, I think, that scholars who have come after Whitney, even such careful and philologically accurate scholars as Wackernagel, have not succeeded in settling the questions which Whitney raised concerning the putative distinction between segments called *anusvāra* and others, called *anunāsika*, and the historical developments associated with these. More recent scholars, especially linguists who are not well acquainted with Sanskrit *prātiśākhya* and *vyākaraṇa* texts, might then still be tempted to argue that statements such as the one Allen cites can be interpreted as merely stating an analysis of a particular scholar with respect to the very same thing that others analyze differently. It is worthwhile, therefore, to adduce evidence to demonstrate that Whitney’s position is not defensible and to treat the development of *anusvāra* and related nasal segments along with allied issues of early Indo-Aryan phonology.

2.1 Consider first the following sūtras.

RPr. 13.15-18: आह्वोषद्धोषवतामकारमेकेऽनुस्वारमनुनासिकानाम् । सोष्मताञ्च सोष्मशामूष्मशाहुः सस्थानेन ।

घोषिणाङ्घोषिशैव । अत्रोत्पन्नावपर ऊष्मघोषौ ।

This set of statements concerns views about a particular analysis of sounds. Some (*eke*)³ consider that stops other than voiced unaspirated stops are derived from these in a componential system. The phonological property of voicing (*ghoṣam*) for voiced stops (*ghoṣavatām*) other than aspirates is said to be the vowel *a* except for nasalized stops (*anunāsikānām*), the voicing of which is anusvāra. The same scholars say (*āhuḥ*) that the property of being aspirated (*soṣmatām*) is to be gotten with the spirant (*ūṣmaṇā*) that has the same place of production (*sasthānena*) as the stop in question, but this applies only for voiceless aspirates, since the aspiration of voiced (*ghoṣiṇām*) aspirates is obtained through the voiced spirant (*ghoṣiṇā* [*ūṣmaṇā*]) *h*. According to these scholars, then, one has *k*, to which voicing as represented by *a* is added to get *g*, voicing and nasality as represented by anusvāra is added to get *ṅ*, aspiration represented by *jihvāmūlīya* is added to get *kh*, and voiced aspiration represented by *h* is added to get *gh*. Others (*apare*), on the other hand, maintain that sounds are not thus built up, and that the phonological properties of being spirants and being voiced (*ūṣmaghoṣau*) are there (*utpannau* ‘arisen’) in sounds (*atra* ‘therein’) as they are produced. These are clearly statements regarding the very same entities, sets of sounds like *k kh g gh ṅ*, about which different scholars entertain varying opinions.

Similarly, although *e* and *o* are admittedly monophthongs, the Ṛgvedaprātiśākhya notes that some treat these as composed of *a* and *i*, *u*; see Cardona 1983a: 16.

2.2 ṚPr. 1.52: द्वयोश्चास्य स्वरयोर्मध्यमेत्य सम्पद्यते स डकारो ङकारः । ङ्हकारतामेति स चास्य ढकारः सन्नूष्मणा

सम्प्रयुक्तः ...

concerns something Vedamitra says:⁴ when it comes between (*madhyam etya*) two vowels (*dvayoh svarayor*), *-ḍ-* (*ḍakārah*) becomes (*sampadyate*) *-l-* and aspirated *-ḍh-* becomes *-lh-*. The very wording of the statement precludes considering this an opinion concerning the analysis or interpretation of a single entity. Instead, this is a statement of what occurs instead of intervocalic *-ḍ-* and *-ḍh-*.

2.3 The sūtras

ṚPr. 1.15-16: तस्मादन्यमवसाने तृतीयङ्गार्ग्यं स्पर्शम् । प्रथमं शाकटायनः।

also concern particular scholars. The first sūtra states that according to Gārgya, only a voiced unaspirated stop (*trīṭiyam*) occurs in final position (*avasāne*), except for nasals,⁵

³This is understood from the preceding sūtra (ṚPr. 13.14: एके वर्णाञ्छ्रितिकान्न कार्यान् ॥).

⁴*vedamitraḥ* is understood from the preceding sūtra.

⁵*tasmād anyam* ‘other than that’; *tasmāt* refers back to *anunāsika* of the preceding sūtra (ṚPr. 1.14: अनुनासिकोऽन्त्यः॥), which provides that the last sound in each stop series (*varge varge* [ṚPr. 1.12]) has the class name *anunāsika*.

which occur in this position; the next states that according to Śākaṭāyana voiceless unaspirated stops (*prathamam*) occur in this position. These sūtras contain nominative terms (nom. sg. *gārgyaḥ*, *śākaṭāyanaḥ*), as do ṚPr. 13.15 (*eke* ‘some’) and ṚPr. 13.18 (*apare*). Moreover, it is appropriate to supply a verb form to be construed with each of these. Uvaṭa supplies *manyate* ‘thinks, considers’.⁶ This does not mean, however, that Gārgya and Śākaṭāyana differ as to how they view a given single entity. It would be difficult to defend the opinion that ṚPr. 1.15-16 say Gārgya considers the *-k* of *vāk* ‘word, speech’ (nom. sg.) to be *-g*, while Śākaṭāyana considers this to be *-k*. On the contrary, as Uvaṭa also notes, ṚPr. 1.15-16 concern the possible occurrence of voiceless and voiced unaspirated nonnasal stops in word-final position. Another rule of the Ṛgvedaprātiśākhya⁷ states that certain sounds do not occur in word-final position (*nāntaym̐ yānti*): spirants (*ūṣman*) other than visarjanīya (*ḥ*), semivowels (*antasthā*), *ṛ*, aspirates (*soṣman*), and palatal stops (*cakāravarga*). Remaining sounds can occur in this position, including voiceless and voiced unaspirated stops and nasal stops other than palatals. ṚPr. 1.15-16 state that Gārgya and Śākaṭāyana respectively allow voiced and voiceless unaspirated stops.⁸ That is, we have here a variation, also taken into account by Pāṇini,⁹ between word-final voiced and voiceless stops.

2.4 The following statements concern something attributed to Gārgya (*gārgyasya* [gen. sg.]):

ṚPr. 6.36-38: यमानासिक्या स्वरभक्तिरुत्तरा गार्ग्यस्य । ऊष्मा सोष्मणः । वर्जयेत्तम् ।

According to Gārgya, in sequences such as *palikkṃñīḥ* ‘grey’ (nom. pl. fem.), *amatthm̐nāt* ‘took away’ (3sg. impfct.),¹⁰ a nasal (*nāsikyā*) epenthetic vowel segment (*svarabhaktiḥ*) occurs after a yama, as in *palikkṃñīḥ*, and a spirantal segment (*ūṣman*) is inserted after an aspirated yama, as in *amatthm̐nāt*. ṚPr. 6.38 states that one should avoid (*varjayet*) the latter (*tam*). The only interpretation which makes sense here is that Gārgya represents a mode of recitation that is unacceptable, hence rejected.

⁶ṚPrU 1.15: तस्मादनुनासिकादन्त्यात्स्पर्शादन्व्यं पदावसाने वर्तमानं स्पर्शं गार्ग्यं आचार्यः स्वं तृतीयं मन्यते । 1.16: शाकटायन आचार्यः प्रथमं मन्यते ।

⁷ṚPr. 12.1: ऊष्मान्तस्थसोष्मचकारवर्गा नान्त्यन्त्यान्वत्र विसर्जनीयात् ॥

⁸ṚPrU 1.15: ऊष्मान्तस्थसोष्मेत्यत्र प्रथमतृतीयपञ्चमान्स्पर्शान्पदान्तीयान् वक्ष्यति । तत्र प्रथमतृतीयविकल्पार्थमिदमारभ्यते ।

⁹A 8.2.39: भलाञ्जशोऽन्ते । provides that word-final consonants other than semivowels and nasals are replaced by voiced unaspirated stops. By 8.4.56: वावसाने (म्लाम् [53] चर [54]) a voiceless stop optionally replaces a voiced one before pause.

¹⁰Respectively from *palikñīḥ*, *amathnāt*. Under the derivational procedure adopted in the Ṛgvedaprātiśākhya, the stops *-k-*, *-th-* are replaced by identical voiceless stops with the added property of nasality (ṚPr. 6.29-30, 32: स्पर्शा यमानननुनासिकाः स्वान्परेषु स्पर्शेष्वनुनासिकेषु । न स्पर्शस्योष्मप्रकृतेः प्रतीयाद्यमापत्तिम् । यमः प्रकृत्यैव सदृक् । Consonant doubling then applies (ṚPr. 6.1-2: 9.1.2.2a), with the unaspirated stop corresponding to *-th-* preceding this. The nasalized velar *kṃ* and dental *thm̐* are among the sounds called *yama* (‘twin’).

2.5 Consider now a set of rules that have to do with word-final *-y* and *-v* preceded by *a*-vowels:

a. TPr. 10.19-21, 23: लुप्येते त्ववर्षपूर्वौ यवकारौ । नोख्यस्य । वकारस्तु साङ्कृत्यस्य । लेशो वात्सप्रस्थैतयोः । According to TPr. 10.19, *-y* and *-v* (*yavakārau*) preceded by an *a*-vowel (*avarnapūrvau*) are deleted (*lupyete*) before a vowel. For example: *āpay undantu* ('May the water moisten ...') → *āpa undantu ...*,¹¹ *tā abrūtām ...* (← *tāv abrūtām*).¹² TPr. 10.20, on the other hand, states that according to Ukhya *-y* and *-v* are not (*na*) deleted under the conditions given. Instead of *āpa undantu ...* and *tā abrūtām*, the tradition of recitation which Ukhya represents has *āpay undantu* and *tāv abrūtām*. Further, as noted in TPr. 10.21, according to Sāṅkṛtya *-v* alone is not dropped. In Sāṅkṛtya's tradition, then, one recites *āpa undantu ...*, without *-y*, but *tāv abrūtām*, with *-v*.¹³ According to TPr. 10.23, in the mode of speaking represented by Vātsapra, there are still other variants: *-y* and *-v* are pronounced as very light glides.¹⁴ *āpa^v undantu ...*, *tā^v abrūtām*. No one could seriously doubt that these statements deal with variant pronunciations in different dialect areas as represented in traditions of recitation attested to by named representatives.

In the language Pāṇini describes, one finds a comparable variation, accounted for by the following sūtras:

b. A 8.3.18-19, 22: व्योर्लघुप्रयत्नतरः शाकटायनस्य । लोपः शाकल्यस्य । हलि सर्वेषाम् । According to Śākaṭāyana, *-v* and *-y* are replaced by sounds that have an extremely light articulatory effort (*laghuprayatnatarah*), but for Śākalya they are replaced by zero (*lopah*). This variation applies only before vowels, since all (*sarveṣām*) agree that word-final *-v* and *-y* are deleted before consonants (*hali*).

2.6 Finally, consider

A 7.3.98-100: रुदश्च पञ्चभ्यः । (अपृक्ते [96] ईट् [93]) अद् गार्ग्यगालवयोः । अदः सर्वेषाम् । which have to do with imperfect forms of certain verbs. By the first sūtra, after the five verbs of the subset starting with *rud* 'cry, weep', an ending that consists of a single sound

¹¹TS 1.2.1.1: आपे उन्दन्तु जीवसे दीर्घायुत्वायु वर्चचे 'May (these) waters wet (this yajamāna's hair so that he may) live, have a long life's duration, brilliance.' *āpay undantu* derives from *āpah undantu* (padapāṭha आपः । उन्दन्तु ।). According to TPr. 9.10 (अथ स्वरपरो वकारम्), visarjanīya changes to *-y* before a vowel.

¹²TS 2.6.7.1: ... ता अत्रूतामित्रावर्षणौ ... (padapāṭha: तौ । अत्रूताम् । मित्रावर्षणविति मित्रा-वर्षणौ । *tāv* derives from *tau* by TPr. 9.15: औकार आवम्, according to which *-au* changes to *-āv* before a vowel.

¹³This is what one finds in standard editions.

¹⁴Pr. 10.23 clearly refers to both the semivowels, since it uses the genitive dual *etayoḥ*. The Tribhāṣyaratna explains that *leśa* signifies a light pronunciation, as though the semivowels were dropped (*luptavad uccāraṇam*): लेशो नाम लुप्तवदुच्चारणम् । The Vaidikābharāṇa, on the other hand, understands *lupyete* from 10.19, contextually modified to the singular *lupyate* in construction with *leśah*, which is said to mean 'a part' (*ekadeśah*). Under this interpretation, TPr. 10.23 states that part of *-y* and *-v* is dropped: लुप्येत इत्यन्वयः । वात्सप्रस्थ मते एतयोर्ववकारयोः लेशः एकदेशः यथोक्तविषये लुप्यते । एकदेशस्तु श्रूयते ।

— that is, in this instance, *-t* or *-s* — receives the initial augment \bar{i} ($\bar{i}t$): *arodīt* (3sg. impfct.), *arodīh* (2sg. impfct.); *asvapīt*, *asvapīh* ‘slept’; *aśvasīt*, *aśvasīh* ‘breathed’; *ānīt*, *ānīh* (*prānīt*, *prānīh*) ‘breathed’; *ajakṣīt*, *ajakṣīh* ‘ate’. A 7.3.99 states that, according to Gārgya and Gālava, the augment *a* is added to the endings in question after the same verbs: *arodat*, *arodaḥ*, and so on. Further, all (*sarveṣām*) agree that this augment is added after *ad* ‘eat’, as in *adat*, *adaḥ*.

2.7 As shown (2.1), there are indeed *prātiśākhyas* statements that describe a point of view adopted by some scholars with respect to the very same entity or entities which others view differently. As I have also shown, however, this is by no means the norm for statements in which different authorities are mentioned. Usually, such statements concern real differences in usage such as the occurrence of intervocalic *-l-* and *-lh-* instead of *-d-* and *-dh-* (2.2) or of final voiced and voiceless stops (2.3). In addition, the strict tradition of the Ṛgveda could condemn a variant mode of pronunciation (2.4). Further, the variation in question can be fairly complex, as in the occurrence of *-y*, *-v*, light glides $\text{ṛ} \text{ṛ}$ and the absence of either (2.5). Nor are such differences in usage limited to aspects of pronunciation. They can be grammatical differences, such as imperfects of the types *arodīt* and *arodat* (2.6). As I have noted, moreover, evidence for such differences in uses with respect to phonology and grammar is to be found not only in *prātiśākhyas* but also in Pāṇini’s grammar. The only justifiable conclusion to be drawn from such evidence is the obvious one, which most scholars have long known: The treatises in question reflect wide dialectal differences that are reflected in differences of recitation of Vedic texts and in the language Pāṇini describes.

It is nevertheless undeniable that early grammarians in India could differ in the ways they chose to account for the same facts. An additional example, concerning grammatical units, will serve to bring home the point. To account for *as* and *s* in *asti* ‘is’, *staḥ* ‘they two are’, *santi* ‘they all are’, Pāṇini posits basic *as* and lets the vowel of this base be deleted before particular affixes. It is known that some other grammarians posited *s* as the base and accounted for *asti* and so on by adding *a*. On such differences of procedure, see recently Cardona 1987, 1997: 787, 824. We learn of such disagreements from a comparison of various grammars and from what commentators tell us. On the other hand, neither Pāṇini nor other grammarians, go out of their way to inform us that others accounted for certain facts in a way different from theirs.

3 This established, let us return now to the issue of *anunāsika* and *anusvāra*, considering first the pertinent rules from the *Aṣṭādhyāyī* and *prātiśākhyas* along with texts which exemplify the usages accounted for by such rules.

3.1 In the Aṣṭādhyāyī, Pāṇini formulates rules for replacing *m* and *n* with anusvāra, subject to further substitution. He also provides for the replacement of *-n* and *-m* by *-R* (*ru*) — *r* marked with *u* to distinguish this replacement for *-s* and *-ṣ* from original *-r* — which entails either nasalizing a preceding vowel or letting anusvāra follow this vowel.

3.1.1 According to

a. A 8.3.23-24: मोऽनुस्वारः (हलि [22]) नश्चापदान्तस्य भलि ।

word-final *-m* (*maḥ*)¹⁵ is replaced by anusvāra (*m̃*) before a consonant (*hali*), and this substitution applies not only to *m* but also to *n* (*naś ca*) which is not the final sound of a word (*apadāntasya*), if it is followed by a consonant other than a semivowel or nasal (*jhali*). The following provide for replacing anusvāra (*anusvārasya*):

b. A 8.4.58-59: अनुस्वारस्य ययि परसवर्षः । वा पदान्तस्य ।

Before a consonant other than a spirant (*yayi*), *m̃* is replaced by a sound homogeneous with the following consonant (*parasavarṇaḥ*); the replacement is optional (*vā*) for word-final (*padāntasya*) *-m̃*. In addition, a dental stop (*toḥ*) is replaced by a consonant homogeneous with a following *l* (*li*):

c. A 8.4.60: तोर्लि ।

The following sūtras state conditions under which *-R* substitutes for *-n* and *-m*:

d. A 8.3.5-9: समः सुटि (रु [1]) । पुमः खय्यम्परे । नश्छव्यप्रशान् । उभयथर्त्तु । दीर्घादटि समानपादे ।

-R replaces the *-m* of *sam* (*samaḥ*) before the initial augment *suṭ* (*suṭi*) and the *-m* of *pum* (*pumaḥ*)¹⁶ before a voiceless stop (*khayi*) which is followed by a vowel, semivowel or nasal (*ampare*). Excepting *praśān* ‘calm’ (*apraśān*), *-R* replaces *-n* (*naḥ*) before voiceless palatal, retroflex, and dental stops (*chavi*). In the same contexts, *-n* in *ṛcs* (*ṛkṣu*) behaves both ways (*ubhayathā*); that is, it is either replaced by *-R* or not. After a long vowel (*dīrghāt*), *-n* is replaced by *-R* if a vowel or a semivowel other than *l* follows (*aṭi*) in the same verse section (*samānapāde*). Replacement by *-R* entails operations for vowels that precede original *-m* and *-n*, stated in the following sūtras:

e. A 8.3.2-4: अत्रानुनासिकः पूर्वस्य तु वा । आतोऽटि नित्यम् । अनुनासिकात्परोनुस्वारः ।

A nasalized vowel (*anunāsikaḥ*) optionally (*vā*) substitutes for the sound preceding (*pūrvasya*) final consonants replaced by *-R* as provided for in following rules (*atra* ‘here’), but this substitution applies obligatorily (*nityam*) to *ā* (*ātaḥ*) before *-R* followed by a vowel or semivowel other than *l* (*aṭi*).¹⁷ Anusvāra (*anusvāraḥ*) follows (*paraḥ*) a

¹⁵A 8.3.23-24 are rules of a section headed by A 8.1.16: पदस्य । Operations stated in rules of this section apply to a unit called *pada*. See Cardona 1997: 105.

¹⁶*pum* itself derives from *pums*, with deletion of *-s* by a rule (A 8.2.23: संयोगान्तस्य लोपः ।) which provides that the final sound of a word ending in a consonant cluster is deleted.

¹⁷This applies where A 8.3.9 applies, so that the usage covered is Vedic.

vowel that is not nasalized¹⁸ consequent upon replacement of *-m* or *-n* by *-R*.

In the spoken language Pāṇini's grammar accounts for, then, anusvāra occurs before *r* and spirants, word-final anusvāra alternates with stops homogeneous with following stops, and in particular contexts nasalized vowels alternate with complexes consisting of clear vowels followed by anusvāra.

3.1.2 Examples

kaṭam karoti '... is making (*karoti*) a mat (*kaṭam*)' → *kaṭam karoti* (8.3.23) → [optionally] *kaṭaṅ karoti* (8.4.59), *gam-sya-te* 'will be understood' (3sg. fut. pass.) → *gamsyate* (8.3.24), *pumāns-am* 'man' (acc. sg.) → *pumāmsam*, *yu-n-j-tas* 'they two are joining, yoking' (3du. pres. indic. act.) → *yu-n-g-tas* (A 8.2.30: चोः कुः ि) → *yu-m-g-tas* (8.3.24) → *yu-m-k-tas* (8.4.55) → *yuṅktas* (8.4.58),¹⁹ *yu-n-j-anti* (3pl.) → *yu-m-j-anti* → ... *yuṅjanti*, *tam lokam* 'that world' (acc. sg.) → *taṁ lokam*, *amuṣmin loke* 'in that world' (loc. sg.) → *amuṣmiṁ loke*; *mahān indra-* → ... *mahāṁ indra-*, *ṛṣṭimān iva* → ... *ṛṣṭimāṁ iva*,²⁰ *sam skaroti* '... is adorning' → *saṁR skaroti* / *saṁR skaroti* → ... *saṁskaroti* / *saṁskaroti*,²¹ *pumskāmā* → ... *pumṣkāmā* / *pumṣkāmā* 'a woman who desires men', *bhavān cinoti* → *bhavāṁR cinoti* / *bhavāṁR cinoti* → ... *bhavāṁś cinoti* / *bhavāṁś cinoti* 'you (*bhavān*) are heaping, plucking ...' *tasmin ca* 'and (*ca*) in that' → *tasmiṁR ca* / *tasmiṁR ca* → ... *tasmiṁś ca* / *tasmiṁś ca*, *asmān ca* 'and us' → *asmāṅ ca*,²² *tān ca* → *tāṁR ca* → ... *tāṁś ca* 'and those'.²³

3.2 In the recitation tradition of the Ṛgveda accounted for by the Ṛgvedaprāṭisākhya, anusvāra does not occur as a word-final segment before stops and semivowels. Instead, full assimilation takes place. Here, anusvāra occurs only before spirants and *r*.

3.2.1 The following rules account for assimilations for *-m*:

- a. ṚPr. 4.6-8: विस्थाने स्पर्श उदये मकारः सर्वेषामेवोदयस्योत्तमं स्वम् । अन्तस्थासु रेफवर्जं परासु तान्ताम्यदा-
दिष्वनुनासिकान्तु । तथा नकार उदये लकारे ।

If a stop (*sparśe*) follows (*udaye*) which has a different place of production (*visthāne*) from that of *-m*, *-m* (*makārah*) changes to the nasal stop (*uttamam*) proper to the stop

¹⁸As transmitted by Pāṇinīyas, A 8.3.5 has *anunāsikāt*, which should be considered a haplological shortening of original *ananunāsikāt*. See Cardona 1983b.

¹⁹For rules involved in the derivation and not dealt with here, see Cardona 1997: 544, 578.

²⁰E.g., ṚV 8.6.1ab: महर्हा इन्द्रो य ओजसा पर्जन्यो वृष्टिर्मा इव । 'Great (is) Indra who in his strength is like Parjanya full of rain.'

²¹For the Pāṇinian rules that state the pertinent replacements, see Cardona 1997: 557, 561, 574.

²²In Pāṇini's system, *-n* → *-ṅ* by a rule (A 8.4.40: स्तोः शुना शुः ि) whereby *ś* and palatal stops (*cu*) substitute for *s* and dental stops (*tu*) contiguous with *ś* and palatal stops. The Ṛgvedaprāṭisākhya accounts for the assimilation by a rule (ṚPr. 4.9: अकारं शकारचकारवर्गयोः [नकारः 8]) according to which *-n* (*nakārah*) changes to *-ṅ* (*ṅakāram*) if *ś* or a palatal stop (*śakāracakāravargayoḥ*) follows.

²³ṚV 2.1.16c: अस्माञ्च तद्भिः प्र हि नेषु वस्य आ 'Lead us and them to great good.'

series of the following stop (*udayasya svam*).²⁴ Before word-initial (*parāsu padādiṣu*) semivowels (*antasthāsu*) other than *r* (*rephavarjam*), *-m* changes to those very semivowels (*tām tām*), only nasalized (*anunāsikān tu*). Similarly, *-n* (*nakārah*) changes to a nasalized *l* if an *l* follows (*udaye lakāre*).

As shown, the change of *-m* to a nasalized semivowel is excluded before *r*-. When this semivowel and spirants follow (*rephoṣmaṇor udayoḥ*), *-m* changes to anusvāra (*anusvāram*):²⁵

b. ṚPr. 4.15: रेफोष्मणोरुदयोर्मकारोऽनुस्वारन्तत्परिपन्नमाहुः ।

The following rules are part of a group of rules that deal with changes for *-n* in particular contexts in the Ṛgveda:

c. ṚPr. 4.65, 68-70, 74, 75: नकार आकारोपधः पद्यान्तोऽपि स्वरोदयः लुप्यते । विवृत्त्यभिप्रायेषु च पीवोअन्नं रयिवृद्धः दधन्वाँ चो जुजुवाँ चः स्ववाँ यातु दद्वँ वेति । हतय्योनौ वचोभिर्यान्वुवन्वूर्वनिषीष्टेति ईकारोकारोपहितो रेफेषु । स्वरेषु च । चरति चक्रे चमसाँश्च चो चिच्चरसि च्यौलश्चतुरश्रिकित्वान् एतेषु सर्वत्र विसर्जनीयवद्दीर्घोपधः । अस्माञ्चमसान्यशूत्र ।

-n (*nakārah*) is deleted (*lupyate*) if it is preceded by *-ā-* (*ākāropadhah*) and followed by a vowel (*svarodayah*). It also drops in collocations which have *-ām* as though in hiatus — so that they are called *vivrṭtyabhiprāya* — although a consonant follows original *-n*. These are specified in ṚPr. 4.68: *pīvoannām rayivṛdhah*, *dadhanvām yah*, *jujurvām yah*, *svavām yātu*, *dadvām vā*. *-n* preceded by *ī* or *ū* (*īkārokāropahitah*) changes to *-r* (*repham*) before the voiced consonants of certain words listed in ṚPr. 4.69: *hatam*, *yonau*, *vacobhiḥ*, *yān*, *yuvanyūn*, *vaniṣṣiṣṭa*. This change also applies before vowels (*svareṣu*). *-n* behaves like *-ḥ* (*visarjanīyavat*) if it is preceded by a long vowel (*dirghopadhah*) and there follows one of the items *carati*, *cakre*, *camasān*, *ca*, *co*, *cit*, *carasi*, *cyautnah*, *caturah*, *cikitvān*. In particular items, *-n* does not (*na*) behave like *visarjanīya*: *asmān*, *camasān*, *paśūn*.

The pertinent operation relative to *visarjanīya* is stated in

d. ṚPr. 4.31: अघोषे रेफचरेफी चोष्माणं स्पर्श उत्तरे तत्सस्थानमनूष्मपरे (विसर्जनीयः [24])।

If there follows (*uttare*) a voiceless (*aghoṣe*) stop (*sparśe*) that is not itself followed by a spirant (*anūṣmapare*), *-ḥ* — whether or not it is of the type that changes to *-r* before vowels and voiced consonants (*rephy arephī*) — changes to the spirant (*ūṣmāṇam*) which

²⁴ṚPr. 4.6 specifies that this change applies according to all authorities (*sarveṣām eva*), because the preceding two sūtras deal with changes proper to the recitation tradition represented by the father of Śākalya.

²⁵ṚPr. 4.15 also says that this is called *paripanna* (*tat paripannam āhuḥ*). ṚPr. 5.25 (सेति चास्य परिपन्नोपधा चेत् ।) provides for the *s* of *sa* to remain unchanged after a retroflexing sound if *sa* is the element preceding a *paripanna* element (*paripannopadhā cet*), that is, if it precedes anusvāra as gotten by ṚPr. 4.15. A finite form of the causative corresponding to *paripanna* is used in ṚPr. 14.37 (*paripādayanti* ‘change to anusvāra’); see 4.2.5c.

has the same place of production as the following stop (*tatsasthānam*).

When *-n* (*nakārasya*) is dropped or changes to *-r* or a spirant (*loparephoṣmabhāve*), the vowel (*svaraḥ*) that precedes (*pūrvah*) the original *-n* (*tatsthānāt*) is nasalized (*anunāsikah*):

e. R̥Pr. 4.80: नकारस्य लोपरेफोष्मभावे पूर्वस्तत्स्थानादनुनासिकः स्वरः।

3.2.2 Examples

a. R̥Pr. 4.6: *yam kumāra* ‘young man, ... which ...’ → *yañ kumāra*,²⁶ *aham ca tvam ca* ‘I and you’ → *ahañ ca tvañ ca*,²⁷ *tam te* ‘that for you’ → *tan te*,²⁸ R̥Pr. 4.7: *yam yam yujam* ‘whomever ... an ally’ → *yaym̃ yaym̃ yujam*,²⁹ *esām lakṣmī-* ‘of these ... a mark’ → *eṣālm̃ lakṣmī-*,³⁰ *tam vaḥ* ‘that one of yours’ → *tavm̃ vaḥ*,³¹ R̥Pr. 4.8: *jigīvān lakṣam* ‘winning ... stake’ → *jigīvālm̃ lakṣam*³²

b. R̥Pr. 4.15: *navam ratham* → *navam̃ ratham* (R̥V 10.135.3a, see note 26), *tvam satyaḥ* ‘you a true one’ → *tvam̃ satyaḥ*, *tvam śāt* ‘you who overcome’ → *tvam̃ śāt*, *tvam śuṣṇam* ‘you ... Śuṣṇa’ → *tvam̃ śuṣṇam*³³

c. R̥Pr. 4.65: *sargān iva* ‘like flows’ → *sargām̃ iva*,³⁴ *mahān indra-* → *mahām̃ indra-* (R̥V 8.6.1, see note 20); R̥Pr. 4.68: *pīvoannān* (‘that have rich food’) *rayivṛdhaḥ* (‘that grow in wealth’) → *pīvoannām̃ rayivṛdhaḥ*,³⁵ R̥Pr. 4.69: *ut pañin hatam* ‘do away with the misers’ → *ut pañim̃r hatam*,³⁶ R̥Pr. 4.70: *raśmīn iva* ‘like reins’ → *raśmim̃r iva*,³⁷ *abhīśūn iva* ‘like reins’ → *abhīśūm̃r iva*,³⁸ R̥Pr. 4.74: *mahān carati* ‘the great one

²⁶R̥V 10.135.3ab: यङ्कुमारं नवं रथमचक्रम्मनुसाकृणोः । ‘Young man, the new wagon without wheels that you made in your mind ...’ The interpretation of this section of a riddle-hymn does not concern us here.

²⁷R̥V 8.62.11.a: अहञ्च त्वञ्च वृत्रहन्सथ्युजाव सुनिभ्य आ ‘Indra, let’s you and I be allied for acquisitions.’

²⁸R̥V 3.48.2cd: तन्नै माता परि योषा जनित्री महः पितुर्दम् आसिञ्चदुग्रै ‘That (Soma juice) did your mother, a young woman, pour for you at the very outset in the home of your great father.’

²⁹R̥V 2.25.1d: यथ्यथ्युजङ् कृणुते ब्रह्मणस्पतिः ॥ ‘... whom Bṛhaspati makes an ally.’

³⁰R̥V 10.71.2d: भुद्रैषाल्लक्ष्मीर्निहिताधि वाचि ॥ ‘An auspicious mark is set down on their speech.’

³¹R̥V 6.48.14ab: तव्वे इन्द्रसुकतुव्वैरंशमिव मायिनम् । ‘That one of yours (do I praise who is) of good insight like Indra, clever like Varuṇa.’

³²2.12.4cd: श्वेतीव यो जिगीवाल्लक्ष्मादददयः ... ‘Who, like a victorious player, took the stake of the Ari ...’

³³R̥V 1.63.3: त्वं सत्य इन्द्र धृष्ट्यातान्त्वमभुक्त्वा नर्यस्त्वं षाट् । त्वं शुष्णव्युजने पुत्र आशौ युने कृहत्साय द्युमते सचाहन् ॥ ‘Indra, you (have struck) these, you the true one, the bold one, leader of the R̥bhus, beneficial to men, you who overcome; as an ally ..., you killed Śuṣṇa for the young Kutsa.’

³⁴R̥V 8.35.20ab: सर्गा इव सजतं सुष्टुतीरुपं श्यावाश्वस्य सुव्रतो मंदच्युता । ‘(Aśvin), let loose like flows the good praises of Śyāvāśva as he presses (the Soma) ...’

³⁵R̥V 7.91.3ab: पीवोअन्नं रयिवृषः श्वेतः सिषक्ति ... ‘The white (wind) follows after those that are endowed with rich food, that grow with wealth ...’

³⁶R̥V 1.184.2b: उत्पुणोर्हितमूर्ध्या मदन्ता । ‘(Aśvins), rejoicing in a flood (of Soma), do away with the misers.’

³⁷R̥V 8.35.21a: रश्मीरिव यच्छतमध्वरो उपं ‘(Aśvins,) take up the rites (of Śyāvāśva) like reins.’

³⁸R̥V 6.57.6ab: उत्पुषणथ्युवामहेऽभीशूरिव सारथिः । ‘We draw up Pūṣan as a charioteer does reins.’

goes' → *mahāms carati*;³⁹ ṚPr. 4.75: *asmān ca* → *asmāñ ca* (RV 2.1.16c, see note 23).

3.2.3 In addition to the realizations illustrated in **3.2.2c**, pronunciations of the type *pīvoannām rayivṛdhaḥ*, *ut pañīmṛ hatam*, *mahāms carati* — with vowels followed by anusvāra instead of nasalized vowels — are known in the traditions of Ṛgvedic recitation. Such realizations, however, were considered errors and censured; see **4.2.5c**.

3.3 Contrary to what is true of the language described in Pāṇini's Aṣṭādhyāyī (3.1) and of the language reflected in the recitation tradition described in the Ṛgvedaprātiśākhya (3.2), the Atharvaveda tradition reflected in the Śaunakīyā Caturādhyāyikā has nasalized vowels and semivowels but lacks anusvāra.

According to

a. ŚCĀ 2.31-33 [2.1.31-33]: मकारस्य स्पर्शे परसस्थानः । अन्तःस्थोष्मसु लोपः । ऊष्मस्वेवान्तःपदे ।

before a stop (*sparśe*), *-m* (*makārasya*) is replaced by a nasal with the same place of production as the following stop (*parasasthānaḥ*) and it is replaced by zero (*lopaḥ*) before semivowels and spirants (*antaḥsthoṣmasu*). This deletion applies also within a word (*antaḥpade*), but only before spirants (*ūṣmasv eva*). In addition, both (*ubhayoḥ*) *-m* and *-n* are replaced by a nasalized *l* (*lakāro 'nunāsikaḥ*) before *l-* (*lakāre*):

b. ŚCĀ 2.35 [2.1.35]: उभयोर्लकारे लकारोऽनुनासकिः ।

The following rules state replacements for *-n* (*nakārasya*):

c. ŚCĀ 2.26-27, 29 [2.1.26-27, 29]: नकारस्य चटतवर्गेष्वघोषेष्वनूष्मपरेषु विसर्जनीयः [Deshpande:

नकारस्य चटतवर्गेषु । आकारोपधस्योपबद्धादीनां स्वरे । नाम्युपधस्य रेफ ऋतूँरुत्सुजते वशीत्येवमादीनाम् ।

Before voiceless palatal, retroflex and dental stops (*caṭatavargeṣv aghoṣeṣu*) not followed by spirants (*anūṣmapareṣu*), *-n* is replaced by visarjanīya. This replacement applies to *-n* before a vowel (*svare*), if it is preceded by *-ā-* (*ākāropadhasya*) in passages with *upabaddhān* and so on. If, however, it is preceded by a retroflexing vowel,⁴⁰ *-n* before a vowel is replaced by *-r* in sequences such as *ṛtūmṛ ut sṛjate*. The substitution by visarjanīya only results in an intermediate stage. Before a voiceless consonant (*aghoṣe*), *-h* (*visarjanīyasya*) is replaced by a spirant with the same place of production as the following consonant (*parasasthānaḥ*); before a vowel (*svare*), it is replaced by *-y* (*yakāraḥ*). Moreover, word-final (*padāntayoḥ*) *-y* and *-v* preceded by a vowel (*svarāt*) are deleted:

d. ŚCĀ 2.40-41 [2.2.1-2]: विसर्जनीयस्य परसस्थानोऽघोषे । स्वरे यकारः ।

e. ŚCĀ 2.21 [2.1.21]: स्वराद्यवयोः पदान्तयोः (लोपः [18])।

Further, when *-n* and *-m* are deleted (*nakāramakārayor lope*), the preceding (*pūrvasya*)

³⁹RV 3.55.9b: अन्तर्महर्षिरति रोचुनेन । 'The great one goes midst the two worlds with his light.'

⁴⁰*nāmyupadhasya*, that is, if it occurs after a vowel other than a *ā*.

vowel is replaced by a nasalized one (*anunāsikah*), and this applies also when *-n* and *-m* change to *-y*, *-r* or a spirant (*varoṣmāpattau*):

f. ŚCĀ 1.67-68 [1.3.5-6]: नकारमकारयोलोपे पूर्वस्यानुनासिकः। यरोष्मापत्तौ च ।

3.3.1 Examples

a. ŚCĀ 2.31 [2.1.31]: *sam kāśayāmi* ‘I show’ → *saṅkāśayāmi*;⁴¹ 2.32 [2.1.32]: *vr̥kṣam yat* → *vr̥kṣam̃ yat*, *anusphuram śaram* → *anusphuram̃ śaram*,⁴² *pitaram varuṇam śatavṛṣṇyam* ‘father ... Varuṇa of a hundred virile powers’ → *pitaram̃ varuṇam̃ śatavṛṣṇyam*,⁴³ *pitaram sūryam* ‘father ... the sun’ → *pitaram̃ sūryam*;⁴⁴ 2.33 [2.1.33]: *viṃśatih* ‘twenty’ (e.g., AV 5.15.2: ... विंशतिश्च)।

b. ŚCĀ 2.35 [2.1.35]: *tam lokam* ‘that world’ → *talm̃ lokam*,⁴⁵ *sarvān lokān* ‘all the worlds’ → *sarvālm̃ lokān*⁴⁶

c. ŚCĀ 2.26 [2.1.26]: *parvatān ca* ‘and mountains’ → *parvatām̃h ca* (1.68 [f]) → *parvatām̃ś ca* (2.40 [d]);⁴⁷ 2.27: *upabaddhān iha* ‘bound up ... here’ → *upabaddhāh̃ iha* → *upabaddhām̃y iha* (2.41, 1.68 [d, f]) → *upabaddhām̃ iha* (2.21 [e]);⁴⁸ 2.29: *ṛtūn ut sṛjate* ‘creates the seasons’ → ... *ṛtūmr̃ ut sṛjate*⁴⁹

3.4 The Yajurveda traditions accounted for in the Vājasaneyiprātiśākhya and the Taittirīyapṛātiśākhya resemble the Ṛgveda tradition (see 3.2) in that anusvāra is distinguished from nasalized vowels and consonants, referred to by the term *anunāsika*. The recitation traditions reflected in these works, however, also differ from that of the Ṛgveda and bear resemblance to the state of language described in the Aṣṭādhyāyī (see 3.1) in that there is greater variation, so that one has both vowels followed by anusvāra and nasalized vowels as well as sequences with anusvāra in addition to nasalized semivowels.

3.4.1 It is best to begin with the Śukla Yajurveda recitation as account for by the Vājasaneyi-prātiśākhya.

⁴¹AV 14.2.12a: सङ्काशयामि वहतुम् ‘I show the vehicle (in which the bride was brought here).’

⁴²AV 1.2.3ab: वृक्षं यद्वावः परिष्वजाना अनुस्फुरं शरमर्चन्त्युधुम् । ‘When the cows embrace the tree and sing to the arrow along with the quivering ...’ As the commentator explains, *vr̥kṣam* ‘tree’ and *gāvaḥ* ‘cows’ refer metaphorically to the wooden bow and the leathern bow-string from which an arrow is shot.

⁴³AV 1.3.3ab: विद्या शरस्य पितरं वरुणं शतवृष्ययम् । ‘We know the father of the arrow to be Varuṇa of a hundred virile powers.’

⁴⁴AV 1.3.5ab: विद्या शरस्य पितरं सूर्यं शतवृष्ययम् । ‘We know the father of the arrow to be the sun ...’

⁴⁵AV 3.28.5c: तल्लोकं यमिन्द्रमिसम्बभूव ‘The cow who has given birth to twin calves reached that world ...’

⁴⁶AV 4.38.5d: ... यः सर्वल्लोकान्ययेति रचन् ‘... (the sun,) which goes around all the worlds to keep them.’

⁴⁷AV 1.12.3cd: यो अन्नजा वातजा यश्च शुष्मो वनस्पतीन्सचताम्यर्वताश्च ॥ ‘Let the (illness) born of water, the one born of the wind, the dry-burning one go to the trees and to the mountains.’

⁴⁸AV 1.7.7ab: त्वमग्ने यातुधानानुपबद्धा इहा वह ‘Agni, bring here the witches, bound up.’

⁴⁹AV 6.36.2b: ऋतूरुत्सृजते वशी (Agni) ... creates the seasons.’

3.4.1.1 The following rules provide for changes that apply to *-m*:

a. VPr. 4.1,10, 12: अनुस्वारं रोष्मसु मकारः । अन्तस्थामन्तस्थास्वनुनासिकाम् परसस्थानाम् । स्पर्शे परपञ्चमम् ।
-m (*makārah*) changes to anusvāra (*anusvāram*) before *r*- and spirants (*roṣmasu*); before semivowels (*antasthāsu*) it changes to a nasalized (*anunāsikām*) semivowel (*antasthām*) with the same place of production as the following semivowel (*parasasthānām*); and before a stop (*sparśe*), *-m* becomes the nasal stop of the series to which the following stop belongs (*parapañcamam*).

A series of sūtras under the heading of

b. VPr. 3.1.133: नुः ।

provides that *-n* (*nuḥ*) undergoes changes in stated contexts. Among these rules are:

c. VPr. 3.1.134-135, 141-142: चछयोः शम् । तथयोः सम् । शत्रून् परिधीन् क्रतून् वनस्पतीन् स्वरे रेफम् ।

आकारोपधो यकारम्।

-n changes to *ś* (*śam*) before *c*- and *ch*- (*cachayoḥ*), to *-s* (*sam*) before *t*- and *th*- (*tathayoḥ*). The *-n* of the accusative plurals *śatrūn* ‘enemies’, *paridhīn* ‘protective sticks forming an enclosure’, *kratūn* ‘insights, rites’, *vanaspatīn* ‘trees’ changes to *-r* (*repham*) before a vowel (*svare*); and *-n* becomes *-y* (*yakāram*) before a vowel if it is preceded by *ā* (*ākāropadhah*). According to

d. VPr. 4.127: यवयोः पदान्तयोः स्वरमध्ये लोपः ।

intervocalic (*svaramadhye* ‘between vowels’) word-final (*padāntayoḥ*) *-y* and *-v* (*yavayoḥ*) are deleted (*lopah*). Further, the rules in **c** are stated under the heading of

e. VPr. 3.130: अनुनासिकमुपधा प्रागन्तःस्थायाः ।

This provides that in conjunction with the changes stated in subsequent rules, prior to VPr. 4.10 (*prāg antasthāyāḥ*, see **a**), the penultimate vowel preceding (*upadhā*) the sound that changes itself changes to a nasalized (*anunāsikam*) vowel.

3.4.1.2 Examples

a. VPr. 4.1: *apām rasena* ‘with the essence of the waters’ → *apām rasena*,⁵⁰ *indram śriyai* ‘Indra for magnificence’ → *indram śriyai*;⁵¹ VPr. 4.10: *sam vapāmi* ‘I pour together’ → *savm vapāmi*;⁵² VPr. 4.12: *bāhubhyām pūṣṇo* → *bāhubbhyām pūṣṇo* (see note 52), *vratam kṛṇuta* ‘do your vow’ → *vratam kṛṇuta*,⁵³ *vratam cariṣyāmi* ‘I will carry

⁵⁰I use *m* to transliterate anusvāra in general, but *ṃ* to transliterate the particular reflexes of anusvāra designated by symbols such as ॠ ॡ ॢ in Yajurveda traditions; see 7.2.3c-d.

⁵¹VS 19.94: अपाठरसेन व्वरुणो न साम्नेन्द्रं विश्वये जुनयवृप्सु राजा ॥ ‘... as Varuṇa the king (bears the foetus) in the waters to engender (Indra) unto magnificence, with the essence of the waters, the sāmān.’

⁵²VS 1.21: देवस्य त्वा सवितुः प्रसवेऽश्विनोर्ब्राह्म्याम्पूष्णो हस्ताभ्याम् । सव्वपामि ... ‘I pour you (the flour into a vessel) under the impulse of god Savitṛ, with the arms of the Aśvins, the hands of Pūṣan ...’

⁵³VS 4.11: वृतञ् कृणुत ... This has to do with carrying out the job of getting milk for the yajamāna to drink.

out a vow' → *vratañ carīṣyāmi*⁵⁴

c-e. VPr. 3.134: *ahīmś ca* 'and ... snakes' → *ahīmś ca*;⁵⁵ VPr. 3.135: *anyān te* 'others ... your' → *anyāms te*;⁵⁶ VPr. 3.141: *śatrūn apa* 'enemies ... away' → *śatrūmr apa*;⁵⁷ VPr. 3.142: *mahān indra-* → *mahāmy indra-mahām indra-*.⁵⁸

3.4.1.3 As shown, according to VPr. 3.130 (**3.4.1.1e**) a vowel preceding original *-n* that changes to *-ś* and so on is nasalized. This is not the entire story, however. According to

a. VPr. 3.131-132: स्वर औपशविः । अनुस्वारेण व्यञ्जने ।

Aupaśavi lets this nasalization apply only if *-n* subject to change precedes a vowel (*svare*); before a consonant (*vyañjane*), according to Aupaśavi, the vowel preceding *-n* is separated from the consonant in question by anusvāra (*anusvāreṇa*).⁵⁹ That is, in the tradition of recitation which Aupaśavi represents and teaches, one has *śatrūmr apa* (← *śatrūn apa*) and *mahām indro* (← *mahān indraḥ*), with nasalized vowels as in other traditions, but *ahīmś ca* and *anyāms te*, where, instead of nasalized vowels, one has pure vowels followed by the nasal segment anusvāra.

There is evidence of additional variation in the Śukla Yajurveda recitational traditions. Consider now

b. VPr. 4.2, 4-5: नुशान्तःपदेऽरेफे । अनुनासिका चोपधा । लोपङ्काशयपशाकटायनौ ।

As shown earlier (**3.4.1.1a**), VPr. 4.1 provides for *-m* going to anusvāra before *r-* and spirants. VPr. 4.2 concerns *m* and *n* (*nuś ca*) in the interior of a word (*antaḥpade*): these also go to anusvāra before the sounds given in the previous rule, excepting *r* (*arephe*). Further, VPr. 4.4 states that the sound preceding (*upadhā*) the operand is nasalized (*anunāsikā*), and according to VPr. 4.5, Kāśyapa and Śākaṭāyana (*kāśyapaśākaṭāyanau*) hold that *m* and *n* are dropped (*lopam*) in the contexts stated. Now, VPr. 3.130 already provides for nasalizing a vowel that precedes a consonant which undergoes changes by subsequent sūtras, so that VPr. 4.4 must serve a special purpose. As explained by commentators, this serves to set two options apart: It is the case that *m* and *n* change to anusvāra, but not for all authorities; and if they do not, then the vowel that precedes them

⁵⁴VS 1.5: अग्नें व्रतपते वृतञ्जरिष्यामि 'Agni, master of the vow, I will carry out a vow.'

⁵⁵VS 16.5: अहोँश्च सर्वाञ्जम्भयन् ... '... and destroying all the snakes ...'

⁵⁶VS 17.11: अन्याँस्ते अस्मत्तपन्तु हेतयः 'Let your missiles burn others than us.'

⁵⁷VS 7.37: जुहि शत्रूँषु मूधौ नुडस्व '(Indra,) kill the enemies, push away those who scorn us.'

⁵⁸VS 7.40 (= RV 8.6.1 [see note 20]): महोँ इन्द्रो ...

⁵⁹Since VPr. 3.132 has an instrumental *anusvāreṇa*, the only plausible interpretation is that found in the commentaries. The Vaidikābharāṇa supplies *vyavadhīyate* 'is separated': the penultimate vowel is separated from the consonant originally following *-n* by anusvāra (व्यञ्जने परे उपधानुस्वारेण व्यवधीयते ।) The Tribhāṣyaratna remarks that the teacher Aupaśavi requires (*icchati* 'desires, accepts') a separation of the vowel from the consonant by an adventitious (*āgamikena*) anusvāra: नकारात्परे व्यञ्जनेऽनुस्वारेण व्यवधानमिच्छत्यागमिकेन औपशविराचार्यः ।

is nasalized.⁶⁰ Thus, if *m* and *n* are deleted, as called for according to Kāśyapa and Śākaṭāyana, then a preceding vowel is nasalized; for example, *apām rasena* → *apām̃ rasena*, *indram śriyai* → *indram̃ śriyai*, with nasalized vowels instead of vowels followed by anusvāra (see 3.4.1.2a). Moreover, the same alternation is now provided for in the interior of a word in forms like *jakṣivāṃsaḥ* / *jakṣivāṃsaḥ* ‘having eaten’, *papivāṃsaḥ* / *papivāṃsaḥ* ‘having drunk’ (pfct. ptcple. nom. pl. masc.), *havīmṣi* / *havīmṣi* ‘oblations’.

3.4.2 The Taittirīyaprātiśākhya also shows evidence of comparable variation in traditions of the Kṛṣṇa Yajurveda.

3.4.2.1 The following rules of the Taittirīyaprātiśākhya provide for changes that *-m* undergoes:

a. TPr. 5.27-29: मकारस्पर्शपरस्तस्य सस्थानमनुनासिकम् । अन्तस्थापरश्च सर्वरामनुनासिकम् । न रेफपरः ।

b. TPr. 13.1-2: अथ मकारलोपः । रेफोष्मपरः ।

-m (*makārah*) followed by a stop (*sparsāparah*) changes to the nasal (*anunāsikam*) stop that has the same place of production (*sasthānam*) as the following consonant. If it is followed by a semivowel (*antasthāparah*), *-m* changes to a nasalized (*anunāsikam*) version of the same sound (*savarṇam*), but *-m* followed by *r-* (*rephāparah*) does not (*na*) undergo this change. If it is followed by *r-* or a spirant (*rephoṣmaparah*), *-m* is dropped (*makāralopah*).

Other rules concern changes for *-n*. Both *-t* and *-n* change to *-l* (*lakāram*) if they are followed by *l-* (*laparau*), but *-l* which thus derives from *-n* is nasalized (*anunāsikam*):

c. TPr. 5.25-26: लपरौ लकारम् (लकारः [22] नकारः [20]) । नकारोऽनुनासिकम् ।

Provided it is followed by a vowel other than that of *iti* (*anitiparah*) *-n* (*nakārah*) changes to *-r* (*repham*) when preceded by *-ī-* or *-ū-* (*īkārokārapūrvah*), to *-y* (*yakāram*)⁶¹ when preceded by *-ā-* (*ākārapūrvah*) in passages of the sections referred to by *graha* (TS 1.4.1-42) *ukhya* (TS 4.1-4.2, excluding the final anuvāka of each), *yājyā* (the final anuvāka of each prapāṭhaka in TS 1.1.14-4.3.13 plus 2.6.11, for a total of 23 anuvākas), *pr̥ṣṭhya* (9 anuvākas: TS 4.4.12, 4.6.6-9, 4.7.15, 5.1.12, 5.2.11-12), *hiraṇyavarṇīya* (TS 5.6.1).

d. TPr. 9.20: (नकारः [19]) अनितिपरो ग्रहोख्ययाज्यापृष्ठचहिरण्यवर्णयेष्वीकारोकारपूर्वो रेफमाकारपूर्वश्च यकारम् । *-n* followed by *c-* (*caparah*) changes to *ś* (*śakāram*):

e. TPr. 5.20: नकारश्शकारञ्चपरः ।

⁶⁰VPrU 4.4: नन्वनुनासिकमुपधा प्रागन्तस्थाया इत्युपधानुनासिक्यं विहितमेव । किमनेन सूत्रेण क्रियते । एवन्तर्हि व्यवस्थार्थं वचनम् । यस्मिन्पत्रेऽनुस्वारो न भविष्यति तस्मिन्पत्र उपधाया आनुनासिक्यं भविष्यति । अधिकाराथोऽयमारम्भः ।

⁶¹This *-y* is then subject to the changes stated in TPr. 10.19 and following; see 2.5a.

When followed by *t-* (*taparah*) in specified items, *-n* changes to *-s* (*sakāram*) on condition that the *-n* in question is original (*prākṛtaḥ*) — that is, does not result from a sandhi alteration of *-m* before *t-* — and the *t-* in question is obligatory (*nitye*) — that is, does not arise from contextual alteration. The particular terms with *-n* are: *-tarhān* (acc. pl. *śatatarhān* ‘who crush a hundred at one blow’), *tasmin* (loc. sg.) ‘in that’, *lokān* (acc. pl.) ‘worlds’, *vidvān* (nom. sg. masc.) ‘knowing’, *tān* (acc. pl. masc.) ‘those’, *trīn* (acc. pl. masc.) ‘three’, *yuṣmān* (acc. pl.) ‘you all’, *ūrdhvān* (acc. pl. masc.) ‘erect’, *ambakān* (acc. pl. *tryambakān* ‘Tryambaka offerings’), *ṛtūn* (acc. pl. masc.) ‘seasons’, *aśman* (voc. sg.) ‘stone’, *kṛṇvan* (nom. sg. masc.) ‘making’, *pitṛn* (acc. pl.) ‘fathers’, *anān* (acc. pl. masc. *prāṇān* ‘breaths’), *kapālān* (acc. pl. masc.) ‘potsherds’, *tiṣṭhan* ‘standing’ (nom. sg. masc.) with a high-pitched first vowel, *devān* (acc. pl.) ‘gods’ preceded by *nemir* ‘wheel rim’, *paśūn* (acc. pl. masc.) ‘animals’ preceded by *savane* (loc. sg.) ‘pressing’. These are specified in the following sūtra:

f. TPr. 6.14: तर्हाँस्त्वस्मिन्लोकान्विद्वाँस्त्वस्त्रीन्युष्मानूर्ध्वानिम्बकानृतूनश्मन्कृशवन् पितृनान्कपालाँस्तिष्ठन्ना-
द्युदात्ते नेमिर्देवान्त्वसवनेपशूँस्त्कारपरस्कारम्प्राकृतो नित्ये ।

Consequent on *-n* (*nakārasya*) becoming *-r*, a spirant, or *-y* (*rephoṣmayakārabhāvāt*), as well as upon its being deleted (*lupte ca*), and once *-m* has been deleted (*malopāc ca*), a preceding vowel (*pūrvasvaraḥ*) is nasalized (*anunāsikaḥ*):

g. TPr. 15.1: नकारस्य रेफोष्मयकारभावाल्लुप्ते च मलोपाच्च पूर्वस्वरोऽनुनासिकः ।

3.4.2.2 Examples

a. TPr. 5.27: *yam kāmayeta* ‘with respect to whom he should wish’ → *yañ kāmayeta*, *puronuvākyāyām dadhyāt* ‘he should put ... in the invitation verse’ → *puronuvākyāyān dadhyāt*;⁶² TPr. 5.28: *sam-yattāḥ āsan* ‘were arrayed against each other’ → *saym̐yattā āsan*, *vāmam vasu* ‘choice treasure’ → *vāmavm̐ vasu*,⁶³ *amum lokam* ‘yonder world’ → *amulm̐ lokam*⁶⁴

b. TPr. 13.1-2: *pratyusṭam rakṣaḥ* ‘the demon has been burned away’ → *pratyusṭam̐ rakṣaḥ* (15.1 [g])⁶⁵

c. TPr. 5.25-26: *amuṣmin loke* → *amuṣmil̐m̐ loke* (see note 64)

⁶²TS 1.6.10.4: यज्ञामयेत् यजमानम्प्रातृव्यमस्य युञ्जस्याशीर्गच्छेदिति तस्यैता व्याहृतीहः पुरोनुवाक्यायान्दध्यात् । ‘If he should wish a yajamāna’s desired result to go to the enemy, he should put the vyāḥṛti — i.e., *bhūr bhuvah suvah* — in the invitation verse of his rite.’

⁶³TS 1.5.1.1: देवासुरास्सद्यैत्ता आसन्ते देवा विज्रयमुपयन्तोऽग्नौ वामव्वसु सन्त्यदधत ‘The gods and the Asura were arrayed against each other. Going for victory, the gods put their choice treasure in Agni.’

⁶⁴TS 1.5.4.4-5: आद्रित्या वा अस्माल्लोकाद्रमुल्लोकमायन्तैऽमुष्मिल्लोके व्यत्थ्यन्त इमल्लोकम्पुनरभ्यवेत्याग्निमाधायैतान् होमान्जुहवुः । ‘The Ādityas went from this world to yonder world. They thirsted in that world. They came back to this world, set up the ritual fire and offered these oblations.’

⁶⁵TS 1.1.2.1: प्रत्युष्टं रक्षः ।

d. TPr. 9.20: *mahān indra-* → ... *mahāṁ indra-*,⁶⁶ *sarvān agnīn apsusaḍaḥ* ‘all the fires located in the waters’ → ... *sarvāṁ agnīm̄r apsusaḍaḥ* (15.1 [g]),⁶⁷ *śatrūn apa* → *śatrūṁr apa*

e. TPr. 5.20: *ahīn ca* → *ahīm̄ś ca* (15.1 [g])⁶⁸

f. TPr. 6.14: *śatatarhān tṛṁhanti* ‘crush those who crush with a single blow’ → *śatatarhāṁś tṛṁhanti* (15.1 [g]),⁶⁹ *tasmin tvā* ‘in that ... you’ → *tasmim̄ś tvā*⁷⁰

3.4.2.3 This is not all, however, since the Taittirīyaprātiśākhya also records different recitation allowed by various authorities. TPr. 5.29 (3.4.2.1a) says that *-m* does not change to a nasalized semivowel before *r-*. In addition,

a. TPr. 5.30: यवकारपरश्रैकेषामाचार्याणाम् ।

says that for some teachers (*ekeṣām ācāryāṇām*) *-m* does not undergo this change also if it is followed by *y-* and *v-* (*yavakāraparaś ca*). According to these teachers, *-m* is dropped when followed by these semivowels, as it is before *r-*:

b. TPr. 13.3: यवकारपरश्रैकेषामाचार्याणाम् (मकारलोपः [1])।

Further, when *-n* changes to *-r*, a spirant or *-y* and when *-n* or *-m* is deleted, it is not only the case that the preceding vowel is nasalized (TPr. 15.1 [3.4.2.1g]). In addition, according to some (*ekeṣām*), this nasalization does not (*na*) apply and, instead, anusvāra follows (*tataḥ* ‘after it’) the vowel:

c. TPr. 15.2-3: नैकेषाम् । ततस्त्वनुस्वारः ।

Thus, in addition to *sayṁyattā* (see 3.4.2.2a), there are two other pronunciations recognized by the Taittirīyaprātiśākhya: *saṁyattā* and *samyattā*. *sayṁyattā* shows full assimilation of *-m* to the following semivowel, agreeing with the accepted mode of recitation for the Ṛgveda and the Vājasaneyisaṁhitā (see 3.2.1a, 3.4.1.1a). *saṁyattā* shows a nasalized vowel, agreeing with the mode of recitation for the Atharvaveda as reflected in the Śaunakīyā Caturādhyāyikā (see 3.3.1a, e). The spoken language which Pāṇini describes has forms of the types *sayṁyattā* and *samyattā* in alternation (see 3.1.1b).

Similarly, TPr. 15.2-3 allows alternants of the type *ahīm̄ś ca*, *śatatarhāṁś tṛṁhanti*, *tasmim̄ś tvā* in addition to *ahīm̄ś ca*, *śatatarhāṁś tṛṁhanti*, *tasmim̄ś tvā*. Such variation is the norm in Pāṇini’s language (see 3.1.1e). The Taittirīyaprātiśākhya rules also

⁶⁶TS 1.4.20: मुहूर्त् इन्द्रो य ओर्जसा पर्जन्यो वृष्टिर्माँ इव । स्तोमैर्वृत्सस्व वावधे ॥ See note 20.

⁶⁷TS 5.6.1.2: सर्वोँ अग्नीँरप्सुषदोँ हुवे । ‘I call all the fires located in the waters.’

⁶⁸TS 4.5.1.2: अहोँश्च सर्वाँञ्जम्भयन् ।

⁶⁹TS 1.5.7.6: एतयोँ ह स्म वै देवा असुराणाँ शतवृहोँस्तृँ हन्ति ‘With that did the gods crush those of the Asuras who could crush a hundred at one blow.’

⁷⁰TS 1.6.5.1: तस्मिँस्त्वा दधामि ‘I put you in that (world).’

recognize alternants like *pratyuṣṭam rakṣaḥ*, *mahām indro*, *sarvām agnīmr apsuṣadaḥ* in addition to *pratyuṣṭam rakṣaḥ*, *mahām indro*, *sarvām agnīmr apsuṣadaḥ*.

Finally, consider

d. TPr. 5.31: उत्तमलभावात्पूर्वोऽनुनासिक इत्यात्रेयः ।

This records what Ātreya says (*ity ātreyaḥ*): when a nasal (*-m*, *-n*) becomes *l* (*uttamalabhāvāt*), the preceding (*pūrvah*) vowel is nasalized (*anunāsikah*). Ātreya would recite *amuṁl lokam* and *amuṣmiṁl loke*, with fully nasalized vowels followed by *l*, instead of *amulṁ lokam amuṣmilṁ loke*, with pure vowels preceding nasalized *l*.

It is noteworthy that commentators indicate which of the variants noted in such rules they can accept. Thus, the Tribhāṣyaratna and the Vaidikābharaṇa on TPr. 5.31 say that the pair of sūtras TPr. 5.30-31 is unacceptable.⁷¹ Both the commentaries note that TPr. 13.3 also is not accepted.⁷² That is, in the Taittirīya recitation tradition received by these commentators, the accepted mode of pronunciation was with nasalized semivowels *yṁ*, *vṁ*, *lṁ*. On the other hand, in this tradition the accepted mode of recitation was of the type *ahīṁś ca*, *śatatarhāṁs tṛṁhanti*, *tasmīṁs tvā*, *mahām indro*, *sarvām agnīmr apsuṣadaḥ*, with pure vowels followed by anusvāra, instead of fully nasalized vowels. For the same commentaries remark that TPr. 15.2-3 state what is acceptable to the author of the *prātiśākhya*.⁷³

Moreover,

e. VŚ 236-237: रोष्मभावात्तु नात्पूर्वं लुप्तान्माञ्च तदुत्तरात् । नकाराद्याकृतेर्लुप्तादनुस्वारागमो भवेत् ।

say that the augment (*āgama*) anusvāra (*anusvārāgamaḥ*) is added when a *-n* changes to *-r* or a spirant, when *-m* is dropped, and when *-n* changes to *-y*.

3.5 In this connection, recall that the tradition received by Aupaśavi has sequences of the type *ahīṁś ca* and *anyāṁs te*, with pure vowels followed by anusvāra instead of nasalized vowels (see 3.4.1.3). Now, consider the following sūtras:

a. VPr. 5.43-44: संस्कृतं संस्कृतिर्माँस्पचन्याः पुँध्रलूमित्यनुनासिकोपधत्वात् । अनुस्वारागमत्वादित्येके ।

These concern the fact that a break between *padas* is not made in *saṁskṛtam*, *saṁskṛtiḥ*, *māṁspacanyāḥ*, *puṁścalūm* in the Vājasaneyipadapāṭha. Two reasons are given. It is first said that this is the case because the first constituent that would be separated has a nasalized vowel as a penult (*anunāsikopadhatvāt*). VPr. 5.44 goes on to note that some (*eke*) say this is not done because the constituent contains anusvāra as an augment

⁷¹TPrS 5.31: सूत्रद्वयमेतदनिष्टम् । TPrG 5.31: नेदं सूत्रद्वयमिष्टम् ।

⁷²TPrS, TPrG 13.3: नैतत्सूत्रमिष्टम् ।

⁷³TPrS 15.2: इदमेवेष्टं न तु पूर्वम् । ‘This alone is accepted, not the preceding.’ TPrG 15.3: स्वमतस्यायमुप-
न्यासः । ‘This is a formulation of his own view.’

(*anusvārāgamatvāt*). Uvaṭa and Anantabhaṭṭa remark that 5.43 reflects the Vājasaneyin (Mādhyandina) tradition, 5.44 the Kāṇva traditions.⁷⁴ That is, according to these commentators, alternations of the type *saṃskṛtiḥ*, *saṃskṛtiḥ* are associated with different śākhās.

3.6 The possible outcomes for original *-m* and *-n* in various contexts provided for by rules of the Aṣṭādhyāyī and prātiśākhya can be summarized as shown in chart I.

4 While presenting phonological rules concerning *-m* and *-n* (2-3) I have proceeded under the assumption that the variations noted in the Aṣṭādhyāyī and prātiśākhya represent true differences in pronunciation. I now turn to the evidence which demonstrates that this is not a mere assumption. There are two main points to consider. First, do *anunāsika* and *anusvāra* as used by authors of prātiśākhya works and śikṣās and by Pāṇini and Pāṇinīyas refer to distinct entities? Secondly, even if *anusvāra* refers to something other than the nasality of a nasalized vowel, does this reflect a true difference in pronunciation between nasalized vowels and nasal consonants on the one hand and sequences consisting of pure vowels followed by *anusvāra*?

4.1 The available evidence demonstrates that for the authors of prātiśākhya and for Pāṇini *anusvāra* was indeed a distinct linguistic entity. In accordance with the order of presentation I followed earlier, I will begin with evidence from the Aṣṭādhyāyī and Pāṇinīyas, go on to evidence from prātiśākhya, and then consider materials from śikṣās and other texts.

4.1.1 The sound units with which Pāṇini operates can be divided into two groups: those found in basic — “underlying” — forms in his system and those which occur only as replacements of such units. *Anusvāra* is one of several elements that are not part of basic items but are introduced as substitutes. As shown in 3.1.1, *anusvāra* replaces word-final *-m* as well as word-interior *-m-*, *-n-* and is itself then subject to replacement by a consonant homogeneous with a following one, optionally across a word boundary. Another such element is *visarjanīya* (*h*). In Pāṇini’s system, *-s* is replaced by *-R*,⁷⁵ and then this as well as basic *-r* undergo certain replacements. Before voiceless consonants and pause, *-R* is replaced by *-h*, which is itself then replaced by *-s* before voiceless consonants. Before voiceless spirants, however, *-h* is optionally retained, and before velar and labial voiceless stops respectively, it is optionally replaced by the fricatives *ç*

⁷⁴VPPrU 5.43: ... वाजसनेयनिमुपधानुनासिकत्वान्नावग्रहः । कारवादीनां तु वक्ष्यमाणसूत्रेण । 5.44: कारवादीनामयं पाठो बोध्यः । VPrA 5.44: एकशब्दोऽत्र मुख्यवचनः तथैवकारवपाठात् ।

⁷⁵A 8.2.66: ससञ्जुषो रुः ।

(*jihvāmūlīya* = [x]) and *p* (*upadhmānīya* = [ϕ]).⁷⁶

As a replacement for other, basic sound units, anusvāra is as much a distinct sound unit as *h*, *k*, and *p*. Moreover, from the time of earliest Pāṇinīyas anusvāra is explicitly recognized as a separate unit, on a par with *h* and certain other sounds that are not parts of posited basic units, all referred to by the term *ayogavāha*. Thus, in the Mahābhāṣya discussion of śivasūtra 5, the following issue is taken up. The ayogavāha sounds are not recited anywhere among the fourteen sūtras that make up Pāṇini’s sound catalog (*akṣarasamāmnāya*) but they are indeed heard (*śrūyante*); they should be recited somewhere in order to allow for operations involving them. The question then is posed: what are these ayogavāha sounds? And Patañjali answers: visarjanīya (*h*), jihvāmūlīya (*k*), upadhmānīya (*p*), anusvāra, the nasal element that is pronounced as a transition between *h* and a following nasal stop (*nāsikya*), and the nasal elements that are pronounced as transitional elements between nonnasal stops and nasal stops (*yama*). In addition, Patañjali explains that these are called *ayogavāha* because they are not “yoked” (*ayuktāḥ*) — that is, are not linked with any śivasūtra — and yet they “flow, transport” (*vahanti*) — that is, they are uttered in usage, which they serve to accomplish; they are not recited (*anupadiṣṭāḥ* ‘not taught’) among the śivasūtras, yet they are heard (*śrūyante*).⁷⁷

4.1.2 The Ṛgvedaprātiśākhya begins with a series of rules which refer to an ordered set of sounds and classifies these sounds for the purpose of phonological rules by assigning to them particular class names (*sañjñā*) which will be used in rules stating phonological operations relative to these classes.

a. RPr. 1.1-3, 5-6: अष्टौ समानाक्षराद्यादितः । ततश्चत्वारि सन्ध्यक्षराणि । एते स्वराः । अनुस्वारो व्यञ्जनं वा स्वरो वा । सर्वः शेषो व्यञ्जनाभ्येव ।

provide that the eight (*aṣṭau*) sounds first listed (*āditaḥ* ‘at the beginning’) — i.e., *a ā r ṛ i ī u ū* — are called *samānākṣara* (‘simple vowels’) and the four given thereafter (*tataś catvāri*) — i.e., *e o ai au* — are called *sandhyakṣara* (‘complex vowels’). These (*ete*) are all called *svara* (‘vowels’). Anusvāra, on the other hand, bears either of two class names: *vyañjana* (‘consonant’) or *svara*. The entire remainder (*sarvaḥ śeṣaḥ*) consists of sounds given the name *vyañjana* alone. According to

⁷⁶For the pertinent sūtras see the references given in note 21.

⁷⁷Bh. I.28.16-18: इदं विचार्यते । इमेऽयोगवाहा न क्वचिदुपदिश्यन्ते श्रूयन्ते च । तेषां कार्यार्थं उपदेशः कर्तव्यः । के पुनरयोगवाहाः । विसर्जनीयजिह्वामूलीयोपध्मानीयानुस्वारानुनासिक्ययमाः । कथं पुनरयोगवाहाः । यद्युक्ता वहन्त्यनुपदिष्टाश्च श्रूयन्ते । Kielhorn-Abhyankar (Abhyankar 1962) reads विसर्जनीयजिह्वामूलीयोपध्मानीयानुस्वारानुनासिक्ययमाः and BhN I.127b reads विसर्जनीयजिह्वामूलीयोपध्मानीयानुस्वारयमाः. BhV I.1.132b and BhR I.97-98 read विसर्जनीयजिह्वामूलीयोपध्मानीयानुस्वारानुनासिक्ययमाः. This last reading has the support of prātiśākhyas, which recognize a separate element called *nāsikya*; see notes 79, 84, 85. For the present discussion, this point is not crucial.

b. R̥Pr. 1.7-14: तेषामाद्याः स्पर्शाः । पञ्च ते पञ्चवर्गाः । चतस्रोऽन्तस्थास्ततः । उत्तरेऽष्टा ऊष्माणः । अन्त्याः सप्त
तेषामघोषाः । वर्गे वर्गे च प्रथमावघोषौ । युग्मौ सोष्मासौ । अनुनासकिोऽन्त्यः ।

the first (*ādyāḥ*) of these (*teṣām*) are called *sparsā* ('stops'), subdivided into five (*pañca*) series of five members each (*pañcavargāḥ*). The next (*tataḥ*) four (*catasraḥ*) sounds — i.e., *y r l v* — are called *antasthā* ('semivowels'). The following (*uttare*) eight (*aṣṭau*) are called *ūṣman* ('spirants'): *h ś ṣ s ḥ k p m*. The last seven (*antyaḥ sapta*) of these (*teṣām*) are called *aghoṣa* ('voiceless'), as are also the first two (*prathamau*) sounds in each stops series (*varge varge*): *k kh c ch ṭ ṭh t th d dh p ph*. The even sounds (*yugmau*) in each such series — *kh gh* and so on — are called *soṣman* ('aspirates'), and the last (*antyaḥ*) sound of each series is called *anunāsika* ('nasal').

The R̥gvedaprātiśākhya explicitly recognizes eight sounds called *ūṣman*. As Uvaṭa notes,⁷⁸ this means that anusvāra is given independent status as a separate element listed among the spirants.

The eighth chapter of the Vājasaneyiprātiśākhya gives the traditional sound list associated with this treatise. This list includes the sounds called *ayogavāha* (cf. 4.1.1), and anusvāra is included among these sounds.⁷⁹

4.1.3 As is known, among the early śikṣās, the Āpiśalaśikṣā is the most general treatise, not restricted to any particular Vedic corpus. Here too, anusvāra is recognized as a distinct entity, as when Āpiśali treats of external efforts (*bāhyaprayatna*) in the production of sounds and says⁸⁰ that the third and fourth sounds of the stop series, semivowels, *h* and anusvāra, as well as the third and fourth yamas are produced with close glottis (*samvyrtakanṭhāḥ*), have *nāda* as their accompanying property, and are voiced (*ghoṣavantah*). The metrical version of the Pāṇinīyaśikṣā⁸¹ in the text reconstructed by Manomohanghosh begins by giving an inventory of sounds: There are twenty-one vowels, twenty-five stops, a group of eight consisting of semivowels and spirants, four yamas, anusvāra, visarga, *k* and *p*.⁸²

4.1.4 Prātiśākhyas contain statements that can justifiably be considered rules of

⁷⁸R̥PrU 1.10: अन्तस्थाभ्य उत्तरेऽष्टा ऊष्माणो वेदितव्याः ... यथा ह श ष स अः :कः :प अं इति । Due to font limitations, I have used :क and :प to represent jihvāmūliya and upadhmanīya.

⁷⁹VPr. 8.18-24: अथायोगवाहाः । :क इति जिह्वामूलीयः । :प इत्युपध्मानीयः । अं इत्यनुस्वारः । अः इति विसर्जनीयः । हुँ इति नासिक्यः । कँ खँ गुँ घँ इति यमाः । For the present discussion, it is not crucial that the chapter in question is probably an accretion.

⁸⁰ĀpŚ 4.4: वर्गाणां तृतीयचतुर्था अन्तस्था हकारानुस्वारौ यमौ च तृतीयचतुर्थौ संवृतकण्ठा नादानुप्रदाना घोषवन्तः ।

⁸¹Although this text is post-Pāṇinian, it antedates Bhartṛhari (late fourth century A.D.), who cites from it.

⁸²PŚ 1-2ab (PŚR 4-5ab): स्वरा विशतिरेकश्च स्पर्शानां पञ्चविंशतिः । यादयश्च स्मृता ह्यष्टौ चत्वारश्च यमाः स्मृताः ॥ अनुस्वारो विसर्गश्च :कःपौ चापि पराश्रयौ ।

syllabification. These provide that particular consonants in given contexts form parts (*aṅga*) of a syllable constituted by a certain vowel. Two such rules are RPr. 1.24: पूर्वस्यानुस्वारविसर्जनीयौ । (see 9.2.2a) and TPr. 21.6: अनुस्वारस्वरभक्तिश्च । (see 9.2.3a). According to the first sūtra, anusvāra and *ḥ* (*anusvāravisarjanīyau*) go with a preceding vowel; the second rule provides that anusvāra and an epenthetic vowel (*svarabhaktiś ca*) go with a preceding vowel. Clearly, anusvāra is given a status in a syllable comparable to that of *ḥ* or an epenthetic vowel.

4.1.5 The available evidence thus leads to the conclusion that *anusvāra* in the Aṣṭādhyāyī and its commentatorial tradition as well as in prātiśākhya and śikṣā works refers to an entity that is distinct from what is referred to by *anunāsika*.

4.2 The issue which remains to be resolved, then, is the following. Pāṇini provides for anusvāra to follow a vowel that has not been replaced by a nasalized vowel (A 8.3.4 [3.1.1e]) and the Taittirīyaprātiśākhya says that anusvāra follows a vowel (TPr. 15.3 [3.4.2.3c]). Such statements might be interpreted in either of two ways:

a. They concern sequences of the type *Vm̄*, such that a pure vowel is followed by a nasal segment called *anusvāra*.

b. They are statements of the type considered above in 2.1 and concern nasalized vowels (*Vṁ*), which are analyzed as consisting of a vowel and an entity that imparts nasality to the vowel.

b alone can be harmonized with Whitney's stand that the treatises in question concerned a 'discordant apprehension and analysis of a single mode of utterance.'

4.2.1 It is difficult to see how one could take position **b** with respect to what Pāṇini says. The sūtras in question definitely do not concern a description of segments. Nor have they to do with opinions attributed to different scholars, although Pāṇini does indeed have occasion to refer to what different scholars say (see 2.5). The only intelligent interpretation of A 8.3.2, 4 (3.1.1e) is the one universally adopted: These sūtras state that a vowel preceding *-n* or *-m* which *-R* replaces by subsequent rules is either replaced by a nasalized vowel or followed by anusvāra. That is, the reasonable interpretation is in harmony with position **a**.

4.2.2 Some of the prātiśākhya statements considered above (3.4.1-3.4.2), on the other hand, do indeed represent what different authorities have to say, so that one might consider oneself on firmer ground in maintaining position **b** of 4.2 with respect to these rules. More careful consideration, however, shows that this too cannot be accepted.

In accordance with **b**, VPr. 3.130-132 (3.4.1.1e, 3.4.1.3) would state the following: a

vowel which precedes *-n* subject to changes stated in subsequent rules is nasalized when these changes apply; Aupaśavi holds that this nasalization applies only if *-n* occurs before a vowel; if a consonant follows *-n* subject to the changes, then anusvāra comes between the vowel preceding original *-n* and the consonant which followed this; in this way, Aupaśavi, who maintains that anusvāra is tantamount to nasality of a vowel, accounts for the nasality of the vowel preceding original *-n*. Even the most ardent adherent of Whitney's position would have to admit, I think, that this is a strange procedure. It certainly does not fit in with the kind of statement made in RPr. 13.15-18 (2.1). On the contrary, VPr. 3.130-132 are worded in the way other phonological rules of the whole section are worded, including the use of a locative (*svare*) to designate the entity before which something applies.

4.2.3 The same is to be said of the Taittirīyaprātiśākhya rules treated in **3.4.2.3**. In this connection, consider now

- a.** TPr. 2.46-48: कण्ठस्थानौ हकारविसर्जनीयौ । उदयस्वरादिस्थानो हकार एकेषाम् । पूर्वान्तसस्थानो विसर्जनीयः ।

These concern the place of production (*sthāna*) for *h* and *ḥ* (*hakāraṅvīsarjanīyau*). The first sūtra states that both sounds have the back of the throat for their place of production (*kaṅṭhasthānau*). The next two rules say what some (*ekeṣām*) consider the *sthāna* for these sounds: *h* is produced at the place where the beginning of the following vowel is produced (*udayasvarādīsthānaḥ*), *-ḥ* at the place where last part of the preceding vowel is produced (*pūrvāntasasthānaḥ*). Saying that *h* is produced in the throat can be considered simply a recognition that this sound has no particular oral point of production. Attributing to *h* the place of production of a vowel segment that follows accounts for the same thing in a slightly different manner. On the other hand, the different places specified for *ḥ* can be based on actual differences. There may have been speakers in whose speech *ḥ* was not colored by the preceding vowel, others in which the vowel color carried over.

This is made all the more probable by something the R̥gvedaprātiśākhya says in its chapter on faults of pronunciation:

- b.** RPr. 14.30: स्वरात्परं पूर्वसस्थानमाहुर्दीर्घान्निरस्तं तु विसर्जनीयम् ।

One of the observations this makes about *visarjanīya* is that some pronounce this sound with the same place of production (*sasthānam*) as a preceding vowel (*svarāt*).⁸³

The following concern the nasal transitional sounds, referred to by the term *nāsikya*,

⁸³RPr. 14.30 involves some difficulty of interpretation in that it contains *dirghāt* 'long', so that, at first blush, it speaks only of *ḥ* following long vowels. Uvaṭa goes into this issue, which I do not take up here. Uvaṭa also cites TPr. 2.46-48.

which are pronounced between nonnasal stops or *h* and following nasals:⁸⁴

c. TPr. 2.49-50: नासिक्या नासिकास्थानाः । मुखनासिक्या वा ।

The first sūtra says they have the nose as place of production (*nāsikāsthānāḥ*), and the second provides an option (*vā* ‘or’): they are oral-nasal (*mukhanāsikyāḥ*). Here there is no question of any other scholars, so that the Vaidikābharaṇa may well be correct in remarking that the two options concern respectively the nasal transitions following stops on the one hand and *h* on the other.⁸⁵

What most bears stressing here, however, is that TPr. 2.46-48 are part of the section in which details concerning the production of sounds are dealt with. Similarly, ṚPr. 13.15-18 (2.1) are sūtras in the chapter of the Ṛgvedaprātiśākhya that deals with the production of sounds. The Taittirīyaprātiśākhya rules considered in 3.4.2.3, on the other hand are parts of sections of phonological rules.⁸⁶ Accordingly, it is proper to consider that these sūtras too provide for different operations that involve true differences in the language.

4.2.4 This conclusion receives support from other evidence. As I noted earlier (4.1.1), Patañjali speaks of the ayogavāha sounds as distinct speech units that are heard (*śrūyante*). It would be inappropriate to accept on the one hand that *k*, *p*, *h* and nasal transition sounds are indeed distinct elements that are uttered and perceived but that *anusvāra* signifies nothing more than the nasal quality of nasalized vowels. Moreover, we have the evidence of Patañjali’s predecessor Kātyāyana to show that *yaymya-* and *yamyā-* — in the intensive of *yam* ‘control, raise’ (3sg. pres. indic. *yaymāmyate*, *yamyamyate*) — were distinct, the former pronounced with a nasalized *y*, the latter with *y* preceded by *anusvāra*. In his second and third vārttikas on A 7.4.85 (नुगतोऽनुनासकान्तस्य ।, see Cardona 1997: 386), Kātyāyana proposes that such forms are accounted for by stating that the augment (*āgama*) *anusvāra* is introduced after the vowel of the first syllable of two syllables that result from doubling and by having the final sound of the syllable be treated as though it were word-final (*padāntavat*), so that the optional assimilation

⁸⁴According to TPr. 21.12-13 (स्पर्शादनुत्तमादुत्तमपरादानुपूर्व्यान्नासिक्याः । तान्यमानेके ।), after nonnasal stops followed by nasal stops, the corresponding *nāsikya* sounds are introduced, which some call *yama* (cf. 2.4 with note 10). TPr. 21.14: हकारान्नश्मपराद्नासिक्यम् । provides that *nāsikya* is introduced after *h* which is followed by *n*, *ṇ* or *m*.

⁸⁵TPrG 2.50: एवमुक्तस्य पक्षद्वयस्य योग्यतया व्यवस्थाश्रयितव्या । स्पर्शेभ्यः परे प्रथमादिव्यदेशभाजो मुखनासिक्याः। हकारात्परस्तु नासिकामात्रस्थान इति ।

⁸⁶W. S. Allen (1953: 42) remarks that Whitney’s view ‘... has support in the fact that the *TP* speaks of *anusvāra* as having precisely this value ...’ and cites (1953: 42 n. 7) TPr. 2.30 with TPr. 15.1. This will not do. The latter simply provides that a vowel which precedes sounds subject to stated changes is nasalized; the former states that *anusvāra* and nasal stops are nasalized segments (*anunāsikāḥ*); see below. These do not justify the conclusion that *anusvāra* is nothing more than the nasality of a vowel or semivowel.

provided by A 8.4.59 (3.1.1b) takes effect.⁸⁷ Here Kātyāyana speaks of anusvāra as an augment that is introduced, a separate segment, not mere nasality of another unit.

4.2.5 As can be seen from the Ṛgvedaprātiśākhya rules considered in 3.2.1, the tradition of recitation for the Ṛgveda accounted for by these sūtras is relatively homogeneous when compared with the sorts of variations that the Taittirīyaprātiśākhya accounts for in recitation of the Taittirīyasamhitā. Yet the Ṛgvedaprātiśākhya also takes into account some variation which involves anusvāra, only it does so in a chapter devoted to faults that are to be avoided in a proper recitation of the Ṛgveda. Consider now

a. ṚPr. 14.54: अनुस्वारमुपधां वान्यवर्षां स्वरोपधात्सोष्मयमोदयश्चेत् तद्धन्त्यञ्ज्मो जद्धन्त ईङ्ङ्यन्तीः सञ्ज्ञातरूपो ऽथ सञ्ज्ञानमिन्द्रः (रक्तात् [53] पूर्वम् [52])।

b. ṚPr. 14.56: रक्तैः रागः समवाये स्वराणां न नूनं नृम्यं नृमशा नृभिर्नृन् ।

The first sūtra concerns sequences such that a nasal (*raktāt*) is preceded by a vowel (*svaropadhāt*) and followed by an aspirated stop or a yama (*soṣmayamodayaś cet*), as in *tañ ghnanti* ‘... kill him’.⁸⁸ Some insert an anusvāra before the nasal (*anusvāram raktāt* [53] *pūrvam* [52]): *tañ ghnanti*. In addition, some convert the nasal to anusvāra: *tañ ghnanti*.⁸⁹ Once we consider ṚPr. 14.56, we can rule out the possibility that when ṚPr. 14.54 speaks of placing an anusvāra before the nasal it is merely saying that the vowel which precedes this nasal is itself nasalized. For the second sūtra explicitly takes into account a fault involving nasalization in sequences like *na nūnam* ‘not now’.⁹⁰ Here the fault of pronunciation consists in the nasality (*rāgaḥ*) of the vowels (*svarāṇām*) which are in conjunction with nasals (*raktaiḥ samavāye*). That is, some nasalize the vowels in such instances. If ṚPr. 14.54 were speaking merely of nasalizing vowels, it could have formulated the fault in the way that ṚPr. 14.56 is worded. Moreover, since both these sūtras concern the actual pronunciation of particular kinds of sequences, there is no question of ṚPr. 14.54 concerning the use of *anusvāra* with reference to nasality in a vowel under a particular analysis.

In the same vein, consider

c. ṚPr. 14.37: स्पशोष्मसन्धीन्स्पशरिफसन्धीनभिप्रायाँश्च परिपादयन्ति ।

This has to do with the collocations dealt with in ṚPr. 4.74, 69, and 68 (see 3.2.1c), which

⁸⁷7.4.85 vtt. 2-3: अनुस्वारागमवचनत्सिद्धम् । पदान्तवच्च । This is not the place to enter into details concerning how the sūtra itself is interpreted in the tradition to provide for the desired results.

⁸⁸RV 2.27.13cd: नकिञ्छद् धन्त्यन्तितो न दुराद्य अदित्वान्प्रम्भवन्ति प्रशीतो ॥ ‘None slay him from near or far who is under the guidance of the Ādityas.’ This is one of six examples which the sūtra refers to explicitly.

⁸⁹As shown, the first alternative involves understanding *raktāt* and *pūrvam*. The second alternative involves understanding only *raktāt* from the preceding sūtra and contextually converting this to an accusative. Uvaṭa notes these two and a third possibility: that an anusvāra is inserted after the nasal.

⁹⁰RV 1.170.1a: न नूनमस्ति नो श्रः ‘There is not now nor will be tomorrow.’

involve a stop and a spirant (*sparśoṣma-*), a stop and *-r* (*sparśarepha-*), and those called *vivṛṭtyābhiprāya*: In all these, some commit the error of converting *-n* to anusvāra (*paripādayanti*, see note 25) instead of dropping it and nasalizing the preceding vowel. That is, as in Yajurveda traditions there were pronunciations such as *ahīmś ca*, with anusvāra (see 3.4.1.3, 3.4.2.3), so too did some recitors of the Ṛgveda use comparable pronunciations, but the strict tradition to which Śaunaka adheres censures these as errors.

5 In arguing for his position, Whitney laid some stress on symbols for anusvāra in the Devanāgarī script, saying (1868: 68-69):

Which of the two views is originally favored by the Devanāgarī alphabet does not admit of much question; the writing of *am̐ca*,* for example, with a nasal sign over the vowel of the first syllable, is an unequivocal recognition of the quality as something affecting the vowel itself. If it had seemed to the framers of this alphabet to be a something interposed between the vowel and the following consonant, they would doubtless have found for it a sign to stand between those of the other elements. This has actually been done, out of a true regard for consistency, by the writers of the Vājasaneyi and Tāittirīya texts; for lack of a better device, they have brought down one of the usual signs of nasality from above the syllable to a position between the syllables, giving it an addition which enables it to maintain its place there* —in the Tāittirīya texts, we have the dotted crescent with the *virāma*, the usual mark for a consonant not graphically combined with a following consonant, beneath it. The scribes of the Rig-Veda seem to have been less solicitous to make their practice square with their theory.

Whitney's footnote on page 68 reads: 'Namely, अंश, or अँश' and his first note on page 69 reads: 'Thus, for अंश or अँश, the Vāj. S. writes अ०श, the Tāitt. S. अँश.' This argument should better be passed over in silence were it not that a more recent author (Allen 1953: 42) alludes to it without comment. For, although it is not difficult to see how Whitney could present such an argument in the 1860's, it is difficult to accept it in view of what has been learned about the history of various orthographic systems in India. Evidence does not support Whitney's argument and his claim of priority for the positioning of the bindu. As Bühler already remarked (1896:56), in early Brāhmī as found in Aśoka's inscriptions:

The Anusvāra mostly stands opposite the middle of the preceding Mātṛkā, as in *maṁ* (32, VIII). But in connection with *i* it is placed regularly in Delhi-Sivalik, Delhi-Miraṭ, Mathia, Radhia, Jaugada, and Dhauli, inside the angle of the vowel, as in *ṛim* (18, VI). There are also other cases in which it occasionally appears, as in the later scripts, above its Mātṛkā, and sometimes, as in *maṁ* (32, II), it sinks to the foot of the latter

More recently still, Srivastava (1972: 217, 219) almost casually makes use of orthographic evidence:

By making signs for anusvāra [N*] and anunāsika [v̄] entirely different in character from regular letters used for nasal mutes, Indian grammarians have established two different types of phonemic units — nāsikya (nasal mutes) and unusrvāra/anunāsika, i.e. /N/. After grouping

other than *r* and before stops, but in alternation with nasalized semivowels (*yṁ vṁ lṁ*) and nasal stops. Full assimilation of *-m* to following stops is the norm in Vedic.

d. There is also evidence of considerable variation from Vedic traditions. Pāṇini's spoken language has an alternation between *-Vṁś / -Vṁs / -Vṁr* and *-Vṁś / -Vṁs / -Vṁr*. In Vedic traditions, forms with nasalized vowels were the norm, but there are also traces of forms with vowels followed by anusvāra. As could be expected, the Kṛṣṇa Yajurveda shows evidence of greatest diversity; e.g., *sayṁyattāḥ / saṁyattāḥ / saṁyattāḥ*, *amulṁ lokam / amuṁl lokam*. The Vājasaneyin tradition too shows variation, as in *ahīṁś ca / ahīṁś ca*. Moreover, in the Ṛgveda tradition also there was comparable variation, but with this difference, that here the variant with anusvāra was condemned.

7 We have now to consider the phonological and phonetic properties of anusvāra.

7.1 Anusvāra has properties that allow it to be viewed either as a consonant or a vowel. For example, in syllabification, it goes with a preceding syllable nucleus, so that it patterns like a consonant; see **4.1.4**, **9.2**. On the other hand, it also patterns like a vowel. For example, the first consonant of a cluster is subject to doubling after a vowel, and this applies also after anusvāra; see **9.1**. Accordingly, the Ṛgvedaprātiśākhya allows anusvāra to be classed as either a consonant or a vowel:

ṚPr. 1.5: अनुस्वारो व्यञ्जनं वा स्वरो वा ।

In referring to anusvāra, moreover, the actual term *anusvāra* is used and larger class names are not used. Thus, the general rule that provides for repeating the initial consonant of a cluster (ṚPr. 6.1 [**9.1.2.2a**]) specifies that the consonant be preceded by either a vowel or anusvāra (*svarānu-svāropahitah*).

Moreover, the Ṛgvedaprātiśākhya classes anusvāra among the voiceless spirants; see **4.1.2b**. It is alone in doing this, however, and for a good reason, as has been recognized before (Allen 1953: 41): In the Ṛgveda recitation tradition accounted for by this treatise, anusvāra occurs only before *r* and voiceless spirants and *-m* is fully assimilated to following stops and semivowels.

7.2 In considering the phonetic properties of anusvāra, it will be best to deal with features of voicing and so on separately.

7.2.1 As was noted earlier (**4.1.2b**, **7.1**) the Ṛgvedaprātiśākhya classes anusvāra among the consonants called *ūṣman* ('spirant') and provides also that it bears the class name *aghoṣa* ('voiceless consonant'). The phonetic correlate of the latter is that the air flow which constitutes anusvāra is *śvāsa*, produced when the glottis is open. Accordingly, anusvāra in this tradition of recitation is phonetically voiceless. In other traditions,

however, it is not classed as a spirant, nor is it voiceless. For example, the Taittirīyaprāṭisākhya assigns the class name *aghoṣa* to spirants⁹³ other than *h* and to the first two stops in each stop series; remaining consonants are called *ghoṣavat*.⁹⁴ In a section describing how sounds are produced, the same text says the material cause for sounds called *svara* ('vowel') and *ghoṣavat* is *nāda*, the air flow produced when the glottis is close, for *h* and voiced aspirates the cause is the air flow termed *hakāra*, produced when the glottis is in a mid state; and the material cause for voiceless consonants is *śvāsa*, the air flow produced when the glottis is open.⁹⁵ Here, then, *anusvāra* is phonetically voiced.

7.2.2 As for the place of production (*sthāna*) for *anusvāra*, authorities agree on one point but differ on another. It is generally agreed that *anusvāra* is produced in the nose (*nāsikā*, *du. nāsike* 'nasal passages, nostrils'), so that this segment is called *nāsikya* 'nasal'.⁹⁶

a. VPr. 1.74: यमानुस्वारनासिक्यानां नासिके ।

ApŚ 1.14: अनुस्वारयमा नासिक्याः ।

PŚ 14ab (PŚR 22ab): अनुस्वारयमानाञ्च नासिका स्थानमुच्यते ।

Similarly, after stating that certain sounds are guttural and so on, the Ṛgvedaprāṭisākhya says the remainder (*śeṣaḥ*) is labial (*oṣṭhyaḥ*), excepting nasal sounds (*apavādya nāsikyān*), then specifies that the sounds thus excepted are the nasal segment which occurs between *h* and a nasal stop (*nāsikya*, see notes 79, 85), *yamas* (see note 10) and *anusvāra*:

b. ṚPr. 1.47-48: शेष ओष्ठ्योऽपवाद्य नासिक्यान् । नासिक्ययमानुस्वारान् ।⁹⁷

The description of the nose as the sole proper place of production for *anusvāra* is accepted by later Pāṇinīyas, so that, for example, Bhaṭṭoji Dīkṣita again says this in a section listing the places of production (*sthānāni*) for sounds:

c. SK I.18: नासिकानुस्वारस्य । इति स्थानानि ।

Complications arise, however, once we consider the possibility of oral places of production for *anusvāra*. This actually involves two questions: First, does *anusvāra* have a definite oral *sthāna* of itself or does it take on the oral *sthāna* of a vowel which it

⁹³In the phonological system which the Taittirīyaprāṭisākhya adopts, there are only six sounds called *uṣman* (TPr. 1.9: परे षडूष्माणः।): *k ś ṣ s p h*.

⁹⁴TPr. 1.12-14: ऊष्मविसर्जनीयप्रथमद्वितीया अघोषाः । न हकारः । व्यञ्जनशेषो घोषवान् ।

⁹⁵TPr. 2.8-10: नादोऽनुप्रदानं स्वरघोषवत्सु । हकारो हचतुर्थेषु । अघोषेषु श्वासः । See Cardona 1986 for details.

⁹⁶*nāsikya* is to *nāsikā* as *dantya* 'located at the teeth' is to *danta* 'tooth', *tālavya* 'located at the palate' is to *tālu* 'palate', and so on. Pāṇini accounts for such derivatives, meaning 'located at ...', by introducing the *taddhita* affix *yat* after terms with a seventh-triplet (locative) ending following a base which signifies a body-part: A 4.3.53, 55: तत्र भवः । शरीरावयवाच्च (यत् [54]); see Cardona 1997: 344-345.

⁹⁷The Ṛgvedaprāṭisākhya section in question ends with ṚPr. 1.49: इति स्थानानि । 'Thus the places of production.'

follows? Secondly, does this apply to any anusvāra or to anusvāra in particular contexts?

As shown above under **a**, PŚ 14ab says that the place of production for anusvāra is the nose. On the other hand, according to

d. PŚ 15ab (PŚR 22cd): अयोगवाहा विज्ञेया आश्रयस्थानभागिनः ।

sounds called *ayogavāha* (see 4.1.1) share the places of production of the sounds on which they are dependent (*āśrayasthānabhāginah*). As Rudra Prasāda explains in his commentary,⁹⁸ *-h* has the same oral places of production as the vowels on which it depends, so that the *-h* of *rāmaḥ* is postpalatal and the *-h* of *hariḥ* is palatal (cf. TPr. 2.48 [4.2.3a]). By the same token, an anusvāra will have the oral place of production that pertains to the vowel with which it goes. For example, the *-m* of *harim* is a nasal segment with the oral place of production of the preceding vowel, that is, the palate (*tālu*), so that *-im* symbolizes a vowel *-i-* followed by a nasalized segment *im̃*.

One must assume that ĀpŚ 1.14 (**a**) also refers to anusvāra viewed in this manner. For, Āpiśali goes on to note that some (*eke*) say anusvāra has both the postpalatal area of the mouth (*kaṇṭha*) and the nose as its places of production (*kaṇṭhanāsikyam*):

e. ĀpŚ 1.15: कण्ठनासिक्यमनुस्वारमेके ।

I will come back to this particular sūtra below.

Consider now

f. TPr. 2.35-37: हनूमूले जिह्वामूलेन कवर्गे स्पर्शयति । तालौ जिह्वामध्येन चवर्गे । जिह्वाग्रेण प्रतिवेष्ट्य मूर्धनि टवर्गे ।

These describe the configuration of an active articulator and a place of production in producing stops of the *k*-series (*kavarga* : *k kh g gh ṅ*), *c*-series (*c ch j jh ṇ*), and *ṭ*-series (*ṭ ṭh ḍ ḍh ṇ*). In producing the first (*kavarge*), one makes contact (*sparsayati* ‘causes to touch’) at the root of the jaw (*hanūmūle*) with the root of the tongue (*jihvāmūlena*); in producing the second set of stops, one makes contact with the middle of the tongue (*jihvāmadhyena*) at the palate (*tālau*); and in producing stops of the *ṭ*-series, one makes contact at the area immediately back of the alveolae (*mūrdhani*) with the tip of the tongue (*jihvāgreṇa*), after curling this back (*prativeṣṭya*) to that spot. This recognizes that the stops *ṅ*, *ṇ*, *ṇ* have fixed oral points of articulation. In addition, these stops are nasal. Accordingly,

g. TPr. 2.30: अनुस्वारोत्तमा अनुनासिकाः ।

says that anusvāra and final members of stop series (*anusvārottamāḥ*) are nasal (*anunāsikāḥ*), and

⁹⁸PŚRP 22: ... अनुस्वारविसर्गजिह्वामूलीयोपध्मानीया आश्रयस्थानभागिनः यत्स्वराश्रिता तस्य तत्स्थानं तत्स्थानका विज्ञेयाः । यथा रामः इत्यत्र विसर्गस्य कण्ठस्थानम् हरिः इत्यत्र विसर्गस्य तालुस्थानम् ।

h. TPr. 2.52: नासिकाविवरणादानुनासिक्यम् ।

states that the property of being nasal (*ānunāsikyam*) that pertains to such sounds results from opening the nasal passage (*nāsikāvivaraṇāt*) while articulating.

It is clear that, in contrast with *nāsikya*, the term *anunāsika* as used in TPr. 2.30 with respect to nasal stops has to do with sounds that are nasal and also have a fixed oral place of production.⁹⁹ In this regard, what is said in

i. TPr. 2.18-19: उपसँहृतरे च जिह्वाग्रमृकार्कार्लकारेषु बर्स्वेषूपसँहरति (हनू [16]) । एकेषामनुस्वार-
स्वरभक्त्योश्च ।

is of interest. TPr. 2.18 has to do with how *r*, *ṛ*, and *ḷ* are pronounced. This sūtra says that in articulating these sounds, the jaws (*hanū*) are brought quite close together¹⁰⁰ and one brings the tip of the tongue (*jihvāgram*) into proximity (*upasamharati*) with the alveolae (*barsveṣu*). TPr. 2.19 deals with anusvāra and the epenthetic vowel segment (*svarabhakti*) that occurs between *-r-* and consonants: for producing anusvāra also, the jaws are brought quite close together and for producing the vowel segment also the tip of the tongue is brought into proximity with the alveolae. It is noteworthy that TPr. 2.19 says this is what holds for some (*ekeṣām*). Since this sūtra describes a definite positioning of organs in the oral cavity, it is reasonable to conclude that it describes a pronunciation of anusvāra such that this sound has a definite oral place of production. Moreover, since this is what some hold, according to others anusvāra is properly nasal, without a fixed oral place, a segment that acquires an oral position from the preceding vowel.¹⁰¹

The most immediate interpretation of TPr. 2.19 would let the segment called *anusvāra* as pronounced by some be a velar element with nasality, distinct from the velar nasal stop *ṅ*. Moreover, ĀpŚ 1.15 (above, e) explicitly attributes to some the position that anusvāra is produced at the post-palatal area and the nose at once (*kaṇṭhanāsikyam*). In connection with TPr. 2.19, I think, one has to consider also what is said in

⁹⁹Cf. A 1.1.8: मुखनासिकावचनोऽनुनासिकः । VPr. 1.75: मुखनासिकाकरणोऽनुनासिकः ।

¹⁰⁰That is, the degree of oral closure is the same as in pronouncing *e*; cf. TPr. 2.16: उपसँहृतरे हनू (एकारे [15]).

¹⁰¹If I understand correctly, this is what the Tribhāṣyaratna conveys in its comments on TPr. 2.19: ... अनुस्वारे हन्वोरुपसंहारः स्वरभक्तौ जिह्वाग्रस्य बर्स्वेषूपसंहारः । एतदेकेषां मतम् । अन्येषां तु मतमनुस्वारस्यानुनासिकमात्रत्वम् ... The Vaidikābharāṇa's comment I find puzzling. According to this, the persons whose view is given in TPr. 2.19 hold that anusvāra is a nāsikya element and the position of the author himself is that it is an anunāsika element, in accord with TPr. 2.30: एकेषामन्येषां मतेन अनुस्वारे हनूपसंहारः कार्यः स्वरभक्तौ जिह्वाग्रस्य बर्स्वेषूपसंहार इति यथा क्रमं विनिवेशः । तेषामनुस्वारस्तावन्नासिक्यः भ्रमश्च स्वमते त्वनुस्वारस्य वक्ष्यत्यानुनासिक्यम् अनुस्वारोत्तमा अनुनासिकाः नासिकाविवरणादानुनासिक्यमिति ... TPrG 2.30 emphasizes that in the Taittirīya śākhā anusvāra is uniquely consonantal and has the form of half a *g*: ... अनुस्वारोऽप्युत्तमवद्भ्रज्जनमेवास्मच्छाखायाम् अर्धगकाररूपत्वात् । Since TPr. 2.19 specifies a configuration in the oral cavity, on the other hand, it would seem preferable to say this sūtra concerns the pronunciation which involves a definite oral place, the velar area.

j. VPr. 1.83: जिह्वामूलीयानुस्वारा हनुमूलेन ।

This sūtra concerns an active articulator (*kaṇa*) for *k*, referred to as *jīhvāmūliya* ('located at the root of the tongue'), and anusvāra: these are produced with the root of the jaw (*hanumūlena*); that is, the mandible is brought to a position such that there is little opening of the mouth. Now, *k* and velar stops are said explicitly to be produced at the root of the tongue (*jīhvāmūle*),¹⁰² that is, the area of the velum. In addition, the Vājasaneyiprātiśākhya also states that for nāsikya sounds (see VPr. 1.74 [above, a] and note 79) and labials the place of production and active articulator are the same.¹⁰³ Accordingly, anusvāra as described here is a nasal segment with a definite oral position: the velar area. Note, moreover, that the Ṛgvedapṛātiśākhya mentions the view of Vyāḍi, according to whom anusvāra can be an anunāsika element, not merely a nāsikya element.¹⁰⁴ Uvaṭa is without any doubt correct when he interprets this sūtra as stating that according to Vyāḍi any anusvāra can have not only the nasal cavity as its proper place of production but both this and an oral place.¹⁰⁵

This evidence from prātiśākhyas and the Āpiśalaśikṣā supports, I think, the conclusion that at the time the Yajurveda prātiśākhyas were being composed, recitation of Yajurveda texts included a velar segment called *anusvāra*. This is well known from other Yajurveda treatises. Thus, according to

k. VŚ 238-239: अनुस्वारो यजुष्येवमध्यायेऽपि यदा भवेत्तदा गकारसंयुक्तो न शान्तिश्शासरूपः ।

when anusvāra occurs in the Yajurveda, it is conjoined with *g* (*gakārasamyuktaḥ*) — which changes to *k* before voiceless segments — unless the *śā* of *śānti* or *sarū* (of *sarūpam*) follows. Further, according to

l. SŚ 43: अध्याये तैत्तिरीयाणामनुस्वारो यदा भवेत् । तदाद्यर्धो गकारः स्यादपरस्त्वनुनासिकः ॥

in the Taittirīya tradition, when anusvāra would occur, its first half (*ādyardhaḥ*) is *g* (*gakāraḥ*) and its second half is a nasalized segment (*anunāsikaḥ*). According to tradition, the anusvāra is thus pronounced *gum̐*, with *g* followed by a nasalized *u*. The Vaidikābharaṇa also remarks that anusvāra contains a velar consonant (see note 101). In the Mādhyandina tradition of the Śukla Yajurveda too, according to

m. PrS 3.1: अथानुस्वारस्य ऽ इत्यादेशः शषसहरेफेषु ।

anusvāra has a particular pronunciation before voiceless spirants and *r*. This is

¹⁰²VPr. 1.65: ऋःक्कौ जिह्वामूले ।

¹⁰³VPr. 1.80: समानस्थानकरणा नासिक्यौष्ठ्याः ।

¹⁰⁴RPr. 13.37: व्याळिर्नासिक्यमनुनासिकं वा ।

¹⁰⁵RPrU 13.37: व्याळिराचार्यः सर्वमनुस्वारं नासिकास्थानं मुखनासिकास्थानं वा मन्यते । It is possible that the sūtra concerns only the instances of anusvāra dealt with earlier in the section, so that it involves only anusvāra before *-s-* and *-r-* of neuter plural forms, but this does not change matters crucially.

traditionally considered to be *gum̐* or *gūm̐*.¹⁰⁶

7.2.3 The duration of segments in complexes of the type *Vim* also varies. In general, a consonant (*vyañjanam*) has the duration of half a short vowel (*hrasvārdhakālam*), that is, half a mora (*ardhamātrā*):

a. TPr. 1.37: ह्रस्वार्धकालं व्यञ्जनम् ।

VPr. 1.59: व्यञ्जनमर्धमात्रा ।

Although anusvāra counts as a consonant, however, it does not conform to the duration of other consonants. Thus, according to

b. TPr. 1.31-34: ऋकारल्कारौ ह्रस्वौ । अकारश्च । तेन च समानकालस्वरः । अनुस्वारश्च ।

r and *l* are called *hrasva* ('short'), as is also *a* (*akārah*) and any vowel that is of the same time duration (*samānakālasvaraḥ*) as this (*tena*). In addition, anusvāra also is said to have the duration of *a* and consequently to count as a short segment of one mora.¹⁰⁷ Other treatises treat in more detail variations in the relative duration of segments in complexes with anusvāra. The most straightforward are

c. VPr. 4.150-151: अनुस्वारो ह्रस्वपूर्वोऽध्यर्धमात्रा पूर्वा चार्धमात्रा । दीर्घार्धमात्रा पूर्वा चाध्यर्धम् ।

ṚT 1.2-3: अं आं इत्यनुस्वारौ । ह्रस्वादीर्घो दीर्घार्धस्वः ।

According to VPr. 4.150-151, anusvāra preceded by a short vowel (*hrasvapūrvah*) has the duration of one and one-half morae (*adhyardhamātrā*), and the vowel preceding it lasts for only half a mora (*ardhamātrā*) instead of the usual full mora; after a long vowel (*dīrghāt*), anusvāra counts for half a mora and the preceding vowel counts for one and one-half morae instead of the usual two morae.¹⁰⁸ The Ṛktantra simply says that a long anusvāra occurs after a short vowel and a short one after a long vowel. Comparably,

d. PrS 3.2: तस्य त्रैविध्यमाख्यातं ह्रस्वदीर्घगुरुभेदैर्दीर्घात्परो ह्रस्वो ह्रस्वात्परो दीर्घो गुरुः परे गुरुः ।

says that anusvāra before *ś ṣ s h r* has three varieties (*traividhyam*): after a long vowel, it

¹⁰⁶See also the editor's comment on YŚ 2.41 (p. 106). Uvāta too mentions the pronunciation of anusvāra in the manner noted; see 7.2.3f with note 110. The wording of PS 3.1 is noteworthy. The sūtra uses the term *ādeśaḥ* construed with the genitive *anusvārasya*. The simplest interpretation of this is that *ādeśa* signifies, as in Pāṇinian grammar, a replacement. Strictly speaking, then, the segment in question is a replacement for a segment called *anusvāra*, found elsewhere.

¹⁰⁷TPrG 1.34 interprets this as saying that anusvāra also has the time duration of *a*: चशब्देनात्र तेन समानकाल इत्यन्वादिश्यते । तथा चानुस्वारोऽकारेण तुल्यकालो भवतीत्यर्थः । The Tribhāṣyaratna, on the other hand, interprets the sūtra as providing that anusvāra also has the class name *hrasva*. It points out that this rule thereby counters what would obtain by TPr. 1.37: ... चकारो ह्रस्वान्वाकर्षकः । अनुस्वारविभक्तिश्चेति स्वरं प्रत्यङ्गत्वविधानादनुस्वारस्य व्यञ्जनत्वम् । तथा सति ह्रस्वार्धकालं व्यञ्जनमित्यर्धमात्रत्वे प्राप्ते तन्मा भूदिति ह्रस्वत्वं विधीयते ।

¹⁰⁸On VPr. 4.150, see also note 171. YŚ 2.42 (वर्णे तु मात्रिके पूर्वे ह्यनुस्वारो द्विमात्रिकः । द्विमात्रिके मात्रिकः स्यात् ।) literally says that anusvāra has the duration of two morae (*dvimātrikaḥ*) if a unimoraic sound precedes (*varne tu mātrike pūrve*) but has one mora's duration (*mātrikaḥ*) if a bimoraic sound (*dvimātrike*) precedes. As Amaranātha Śāstrī shows in his commentary, this can be interpreted to agree with what is said in VPr. 4.149-150, but it is not necessary to go into this issue here. Note that according to Uvāta and Anantabhaṭṭa VPr. 4.150 has to do only with anusvāra that does not precede a consonant cluster.

is short, after a short vowel it is long, and before a cluster it is heavy (*guruḥ*).

The Ṛgvedaprāṭisākhya also notes what some say (*āhur eke*) concerning the relative duration of segments in sequences of the type *Vm*:

- e. ṚPr. 13.32-33: ह्रस्वामर्धस्वरभक्त्यासमामामनुस्वारस्योपधामाहुरेके । अनुस्वारं तावतैवाधिकं च ह्रस्वोपधम् ॥
दीर्घपूर्वं तदूनम् ।

A short vowel (*hrasvām*) preceding anusvāra (*anusvārasyopadhām*) is lessened (*asamāptām* ‘incomplete’) by the duration of half a svarabhakti segment (*ardhasvarabhaktyā*) — that is, by one-fourth of a mora — and the anusvāra increased by that amount (*tāvataivādhikam*). An anusvāra preceded by a long vowel (*dīrghapūrvam*) is lessened by the same amount (*tadūnam*), one-fourth of a mora.

In the same section, moreover, the Ṛgvedaprāṭisākhya has a set of rules specifying instances of non-final (*anantastham*) anusvāra. For example, the first sūtra of this group,

- f. ṚPr. 13.22: नपुंसकं यदूष्मान्तं तस्य बह्वभिधानजः । अनुस्वारो दीर्घपूर्वः सिष्यन्तेषु पदेषु ॥

says that the anusvāra which appears in plural forms (*bahvabhidhānaḥ*) of neuters ending in spirants (*napuṃsakam yad ūṣmāntam*), in words with *-si*, *-ṣi* (*siṣyanteṣu padeṣu*), of the types *avāmsi* ‘aids’, *caṣṣūmṣi* ‘eyes’ is preceded by a long vowel (*dīrghapūrvah*). After thus specifying instances where a long vowel precedes word-internal anusvāra — and including an exception — the text sums up: this is the extent of anusvāra (*etāvān anusvārah*) after a long vowel (*dīrghāt*) in ṛcs; any word-interior anusvāra other (*itarah*) than one in the specified environments follows a short vowel (*itarathā* ‘differently’):

- g. ṚPr. 13.28-29: एतावानुक्तवनुस्वारो दीर्घात् । इतरथेतरः ।

The group of rules in question ends by stating that prior rules say what applies to anusvāra that is not final:

- h. ṚPr. 13.36: अनन्तस्थं तमनुस्वारमाहुः ।

Now, in his comments on ṚPr. 13.22 Uvaṭa questions the need for this and subsequent related rules, given that the quantity of the vowels precede anusvāra in the instances concerned is known from the very recitation itself. One of the reasons considered has to do with the pronunciation of a velar segment where anusvāra should occur (see 7.2.2j-m): Some wrongly recite items like *havīmṣi* ‘oblations’ with *-ṅ-* instead of the usual anusvāra and with a transitional *-k-* after *-ṅ-*: *havīṅkṣi* and so on.¹⁰⁹ The rules specify that anusvāra follows the vowels in the items concerned, thus excluding such a pronunciation.

¹⁰⁹Note in passing that the Sārasvatavyākaraṇa of Anubhūtiśvarūpa (13th-14th c.) has a rule (SāV I.153.46: असम्भवे पुंसः कक् सौ ।) providing for the stem *pums-* to receive the augment *k* before the locative plural ending *su*: *puṅksu* instead of *pumsu* ‘men’. Candrakīrti’s commentary says that *asambhave* refers to Vedic usage. In the present discussion it is not necessary to enter into further details concerning this rule and its interpretation.

Uvaṭa realizes brings up an objection to this explanation. Those who pronounce *-ṅk-* do so also in items where word-final anusvāra precedes a spirant. For example, the accusative singular *tvām* ‘thee’ can be followed by *h-*, as in ṚV 1.63.6a (त्वां ह ... ‘Thee, truly ...’). Therefore, if the purpose were to exclude such a pronunciation, an effort would have to be made to take care of these instances also. This objection is met by saying that ṚPr. 4.15 (see 3.2.1b) provides by rule where word-final anusvāra occurs but no comparable provision is made for word-internal anusvāra. But this too is found insufficient. Those who pronounce *havīm̐ṣi* and so on with *-ṅk-* also pronounce items like *vim̐śatyā* ‘twenty’ (instr. sg.), *am̐seṣu* ‘shoulders’ (loc. pl.) with *-ṅk-*, so why specify the contexts with long vowels? The answer to this objection is that the *-ṅ-* pronounced instead of anusvāra is more clearly perceptible in forms with long vowels. Uvaṭa also finds this reasoning insufficient, since he goes on to note an answer offered by others. Some recitors recite forms like *vim̐śatyā*, *am̐seṣu* lengthening the vowel that precedes anusvāra. To exclude such improper recitation of the ṛcs in question, the Ṛgvedaprāṭisākhya specifies just where word-interior anusvāra is preceded by a long vowel.¹¹⁰ Whatever interpretation one find preferable, one thing is clear: Uvaṭa knew of recitors of the Ṛgveda who realized word-interior anusvāra as *-ṅk-* after long vowels.

7.2.4 The variation in duration that pertains to each component of a complex consisting of a vowel followed by anusvāra has a parallel in the diphthongs *ai* and *au*. As long vowels, these have the value of two morae. According to

a. VPr. 1.73: ऐकारौकारयोः कण्ठ्या पूर्वा मात्रा ताल्वोष्ठयोरुत्तरा ।

the first (*pūrvā* ‘prior’) mora of *ai* and *au* is a kaṅthya element — that is, *a* — and the second mora is produced at the palate for *ai*, at the lips for *au*.¹¹¹ In other words, each component of the diphthongs has the same time duration as the other. On the other hand,

b. TPr. 2.26, 28-29: अकारार्धमैकारौकारयोरादिः । इकारोऽध्यर्धः पूर्वस्य । उकारस्तूत्रस्य ।

¹¹⁰ṚPrU 13.22: किमर्थमनुस्वारस्य दीर्घपूर्वस्य पदमध्ये वर्तमानस्य बहुभिः श्लोकैर्लक्षणं क्रियते । ननु पाठादेव सिद्धम् यथान्येषां वर्णानां पाठात्सिद्धम् । सत्यम् । किन्तु दुरामाननिवृत्त्यर्थमनयोः शिवापटलयोर्बहूनां वर्णानां लक्षणं क्रियते । ... कथं पुनर्दुरामानप्रसङ्गः । सन्ति ह्यतीर्थोपिता अलसा अगुणदोषज्ञा अन्योन्याध्यापकाः सर्ववर्णान्यत्वजनयितारः । तदोषनिवृत्त्यर्थमाचार्येण शिष्यहितार्थमिदमारब्धम् । अनुस्वारस्य तावत्स्थाने डकारं जनयन्ति । तस्माद् डकारात्परं ककारमन्तःपातं जनयन्ति हवींषि सर्पीषि भासांसि अवांसि इत्येवम् । तत्रिवृत्त्यर्थमनुस्वारलक्षणं क्रियते । यद्येवं पदान्तेऽप्यनुस्वारस्य तच्छ्रवणं तुल्यम् त्वां ह ... तस्मादत्रापि यत्नः कर्तव्यः । न कर्तव्यः । रेफो षशोऽरुदयोर्मकारोऽनुस्वारमितति विहितमनुस्वारं जानात्यसौ । तत्र पदमध्येऽनुस्वारलक्षणं नास्ति येनानुस्वारं जानीयात् । एवं सत्यपि किमर्थं दीर्घपूर्वं गृह्यते न ह्रस्वपूर्वः ... आ विंशत्या त्रिंशता अंसेषु व इति । उभयत्र हि डकारश्रवणं तुल्यम् । तत्र तावदाहुः । यथा दीर्घपूर्वस्य व्यक्ता डकारश्रुतिं तथा ह्रस्वपूर्वस्य । तस्मान्न गृह्यते । अपर आहुः । अनुस्वारस्योपधां ह्रस्वां केचिद् द्राघयन्त इव पठन्ति । तत्रिवृत्त्यर्थं दीर्घपूर्वं परिगृह्यते एतावानुच्चनुस्वारो दीर्घादित्येवमन्तः ।

¹¹¹Given that the second half of the diphthongs has the value of one mora only, it would make immediate sense to say that the composition is then *a-i* and *a-u*. However, both Uvaṭa and Anantabhaṭṭa say the second half is *e* and *o*. Their view may well be based on phonological considerations, but this detail need not concern us here.

say that the first part of *ai* and *au* consists of half an *a* (*akārārdham*) and the second part of one and one-half *i* and *u* respectively. That is, the two morae of these diphthongs are now distributed differently: half a mora of *a*-vowel followed by one and one-half morae of *i* and *u*. This composition was known to Kātyāyana, who explicitly mentions the view that the second part of *ai* and *au* takes a greater part of the vowels.¹¹²

The Ṛgvedaprātiśākhya also deals with the composition of the vowels called *sandhyakṣara*, namely *e o ai au*. Concerning the last two (*pare*) in particular,

c. RPr. 13.41: ह्रस्वानुस्वारव्यतिषङ्गवत्परे ।

says that their composition is like that of a short vowel followed by anusvāra. That is, as a short vowel followed by anusvāra is abbreviated by one-fourth of a mora and the anusvāra following it is increased by an equivalent amount (RPr. 13.32 [7.2.3e]), the *i* and *u* constituents of *ai* and *au* take up a greater part of these diphthongs than does the first constituent *a*-segment.¹¹³

7.2.5 The tendency to give anusvāra the greater part of the duration in a sequence where it follows a short vowel can also be linked to a tendency noted in the Ṛgvedaprātiśākhya's chapter concerning faults of pronunciation that are to be avoided in reciting the Ṛgveda. According to

a. RPr. 14.51: रक्तं ह्रस्वं द्राघयन्त्युग्रं ओकः ।

some lengthen (*drāghayanti*) a short nasalized vowel (*raktam hrasvam*), as in *ugram okah* 'mighty (Indra, make) an abode' (RV 7.25.4cd: विश्वेदहानि तविषीव उग्रं ओकः कृणुष्व हरिवो न मर्धीः ।). Instead of reciting *ugram* with a short nasalized *-a* (*am̃*), some commit the fault of lengthening such a vowel. Comparably, the nasal segment anusvāra in a sequence like *am̃* is given greater duration than would normally pertain to an ordinary consonant.

There is additional evidence that in some dialects a nasalized vowel was lengthened. This is linked to another feature, the relative nasality of segments according to various authorities, as dealt with in

b. TPr. 17.1-5: तीव्रतरमानुनासिक्यमनुस्वारोत्तमेष्विति शैत्यायनः । सम^५सर्वत्रिति कौहळीपुत्रः । अनुस्वारे

उश्विति भारद्वाजः । नकारस्य रेफोष्मयकारभावाल्लुप्ते च मलोपाच्चोत्तरमुत्तरन्तीव्रतरमिति स्थविरः कौशिकः ।

व्यञ्जनकालश्च स्वरस्यात्राधिकः ।

According to Śaītyāyana, the nasality (*ānunāsikyam*) in anusvāra and nasal stops

¹¹²1.1.48 vt. 4: ऐचोश्चोत्तरभूयस्त्वात् । See Cardona 1983a: 27-28. In their commentaries on VPr. 1.73, Uvata and Anantabhaṭṭa also remark that some say only half a mora in *ai* and *au* is made up of *a*: अत्र केचिदाहुः अकारस्यार्धमात्रा एकारस्याध्यर्धमात्रा ऐकारे । अकारस्यार्धमात्रा ओकारस्याध्यर्धमात्रा औकार इति । (VPrU 1.73); similarly VPrA 1.73.

¹¹³Thus RPrU 13.41: ... किमुक्तं भवति । यथा तत्रानुस्वारः पादमात्राधिक उपधा च तावता न्यूना एवमिहापि द्रष्टव्यम् । इवशोर्वर्णयोर्भूयसी मात्रा अल्पीयस्यवर्णस्य ।

(*anusvārottameṣu*) is more intense (*tīvrataram*) than in other nasal segments, that is, in nasalized vowels; but according to the son of Kauhaḷī, nasality is the same everywhere (*samaṁ sarvatra*). Bhāradvāja, on the other hand, maintains that the nasality in anusvāra is very slight (*aṇu*). In addition, the elder Kauṇḍinya says that there is a gradation of nasality in the following circumstances: when *-n* is converted to *-r*, to a spirant, to *-y* or is dropped, and when *-m* is dropped. A vowel that precedes an *-n* or *-m* subject to these changes is nasalized (TPr. 15.1 [3.4.2.1g]). The nasality of the vowel for each successive instance is more intense than for the preceding (*uttarottaran tīvrataram*). Thus the nasality of the nasalized vowels of *agnīṁr apsusaḍaḥ*, *ahīmś ca*, *mahāṁy indraḥ*, *mahāṁ indraḥ*, and *pratyusṭam rakṣaḥ* is relative: most intense in the last example, relatively less intense in the next-to-the-last, and so on. Moreover, according to the elder Kauṇḍinya, in such instances, where a vowel is nasalized, it has an additional duration (*kālas ca svarasyātrādhikaḥ*) equivalent to the duration of a consonant (*vyañjanakālaḥ*), that is, of half a mora. In the elder Kauṇḍinya's recitation, then, the nasalized vowels of the examples shown have the duration of two and a half morae and not of two morae, which is the norm for long vowels.

7.3 The evidence of *prātiśākhya*s and *śikṣā*s thus leads to the following conclusions.

a. Anusvāra is a nasal (*nāsikya*) segment (7.2.2a-c) which could be without a fixed oral place of production. Anusvāra could then have the oral place of production of a following spirant or *r-*, and also be a voiceless spirant (4.1.2b, 7.1, 7.2.1). In addition, it could be produced at the place proper to the vowel which it follows. It is then a nasalized continuation of a clear vowel. Further, the nasal segment before spirants and *r-* could be lowered and backed to the point where it is articulated as a velar element accompanied by nasality (*gum̃, ṅ*: 7.2.2d-k, 7.2.3f, note 110). These are varieties accounted for in different traditions, and alternatives are attributed to several authorities. Accordingly, it is plausible to view them as dialectal outcomes in early Indo-Aryan.

b. Just as the phonetic realizations of anusvāra differ dialectally, so does the distribution of time duration between constituents of vowel-anusvāra sequences (7.2.3). This is paralleled by differences in the duration of components in the diphthongs *ai* and *au* (7.2.5).

7.4 As noted in 7.2.3, a complex of the type *-am̃*, such that anusvāra follows a short vowel, has a longer duration than a simple short vowel. From what is said in RPr. 14.51 (7.2.5a), moreover, one must conclude that a nasalized short vowel remained short, although in some recitations it was lengthened. This has import for metrics.

7.4.1 To begin, let me refer to two well known verses that set forth how light (*laghu*) and

heavy (*guru*) syllables are constituted:

a. दीर्घ संयोगपरं तथा प्लुतं व्यञ्जनान्तमूष्मान्तम् । सानुस्वारञ्च गुरुं क्वचिदवसानऽपि लघ्वन्त्यम् ॥¹¹⁴

b. VR 1.9: सानुस्वारो विसर्गान्तो दीर्घो युक्तपरश्च यः । वा पादान्ते त्वसौ ग्वक्रो ज्ञेयोऽन्यो मातृको लृजुः ॥

According **b**, a short vowel accompanied by anusvāra or followed by visarga, a short vowel followed by a consonant cluster, as well as a long vowel are *guru*, and a short vowel is optionally *guru* if it occurs at the end of a verse section. A vowel of one mora occurring in other contexts is *laghu*. *Guru* and *laghu* syllables are respectively symbolized by ऽ (*vakra*) and । (*rju*). The first verse deals explicitly only with *guru* syllables, which are said to be: a long vowel, a vowel followed by a cluster, an extra-long vowel, one that is followed by a final consonant before pause or by a spirant — i.e., *-h*, *k*, *p* — or accompanied by anusvāra; a vowel that qualifies a *guru* is also sometimes *laghu* in absolute final position.

In Prākṛta metres also the same situation holds in general. For example, Prākṛtapaiṅgalam 1.2 (Vyasa 1959:2) states that a long vowel (*dīho*), a vowel followed by a consonant cluster (*samjuttaparo*), one combined with a bindu (*bindujuo*) — that is, one with anusvāra, symbolized by a bindu — as well as a vowel that is put at the end of a verse section (*pāḍio a caraṇante*) is *guru* (*sa gurū*), symbolized by ऽ (*vaṅka*) and has the value of two morae (*dumatto*); any other (*aṅṇo*) vowel is *laghu* (*lahu hoi*) and has the value of one mora (*ekkaalo*):

c. दीहो संयुक्तपरो बिंदुजुओ पाडिओ अ चरन्ते । स गुरू वंक दुमत्तो अरणो होइ सुद्ध एक्कअलो ॥

Note that, although a syllable containing vowel with anusvāra counts as heavy, nasalization of a vowel does not of itself result in a syllable's being heavy. As has long been recognized by modern scholars (e.g., Pischel/Jhā 136 [§ 179]), bindu makes position but '... ardhacandra never makes position.'

7.4.2 The same holds also in general for Vedic. Consider first

a. VPr. 4.109: संयोगपूर्वव्यञ्जनान्तावसानगताः स्वरा द्विमात्राः ।

According to this, vowels which precede a consonant cluster (*samyogapūrva*), which precede a final consonant (*vyañjanānta*), and which occur in absolute final position (*avasāna*) have the time duration of two morae (*dvimātrāḥ*). That is, as Uvaṭa and Anantabhaṭṭa note, such vowels are heavy (*guravaḥ*) though not phonologically long vowels (*dīrghāḥ*).¹¹⁵

¹¹⁴This is the first of several introductory verses to Piṅgala's *Chandaḥsūtram* (verse 8 in Vidyasagar (1928: 4).

¹¹⁵VPrU 4.109: ... एते स्वराः द्विमात्राकाला भवन्ति न तु दीर्घाः । गुरव एव भवन्ति । अत्रोच्यते गुरवो द्विगुणकालाः । व्यञ्जनद्विरुक्तिप्रसङ्गेन स्वराणामपि गौरवमुक्तम् । तत्र हि द्विगुणः कालो भवति । Anantabhaṭṭa too notes that this is brought up in the context of rules for doubling consonants, since in both instances one has segments with twice the starting duration: व्यञ्जनद्विरुक्तिप्रसङ्गेन स्वराणामपि गुरत्वमुक्तम् । (VPrA 4.109).

Other *prātiśākhya*s have rules which directly concern light and heavy syllables. According to

b. RPr. 1.20-21: गुरुणि दीर्घाणि । तथेतेरेषां संयोगानुस्वारपराणि ।

c. RPr. 18.38-39: लघु ह्रस्वं न चेत्संयोग उत्तरः । अनुस्वारश्च ।

long vowels are called *guru* ('heavy'), as are those among other vowels (*itareṣām*) that are followed by a consonant cluster or anusvāra (*saṃyogānusvārparāṇi*). A short vowel (*hrasvam*) counts as light (*laghu*) unless (*na cet*) neither a consonant cluster or anusvāra follows (*saṃyoga uttaraḥ anusvāraś ca*). Similarly,

d. TPr. 22.14-15: यद्ब्रह्मज्ञानान्तं यद् चापि दीर्घं संयोगपूर्वञ्च तथानुनासिकम् । एतानि सर्वाणि गुरुणि विद्वात् ॥

शेषाण्यतोऽन्यानि ततो लघूनि । अब्रह्मज्ञानान्तं यद् भ्रस्वमसंयोगपरञ्च यत् । अननुस्वारसंयुक्तमेतल्लघु निबोधत ॥

state what kinds of units count as heavy (*guru*) and light (*laghu*), as follows: A syllable with a long vowel (*dīrgham*), one that ends with a final consonant (*vyañjanāntam*), one in which a vowel occurs before a consonant cluster (*saṃyogapūrvam*), and one with anusvāra (*anunāsikam*) is heavy. The remainder are light, and this remainder consists of any syllable that does not end with a consonant (*avyañjanāntam*), contains a short vowel (*hrasvam*) not followed by a consonant cluster (*asaṃyog-aparam*) or one that is not accompanied by anusvāra (*ananusvāram*) or a following consonant cluster (*asamyuktam*).¹¹⁶

7.4.3 That anusvāra serves to make position in Vedic metres can easily be illustrated. It will suffice to consider a few examples from the Ṛgveda:

a. RV 2.7.1c: वसो पुरुस्पृहं रयिम् ॥ (Gāyatrī, cadence: · ~ ~ ~ : ... *sprham rayim*)

b. RV 3.12.1a: इन्द्राग्नी आ गतं सुतम् । (Gāyatrī: ... *gataṃ sutam*)

c. RV 2.39.7b: चामेव नुस्समजतुं रजांसि । (Triṣṭubh, cadence: ~ ~ ~ : ... *-tam rajāmsi*)

d. RV 2.39.7d: ऋग्रेणैव स्वधित्तिं सं शिशीतम् ॥ (... *saṃ śiśītam*)

e. RV 2.2.3d: अग्निम्मित्रन्नक्षितिषु प्रशंस्यम् ॥ (Jagatī, cadence: ~ ~ ~ ~ : ... *-ṣu praśamsiyam*)

The converse — that a short nasalized vowel retains the metrical value of an unnasalized short vowel — cannot be demonstrated directly for the traditions represented in the Ṛgvedaprātiśākhya and the Taittirīyaprātiśākhya. For phonological nasalization applies generally to long vowels, and, where one has optional nasalization of short vowels, it is in prepause position, where a syllable is anceps. Thus, according to

¹¹⁶Since TPr. 22.15 has *ananusvāram*, the antithesis of this in the preceding verse TPr. 22.14, designated by *anunāsikam*, must be a vowel accompanied by anusvāra. Recall that anusvāra and nasal stops are both nasal elements, named *anunāsika* (TPr. 2.30 [7.2.2g]). In his comments on TPr. 22.14, Whitney says (1868: 401), 'The use of the word *anunāsika* in describing a syllable containing *anusvāra* is (as already noted under ii.30) one more sign of a theory which regards the *anusvāra* as a quality and not an element.' As has been shown earlier in my discussion (4-6), however, this claim cannot be maintained. Moreover, as Whitney also remarks in his comments on this rule, the metre of the verse would be more appropriate with *tathānusvāram* instead of *tathānunāsikam*.

f. RPr. 1.63: अष्टावाद्यानवसानेऽप्रगृह्यानाचार्या आहुरनुनासिकास्वरान् ।

teachers say (*ācāryā āhuḥ*) that the first eight vowels (*aṣṭāv ādyān svarān*) of the R̥gvedaprātiśākhyā catalog — that is, *a ā ṛ ṝ i ī u ū* — are nasalized (*anunāsikān*) if they are not pragr̥hya elements, when they occur before pause (*avasāne*). In a comparable manner, in

h. A 8.4.57: अणोऽप्रगृह्यस्यानुनासिकः (वावसाने [56])

Pāṇini provides that a vowel *a ā i ī u ū* (*aṇaḥ*) that is not a pragr̥hya element (*apragr̥hyasya*) is optionally (*vā*) replaced by a nasalized (*anunāsikaḥ*) counterpart, if it occurs before pause. Similarly,

i. TPr. 15.6: अप्रग्रहाः समानाक्षरायनुनासिकान्येकेषाम् ।

says that according to some (*ekeṣām*) non-pragraha simple vowels (*samānākṣarāṇi*)¹¹⁷ are nasalized.

Nevertheless, recall that RPr. 14.51 (7.2.5a) notes as a fault the lengthening of such final nasal vowels and that TPr. 17.5 (7.2.5b) records the lengthening of word-final nasalized vowels only as something found in the tradition sanctioned by the elder Kauṇḍinya. Moreover, there is one prātiśākhyā which explicitly says that a nasalized vowel (*anunāsikaḥ*) in the interior of a word (*antaḥpade*) belongs to the class of vowels termed *hrasva* (‘short vowels’):

j. ŚCĀ 1.83 [1.3.21]: अनुनासिकोऽन्तःपदे ह्रस्वः ।

Subsequent rules go on to list the categories where word-interior long nasal vowels occur; for example,

k. ŚCĀ 1.84 [1.3.22]: दीर्घो नपुंसकबहुवचने ।

states that the nasal vowel in a neuter plural form (*napūmsakabahuvacane*) — of the type *havīm̐ṣi* corresponding to *havīm̐ṣi* / *havīm̐ṣi* of other traditions — belongs to the category of long (*dirghaḥ*) vowels. Consequently, j concerns only underlying short vowels. In other words, in the tradition represented by the Śaunakīyā Caturādhyāyikā, nasalization of a vowel does not entail its lengthening.

7.4.4 This is of interest in view of some metrical facts. The same prātiśākhyā also has rules that correspond to those considered in 7.4.2:

a. ŚCĀ 1.51-54 [1.2.11-14]: ह्रस्वं लघ्वसंयोगे । गुर्वन्यत् । अनुनासिकञ्च । पदान्ते च ।

A short vowel (*hrasvam*) is called *laghu* (‘light’) provided it is not followed by a consonant cluster (*asamyoge*); any other (*anyat*) vowel is called *guru* (‘heavy’). Moreover, a nasalized vowel (*anunāsikam*) also is called *guru*, as is a vowel in word-

¹¹⁷TPr. 1.2 (अथ नवादितस्समानाक्षराणि ।) provides that the first nine items of its sound lists — namely *a ā ā̃ i ī ī̃ u ū ū̃* — bear the class name *samānākṣara*.

final (*padānte*) position.¹¹⁸ That is, the nasalized vowel of *am̐hasaḥ* ‘danger’ (abl. sg.) is phonologically a short vowel but metrically the first syllable of this item counts as heavy. This is required, as in

b. AV 2.4.3cd: अयन्नो विश्वभेषजो जङ्गिडः पात्वंहसः ।

The third pāda of this verse has a cadence $\sim\sim\sim$, as expected; the last pāda too has this cadence once *pātv* is resolved to *pātuv*, provided also that *am̐hasaḥ* begins with a heavy syllable.¹¹⁹

In a tradition where anusvāra is found, *am̐-* of *am̐hasaḥ* counts for two morae and the syllable is heavy. But the nasalized vowel of *am̐hasaḥ* in the tradition represented by the Śaunakīyā Caturādhyāyikā is short and counts for one mora only. This apparent conflict is resolved once we make a fairly straightforward historical assumption, as follows. The Śaunakīyā Atharvaveda saṁhitā as originally transmitted was like other Vedic saṁhitās in that it had anusvāra before *r* and voiceless spirants. Accordingly, syllables of the type found in *am̐hasaḥ* counted as metrically heavy. In a particular dialect area, however, a sequence of the type *-am* developed to a nasalized vowel before *r* and voiceless spirants, without vowel lengthening. Reciters representing this dialect transmitted the Atharvaveda saṁhitā as accounted for in the Śaunakīyā Caturādhyāyikā.

8 In view of the data discussed, I think it is possible to set forth a plausible set of historical developments for nasals in early Indo-Aryan which would account for the distribution of anusvāra and nasalized vowels, as follows.

8.1 Word-final *-Vm* was subject to several dialectal outcomes based on transitional differences of timing in the onset of nasality in assimilatory processes.

a. There is onset of nasality with anticipation of the place of production of the following consonant. Accordingly, there is full assimilation of *-m* to following stops, semivowels, and spirants: *-Vm k-* → *-Vṅ k-* and so on; *-Vm y-* → *-Vyṁ m-* and so on; *-Vm ś-* → *-Vṣ ś-* and so on, where *m̐* symbolizes a voiceless spirant with nasality, referred to as *anusvāra*.

¹¹⁸This can apply to pre-pause word-final vowels, as Deshpande remarks (1997: 190). In some modern recitations too, final short vowels are lengthened. I have recorded this practice also for the Aṣṭādhyāyī as recited by a Maharashtrian scholar.

¹¹⁹The extreme irregularity of metrical schemes in the Atharvaveda has been remarked upon often by modern scholars, so that no comment concerning this is called for here. I nevertheless think it appropriate to note, albeit in a tentative manner, that assuming an original *Vm̐*, with a nasalized vowel segment of the same color as a preceding vowel, can restore metrical regularity in certain instances. For example, consider AV 1.24.2cd: अनीनशक्त्विः ससुपामकुरुत्त्वचम् ॥ Elsewhere the final *-am* of *kilāsam* would have the value of two morae (see 7.2.3c-e). Assuming either the well known distention of a long vowel to two syllables — of the type *-ām = -aam* — or a pronunciation such that the nasalized segment representing the realization of anusvāra is given separate status, the third pāda of AV 1.24.2 then has eight syllables, as does the last pāda. The same can be said of some other examples (e.g., AV 2.6.5d). I emphasize, however, that this is tentative.

b. *-m* loses its occlusion, and nasality sets in as a property in the continuation of a preceding vowel, which begins as a clear vowel: $-Vm \rightarrow -Vv\check{m}$, where $v\check{m}$ symbolizes a nasal segment that has the place of production of the preceding vowel. This segment too is referred to as *anusvāra*.

c. The nasal segment in $-Vv\check{m}$ before spirants and *r-* is lowered and backed to the point where it acquires occlusion, resulting in a velar articulation, either with an accompanying nasal vowel ($-Vgum\check{s}$) or with a transitional voiceless velar before spirants ($-V\check{n}k$). This segment, which replaces *anusvāra* (see 7.2.2m with note 105), also is referred to as *anusvāra*.

d. *-m* loses its occlusion, and anticipatory nasality sets in with the beginning of the preceding vowel, so that the outcome is a fully nasalized vowel. Such a vowel is referred to by the term *anunāsika*.

8.2 Word-final $-Vns$ was subject to comparable developments, yielding sequences of the types $-V\check{m}s$ before voiceless consonants and $-V\check{m}r$ before voiced segments, both alternating with complexes in which an *anusvāra* followed the vowel. It is common knowledge that the type *ahīmś ca* represents a development involving an inherited *-ns*. It is equally clear, moreover, that a reanalysis took place quite early, so that sequences $-V\check{m}s$ and so on were treated synchronically as derived from complexes with word-final *-n*. Consequently, one could have *tasmimś tvā* already in Vedic (see 3.4.2.2f), involving a form — the locative singular *tasmin* — which etymologically did not have an *-s*. The rules of the Aṣṭādhyāyī and prātiśākhya, which start with $-Vn$ and let *-n* go to *-r* and so forth (see 3.1.1d-e), are thus synchronically appropriate.

8.3 The same alternation between vowels followed by *anusvāra* and nasalized vowels is found in forms of the type *havīmṣi*: *havīmṣi*, *havīmṣi*, *havīmṣi*. See 3.3.1a (ŚCĀ 2.33), 3.4.1.3b (VPr. 4.5).

8.4 The development noted in 8.1c is vouched for by prātiśākhya statements and statements of commentators (see 7.3a). The type $-V\check{n}k$ - associated with *anusvāra* reflects a wide-spread transitional phenomenon attested to in early Indo-Aryan by Pāṇini and authors of prātiśākhya. The following rules have to do with such transitions:

a. A 8.3.28-31: इणोः कुक्कुक्शरि (वा [26]) । डः सि धुट् । नश्च । शि तुक् ।

TPr. 5.32-33: डपूर्वः ककारस्सषकारपरः । टनकारपूर्वश्च तकारः ।

ŚCĀ 2.8-9 [2.1.8-9]: टकारात्सकारे तकारेण । इणनेभ्यः कटतैः शषसेषु ।

The Pāṇinian sūtras (see Cardona 1997: 560) provide for certain sounds optionally (*vā*) to occur as final and initial augments to word-final and word-initial segments: $-ṅ -ṅ$ (*ṅṅoh*)

respectively receive the augments *-k -t* (*kuk t̥uk*) if any voiceless spirant follows (*śari*); after *-d* (*daḥ*), *s-* gets the initial augment *dh* (*dhut*) — which is subsequently replaced by *t* — and this applies to *s-* also after *-n* (*naś ca*), which is augmented with *-t* (*tuk*) if *ś-* follows. The prātiśākhya rules are textually more restricted in their scope. TPr. 5.32-33 provides that *k* (*kakāraḥ*) occurs as a transitional augment preceded by *-ñ* (*ñapūrvah*) and followed by *s-* or *ṣ-* (*saśakāraparah*), with which *t* (*takāraḥ*) occurs as an augment preceded by *-t* or *-n* (*tanakārapūrvah*). The Śaunakīyā Caturādhyāyikā rules provide that in a sequence *-t s-* the two consonants are separated by *t* (*takāreṇa*) and that *-ñ*, *-n*, and *-n* respectively are separated by *k t t* (*kaṭataiḥ*) from following *ś ṣ s*. For example: *san sadṛṇ* → *santsadṛṇ* ‘being ... similar’, *sadṛṇ samānaiḥ* ‘similar to equals’ → *sadṛṇksamānaiḥ*;¹²⁰ *pṛtanāṣāṭ suvīraḥ* ‘victorious over armies in battle, accompanied by good heroes’ → *pṛtanāṣāṭsuvīraḥ*.¹²¹

b. RPr. 4.16-17: डकारेऽघोष्मपरेऽन्तरेके ककारम् । टकारनकारयोस्तु आहुः सकारोदययोस्तकारम् ।

provide for comparable transitions, but specify that some (*eke*) say (*āhuḥ*) these apply: *k* (*kakāram*) between (*antarā*) contiguous sounds when *-ñ* occurs (*ñakāre*) followed by a voiceless spirant (*aghoṣmapare*); *t* occurs when *-t -n* (*takāranakārayoḥ*) are followed by *s-* (*sakārodayoḥ*).

Further,

c. VPr. 4.15-16: ड्नौ क्ताभ्यां सकारे । न दात्म्यस्य ।

provide that *-ñ* and *n* (*ñnau*) are respectively separated by *k* and *t* (*ktābhyām*) from a following *s-* (*sakāre*), and that this does not (*na*) apply according to Dālbhya.

Such dialectal transitional features are of interest in connection with anusvāra also. There is some evidence, albeit tenuous, for another particular realization of anusvāra before spirants and *r*. The metrical version of the Pāṇinīyaśikṣā as commented on in the Pañjikā and in Rudraprasāda’s edition has a verse that reads as follows:

b. PŚR 23 (= PŚPa. 17): अलाबुवीणानिर्घोषो दन्तमूल्यः स्वराननु । अनुस्वारस्तु कर्तव्यो नित्यं होः शषसेषु च ॥

This states that anusvāra occurs after vowels (*svarān anu*) — a quasi-etymological statement — obligatorily (*nityam*) before *h r ś ṣ s*. It also describes how anusvāra sounds: It has the sound of a *vīṇā* made from the Alābu gourd (*alābuvīṇānirghoṣaḥ*). Moreover, the passage gives an oral place of production for this anusvāra. As shown, this version has *dantamūlyah* ‘located at the roots of the teeth’. Commentators also explicitly

¹²⁰TS 2.2.8.6: योऽलं चिद्वै सन्त्सुदृङ् क्समानेस्स्यात् ... ‘... (for one) who is worthy of great wealth yet is on a par with his equals.’

¹²¹AV 11.1.2cd: अयमग्निहर्षतनाषाट्सुवीरो येन देवा असंहन्त दस्यून् ॥ ‘This is Agni the one who overcomes in battle, who has great heroes, with whom the gods prevailed over the Dasyus.’

mention and explain this in their comments.¹²² On the other hand, in his reconstructed text Ghosh (1938: 3, verse 15) reads अलाबुवीणानिषोऽदन्तमूल्यः स्वराननु । and translates (1938: 68): ‘The anusvāra after the vowels not pronounced at the root of the teeth, should be made sonorous like the sound of an *alābu-vīṇā*, but when it stands before *h*, *ś*, *ṣ* and *s* this pronunciation is compulsory.’ Since there are no vowels said to be pronounced at the root of the teeth and the text has a nominative singular instead of an accusative plural, this interpretation is suspect and *dantamūlyah* accepted by commentators is to be preferred. Nor is it difficult to understand that, at least before *r* and spirants other than *h*, anusvāra could be realized with the tongue tip near the lower teeth.¹²³

As was shown quite some time ago (Varma 1929: 152), there is also inscriptional evidence for both the velar and dental reflexes of anusvāra, as in *vañśe* ‘lineage’ (loc. sg. *vañśe*), *vañśalakṣmīm* ‘splendor of the lineage’; *abhrāñsi* ‘clouds’ (*abhrāñsi*), *yaśāñsi* ‘renowns’ (*yaśāñsi*). Varma also noted (1929: 53) contrasts such as the one between the Hindi and Panjabi words for ‘bamboo’: H *bāñs* (बाँस): P *vañjh*. The former has a long nasal vowel,¹²⁴ the latter a short vowel followed by a nasal consonant. Moreover, as Bloch noted (Bloch/Master 1965: 91 [88]), the development seen in Panjabi *vañjh* and Sindhi *vañjhu* is to be accounted for on the assumption that a transitional *-t-* was used.

8.5 In sum, the single term *anusvāra* was used in by early authors on Sanskrit grammar, phonology and phonetics to refer to dialectally diverse outcomes of complexes with *m* and *n*.

9 The reanalysis that allowed for innovations such as *tasmimś tvā* (see **8.2**) requires that speakers have treated items of the type *ahimś* in *ahimś ca* as contextual variants related to forms of the type *ahin*, with *-n* due to final cluster reduction, forms which occur before pause. That is, word boundaries come into play. Word boundaries play a role in the alternation between *-m* and nasalized segments homogeneous with following semivowels and stops (see **3.1.1b**). Given that the full assimilation of *-m* to a following stop applies for early Vedic in general, it is reasonable to assume that the alternative occurrence of word-final *-m* before stops is an innovation. This is comparable to what occurred in retroflexion. At an early stage, the retroflexion of *s* to *ṣ* after *i ī u ū r e o r* and velars applied to word-final *-s* as well as others. In the spoken language Pāṇini describes, on

¹²²E.g., PŚPa. 17: स्थानं दन्तमूलम् । तत्र भवो दन्तमूल्यः ।

¹²³A velar position would of course be more expected before *h*.

¹²⁴In view of one of the realizations to be accepted for anusvāra in Old Indo-Aryan, I consider it possible to say that the type *bāñs* (*bāñs*) may be the outcome of coalescence from earlier *vañśa* and need not necessarily represent nasalization with compensatory lengthening consequent on the loss of a nasal.

the other hand, this retroflexion regularly applies to *s* which is not word-final.¹²⁵ One also has variation of the type *-Ṛmy y-* / *-Ṛym̃ y-* across word boundaries in Vedic (see 3.4.2.3), even in dialects where the full assimilation of *-m* to following stops is the norm.

If the different outcomes reflect various timings in the onset of nasality and also reflect transitional phenomena, it is reasonable to bring into consideration other aspects of transition, namely consonantal doubling and the transition from one tonal unit to another.

9.1 Prāṭishākyas and the Aṣṭādhyāyī have rules which provide for sequences of the type VCCV instead of VCV. The descriptions account for such sequences by doubling consonants and introducing augments.

9.1.1 It will be simplest to start with Pāṇini's rules:

- a. A 8.4.46-52: अचो रहाभ्यान्द्रे (यरो वा [45]) । अनचि च । नादिन्याक्रोशे पुत्रस्य । शरोऽचि । त्रिप्रभृतिषु
शाकटायनस्य । सर्वत्र शाकल्यस्य । दीर्घादाचार्याणाम् ।

The first two sūtras provide for optionally (*vā*) replacing with two (*dve*) a consonant other than *h* (*yaṛaḥ*). This doubling applies to a consonant which follows *r* or *h* (*rahābhyām*) preceded by a vowel (*acaḥ*) or which directly follows a vowel and precedes a sound other than a vowel (*anaci*). For example: *arkaḥ* → *arkkaḥ* 'ray, sun', *brahmā* → *brahmmā* 'Brahman', *apa hṇute* → *apa hnnute* 'denies', *putrādinī* → *puttrādinī* 'one who eats her child', *adya* → *addya* 'today', *dadhy atra* → *dadhdhy atra* → *daddhy atra*¹²⁶ 'there is yogurt here'. The next sūtra concerns a particular term in a specific collocation under a special meaning condition: doubling does (*na*) apply to *putra* before *ādin* if censure is understood to be conveyed (*ākrośe*): *putrādinī tvam asi* 'You're a child-eater!' The next rule disallows consonant doubling in a particular phonological context. This does not apply to a voiceless spirant (*śaraḥ*) followed by a vowel (*aci*); e.g., *varṣati* 'It is raining', where the *-ṣ-* which follows *-ar-* is not subject to doubling. The last three sūtras of the set also provide that doubling does not apply, but now according to certain authorities. For Śākaṭāyana (*śākaṭāyanasya*), doubling does not apply in clusters of three or more consonants (*triprabhṛtiṣu*); e.g., *indraḥ* 'Indra', *uṣṭraḥ* 'camel', in which cluster-initial *-n-* and *-ṣ-* are not doubled. Śākalya (*śākalyasya*), on the other hand, disallows doubling under any circumstances (*sarvatra* 'everywhere'). And according to some teachers (*ācāryāṇām*), doubling fails to apply after a long vowel (*dīrghāt*); e.g., *dātram* 'sickle', *sūtram* 'thread'.

¹²⁵A 8.3.55: अपदान्तस्य मूर्धन्यः । See Cardona 1997: 105. The occurrence of word-final *-is* and so on already begins in Vedic. On the history of retroflexion in Sanskrit see Hock 1979.

¹²⁶By A 8.4.53: भलां जश्मसि । a consonant other than a semivowel or nasal (*jhalām*) is replaced by a voiced unaspirated stop (*jaś*) if it occurs before a voiced stop (*jhaśi*).

There are also contexts in which *cch* occurs instead of *ch*. Pāṇini accounts for these by introducing the final augment *tuk* to a vowel preceding *ch* under stated conditions, the *t* of *tch* then being replaced by *c* (see Cardona 1997: 536):

b. A 6.1.73-76: छे च (ह्रस्वस्य तुक् [71] । आङ्माडोश्च । दीर्घात् । पदान्ताद्वा ।

A short vowel (*hrasvasya*) is augmented with *tuk* before *ch* (*che*). This augmenting applies also to a long vowel (*dīrghāt*), but only optionally (*vā*) if the vowel is word-final (*padāntāt*). On the other hand, *ā* of the particle *āñ* and the negative particle *māñ* receives the augment obligatorily before word-initial *ch-*. For example: *gacchati* (← *gatch-a-ti*) ‘is going, goes’, *icchati* (← *ich-a-ti*) ‘wishes, desires’, *hrīcchati* ‘is ashamed’, *kuñichāyā* / *kuñicchāyā* ‘shade of a hut’, *ācchādayati* (← *ā chādayati*) ‘covers’, *mācchaitṣīt* (← *mā chaitṣīt*) ‘may he not cut off’.

As shown in the examples given, these rules apply both across word boundaries and within words. There are also transitional phenomena that appear only across word boundaries (see 8.4a). The following sūtra concerns sequences in which word-final *-ñ*, *-ṅ*, and *-n* preceded by a short vowel (*hrasvāt*) occur before a word-initial vowel (*aci*).

c. A 8.3.32: ङमो ह्रस्वादचि ङमुशिनत्यम् (पदस्य [8.1.16])।

ñ-, *ṅ-*, and *n-* are then added as initial augments (*namuṭ*) to the word-initial vowel. For example: *pratyañ āste* → *pratyaññāste* ‘... is seated facing west’, *kurvan avocat* → *kurvannavocat* ‘... spoke while doing something’.

9.1.2 Among *prātiśākhya*s, the *Taittirīyaprātiśākhya* contains the most detailed statements regarding such doubling, so that I begin with sūtras from this work.

9.1.2.1 The following provide that a consonant (*vyañjanam*) is doubled (*dvivarnam* [sc. *āpadyate*] ‘[becomes] two sounds’) under stated conditions.

a. TPr. 14.1-4: स्वरपूर्वं व्यञ्जनद्विवर्णं व्यञ्जनपरम् । लवकारपूर्वस्पर्शश्च पौष्करसादेः । स्पर्श एवैकेषामाचार्याणाम् ।
रेफात्परञ्च ।

Two types of doubling are allowed for: (1) $VC_1C_2 \rightarrow VC_1C_1C_2$, (2) $VC_1C_2 \rightarrow VC_1C_2C_2$. TPr. 14.1 gives the most general condition, providing for (1): a consonant preceded by a vowel (*svrapūrvam*) and followed by another consonant (*vyañjanaparam*); e.g., *iṣe tvā* → *iṣettvā* (‘you for nourishment’),¹²⁷ *uru prathasva* → *uruprathasva* (‘spread wide’).¹²⁸ The next three rules provide for (2). By TPr. 14.4, a consonant undergoes doubling after *-r* preceded by a vowel; e.g., *ūrmiṅṅh madhumattamāḥ* → *ūrmmiṅṅhmadhu-mattamāḥ*

¹²⁷TS 1.1.1.1: इषे त्वोर्जेत्त्वा (I cut) you for nourishment, you for strength.’

¹²⁸TS 1.1.8.1: ... उरु पृथस्वोरु तै युञ्जपतिः प्रथताम् ‘Spread wide, (you puroḍāsa cake,) may your ritual master be wide spread.’

(‘full of flow, most sweet’).¹²⁹ TPr. 14.2-3 concern sequences in which a stop (*sparsaḥ*) is preceded by *l* or *v* (*lavakārapūrvah*) that follows a vowel. According to Pauṣkarasādi, both the stop and the preceding *l* or *v* are subject to doubling; according to some teachers (*ekeṣām ācāryānām*), on the other hand, only the stop (*sparsa eva*) undergoes doubling under these conditions;¹³⁰ e.g., *kalpān juhōti* → *kalppāñjuhōti* / *kallpāñjuhōti* (‘offers with kalpa mantras’),¹³¹ *vibhūdāvne* → *vibhūdāvne* / *vibhūdāvne* (‘who grants power’).¹³² According to some teachers, however, one says only *kalppāñ juhōti* and *vibhūdāvne*.

As shown above (a with note 126), in Pāṇini’s system, doubling applies to give *dadhdhy*, then the first of the contiguous aspirates is replaced by an unaspirated stop. Under the procedure adopted in the Taittirīyaprātiśākhya, similar results are accounted for in a different manner. Instead of providing for an aspirated stop to be doubled, the corresponding unaspirated stop is introduced before the aspirate.

b. TPr. 14.5-7: द्वितीयचतुर्थयोस्तु व्यञ्जनोत्तरयोः पूर्वः । रेफपूर्वयोश्च नित्यम् । लकारपूर्वे च । concern such consonants. TPr. 14.5 provides that second and fourth stops (*dvitīya-caturthayoḥ*) — that is, voiceless and voiced aspirates — followed by a consonant (*vyañjanottarayoh*) receive as an augment the stop which precedes them (*pūrvah*) in their series; e.g., *akhyat* → *akkhyat* (‘looked’),¹³³ *manasā dhyāyati* → *manasāddhyāyati* (‘considers with the mind’).¹³⁴ In addition, aspirates preceded by *r* (*rephapūrvayoḥ*) are always (*nityam*) similarly augmented, whether or not a consonant follows the aspirate; e.g., *mūrkhā* (‘foolish, given to angry behavior’) → *mūrkkhā* (TS 7.1.6.2: मूर्क्खा), *ūrdhvaḥ*

¹²⁹TS 1.1.3.1: सम्मृच्छदध्वमृतावरूरूमिर्मशीर्मधुमत्तमाः ‘(Waters,) full of truth, of floods, most sweet, blend with (the milk).’

¹³⁰Commentators agree that the second option alone is acceptable, rejecting Pauṣkarasādi’s way of reciting (इदमेव सूत्रमिष्टं न तु पूर्वसूत्रम् । [TPrS 14.3], नेदं सूत्रमिष्टम् । [TPrG 14.2]), so that the accepted recitation has only *kalppāñ*, *vibhūdāvne*. They differ, however, in how they understand TPr. 14.2 to provide for the two possible doublings noted. According to Somayārya, *ca* ‘and, also’ of TPr. 14.2 serves to indicate that doubling (*dvitvam*) and being preceded by a stop (*sparsapūrvatvam*), stated in the previous sūtra, also are referred to here: स्वरपूर्वत्वं द्वित्वं चान्वादिशति चकारः । (TPr.S 14.2). Since, moreover, TPr. 14.3 states a restriction using *eva* ‘only’ and this sūtra is separately formulated, it is understood that the previous rule allows doubling of *l* and *v* according to Pauṣkarasādi: अनेनावधारणेन सूत्रान्तरारम्भेन च पौष्करसादिमते लवकारयोश्च द्वित्वमस्तीति गम्यते । (TPrS 14.3). Gārgya Gopāla, on the other hand, understands that *ca* is used in TPr. 14.2 so as to allow the doubling not only of a consonant following *l* or *v* but also of these semivowels: लकारवकाराभ्यां परस्परौ द्वित्वमश्नुते चशब्दाल्लवकारौ च । (TPr. 14.2G).

¹³¹TS 5.4.8.5: कल्प्याञ्जुहोत्स्यक्लृप्सस्य क्लप्स्यै ‘(The Adhvaryu) offers with the kalpa mantra in order to obtain capacity for one who is not capable.’

¹³²TS 3.5.8.2: ... तस्मै त्वा प्यजापतये विभूदाव्ने ... जुहोमि ‘I offer you to ... Prajāpati ... who grants power.’

¹³³TS 4.1.2.2: अन्वुगिनरुषसाग्रमकृष्यत् ‘Agni gazed on (and thus illuminated) one after the other the beginning of the dawns.’

¹³⁴TS 2.5.11.5: यद्धि मनसादध्यायति तद्द्वाचा वदतीति ‘One utters in speech what one thinks of in one’s mind.’

→ *ūrdhvah* ('erect').¹³⁵ Further, if a voiced aspirate is preceded by *l* (*lakārapūrve*), it is augmented similarly; e.g., *pragalbhah* → *pragalbbhah* ('adept, capable').¹³⁶

c. TPr. 14.8: उपसर्गपाथएषोत्यातिधामपरमभूतेपूर्वेषु छत्रिभुजेषु च ।

provides for augmenting similarly *ch* (→ *cch*), *kh* in *khi* (→ *kkhi*), and *bh* in *bhuja* (→ *bbhuja*) after preverbs and certain other specified items. For example, *ā chettā* → *ācchettā* ('cutter').¹³⁷

d. TPr. 14.9: अघोषादूष्मणः परः प्रथमोऽभिनिधानस्पर्शपरात्तस्य सस्थानः ।

After a voiceless spirant (*aghoṣād uṣmaṇaḥ paraḥ*) followed by a stop (*sparśaparāt*), an unreleased voiceless unaspirated stop (*prathamo 'bhinidhānaḥ*) with the same place of production (*sasthānaḥ*) as the voiceless stop is introduced. For example, *yaḥ kāmayeta* ('who should wish ...') → *yaḥkkāmayeta* (e.g., TS 2.1.2.3).¹³⁸

There are also rules which disallow (*na* 'not') consonantal doubling and its equivalent. These are stated under the heading (*atha* 'now') of

e. TPr. 14.14: अथ न ।

The following rules come under this heading:

f. TPr. 14.15-16, 23-24: अवसाने रविसर्जनीयजिह्वामूलीयोपध्मानीयाः । ऊष्मा स्वरपरः । सर्वर्षसवर्गीयपरः ।

नानुत्तमपरः ।

No consonant undergoes doubling or the augmenting equivalent to this if it is followed by a pause (*avasāne*); nor are *r*, *h*, *k*, *p* (*ravisarjanīyajihvāmūlīyopadhmanīyāḥ*) subject to doubling. For example, in the *padapāṭha* one has *ūr**k* followed by a pause; contrary to

¹³⁵TS 1.2.14.2: ऊर्ध्वो भव (Agni,) be erect ...

¹³⁶TS 2.5.5.3: ... प्रगुल्भोऽस्य जायते 'An adept (son) is born to that (yajamāna).'

¹³⁷TS 1.1.2.1: आच्छेत्ता ते मा रिषम् '(Barhis,) may I who cut you not suffer harm.'

¹³⁸TPr. 14.9 can also apply to introduce a transitional element in examples like *grīṣme* ('in the hot season'): *grīṣme* (e.g., TS 2.1.2.5: ग्रीष्मे). As stated in TPr. 14.10 (अघोषे प्लाचेः ऽ), however, according to Plākṣi this applies only when a voiceless consonant follows (*aghoṣe*), so that no transitional stop is introduced in *grīṣme*. Further, TPr. 14.11 (उत्तमपरानु प्लान्नायणस्य ऽ) informs us, according to Plākṣāyaṇa, a voiceless unaspirated stop is introduced after a voiceless spirant followed by a nasal stop (*uttamāt*), as in *aśnāti* 'eats' (→ *aśmāti*). In addition, TPr. 14.12 (प्रथम ऊष्मपरो द्वितीयम् ऽ) provides that a voiceless unaspirated stop followed by a spirant (*prathama uṣmaparaḥ*) — as in *tat savitūḥ* 'that (brilliance) of Savitṛ' (e.g., TS 1.5.6.4: तत्सवितुर्वरेण्यमृषर्गो देवस्य धीमहि ऽ) — changes to a voiceless aspirated stop (*dviṭīyam*); → *tattsavitūḥ* → *tatthasavitūḥ*. As shown, doubling applies first, then the aspiration. This is explicitly noted in the Vaidikābharāṇa: अत्र प्रथमानां पूर्वसूत्रविहिते द्वित्वे जाते द्वितीयरूपस्य द्वितीयादेशः । (TPrG 14.12). Finally, TPr. 14.13 (बाडभीकारस्यासस्थानपरः ऽ) takes into account what Bāḍabhīkāra observes: the change stated in the preceding sūtra applies only if the stop is followed by a spirant with a different place of production (*asasthānaparaḥ*). According to Bāḍabhīkāra, then, the *-t* of *tatt* in *tattsavitūḥ* remains unchanged, but the *-t* of *tatt* in *tattṣoḍaśī* (TS 6.6.11.1: तत्त्वोडुश्शर्वभवत् 'That became the ṣoḍaśin.') does undergo the change: *tattṣoḍaśī*. The change of an unaspirated stop to an aspirate before a spirant is known from other sources also (RPr. 6.54, VPr. 4.122, ŚCĀ 2.6 [2.1.6]), including the third vārtika on A 8.4.48 (चयो द्वितीयाः शरि षोष्करसादेः ऽ), where Kātyāyana attributes this practice to Pauṣkarasādī. Additional details cannot be considered here.

TPr. 14.4 (a), the *-k* of this word is not subject to doubling. In the *samhitāpāṭha*, on the other hand, the *-k* of *ūrka* is doubled before *ca* ('and'): *ūrkkca*.¹³⁹ The *r* of this and other clusters is also excluded from doubling, as are also the spirants in examples such as the following: *manaḥ kṣeme* → *manaḥkṣeme* ('mind on maintenance'),¹⁴⁰ *yaḥkkāmayeta* ('who would wish'), *yappāpmanā* ('who ... with sin').¹⁴¹ Doubling would otherwise apply by the general rule TPr. 14.1 (a). Recall that in the language Pāṇini describes a voiceless spirant is not doubled if a vowel follows (A 8.4.49 [9.1.1a]). This is true also for Vedic, and TPr. 14.16 provides that a spirant (*ūṣmā*) which is followed by a vowel (*svarparaḥ*) is not doubled, contrary to what would obtain according to TPr. 14.4 (a). For example, the *-ṇ-* of *pūrṇa* is doubled, but the *-ś-* of *darśa-* is not: *darśapūrṇamāsau* 'new and full-moon rites' (e.g., TS 1.6.7.1: दर्शपूर्णमासौ). TPr. 14.23-24 concern clusters such that the first consonant is followed by one which is either identical to it or of the same stop set (*savarṇasavargīyaparaḥ*). In general, contrary to TPr. 14.1 (a), such a consonant is not doubled, but this exclusion does not (*na*) apply for a nonnasal stop followed by a nasal. For example, the initial consonant of *-tt-* is not doubled, as in *sayṁyattāḥ* (see 3.4.2.2a), but the *-p-* of *-pm-* is doubled, as in *pāpmanā* (see above).

The section headed by (e) TPr. 14.14 includes statements which give details about what certain teachers representing recitation traditions disallow in this sphere, among them the following:

g. TPr. 14.17: प्रथमपरश्च प्लान्निप्लान्नायणयोः (ऊष्मा [16])।

h. TPr. 14.18-21: ऊष्माऽघोषो हारीतस्य । रेफपरश्च हकारः । टवर्गश्च तवर्गपरः । लतवर्गौ यवकारपरौ ।

i. TPr. 14.22: परश्च ।

j. TPr. 14. 25-28: अथैकेषामाचार्याणाम् । लकारो हशवकारपरः । स्पर्शस्पर्शपरः । पदान्तश्च व्यञ्जनपरः प्राकृतः ।

(g) concerns the tradition represented by Plākṣi and Plākṣāyaṇa, that is, by members in a family that traces its lineage to Plakṣa. Here a voiceless spirant also (*ca*) does not double if it is followed by a voiceless unaspirated stop (*prathamaparaḥ*); for example: *viśpati* 'master of a clan', *aṣṭau* 'eight', *bṛhaspati* 'Bṛhaspati' instead of *viśśpati*, *aṣṣṭau*, *bṛhasspati*.¹⁴² Sūtras in (h) deal with contexts where Hārīta does not observe doubling. For him, doubling does not apply to the following: a voiceless (*aghoṣaḥ*) spirant (*ūṣmā*) in any context, *h* followed by *r* (*rephaparaḥ*), a retroflex stop (*tavargah*) followed by a

¹³⁹TS 4.7.4.1: ऊर्क्च मे ... '(May) strength (be) mine and ...'

¹⁴⁰TS 5.2.1.7: तस्माद्दोगेऽन्यासाम्प्रजानाम्मनःवत्तेनेऽन्यासाम् 'Therefore, the mind of some creatures is on active acquisition, of others on maintaining what has been acquired.'

¹⁴¹TS 2.3.13.2: वरुण एनव्वरुणपाशेन गृह्णाति यःप्याप्मना गृहीतो भवति । 'Varuṇa seizes him who is taken by sin with the noose of Varuṇa.'

¹⁴²E.g., TS 2.3.1.3: विश्वपतिना, TS 6.4.5.2: अष्टावष्टौ, TS 1.2.2.1: बृहस्पतिर्नो हविषा वृधातु 'May Bṛhaspati cause (the worlds) to grow with our oblation.'

dental stop (*tavargaparah*), *l* and dental stops (*latavargau*) followed by *y* and *v* (*yavakāraparau*). For example: *puṣyati* ‘thrives’, *aduhran* ‘milked’, *viḍ draviṇam* ‘Vaiśyas (your) wealth’, *sinīvālyai* ‘for Sinīvālī, and *iṣe tvā* instead of *puṣṣyati*, *aduhhran*, *viḍḍdraviṇam*, *sinīvālyai*,¹⁴³ and *iṣettvā* (see note 127). Hārīta also disallows doubling of *v*; e.g., *vibhūdāvne* (see a).¹⁴⁴ The sūtras in (j) concern the practices of some teachers (*ekeṣām ācāryāṇām*), according to whom doubling does not apply to the following: *l* followed by *h*, *ś* or *v* (*haśavakāraparah*); any stop (*sparśaḥ*) followed by a stop (*sparśaparah*); a word-final (*padāntaḥ*) stop followed by a consonant (*vyañjanaparah*), if it remains in its original state (*prākṛtaḥ*) — that is, if it is not subject to other contextual modification — before that consonant. For example: *malhā* ‘a female goat with two teats on its neck area’, *śatavalha* ‘with a hundred sprouting branches’, *bilva* ‘Bilva tree’ instead of *mallhā*, *śatavallśa*, *billva*,¹⁴⁵ *ūrka ca* instead of *ūrkkca* (see note 139), and *ādittyān yāciṣāmahe* ‘we will beg the Ādityas’ instead of *ādittyānnyāciṣāmahe*.¹⁴⁶

On the other hand, as the language Pāṇini describes does not allow sequences of the type *-Vñ V-* and *-Vñ V-*, in which a word-final *-ñ* or *-n* is preceded by short vowel (see

¹⁴³E.g., TS 2.1.9.4: पुष्पयति पुत्र्यां पशुभिः । ‘He thrives in offspring, in cattle.’ TS 1.7.1.1: यज्जव्वै देवा अर्दुहहन ‘The gods did milk dry the rite.’ TS 1.8.13.1: विराजता तिष्ठ जगती च्चा छन्दसामवतु सम्पदशस्तोमो वैरूपं सामं मरुतो देवता विड्द्रविणम् (Yajamāna, take your stand in the west, among the metres let the jagatī help you, let the saptadaśa stoma, the vairūpa sāman, the Maruts as the deity, the Vaiśyas (protect your) wealth.’ TS 1.8.8: ... सिनीवाल्ल्ये चुरुङ् ... ‘... (puts down) a porridge for Sinīvālī ...’

¹⁴⁴Commentators interpret TPr. 14.22 disparately. According to Gārgya Gopāla, *ca* serves to indicate that *v* of *yavakāra-* in the preceding rule is referred to, and the rule provides that a sound following (*parah*) this is not doubled: चशब्देन वकारोऽन्वादिश्यते । तस्मात्परो वर्णो द्वित्वं नाश्नुते हारीतस्य मते । (TPrG 14.22). Nevertheless, the only example cited is *oṣiṣṭhadāvne* (TS 1.6.12.3) ‘to him who gives (water countering) the most burning’, printed with *-nn-* (ओषिष्ठदावन्ने). Somayārya, on the other hand, understands that TPr. 14.22 denies doubling of *v*. He also gives two interpretations of the rule. First, *ca* serves to bring in *hārūtasya* and *v* of *yavakāra* in the previous sūtra is understood to be referred to by *parah*, since this is singular; this too does not undergo doubling according to Hārīta: चकारो हारीताकर्षकः । पर इत्येकवचनेन वकारो गृह्यते । पूर्वसूत्रस्थनिमित्तयोः यः परः सोऽपि न द्वित्वमापद्यते हारीतमते । यथा विभूदावन्ने ... (TPrS 14.22). Alternatively *para* refers to the second of two consonants which result from doubling. As the Tribhāṣyaratna also notes, however, the doubling thus disallowed would be taken care of by TPr. 14.23 (f). Somayārya gets around this by remarking that TPr. 14.22 states a different opinion, so that 14.23 does not come into play: अथवा द्वित्वे कृते परो द्वितीयपर्यायो द्वित्वविधिर्नास्ति अनवस्थापसङ्गात् । ननु सर्वशंसवर्गीयपर इति परसूत्रेणापि पुनर्द्वित्वनिषेधः पौनरुक्त्यमावहति । मतभेदान्नैष दोष इति ब्रूमः । (TPrS 14.22). This second alternative is the interpretation given by Māhiṣeya (एवं द्वित्वे कृते पुनःपुनर्द्वित्वं नापद्यत इत्येवमर्थं सूत्रम् । [TPrM 14.23]), who, however, reads *i* after *e*. I can say no more.

¹⁴⁵E.g., TS 1.8.19: आदित्याम्मुल्लहाडङ्गुर्भिर्शीमा लभेत ‘One should immolate a pregnant ... dedicated to Aditi.’ TS 1.1.2.1-2: ... शतवल्क्ष्वांश्चि रोह सहस्त्रवल्क्ष्वा वि वृयं रंहेम ‘(Barhis of the gods,) grow with a hundred sprouts, we would grow with a thousand offspring.’ TS 2.1.8.1-2: बैल्ल्वो वृष भवत्सुसौ वा आदित्यो यतोऽजायत ततो विल्ल्व उदतिष्ठत् ‘The sacrificial pole is made of Bilva wood; for truly the Bilva tree rose up from the place whence yonder sun was born.’

¹⁴⁶TS 2.1.11.5: त्यानु क्नुत्त्रियाँ अत्र आदित्यान्वाचिषामहे ‘We will beg those mighty Ādityas for help.’

9.1.1b), so also are such sequences not permissible in the recitation tradition of the Taittirīyasamhitā. According to

k. TPr. 9.18-19: ह्रस्वपूर्वो ङकारो द्विवर्णम् । नकारश्च ।

-*ṅ* preceded by a short vowel (*hrasvapūrho ṅakāraḥ*) is doubled (*dvivarnam* ‘[becomes] two sounds’), and the same applies to -*n* (*nakāraś ca*) preceded by a short vowel. For example: *nyañ agniḥ* → *nyañnagniḥ* (‘the fire altar face down’),¹⁴⁷ *asmin eva* → *asminneva* (‘in this alone’).¹⁴⁸

9.1.2.2 The Ṛgvedaprātiśākhya also provides details concerning consonant doubling, as in the following sūtras:

a. RPr. 6.1-2: स्वरानुस्वरोपहितो द्विरुच्यते संयोगादिः स क्रमोऽविक्रमे सन् । सोष्मा तु पूर्व्येण सहोच्यते सकृत्स्वेन ।

b. RPr. 6.3: असंयोगादिरपि च्छकारः ।

c. RPr. 6.4-5: परं रेफात् । स्पर्श एवल्लकारात् ।

d. RPr. 6.6, 9: ऊष्मणो वा । वोष्मा संयुक्तोऽनुपधः ।

A consonant which is preceded by a vowel or anusvāra (*svarānusvāropahitaḥ*) is doubled (*dvir ucyate* ‘is uttered twice’) if it occurs as the first member of a consonant cluster (*saṃyogādīḥ san*), provided there is not an unchanged *ḥ* in this position (*avikrame*); and if the consonant in question is an aspirated stop (*soṣmā*), it is uttered (*ucyate*) once (*sakṛt*) together with a consonant that precedes it in its stops set (*pūrvyena saha svena*). In addition (b), *ch* (*chakāraḥ*) is doubled even if it is not cluster-initial (*asaṃyogādir api*). Further (c), a consonant which follows cluster-initial *r* (*rephāt*) preceded by a vowel is subject to doubling, and a stop (*sparsaḥ*) is similarly (*evam*) doubled after cluster-initial *l* (*lakārāt*). Moreover (d), a stop is optionally (*vā*) doubled after a cluster-initial spirant (*ūṣmaṇaḥ*); and a conjoined spirant (*ūṣmā saṃyuktaḥ*) is optionally doubled if it is not immediately preceded by another segment (*anupadhaḥ*), that is, if it follows a pause. For example: *ā tvā* → *āttvā*,¹⁴⁹ *somānam svarāṇa-* → *somānamssvarāṇa-*,¹⁵⁰ *ati kyaḥ* → *atikkhyaḥ*,¹⁵¹ *upa chāyām* → *upacchāyām*,¹⁵² *aṣṭābhīḥ*

¹⁴⁷TS 5.5.3.2: ब्रह्मवादिनो वदन्ति न्यङ्स्त्रङ्गिग्नश्चेतवयाः उच्यते इति ‘Those who discuss ritual say, “(These two are possible:) the fire-altar is to be set up (in the shape of a bird) face-down, face-up”.’

¹⁴⁸E.g., TS 2.6.2.4: पुरस्ताल्लक्ष्मा पुरोनुवाक्या भवत्यस्मिन्नेव लोके ज्योतिर्दधते ... ‘The verse of invitation has the mark (i.e., the name of the deity) in the beginning; he makes light for himself in this world...’

¹⁴⁹RV 8.68.1ab: आ त्वा रथ्यथेतये सुम्नाय वर्त्तयामसि । ‘(Indra,) we drive you hither like a chariot, for help and benevolence.’

¹⁵⁰RV 1.18.1: सोमानं स्ववर्णङ्कृणुहि ब्रह्मणस्पते। कक्चीवन्तय्यं औशिजः ॥ ‘Brahmaṇaspati, make the offerer of Soma resound, a Kakṣīvat son of Uśij.’

¹⁵¹RV 1.4.3c: मा नो अतिक्रव्य आ गेहि ॥ ‘(Indra,) do not overlook us, come.’

¹⁵²RV 6.16.38.ab: उपं च्छायामिव पृथेरगन्म शर्म ते वयम् । ‘(Agni,) we have come to your shelter, as to the shade from heat.’

daśabhiḥ → *aṣṭābhirddaśabhiḥ* ('with eight, ten'),¹⁵³ *ulbam* → *ullbam* ('embryo covering'),¹⁵⁴ *hvayāmi* → *hhvayāmi* ('I call'),¹⁵⁵ *ścotanti* → *śścotanti* ('drip').¹⁵⁶

A group of rules provide that doubling does not (*na*) apply to certain consonants, under stated conditions. According to

e. RPr. 6.7-8, 10: नावसितम् । न रेफः । न तूष्मा स्वरोष्मपरः ।

a consonant in absolute final position, before a pause (*avasitam*), is not doubled; nor is *r* (*rephaḥ*) or a spirant (*ūṣmā*) which is followed by a vowel or another spirant (*svaroṣmaparaḥ*). For example, *parā varḥ* 'separated, cut off' occurs at the end of a verse;¹⁵⁷ although *k* follows *r*, a context for doubling (RPr. 6.4 [c]), it is not doubled. Similarly, the *ṣ* of *parṣi* 'carry across' (2nd sg. imper., e.g. RV 8.67.11a) remains single. In both instances, cluster-initial *r* also does not get doubled. The cluster-initial spirant *s* in *cetathas sutānām* ('you two are aware of the pressed Soma')¹⁵⁸ also is exempt from doubling.

In addition, in a sequence C_1C_2 such that C_2 is doubled, the preceding C_1 that conditions doubling (*parakramopadhā*) is itself not doubled:

f. RPr. 6.11: न परक्रमोपधा ।

Thus, the *-b-* of *ulbam* is doubled, but not the *l* which precedes it.

As noted under **b**, *ch* is subject to special treatment. The special status of *ch* extends to the absence of doubling for this segment. Thus (**g**), word-initial (*padādiḥ*) *ch-* is not doubled if it is preceded by a long vowel (*dīrghēṇa* [*upahitaḥ*]) except for the *-ā* of the negative particle *mā* (*metivarjam*):¹⁵⁹

g. RPr. 6.13: दीर्घेण च मितिर्वर्जम् (पदादिः छकारः [12])।

For example, the *ch-* of *chādayāmi* 'I cover' is not subject to doubling after the *-ā* of *varmaṇā*,¹⁶⁰ but the *ch-* of *chedma* in *mā chedma* is doubled: *mācchedma* ('let us not

¹⁵³RV 2.18.4a-c: आदद्वाब्ध्यां हरिबध्यामिन्द्र याह्याया चतुर्भिरा षड्भिर्हृयमाननः । आष्टाभिर्दशभिस्सोमुपेयम् '(Indra,) with two, four, six, eight, ten horses, come to drink Soma.'

¹⁵⁴RV 10.51.1ab: महत्तदुल्बं स्थविरन्तदासीदधेनाविष्टितःप्रविवेशिथापः । 'Big and solid was that covering enveloped in which you entered the waters.'

¹⁵⁵RV 1.35.1a: हृह्वयाम्यग्निमम्यथमं स्वस्तये 'I first call Agni for well being.'

¹⁵⁶RV 1.87.2c: रथोर्तन्ति कोशा उपे वो रथेष्ववा '(Maruts,) the buckets (i.e., clouds) on your chariots let loose water.'

¹⁵⁷RV 10.8.9cd: त्वाष्ट्रस्य चिदिदृश्वरूपस्य ... त्रीणि शीर्षा परावर्क ॥ '(Indra) cut off the three heads of Viśvarūpa, son of Tvaṣṭr ...'

¹⁵⁸RV 1.2.5ab: वायुविन्द्रश्च चेतथस्सुतानांवाजिनीवसू । 'Vāyu and Indra, you two ... are aware of the pressed Soma.'

¹⁵⁹RPr. 6.12 provides for not doubling word-initial *ch* preceded by particular words. It is not necessary to consider here the details of this sūtra.

¹⁶⁰RV 6.75.18a: मर्माणि ते वर्मणा छादयामि 'I cover your vulnerable points with armor.'

cut’).¹⁶¹

In addition, consonant doubling does not apply in the speech of certain speakers. Thus,

h. RPr. 6.14: संयुक्तन्तु व्यञ्जनं शाकलेन ।

states that according to the teaching of Śākalya (*śākalena*), a conjoined consonant (*saṃyuktam vyañjanam*) is not doubled.¹⁶²

Again as in the spoken language Pāṇini describes (9.1.1b) and in the recitation tradition accounted for in the Taittirīyaprātiśākhya (9.1.2f), in the tradition of Ṛgveda recitation which Śaunaka accounts for also *-ñ* and *-n* (*padāntīyo nakārao nakāraś ca*) preceded by a short vowel (*hrasvapūrvah*) are not allowed to remain as such before a vowel (*uttare svare*); they are doubled (*krāmataḥ*):

c. RPr. 6.15: पदान्तीयो ह्रस्वपूर्वो ङकारो नकारश्च क्रामत उत्तरे स्वरे ।

For example, the *-ñ* of *kīdṛñ* ‘of what sort?’ is doubled before the vowel of *indraḥ*, as is the *-n* of *ahan* ‘slew’ before the vowel of *ahim* ‘serpent’: *kīdṛññindraḥ*, *ahannahim*.¹⁶³

9.1.2.3 Consider now consonant doubling rules that account for the tradition of recitation for the Vājasaneyisamhitā as described in the Vājasaneyiprātiśākhya. The following provide for doubling:

a. VPr. 4.101: स्वरत्सयोगादिर्द्विरुच्यते सर्वत्र ।

b. VPr. 4.102-104, 107: परन्तु रेफहकाराभ्याम् । ऊष्मान्तस्थाभ्यश्च स्पर्शः । जिह्वामूलीयोपध्मानीयाभ्याञ्च ।

विसर्जनीयाद्ब्रह्मञ्जनपरः ।

c. VP4. 4. 110: पथमैर्द्वितीयास्तृतीयेश्चतुर्थाः ।

In general (a), the first consonant of a cluster (*saṃyogādih*) is uttered twice (*dvir ucyate*) following a vowel in any context.¹⁶⁴ However (*tu*), doubling applies (b) to a consonant

¹⁶¹RV 1.109.3a: मा च्छेदग्रश्मीरिति नाधमानाः ‘... calling for help, (saying,) “may we not cut the reins”.’

¹⁶²Uvaṭa mentions different interpretations of **h**. According to some, *dirghena* and *padādih* of the preceding two sūtras are understood in this sūtra, so that the exemption from doubling applies to word-initial consonants after long vowels. According to other interpreters, *dirghena* and *padādih* are not understood in RPr. 6.14, which then provides for the absence of doubling for any cluster-initial consonant. RPrU 6.14: संयुक्तं व्यञ्जनं दीर्घपरं न क्रामति शाकलेन विधधानेन ... पदादिरित्येवानुवर्तते ... अपरे दीर्घग्रहणं पदादिग्रहणं च नानुवर्तयन्ति । अविशेषेण सर्वत्र शाकलमिच्छन्ति । RPr. 6.14 is accordingly comparable to A 8.4.52 or 8.4.51 (9.1.1a). Now, Uvaṭa glosses *śākalena* of the sūtra with *śākalena vidhānena* ‘provision taught by Śākalya’. This is appropriate: *śākala* is a derivate which is paraphrased by *śākalyena proktam* ‘propounded by Śākalya’. In view of this, if the Śākalya whose teaching is alluded to in RPr. 6.14 is the same as the Śākalya to whom Pāṇini refers — something which, so far as I know, cannot be determined with certainty for this particular rule, although Pāṇini elsewhere refers to Śākalya the author of the Ṛgveda padapāṭha — then the second interpretation noted by Uvaṭa is appropriate.

¹⁶³RV 10.108.3a: कौडङ्ङन्द्रः सरमे ... ‘Saramā, of what sort is Indra ...’ RV 3.32.11a: अह्नहिम्परिशयानुमयर्थः ‘(Indra) slew the serpent lying around the waters.’

¹⁶⁴*sarvatra* ‘everywhere’. That is, doubling applies not only across pada boundaries but also within words. Similarly, RPr. 6.16 (अनादेशे पटलेऽस्मिन्विधानं सर्वत्र विद्यादपि वैकृतानाम् ।) states that, if no special statement to the contrary is made (*anādeśe*), a provision made in this chapter (*paṭale’smin vidhānam*)

following *r* or *h* (*param rephahakārābhyām*). Further, in clusters such that a stop (*sparśah*) follows a spirant or a semivowel (*ūṣmāntasthābhyām*) as well as *k* or *p* (*jihvāmūlīyopadhmanīyābhyām ca*), it is the stop that is doubled, and after *-h* (*visarjanīyāt*) a stop is doubled if it is followed by a consonant (*vyañjanaparāh*). Finally (**c**), voiceless and voiced aspirated stops (*dviṭīyāh*, *caturthāh*) subject to doubling are uttered respectively with preceding voiceless and voiced unaspirated stops of their series (*prathamaiḥ*, *ṭṭīyaiḥ*), that is, their unaspirated counterparts. For example: *iṣe tvā* → *iṣettvā*, *ūrje tvā* → *ūrjettvā*,¹⁶⁵ *bahvīḥ* → *bahvvīḥ* ('many'),¹⁶⁶ *vāyavaḥ stha* → *vāyavastha* ('you are the winds'), ... *pra arpayatu śreṣṭhatamāya* ('make go to the best') → ... *pprārppayatuśśreṣṭṭhatamāya* (see note 164), *vaḥ kāmādharaṇam* → *vaḥkkāmādharaṇam* ('your maintaining desires'),¹⁶⁷ *oṣadhīḥ pūrvāḥ* → *oṣadhīpppūrvāḥ* ('plants first ...'),¹⁶⁸ *viṣṇoḥ kramāḥ* → *viṣṇoḥkkramāḥ* ('the stride of Viṣṇu').¹⁶⁹

The following rules disallow doubling:

- d. VPr. 4.105: येस्तु परं तेन पूर्वम् ।
- e. VPr. 4.111-115: नानुस्वारः । सवर्णे । ऋवर्णे । लृवर्णे । यमे ।
- f. VPr. 4.116-117: विसर्जनीयः । स्ववर्गीये चानुत्तमे ।
- g. VPr. 4.118: अवसितञ्च ।

Consonants which condition doubling of a following consonant (*yaiḥ param*) do not simultaneously condition doubling of a preceding one (*tair na pūrvam*). For example, *sukṣmā* 'good earth' meets the conditions for *-k-* to undergo doubling by virtue of being the first member of a cluster (VPr. 4.101 [a]) and *-m-* is eligible for doubling after the spirant *-ṣ-* (VPr. 4.103 [b]). The stop which follows the spirant is doubled but not the one which precedes it: *sukṣmmā* (e.g., VS 1.27: सुक्ष्मा).¹⁷⁰ Doubling is also excluded for

applies everywhere (*sarvatra*) and also to items that have already undergone phonological change (*vaiḥṭānām api*). This holds for doubling rules considered above (9.1.2.2).

¹⁶⁵VS 1.1: इषेत्त्वोर्ज्जेत्त्वा व्यायव स्थ देवो व-सवविता प्यार्पयतु इश्रेष्ठतमायु कर्मणे '(Branch, I cut) you for nourishment, you for strength. You (calves) are the winds; may god Savitṛ make you go for the best deed (the sacrifice).' See also note 127.

¹⁶⁶VS 1.1: ... ध्रुवा अस्मिन्गोपतौ स्यात् बृहव्वीर ... '(Cows,) be steadfast and many in this master of cows.'

¹⁶⁷VS 3.27: मयि वृक्कामधरणाभूयात् 'May the maintaining of desires (i.e., their accomplishment) which is yours be in me.'

¹⁶⁸VS 12.75: या ओषधोऽप्यूर्वा ज्ञाता ... 'The plants that were first born ...'

¹⁶⁹VS 12.5: विषाणोऽक्कमोऽसि सपत्नुहा '(You are) the stride of Viṣṇu that kills competitors.'

¹⁷⁰I have omitted VPr. 4.106 (नास्वरपूर्वा ऊष्मान्तस्थाः ि), which under the interpretation of Uvaṭa and Anantabhaṭṭa also concerns clusters of the type C₁C₂C₃ and is an exception to VPr. 1.103 (b): spirants and semivowels (*ūṣmāntasthāḥ*) not preceded by vowels (*asvarapūrvāḥ*) do not condition doubling for stops that follow them: ऊष्माणामन्तस्थानां च परस्य स्पर्शस्य द्विर्भाव उक्तः । तदपवादोश्चयं योगः । अस्वरपूर्वा ऊष्माणोश्चान्तस्थाश्च परान्स्पर्शां द्विर्भावयन्ति । (VPrU 4.106), ऊष्माणामन्तस्थाभ्यश्च स्पर्शस्य परस्य द्विर्भाव उक्तः । तत् क्वचिदपोद्यते । अस्वरपूर्वा ऊष्माणोश्चान्तस्थाश्च परान्स्पर्शां द्विर्भावयन्ति । (VPrA 4.106). All the examples given involve sequences in which the first consonant is an unchanged visarjanīya, as in *divaḥ skambhanīḥ* 'prop of heaven' (VS 1.19: दिवः

(e): anusvāra;¹⁷¹ a consonant followed by one homogeneous with it (*savarṇe*); a consonant preceding *r* (*rvarṇe*), *l* (*lvarṇe*), or a yama. For example: *somānam svarāṇam* → *somānaṃ svarāṇam*,¹⁷² *savm̃ vapāmi* (see 3.4.1.2a), *aniṣkṛtaḥ* ‘not defeated, harmed’ (VS 27.4: अनिष्कृतः), *ṛddhiḥ* ‘thriving’, *klptam* ‘what one has been capable of attaining’,¹⁷³ *sakththm̃nā* (← *sakthnā*) ‘by the thigh’ (VS 23.29: सक्थ्थंनā). In the last example, the yama *thm̃* comes in as a transitional segment between *th* and the following nasal, and the first consonant of the cluster is exempted from doubling. Further (f), *h* is exempted from doubling, as is a stop preceding another stop of its own series (*svarvargīye*) unless the latter is a nasal (*anuttame*).¹⁷⁴ And (g) an absolute final consonant is not doubled before a pause (*avasitaṃ ca*). For example, *divaḥ kakut* ‘peak of heaven’,¹⁷⁵ *indrāya* (‘for Indra’),¹⁷⁶ *ūrka* (padapāṭha for VS 18.9).

As elsewhere, however (see 9.1.1b, 9.1.2f, i), single word-final (*padāntau*) -*n̄* and -*n*

स्कम्भनोरसि ‘You are the prop of heaven’). If the -*h* of *divaḥ* is kept unchanged, this applies. If, on the other hand, this -*h* is deleted before *sk-* (VPr. 3.13: लुङ् मुदि जित्त्वे ि), then doubling applies according to VPr. 4.103: *divaskkambhaniḥ*. To my understanding, the syntax of VPr. 4.106 involves difficulties in this interpretation, but these need not be dealt with in the present discussion.

¹⁷¹Uvaṭa and Anantabhaṭṭa consider that *samyogapūrva* ‘preceding a cluster’ is understood in VPr. 1.111 from VPr. 1.109, so that the former denies doubling only for an anusvāra that precedes a cluster: संयोगपूर्वं इत्यनुवर्तते । संयोगपूर्वोऽनुस्वारो न द्विरुच्यते । (VPrU 4.111), संयोगपूर्वं इति वर्तते । संयोगपूर्वोऽनुस्वारो न द्विरुच्यते । (VPrA 4/111). They consider that this is so because they also consider that VPr. 1.150 (see 7.2.3e) has to do with anusvāra not followed by a cluster. The reasoning is as follows. VPr. 1.111 establishes that anusvāra followed by a cluster has the duration of half a mora, so that VPr. 1.150 has to deal with anusvāra not followed by a cluster: . On the other hand, VPr. 1.111 is straightforwardly interpretable as stating that anusvāra does not undergo doubling. This implies that anusvāra is treated as the initial consonant of a cluster.

¹⁷²VS 3.28: सोमानुस्वरंशङ्खकृणुहि ब्रह्मणस्पते । क्वक्षीवन्तुथ्यं औशिजः ॥ Note that the Ṛgveda mode of recitation differs; see 9.1.2g with note 150.

¹⁷³VS 18.11: ऋद्धिश्च मे क्लुप्सच्च मे । Uvaṭa and Annambhaṭṭa cite ऋद्धिः क्लुप्सच्च to illustrate VPr. 114: लृवर्णे प्रत्यये न द्विरुक्तिर्भवति । ऋद्धिः क्लुप्सच्च । विसर्जनीयाद्भ्यञ्जनपर इति प्राप्तिः । (VPrU 4.114), लृवर्णे च फे न द्विरुच्यते । ऋद्धिः क्लुप्सच्च । अत्र विसर्जनीयाद्भ्यञ्जनपर इति जिह्वामूलीयोपध्मानीयां चेति प्राप्तकारद्वित्वापवादः । (VPrA 4.114). For the example cited by the commentators, VPr. 4.114 (e) is an exception to VPr. 4.107 (a), as they both point out; Annambhaṭṭa also notes that the former can be an exception to VPr. 4.104 (b), which he quotes in a variant version. For the example as found in the Vājasaneyisamhitā text, VPr. 4.114 is an exception to VPr. 4.1.101. In any case, the *k* of *klpta* would have to be treated as preceding a consonant. Accordingly, the sūtra must consider *l* to have the pronunciation *le*, comparable to the pronunciation *re* of *r*, which is known from early sources. PrS 2.3-5 (अथापरान्तस्थस्यानुक्तान्यहलः सथ्युक्तस्योष्मत्रकारैरेकारसहितोच्चारणम् । एवं तृतीयान्तस्थस्य क्वचित् । ऋकारस्य तु सथ्युक्तस्यथ्युक्त्वाविशेषेशैवम् ।) provide that *r* conjoined with a spirants or *r* is pronounced accompanied by *e*, that *l* is similarly pronounced with *e* sometimes, and that *r*, whether conjoined with another sound or not, always is pronounced with *e*.

¹⁷⁴In view of what VPr. 4.117 provides, VPr. 4.112 (e) must apply with respect to semivowels alone. This is noted by the commentators: अन्तस्थासंयोगोऽत्रोदाहरणम् । स्ववर्गीये चानुत्तम इति स्पर्शानां वक्ष्यति । (VPrU 4.112), अन्तस्थासंयोगोऽत्रोदाहरणम् । स्ववर्गीये चानुत्तम इति स्पर्शानां तु वक्ष्यति । (VPrA 4.112).

¹⁷⁵VS 3.12: अग्निर्मुद्धो दिवःककुहत्पतिः पृथिव्या अयम् ... ‘Agni the head, the peak of heaven, this (Agni) the master of earth ...’ In the padapāṭha, *kakut* is followed by a pause.

¹⁷⁶But *tan naḥ* (‘that to us’) → *tannaḥ*: VS 33.42: तन्नो मित्रो वरुणो मामहन्ताम् ... ‘Let Mitra, Varuṇa ... grant us that.’ Both Uvaṭa and Anantabhaṭṭa cite this as an example for VPr. 4.117. This is appropriate. For in a cluster where a non-nasal stop precedes a nasal of the same series, a yama is introduced, so that doubling is precluded by VPr. 4.115 (e).

followed by a vowel (*svare*) and preceded by a short vowel (*hrasvapūrvau*) are disallowed; instead, they are doubled:

h. VPr. 4.108: इत्तौ चेद्भ्रस्वपूर्वौ स्वरे पदान्तौ ।

For example: *yuñ asi* ('you are the yoker') → *yuññasi* (VS 10.25: युङ्ङसि), *aśman ūrjam* ('the strength on the rock') → *aśmannūrjjam* (VS 17.1: अश्मन्तूर्जम्...).

9.1.2.4 The following rules of the Śaunakīyā Caturādhyāyika concern consonantal doubling:

a. ŚCĀ 3.27-28 (3.2.2-3): डणना ह्रस्वोपधाः स्वरे (पदान्ते द्विः [26]) । संयोगादि स्वरात् ।

b. ŚCĀ 3.29-30 (3.2.6-7): न विसर्जनीयः । सस्थाने च ।

c. ŚCĀ 3.31-32 (3.2.8-9): रेफहकारौ परन्ताभ्याम् । शषसाः स्वरे ।

The first of these rules states that *-ñ*, *-ṇ* and *-n* (*padānte ṇññāḥ*) preceded by short vowels (*hrasvopadhāḥ*) are uttered twice if a vowel follows (*svare*), and the next sūtra provides for doubling the first consonant of a cluster (*samyogādi*) after a vowel. Rules in (b) disallow (*na*) doubling. This does not apply for *-ḥ* (*visarjanīyaḥ*) or to a consonant preceding one with the same place of production (*sasthāne*). Also exempted from doubling are (c) *r* and *h* (*rephahakārau*) and *ś*, *ṣ*, *s* before a vowel. On the other hand, a consonant that follows *r*, *h* (*paran tābhyām*) is doubled. In addition,

d. ŚCĀ 3.26 (3.2.1): पदान्ते व्यञ्जनन्दिः ।

provides that a consonant undergoes doubling at the end of a word (*padānte*). These rules are much more summary than those of other prātiśākhya. Moreover, ŚCĀ 3.26, for which I can contribute no new explanation,¹⁷⁷ is unique among these texts.¹⁷⁸

9.1.2.5 As can be seen from the rules considered, there are certain broad principles that apply generally for the transitional phenomena in question. Thus, in all Vedic recitation traditions and in the spoken language which Pāṇini describes sequences of the type *-ñ | V-* and *-n | V-* involving word final *-ñ* and *-n* preceded by short vowels are disallowed. Instead, one has two identical nasals straddling the word boundary. There are also many variations in different recitation traditions reflecting dialectal diversity, and some can involve competing principles. Thus, in a cluster AŚ₁K₂ the spirant can be subject to doubling by virtue of being the first member of a cluster. On the other hand, as can be seen from Middle Indic assimilations of the type Pāli *atthi* 'is' (Skt. *asti*), the stop of such

¹⁷⁷Possibly what is meant is that the consonant is checked and held, so that there is no immediate release. I cannot discuss this further, since it would require a discussion of details concerning the checking and holding of a consonant (*abhinidhāna*).

¹⁷⁸I say 'among these texts' because Kātyāyana too allows for doubling a word-final consonant (8.4.47 vt. 3: अ्रवसाने च ।). Patañjali (Bh. III.464.15-16) illustrates this option with *vākk/vāk* 'speech', *tvakk/tvak* 'skin', *srukk/sruk* 'ceremonial ladle': अ्रवसाने च द्वे भवत इति वक्तव्यम् । वाक्क् वाक् त्वक्क् त्वक् सुक्क् सुक् ।

a cluster has a higher tendency to predominate, so that it can be doubled. It is not surprising, then, to find alternates of the kind shown under 4 of chart II. In addition, particular details in *prātiśākhya*s can be due to the fact that the specific texts for which these works account may or may not have instances of certain particular sequences. For example, these texts have no instances of word-final *-ṅ* preceded by a short vowel and followed by a word-initial vowel.

Chart II summarizes the data considered.

9.1.2.6 The *Ṛgvedaprātiśākhya* acknowledges that *anusvāra* behaves phonologically like a consonant or a vowel (RPr. 1.5 [4.1.2a]). In its general rule for consonant doubling, the same treatise (RPr. 6.1 [9.1.2.2a]) provides that this applies to the first consonant of a cluster preceded by a vowel or *anusvāra*. It is to be assumed, I think, that, as doubling does not apply to a vowel, so also does it not apply to *anusvāra*, which is not treated as a cluster-initial segment. On the other hand, it is reasonable to conclude that the *Vājasaneyiprātiśākhya* treats *anusvāra* as a consonant and, accordingly, as a possible first member of a cluster. For it has a rule (VPr. 4.111 [9.1.2.3e]) specifically disallowing doubling of *anusvāra*. In both recitation traditions, then, *anusvāra* is not susceptible to doubling. In the traditions of the *Taittirīyasamhitā*, however, there is some variation concerning this point. Commenting on TPr. 14.1 (9.1.2.1a), the *Vaidikābharāṇa* remarks that this *sūtra* also provides for the first consonant of a cluster to undergo doubling in examples such as *indram ssvarājānam* (← *indram svarājānam*).¹⁷⁹ This is explained as follows. There is a general metarule governing how sandhi rules apply: a linearly prior operation or a prior rule (*pūrvam pūrvam*) is applied first (*prathamam*):

a. TPr. 5.3: पूर्व पूर्वम्प्रथमम् ।

In accordance with this, doubling by TPr. 14.1 applies prior to the introduction of *anusvāra* by TPr. 15.3 (3.4.2.3c). Before *anusvāra* is introduced, then, one has *indra svarājānam*, in which the cluster *sv-* directly follows a vowel, so that doubling can apply by TPr. 14.1; only after TPr. 15.3 has applied to introduce *anusvāra* is the first member of the consonant cluster separated from the preceding vowel.¹⁸⁰ The *Vaidikābharāṇa* immediately goes on, however, to note that according to the *śikṣā* *anusvāra* is doubled,

¹⁷⁹TS 2.3.6.1: तद्विमाल्लोकानुभ्यर्त्यरिच्युतेन्द्रं राजानमिन्द्राधिराजमिन्द्रं स्वराजानम् ‘That (food) encompassed and went beyond these worlds: (those ruled over by) king Indra, overlord Indra, self-ruling Indra.’ Instead of इन्द्रं स्वराजानम्, with a single *anusvāra*, the edition of the *Vaidikābharāṇa* prints a double *anusvāra*, but this is inappropriate for the context of the argument. It is only subsequently that *Gārgyagopāla* Jayvan goes on to note that doubling of *anusvāra* is desired in accordance with what the *śikṣā* says.

¹⁸⁰TPrVA 14.1: तथानुस्वारस्य तु परसुत्रविधेयत्वेनाव्यवधायकत्वमुक्तमष्टाध्याये । तेनानुस्वारात्परस्य संयोगादेरनेन विधिना द्वित्वं भवति । The reference to the eighth *adhyāya* is to the *Vaidikābharāṇa* on TPr. 8.15, which need not be considered here.

even though it is provided for by a later rule, and he cites

b. SŚ 5: ... अनुस्वारो द्विरुच्येत संयोगे परतस्स्थिते ।

according to which anusvāra should be uttered twice (*anusvāro dvir ucyeta*) if a consonant cluster follows (*saṃyoge paratas sthite*).¹⁸¹ This mode of recitation would correlate with the change of anusvāra to a velar consonant (see 7.2.2k-m).

9.1.2.7 As shown (see 9.1.1c, 9.1.2.1k, 9.1.2.2c, 9.1.2.3c, 9.1.2.4a, chart II.9), *-m* differs from *-ṅ*, *-ṇ* and *-n* with respect to a transitional property. A sequence of the type *-an|A-* is impermissible; instead, one finds *-an | nA-*. On the other hand, *-am | A-* does occur, and one does not have instead *am | mA-*, with a doubled *m* straddling a word boundary after a short vowel. This can be related with degrees of occlusion, such that *-m* is characterized by less occlusion than other word-final nasals. In turn, this is associated with the fact that *-m* assimilates fully to following consonants.

9.2 Prātiśākhya also contain rules of syllabification.¹⁸² It will be best to begin with the rules of the Vājasaneyiprātiśākhya.

9.2.1 The word which is generally translated *syllable* is *akṣara*. It is clear from what the Vājasaneyi-prātiśākhya says that the basic aspect of an *akṣara* is its having a vowel, which is the proper tone bearer. Thus,

a. VPr. 1.99: स्वरोऽक्षरम् ।

provides that a vowel (*svaraḥ*) has the class name *akṣara*, and

b. VPr. 1.107: व्यञ्जनं स्वरेण सस्वरम् ।

states that a consonant (*vyañjanam*) has a pitch tone (*sasvaram*) in association with the vowel (*svareṇa*) to which it is ancillary.¹⁸³ A vowel by itself can thus constitute an *akṣara*, which can also consist of a vowel with one or more consonants. Other rules of

¹⁸¹TPrG 14.1: अनुस्वारस्य तु परसूत्रविधेयस्यापि संयोगपरत्वे द्वित्वमिष्यते अनुस्वारो द्विरुच्येत संयोगे परतस्स्थिते इति शिञ्जावचनात् । Gārgyagopāla Yajvan explicitly says that the doubling is desired and accepted (*iṣyate*) by virtue of what the śikṣā says, so that presumably this was the accepted pronunciation in the recitation known to him.

¹⁸²On this topic, see recently Kobayashi 2004: 39-41.

¹⁸³In his discussion of A 1.2.29-30, Patañjali also makes the point that pitches are properly qualities (*guṇāḥ*) of vowels alone (*aca eva*), not of consonants (*naite vyañjanasya guṇāḥ*). He also remarks that pitches are indeed directly perceived (*pratyakṣam upalabhyante*) to be qualities of consonants, and cites इषे त्वोर्जेत्त्वा to illustrate (see notes 127, 165). He then goes on to say that a consonant is perceived as having a pitch property because of being close to a vowel with the property: Bh. 1.206.16-19: अथ प्रथमानिर्दिष्टमज्ग्रहणमनुवर्तत उताहो न । किं चार्थोऽनुवृत्त्या । बाढमर्थः यद्येते व्यञ्जनस्यापि गुणा लक्ष्यन्ते । ननु प्रत्यक्षमुपलभ्यन्ते इषे त्वोर्जेत्त्वा । नैते व्यञ्जनस्य गुणाः किन्त्वच एव । तत्सामीप्यात् व्यञ्जनमपि तद्गुणमुपलभ्यते । A similar point is made in the Yājñavalkyaśikṣā, where it is said that a vowel (*svaraḥ*) is high (*uccaḥ*), low (*nīcaḥ*) or svarita and that a consonant has pitch properties by virtue of occurring with a vowel: YŚ 2.29 (p. 96): स्वर उच्चः स्वरो नीचः स्वरः स्वरित एव च । स्वरप्रधानं त्रैस्वर्यं व्यञ्जनं तेन सस्वरम् ॥ This passage is cited by Uvaṭa and Anantabhaṭṭa in their comments on VPr. 1.107 and by Uvaṭa in his comments on RPr. 1.22 (see 9.2.3).

this section state which consonants of a sequence go with what vowel:

c. VPr. 1.100-101: सहाद्यैर्व्यञ्जनेः (स्वरोऽक्षरम् [99])। उत्तरैश्चावसितैः ।

d. VPr. 1.102-106: संयोगादिः पूर्वस्य । यमश्च । क्रमजञ्च । तस्माच्चोत्तरं स्पर्शं । अवसितञ्च ।

A vowel forms an akṣara together with (*saha*) initial consonants (*ādyair vyañjanaiḥ*) that precede it and with absolute final (*avasitaiḥ*) consonants that follow it (*uttaraiḥ*): CV-, -VC#. Certain consonants go with a vowel that precedes (*pūrvasya*): the first consonant of a cluster (*saṁyogādih*); a yama (*yamaḥ*);¹⁸⁴ the first consonant of a sequence which results from doubling conditioned by a preceding consonant (*kramaḥ*); the consonant that immediately follows this (*tasmāt uttaram*) and precedes a stop (*spārśe*); a final consonant before pause (*avasitam*). For example, in *iṣettvā* (see 9.1.2.3a), the first consonant of the cluster *-ttv-* goes with the preceding vowel: *i-ṣet-tvā*. In *sakththmñā* (← *sakthnā*), there is a cluster *kththmñ*; the yama (*thmñ*) that makes a transition between *th* and the following nasal goes with the preceding vowel, along with the *th* it accompanies: *sakththmñ-nā*.¹⁸⁵ In *varṣṣyāya* (dat. sg. ← *varṣyāya*) ‘pluvial’ (VS 16.38: नमो वष्य्याय), the cluster *-rṣṣy-* contains *-ṣṣ-* as a result of consonant doubling after *-r-* (VPr. 4.1.102); the *-r-* (VPr. 1.102) and the first *-ṣ-* of this cluster go with the preceding vowel: *vārṣ-ṣyā-ya*. *pārṣṣṇyā* (instr. sg. ← *pārṣnyā*) ‘with the heel’ contains a cluster *-rṣṣṇy-* in which *-ṣṣ-* results from doubling after *-r-*, *-ṇ-* from doubling after the spirant (VPr. 4.103 [9.1.2.3b]); the cluster-initial *-r-*, the *-ṣ-* following it (VPr. 1.104) and the *-ṣ-* and *-ṇ-* which follow this (VPr. 1.105) all go with the preceding vowel: *pārṣṣṇ-nyā*.¹⁸⁶

¹⁸⁴If this nasalized transitional stop goes with a preceding vowel, the stop which accompanies must also do so. According to Uvaṭa and Annambhaṭṭa, *ca* of VPr. 1.103 serves to provide that a yama it goes with a preceding vowel accompanied by the stop that precedes: यमः पूर्वस्याङ्गं भवति । चशब्दात्पूर्ववर्णसहितः । (VPrU 1.103), ... चशब्दात्पूर्ववर्णसहितः । (VPrA 1.103).

¹⁸⁵Examples such as *rukmaṁ* involve issues that I do not consider here. In his commentary on VPr. 1.103, Uvaṭa remarks that this has a double *k* followed by a yama and *m*, with a division *rukkm-mam*: यथा रुक्मम् । ककारद्वयमकाराः संयोगः । तत्र ककारयमौ पूर्वस्य मकार उत्तरस्य । (VPrU 1.103).

¹⁸⁶The example *pārṣṣṇyā* requires some discussion. Uvaṭa and Annambhaṭṭa comment as follows: तस्मात् क्रमजा-द्यदुत्तरं व्यञ्जनं तत्पूर्वाङ्गं भवति स्पर्शं परभूते । यथा पाष्यार्या (Varma 1975: 57: पाष्यार्या) । रेफकारौ द्वौ शकारौ यकारश्च संयोगः । तत्र रेफः संयोगादिरिति षकारः क्रमजमिति कृत्वा तस्माच्चोत्तरं स्पृश इति कृत्वा पूर्वशकारश्च एते पूर्वाङ्गम् द्वितीयशकारो यकारश्चोत्तरस्य स्वरस्याङ्गम् । (VPrU 1.105), तस्मात् क्रमजादुत्तरं व्यञ्जनं पूर्वाङ्गं भवति स्पर्शे परे । यथा पाष्यार्या (Varma 1975: 58: पाष्यार्या) इत्यत्र रेफकारौ द्वौ शकारौ यकारश्च संयोगः ॥ तत्र रेफस्य संयोगादित्वात्पूर्वाङ्गत्वम् प्रथमषकारः क्रमज इति कृत्वा पूर्वाङ्गमेव तस्माच्चोत्तरं स्पर्श इति कृत्वा पूर्वशकारः पूर्वाङ्गम् द्वितीयशकारो यकारश्चोत्तराङ्गं भवति । (VPrA 1.105). It is noteworthy that both commentators state how the sequence of consonants arises and speak of a prior *ṇ* (*pūrvaṇakārah*) and a second *ṇ* (*dvītiyaṇakārah*), and that Annambhaṭṭa speaks of a first *ṣ* (*prathamah ṣakārah*). They thus assume that the form in question should indeed be realized as *pārṣṣṇyā*, under the view that VPr. 4.102-103 do not provide for optional doubling. If, on the other hand, these rules are considered to apply as alternatives one to the other, they would allow *pārṣṣṇyā*, with only one *-ṇ-*, the first *ṣ* would be assigned to the preceding vowel by VP4. 1.104, the second by VPr. 1.105. The reading *pārṣṣṇyā* (पाष्यार्या) is in fact found in some editions, for example that of Pt. Daulatram Gaur (1965). It is undeniable, however, that both Uvaṭa and Anantabhaṭṭa doubtless must have heard recitations with two *ṇ*

9.2.2 According to

a. TPr. 21.1-2: व्यञ्जनं स्वराङ्गम् । तत्परस्वरम् ।

b. TPr. 21.3-6: अवसितम्पूर्वस्य । संयोगादि । परेश चासाहितम् । अनुस्वारस्वरभक्तिश्च ।

a consonant (*vyañjanam*) is a subsidiary constituent relative to a vowel (*svarāṅgam*); that is, it goes along with a vowel. Moreover, it partakes of the accentual properties of that vowel (*parasvaram*).¹⁸⁷ A consonant followed by pause (*avasitam*), on the other hand, shares the accentual properties of a preceding vowel (*pūrvasya*), with respect to which it is a constituent (*svarāṅgam*). This is true also of: the first consonant of a consonant cluster (*samyogādi*); a consonant that is not directly joined with (*asamhitam*) a following vowel (*pareṇa*); anusvāra and an epenthetic vowel segment. The following provide that certain consonants which, by previous rules, would go with a preceding vowel do not (*na*):

c. TPr. 21.7-9: नान्तस्थापरमसवर्णम् । नासिक्याः । स्पर्शश्लोष्मपर ऊष्मा चेत्यरस्य ।

The consonants in question are: one followed by a semivowel (*antasthāparam*), provided the two are not homogeneous, identical (*asavarṇam*); nasal segments introduced as transitions (*nāsikyāḥ*); a stop (*sparśaḥ*) followed by a spirant (*ūṣmaparaḥ*), if the spirant goes with the following vowel (*ūṣmā cet parasya*).

For example: *iṣettvā* (← *iṣe tvā*: TPr. 14.1 [9.1.2.1a]) = *i-ṣet-tvā*; *vāk* (VS 5.33 *padapāṭha*), *urupprathassva* (← *uru prathasva*) = *u-rup-pra-thas-sva*, *ūrmmiñīrmmadhumattamāḥ* (← *ūrmiñīr madhumattamāḥ*) = *ūrm-mi-ñīrm-ma-dhu-mat-ta-māḥ*, *pratyusṣṭam rakṣaḥ* (← *pratyusṣṭam rakṣaḥ*, see 3.4.2.3c) = *prat-tyuṣ-ṣṭam rak-ṣaḥ*, *rukknmam* (← *ruknam*) = *rukk-kñmam*, *tatthasavituh* (TPr. 14.12 [note 138]) = *tat-thsa-vi-tuh*.

9.2.3 The following rules of the Ṛgvedaprātisākhya also provide for consonants to go with vowels as syllabic members:

sounds here. There also remains a textual issue: instead of रेफकारौ one could better read रेफः षकारौ to accord with the rest of the commentaries. Other details need not be dealt with here. Note only that the Ṛgveda recitation tradition differs; see 9.2.3 with note 191.

¹⁸⁷*tat* ‘that’ in TPr. 21.2 refers to a consonant and *svaraparam* is susceptible to different interpretations. Somayārya interprets this as a karmadhāraya compound and supplies *bhajate*, so that the sūtra states that a consonant partakes of a vowel, is subservient to it, that is, goes with it and shares its properties: ... तत् अङ्गभूतं व्यञ्जनं परस्वरं भजते ... परश्चासौ स्वरश्च परस्वरः तं परस्वरम् । (TPrS 21.2). The Vaidikābharāṇa specifies that the consonant partakes of the accentual properties of the vowel with which it goes: अनेन पूर्वोत्तरयोगुणभेदे उत्सर्गरूपा विनिगमनोच्यते । तद्व्यञ्जनं परस्परगुणभूतमुदात्तादिस्वरं भजत इति सामान्यम् । Gārgyagopāla Yajvan understands *svara* as referring here to accentual features of a vowel. This makes it much easier to understand *parasvaram* as a bahuvrīhi: *para udātādīrūpaḥ svaro yasya tat*: a consonant has the accent which follows; that is, it shares the accentual properties of a following vowel. Thus, TPr. 21.2 explains how a consonant is an ancillary constituent relative to a vowel (*svarāṅgam*): in general, it shares the properties of a following vowel. Subsequent sūtras provide that such and such a consonant is a *svarāṅga* relative to a preceding vowel; it has this status by sharing the accentual properties of that vowel.

- a. RPr. 1.22: अनुस्वारो व्यञ्जनञ्चाक्षराङ्गम् ।
 b. RPr. 1.23: स्वरान्तरे व्यञ्जानान्युत्तरस्य ।
 c. RPr. 1.24: पूर्वस्यानुस्वारविसर्जनीयौ ।
 d. RPr. 1.25-26: संयोगादिर्वा । च परक्रमे द्वे ।

The first sūtra states that anusvāra and any consonant is a syllable constituent ancillary to a vowel (*akṣarāṅgam*). Consonants (*vyañjanāni*) that occur between vowels (*svarāntare*) belong to a following vowel (*uttarasya*). Anusvāra and visarjanīya, however, belong to a preceding vowel (*pūrvasya*). The first member of a consonant cluster (*saṃyogādih*) optionally (*vā*) goes with the preceding vowel. In clusters where doubling applies to a consonant after another (*parakrame*), two consonants (*dve*) that result also (*ca*) optionally go with the preceding vowel. In addition, by

- e. RPr. 1.32: स्वरभक्तिः पूर्वभागक्षराङ्गम् ।

an epenthetic vowel segment (*svarabhaktih*) introduced after post-vocalic *r* followed by consonants¹⁸⁸ is a syllable constituent (*akṣarāṅgam*) that goes with the preceding vowel (*pūrvabhāk*).

For example, the *-y-* of *ayam* ‘this’ (nom. sg. masc.) goes with the second vowel: *a-yam*. It thereby partakes of the high-pitch quality proper to this vowel, not the low-pitch of the first vowel.¹⁸⁹ The first consonant of the cluster *-ttv-* in *āttvā* (← *ā tvā*: RPr. 6.1 [9.1.2.2a]) optionally goes with the first vowel: *āt-tvā*. The high-pitch of *ā* then extends through *t*, which is perceived as having this tonality, then a transition to low pitch applies starting with the *t* of *tvā*. On the other hand, if doubling does not apply (RPr. 6.14 [9.1.2.2h]), one can have *ā tvā*.¹⁹⁰ In *pārṣṣṇyā* (RV 1.162.17b: पाष्शर्षी), the cluster

¹⁸⁸RPr. 6.46-53 concern svarabhakti, the contexts in which it is introduced, its vowel-color, and its duration. I cannot consider these rules here.

¹⁸⁹Uvaṭa makes a point of bringing out the accentual features, as when he says that since *ayam* has a high-pitched last vowel (*antodāttatvāt*), *y* is heard (*śrūyate*) as high-pitched (*udāttavat*): यथा अयम् इत्ययंशब्दस्यान्तोदात्तत्वाद्यकार उदात्तवच्छ्रूयते । (RPrU 1.23).

¹⁹⁰In his commentary on RPr. 1.25, Uvaṭa considers *āttvā*, about which he says the following. The first *t*, which results from doubling (*kramajas takārah*), goes with the preceding vowel; and since this vowel is high-pitched, the *t* is heard as high-pitched. The second *t*, which is the first consonant of the original cluster, goes either with the preceding vowel, in which case it too is heard as high-pitched, or with the second vowel, in which case it is heard as low-pitched. The *v* pertains to the second vowel and is heard as low-pitched because this vowel is low-pitched: यथा आ त्वा रथम् इति द्वौ तकारौ वकारश्च संयोगः । तत्र क्रमजः प्रथमस्तकारः पूर्वस्याङ्गं तस्य चोदात्तत्वादुदात्तवच्छ्रूयते । द्वतीयः संयोगादिः पूर्वस्य वोदात्तस्याङ्गमुत्तरस्य वानुदात्त-स्वरस्याङ्गमुदात्तानुदात्तवच्छ्रूयत इत्यर्थः । वकारो द्वितीयस्य स्वरस्याङ्गं तस्य चानुदात्तत्वादनुदात्तवच्छ्रूयते । There are some points here that merit comment. First, the Ṛgvedaprātiśākhya does not have an explicit rule comparable to VPr. 1.104 (9.2.1d). Secondly, there is nothing in the text to indicate that *saṃyogādih* refers to anything other than the first consonant of a cluster. As is clear from RPr. 1.26, moreover, the rules of this section apply after rules of consonantal doubling have taken effect. Consequently, *saṃyogādih* of RPr. 1.25 should, on the face of it, refer to the first consonant of a cluster pure and simple, including the initial consonant of a cluster after doubling. Accordingly, *āttvā* could be segmented *āt tvā* or *ā ttvā*. In addition, if doubling does not apply, in accordance with Sākalya, *ā tvā* can at least theoretically be segmented also as *āt vā*.

-*rṣṣṇy-* contains -*ṣṣ-* due to doubling after -*r-* (ṚPr. 6.4); -*r-* along with its anaptyctic vowel segment goes with the preceding vowel; the doubled consonant -*ṣṣ-* optionally goes with the same preceding vowel or not: *pārṣṣ-nyā* / *pār-ṣṣnyā*.¹⁹¹

9.2.4 Once more, the Śaunakīyā Caturādhyāyikā rules are the most summary:

ŚCĀ 1.55-58 [1.2.15-18]: परस्य स्वरस्य व्यञ्जनानि । संयोगादि पूर्वस्य । पद्यञ्च । रेफहकारक्रमजञ्च ।

In general, consonants (*vyañjanāni*) pertain to a following vowel (*parasya svarasya*). However, consonants in particular contexts go with a preceding vowel: the first consonant of a cluster (*saṃyogādi*), a word-final consonant (*padyam*) before pause, and the first consonant resulting from doubling (*kramajam*) after *r* and *h* (see 9.1.2.4c).

9.2.5 There is also some evidence from the Aṣṭādhyāyī which should be noted in this context. This involves the derivation of desiderative bases from bases that begin with a vowel, formed with the suffix *sa*.¹⁹² For example *edidhiṣa* (3rd sg. pres. ind. *edidhiṣate*) is the desiderative of *edh* ‘thrive’. Pāṇini provides for repeating a segment of a base containing *sa* that contains a single vowel (*ekāc*), that is, a syllable. The general rule for all such repetition is that the first syllable is repeated, but if an item subject to this operation begins with a vowel, then the second syllable is repeated. Thus, in deriving *bubhūṣa* ‘wish to be’ (*bubhūṣati*) the first syllable of *bhū-sa* is iterated, but to derive *edidhiṣa* the second syllable of *e-dhi-sa* is iterated. Here the morphological division of the base prior to iteration is *edh-isa*, with the initial augment *i* added to the suffix.

Consider now the desideratives of *und* ‘wet’ and *arc* ‘praise, honor’: *undidiṣa* (*undidiṣati*), *arciciṣa* (*arciciṣati*). The morphological division here is *und-isa*, *arc-isa*. To arrive at *undidisa* and *arcicisa*, whence *undidiṣa* and *arciciṣa*, one of the segments is to be repeated. Moreover, we know from Vedic recitation traditions that there was variation in how the initial consonant of an interior cluster is distributed: generally, it goes with the prior vowel (VPr. 1.102 [9.2.1d], TPr. 21.3 [9.2.2b], ŚCĀ 1.56 [9.2.4]), but the Ṛgvedaprātiśākhya (1.25 [9.2.3d]) allows also both consonants of a biconsonantal cluster to go with a following vowel. If *undisa* and *arcisa* are segmented *un-di-sa* and *ar-ci-sa*, according to the prevailing pattern, nothing more need be said. Repeating the segments *di* and *ci* gives *undidisa* and *arcicisa*, as required. On the other hand if *undisa*

Certainly, Uvaṭa mentions a similar possibility. On the other hand, external sandhi rules call for voicing under such circumstances and the Taittirīyaprātiśākhya explicitly says that a consonant other than an identical semivowel does not go with a preceding vowel (TPr. 21.7 [9.2.2c]). I therefore doubt that such a segmentation was truly made, although I cannot definitely prove this.

¹⁹¹ṚPrU 1.26: तथा पाष्प्या वा इति रेफः षकारौ द्वौ षकारौ यकारश्च संयोगः । तत्र रेफः स्वरभक्त्या सहितः पूर्वस्वरस्याङ्गं तस्य चोदात्तत्वादुदात्तवच्छ्रूयते। षकारौ पूर्वस्य वा स्वरस्याङ्गमुत्तरस्य वा । संयोगादिर्षकारो यकारश्चोत्तरस्य स्वरस्याङ्गं तस्य स्वरितत्वात्स्वरितवच्छ्रूयते । See note 186.

¹⁹²*san*, with the marker *n*. On rules which apply relative to the derivation of desideratives with this suffix, see Cardona 1997: 24, 279, 382-383 and pp. xvi-xvii.

and *arcisa* are segmented *u-ndi-sa* and *a-rci-sa*, simply repeating the second segment leads to undesirable results. The immediate outcome of this operation is *u-ndi-ndi-sa* and *a-rci-rci-sa*. The first of two segments that result from such repetition is called *abhyāsa*, and only the first consonant of an *abhyāsa* is allowed to remain. Accordingly, the second consonant of *-ndi-* and *-rci-* would now be dropped: *u-ndi-ndi-sa* → *u-ni-ndi-sa*, *a-rci-rci-sa* → *a-ri-rci-sa*. The outcome would be **unindiṣa* and **arirciṣa* instead of *undidiṣa* and *arciciṣa*. To avoid the undesirable results under this segmentation, then, requires one to disallow repeating the *-n-* and *-r-* of *undisa* and *arcisa*. The Aṣṭādhyāyī has a rule (A 6.1.3: न न्नाः संयोगादयः ि) which states that cluster-initial (*saṃyogādayaḥ*) *n*, *d* and *r* (*ndrāḥ*) of a second segment with a single vowel are not (*na*) repeated under conditions stated. We have, then, to conclude that for Pāṇini *undisa* and *arcisa* were indeed segmented *u-ndi-sa* and *a-rci-sa*, so that cluster-initial *-n-* and *-d-* followed a vowel. This although the language does not allow word-initial *ndV* and *rcV* and the prevalent segmentation is otherwise.¹⁹³

9.6 In sum, evidence from *prātiśākhya*s and Pāṇini bears witness to a variation in syllabic segmentation also.

10. The available evidence requires one to accept that in early Indo-Aryan there was considerable variation with respect to timing and transitions, so that there were alternative sequences of the types *āt-tvā*, *ā tvā* (see 9.1-9.1.2.6), which involved differing transitions from one tonal segment to another (see 9.2-9.2.5). Dialectal variants of the types *sayṃyattāḥ*, *saṃyattāḥ*, and *samyattāḥ*, with a nasalized consonant (*yṃ*), a nasalized vowel (*aṃ*), and a vowel followed by anusvāra, are also best interpreted as reflecting differences in transition, starting with *samyattāḥ*, in which a word boundary occurs between *sam* and *yattāḥ* (see 8-8.5).

Its phonological behavior justifies concluding that word-final *-m* was characterized by less occlusion than other word-final nasals. Accordingly, *-m* does not occur in sequences

¹⁹³This brings up the question, what relation do the syllabification rules given in *prātiśākhya*s have to the phonological rules formulated in these texts. From what has been shown, it is clear that the syllable division rules presuppose the earlier application of phonological rules, including those which provide for consonant doubling and epenthesis. The segmentations provided by these rules thus does not play a role in the application of phonological rules. It is noteworthy that Pāṇini has a very detailed set of phonological rules, including rules providing for consonantal doubling — not, however, epenthesis rules — but does not have any syllabification rules. I therefore consider it appropriate to accept that the purpose of *prātiśākhya* syllabification rules is as portrayed by commentators: These rules deal with segmentations involving transitions from one tonal unit to another. Although the common wisdom is that there is no ascertained correlation between any physical phonetic properties and syllables — which are phonological constructs — the fact that the *prātiśākhya* segmentation rules serve no purpose in the phonological rules of these treatises forces us, I think, to two possible conclusions. First, the Indian phonologists/phoneticians did indeed perceive tonal transitions which they could associate with different segmentations. Alternatively, the segmentation rules formulated in the *prātiśākhya*s are not syllabification rules as conceived of by modern phonologists.

of the type $-am \mid mA$ comparable to $-an \mid nA$ (see 9.1.2.7). $-m$ also does not occur as the initial consonant in consonant clusters of the type $-m \mid Y-$, which would be subject to consonantal doubling: $-mmY-$ across a word boundary. Instead, $-m$ assimilates to following stops and semivowels other than r : $-m \mid Y- > -Y\acute{m} \mid Y-$, $-m \mid K- > -K^n \mid K-$. In addition, the word boundary could have the effect of keeping $-m$ with a preceding vowel as part of a grammatical and pitch segment, so that $-Am$ could develop either into a nasalized vowel ($-A\acute{m}$) or a clear vowel followed by a vocalic segment of the same color but with nasality, that is, to a sequence of vowel and anusvāra. The Vedic evidence indicates it is reasonable to say these last two developments were originally restricted to $-m$ followed by r or spirants and that they were subsequently generalized as variants before stops and semivowels other than r , as in the language described by Pāṇini.

Chart I. Behavior of *-m* and *-n* (3-3.5)

[Symbols used: A: vowel (*svara*); Ā: long vowel; K: stop (*sparsā*); Kⁿ: nasal stop (*uttama, pañcama*); Y: semivowel (*antasthā*) other than *r*; Ś: spirant (*ūṣman*) ś ś *s* and semivowel *r*; R: *-r -ś -ṣ -s -h* (see 4.1.1 with note 77), depending on context; C: consonant; Cx: set of consonants specified in rule; |: word boundary; P: Pāṇini; ṚPr.: Ṛgvedaprātiśākhya; TPr.: Taittirīyaprātiśākhya; VPr.: Vājasaneyiprātiśākhya; VŚ: Vyāsaśikṣā; ŚCĀ: Śaunakīyā Caturādhyāyikā; some: some teachers or recitors]

Original	Outcome	Sources
1. <i>-Am</i> K-	-AK ⁿ K-	P ṚPr. ŚCĀ VPr. TPr.
<i>-Am</i> K-	-Aṁ K-	P
2. <i>-Am</i> Y-	-AYṁ Y-	P ṚPr. ŚCĀ VPr. TPr.
<i>-Am</i> Y-	-Aṁ Y-	P TPr. (some)
<i>-Am</i> Y-	-Aṁ Y-	TPr. (some)
3. <i>-Am</i> Ś-	-Aṁ Ś	P ṚPr. VPr. TPr.
<i>-Am</i> Ś-	-Aṁ Ś-	ŚCĀ VPr. (Kāśyapa, Śākaṭāyana)
4. <i>-An</i> <i>l</i> -	-Alṁ <i>l</i> -	P ṚPr. ŚCĀ VPr. TPr.
<i>-An</i> <i>l</i> -	-Aṁ <i>l</i> -	TPr. (Ātreya)
5. <i>-An/Am</i> Cx-	-AṁR Cx-	P ṚPr. ŚCĀ VPr. TPr.
<i>-An/Am</i> Cx-	-AṁR Cx-	P ṚPr. (some: error) VPr. (Aupaśavi)
[Cx = palatal, retroflex or dental voiceless stop]		
6. <i>-Ān</i> A-	-Aṁ A-	P ŚCĀ VPr. TPr.
<i>-Ān</i> A-	-Aṁ A-	TPr. (some) VŚ

Chart II. Transitional phenomena (9.1-9.1.2.5)

[In addition to the symbols used in chart I, the following are used here: a: short vowel, K^v: stop of the same series (*savargīya*) other than a nasal, K^l: voiceless stop (*prathama*), K^r: retroflex stop (*tavarga*), K^d: dental stop (*tavarga*), Ś^a: voiceless spirant (*aghoṣa ūṣmā*), #: pause. Subscripts indicate the position of a consonant; e.g., C₁, C₂ designate the first and second consonants of a cluster, K₂ a stop which is the second member of a consonant cluster]

Original	Result of doubling	Doubling disallowed	Sources
1. AC ₁ C ₂	AC ₁ C ₁ C ₂		P TPr. ṚPr. VPr. ŚCĀ
2. ArC ₂ A	ArC ₂ C ₂ A		P TPr. ṚPr. ŚCĀ
3. AhC ₂ A	AhC ₂ C ₂ A		P VPr. ŚCĀ
4. a. AŚ ₁ K ₂	AŚ ₁ Ś ₁ K ₂ / AŚ ₁ K ₂ K ₂		ṚPr.
b. AŚK ₂	AŚK ₂ K ₂		VPr.
5. a. AŚC ₁ C ₂	AŚC ₁ C ₂ C ₂		VPr.
b. AYK ₂	AYK ₂ K ₂		VPr.
c. AḷK ₂	AḷK ₂ K ₂		VPr.
d. ApK ₂	ApK ₂ K ₂		VPr.
e. Ah K ₂ C	Ah K ₂ C ₂		VPr.
6. a. A/K ₂	A//K ₂ / A/K ₂ K ₂		TPr. (Pauṣkarasādi)
b. A/K ₂	A/K ₂ K ₂		TPr. (some) ṚPr.
7. a. AvK ₂	AvvK ₂ / AvK ₂ K ₂		TPr. (Pauṣkarasādi)
b. AvK ₂	AvK ₂ K ₂		TPr. (some)
8. -AC	-ACC		ŚCĀ
9. a. āñ A-	āñ ñA-		P TPr. ṚPr. VPr. ŚCĀ
b. ān A-	ān nA-		P TPr. ṚPr. VPr. ŚCĀ
c. āṇ A-	āṇ ṇA-		P ŚCĀ
10. a. āch	ācch		P ṚPr.
b. -Ā ch-	-Ā ch- / -Ā cch-		P
c. mā ch-	mā cch-		P ṚPr.
d. ā ch-	ā cch-		P TPr.
[See also TPr. 14.8 (9.1.2.1c), ṚPr. 6.12-13 (9.1.2.2c, note 159)]			
11. Ś ₁ C ₂	Ś ₁ Ś ₁ C ₂ / Ś ₁ C ₂		ṚPr.
12. -C #	-C ₁ C ₁ #		ŚCĀ

Original	Result of doubling	Doubling disallowed	Sources
13. AC ₁ C ₂		AC ₁ C ₂	P ṚPr. (Śākalya)
14. ĀC ₁ C ₂		ĀC ₁ C ₂	P (ācāryas)
15. AC ₁ C ₂ C ₃		AC ₁ C ₂ C ₃	P (Śākaṭāyana)
16. AC ₁ C ₁		AC ₁ C ₁	TPr. ŚCĀ
17. a. AK ^v ₁ K ^v ₂		AK ^v ₁ K ^v ₂	TPr. VPr. ŚCĀ
b. AC ₁ C ₂ C ₂		AC ₁ C ₂ C ₂	ṚPr.
18. ArŚ ₂ A		ArŚ ₂ A	P TPr. ṚPr.
19. a. Ah C		Ah C	TPr. ŚCĀ
b. Ahk C		Ahk C	TPr.
c. Ahp C		Ahp C	TPr.
20. AŚK ¹		AŚK ¹	TPr. (Plākṣi, Plākṣāyana)
21. AŚ ^a C		AŚ ^a C	TPr. (Hārīta)
22. Ahr		Ahr	TPr. (Hārīta)
23. AK ¹ K ¹		AK ¹ K ¹	TPr. (Hārīta)
24. a. Aly			TPr. (Hārīta)
b. Aty		Aty	TPr. (Hārīta)
c. Alv		Alv	TPr. (Hārīta)
d. Atv		Atv	TPr. (Hārīta).
25. AvC		AvC	TPr. (Hārīta)
26. a. Alh		Alh	TPr. (some)
b. Alś		Alś	TPr. (some)
c. Alv		Alv	TPr. (some)
27. AC ₁ C ₂		AC ₁ C ₂	TPr. (some)
28. ArC #		ArC #	TPr. ṚPr. VPr.

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- BhR Rohtak edition of the *Mahābhāṣya*. See Vedavrata.
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ṚPrU Uvaṭa's commentary on the *Ṛgvedaprātiśākhya*. See Shastri, Mangal Deva.

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初期インド・アーリア語における鼻音の発達： アヌナーシカとアヌスヴァーラ

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キーワード：インド・アーリア語 音韻と音声 鼻音 韻律 タイミングと遷移

要旨

初期インド・アーリア語の鼻音の発達についてはさまざまな議論がなされてきた。その主たる争点は、文法家パーニニやプラーティシャークヤ文献、シクシャー文献の著者がアヌナーシカとアヌスヴァーラと呼ばれる音を区別していることが、実際の言語における区別を反映しているか、あるいは同じものの違った見方にすぎないかという点であった。Whitney は後者の見解を示し、彼の見方はのちに批判されたものの、まだ決定的に論駁されていない。本論で筆者は、問題の区別は実際の言語における、鼻母音または非継続鼻音であるアヌナーシカと、母音に後続する鼻音分節音であるアヌスヴァーラの区別を明確に反映するものであることを論証する。また、それに関連したタイミング、遷移、子音重複の問題もあわせて考察する。

本論文の構成は以下の通りである： 1. はじめに 2. パーニニの『アシュターディヤーイー』やプラーティシャークヤ文献における、見解の違いと実際の用法の違いを示す記述の例 3. 語末の -m に関する『アシュターディヤーイー』とプラーティシャークヤ文献の規則、および関連する -n に関する規則 4-6. これらの規則が Whitney の説では解釈できず、Whitney が主張するデーヴァナーガリー文字からの証拠も受け入れられない 7. アヌスヴァーラの音韻・音声的性質：韻律からの証拠 8. タイミングと遷移に関する違いと -m の史的発展のかかわり 9. 子音重複や音調の遷移にかかわる、そうした違いの類例 10. まとめ