1   Introduction

Western grammatical theory has been influenced by it [= Pāṇini's grammar] at every stage of its development for the last two centuries. The early 19th century comparativists learned from it the principles of morphological analysis. Bloomfield modeled both his classic Algonquian grammars and the logical-positivist axiomatization of his *Postulates* on it. Modern linguistics acknowledges it as the most complete generative grammar of any language yet written, and continues to adopt technical ideas from it.

– Kiparsky (1993)

In the sphere of grammar it is a gratifying custom of present-day linguists to pay lip-service to the greatest of descriptive grammarians, the ancient Indian Pāṇini.

– Allen (1953)

The modern Western tradition of linguistics owes a great debt to the linguists of ancient India.[1] Yet the vast majority of linguists working within the modern Western tradition know very little about this debt. Most modern linguists today know little or nothing about the sophisticated and extensive tradition of linguistics which flourished in ancient India for more than two thousand years, and which has – as noted by Kiparsky (1993) in the quote given above – had a considerable influence on the development of the modern Western tradition. Many introductory linguistics courses begin with passing reference to Pāṇini, and many linguistics students may be made aware that standard linguistic terminology such as *sandhi* and *bahuvrihi* are Sanskrit terms, borrowed into modern

[1] Throughout this work, I use and contrast the terms 'modern (Western) linguistics' and '(ancient) Indian linguistics'. These terms are used for ease of reference, though they naturally obscure the finer detail. In referring to the tradition of 'modern Western linguistics', I mean to refer to the tradition(s) of linguistic analysis which developed primarily in Europe and North America in the nineteenth and twentieth centuries, growing out of the Classical (Hellenistic and Roman) traditions of linguistics, and which is now an established field of academic study the world over. By 'ancient Indian linguistic tradition', I mean to refer to the tradition of linguistic analysis which, as discussed below, originated in the Indian subcontinent in the second or first millennium BC, which flourished across the subcontinent well into the early modern period, and which survives today as a living tradition of linguistics within the traditional Indian scholarly community. Thus 'modern Western linguistics' is today not exclusively 'Western', and 'ancient Indian linguistics' is not exclusively 'ancient'. Yet the terms are not without meaning and reflect real historical and intellectual differences. One of the aims of this book is to explain some of the historical relations between the two traditions, and to point out similarities and differences between the traditions in how they approach and analyse common linguistic questions.

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linguistics from ancient India. But beyond a name and a few technical terms, the ancient Indian tradition, and its influence on and continuing relevance to modern Western linguistics, is a mystery to anyone who has not been fortunate enough to have had the opportunity to learn Sanskrit and to study the ancient tradition through its original – mostly highly complex and intractable – works. Even the many English translations and commentaries on important texts such as the *Aṣṭādhyāyī* and the *Vākyapadīya* are incomprehensible to anyone not well versed in Sanskrit linguistic concepts and terminology. In parallel manner, most students of Sanskrit language and literature know that the ancient Indians had a sophisticated linguistic tradition, but few of them study that tradition in detail, and fewer still know anything but the barest facts about modern linguistics, and about its relations with the Indian tradition.

This book is intended as a first step, albeit a limited and uncomprehensive step, for linguistics students and scholars in the modern Western tradition to begin to address this knowledge gap. My aim is to introduce modern linguists to the ancient Indian linguistic tradition, and to explore both the Ancient Indian tradition of linguistics in the light of modern linguistics and key ideas of modern linguistics in the light of the Indian tradition. In so doing, I will show that many of the issues addressed by the Indian tradition are issues that are still of great importance in linguistics today, and the assumptions and choices made by that very different tradition shed new light on the assumptions and choices that modern linguists make today. Thus, this is not merely a matter of historical interest, a topic for students of the history of linguistics rather than for students of linguistics itself: to expand on the quote given at the start of the Acknowledgements, from the great philosopher-grammarian Bhartṛhari (VP 2.489), it is only by understanding and engaging with systems and traditions of analysis different from our own that we can make progress both in understanding the data we seek to analyse and in advancing and improving our own analytical procedures. If we are unable to look beyond our own tradition's ideas of how language works, and of how one or another phenomenon should be understood and analysed, we can never hope to do more than continue that tradition, as opposed to advancing and improving our analysis and coming closer to a true understanding of language.[2] The ancient Indian tradition was by far the most sophisticated and insightful tradition of linguistics in the ancient world, the most sophisticated and insightful tradition of linguistics to have existed (as far as we know) before the advances of modern Western linguistics in the twentieth century, and it therefore stands as the primary point of comparison for the tradition of modern Western linguistics. My hope is therefore not only that readers of this book might fill a gap in their knowledge of the history of linguistics, but that they might see the value of understanding and engaging with

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[2] The same may be said of sub-traditions within modern linguistics, e.g. the various traditions of contemporary syntactic theory.

different traditions – even different modern traditions – for their own work in linguistics.

In the rest of this chapter I introduce the ancient Indian linguistic tradition, its origins and history, and survey its influence on the tradition of modern linguistics to date. In Section 1.4, I provide a brief initial foray into the connections and comparisons between the two traditions, by investigating the concept of the 'sign' in modern linguistic thought and the concept of *sphoṭa* in ancient Indian thought.

This book treats the ancient Indian linguistic tradition in the very broadest sense, going beyond the central Indian school of *vyākaraṇa* 'grammatical analysis' and its figurehead, Pāṇini. Nevertheless, because vyākaraṇa was the central and most developed field of linguistics in ancient India, and because Pāṇini holds so central a place not only in Indian linguistic thought but also in terms of Indian influence on Western linguistics, this book necessarily focuses more on Pāṇini, and his grammar of Sanskrit, the *Aṣṭādhyāyī*, than on any other scholar or text of the Indian tradition. Pāṇini and his *Aṣṭādhyāyī* are central to Chapters 2 to 6. In introducing the Indian tradition, I therefore begin by introducing Pāṇini himself.

1.1 Who Was Pāṇini?

Pāṇini – in ancient texts referred to also as Dākṣīputra 'son of Dākṣī' – is the reputed author of the *Aṣṭādhyāyī*, widely regarded as the most important product of the ancient Indian linguistic tradition. Although it is clear that the *Aṣṭādhyāyī* was not an isolated creation but rather the product of a long and sophisticated tradition, it does not seem unlikely that the particularly sophisticated and ingenious nature of the grammar, which rendered the whole of the preceding tradition so obsolete that it has not survived, is attributable to the work of a single, particularly brilliant, scholar.[3] His date and location cannot be known for certain, though the latter is subject to less controversy. Pāṇini is reputed to have come from the ancient province of Gandhāra, and more specifically a settlement called Śalātura, located near modern-day Chota Lahor in the far north-west of the Indian subcontinent, in modern-day Pakistan. Given that Taxila, at the time the most important centre of learning in the subcontinent, was less than fifty miles from Śalātura, it seems likely that Pāṇini would have studied and worked there, though there is no evidence for this.

Dating almost any text or author in ancient India, particularly in the period BC, is highly problematic. This is because few historical events or persons (such as kings) can be dated with certainty, due to a lack of chronologically

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[3] There is no reason to doubt the existence of a single primary author/compiler of the *Aṣṭādhyāyī*, even granted the (in certain respects arguable) evidence for inconsistencies and layers of composition in the *Aṣṭādhyāyī*. For discussion of these issues, compare Joshi and Roodbergen (1983) and Cardona (1999: 112–140).

reliable histories and firm archaeological evidence. Moreover, most ancient Indian texts do not in any case locate themselves relative to any person, event, or thing that is firmly (or not firmly) dateable. The wide disagreements over the date of perhaps the most important historical figure from the first millennium BC, Gautama Buddha, are a case in point.[4]

It is possible to date Pāṇini relative to later authors. The *Mahābhāṣya* of Patañjali is widely agreed to have been written around 150 BC.[5] This is a commentary primarily on Kātyāyana's *Vārttikas*, which are themselves a commentary on the *Aṣṭādhyāyī*. Kātyāyana therefore necessarily precedes Patañjali, and Pāṇini necessarily precedes Kātyāyana by some time, since it is clear that there was a break in the tradition between Pāṇini and Kātyāyana, which resulted in Kātyāyana and all later authors lacking a full understanding of certain aspects of Pāṇini's grammar.[6] But how long an intermission should be assumed between Pāṇini and Kātyāyana is impossible to determine.

Pāṇini has been dated absolutely as early as 700 BC, and as late as the Mauryan dynasty, that is, the late fourth century BC. As discussed by Cardona (1976: 260–268), although the evidence is uncertain, most modern scholars believe that Pāṇini lived before the conquests of Alexander the Great and thus cannot be later than the first half of the fourth century.[7]

Gandhāra was one of the sixteen traditional *mahājanapadas*, or kingdoms/ realms, of India in the mid-first millennium BC. Around 520 BC the Persians captured Gandhāra and neighbouring Kamboja, and these remained as provinces of the Persian (Achaemenid) empire until the coming of Alexander the Great in 327 BC. Although Persian influence in the region waned in the decades preceding Alexander, it is therefore possible that Pāṇini was technically a subject of the Persian empire. But the cultural and intellectual tradition in which Pāṇini worked was thoroughly Indo-Aryan and shows no sign of Persian influence.

Pāṇini's importance in the development of Indian scientific thought has been compared to that of Euclid in the West (e.g. by Staal 1965b). The *Aṣṭādhyāyī* is the earliest surviving monument of Indian scientific thought, and it was highly influential in the development of the later scientific and mathematical traditions in India. In this sense the status of the tradition of vyākaraṇa in ancient India was more like that of mathematics or physics in the modern Western world: it was in some sense the original, the prototypical science and a fundamental influence on all other fields of science. Beyond India, the Indian linguistic

[4] For a discussion of the Buddha's date, see Cousins (1996).
[5] Cardona (1976: 263–266).
[6] See, for example, Kiparsky (1979: 235–249).
[7] It is worth noting, however, that Patañjali believed Pāṇini to have lived in the Mauryan period, i.e. following the Alexandrian conquests.

tradition has also had a significant influence on the development of Western linguistics.

1.2   Pāṇini's Influence on Modern Linguistics

There are differing opinions on the degree to which modern linguistics has been influenced by the ancient Indian tradition, and in particular by Pāṇini.[8] The quotation from Kiparsky (1993) given at the start of this chapter exemplifies one side of the debate, taking Pāṇini's influence as pervasive; the following assessment concurs:

Although often not explicitly acknowledged by the influential linguists indebted to it nor recognized by historians of linguistics, Pāṇinian grammar has had a profound influence on modern linguistics. (Scharf 2007: 78)

In contrast, Allen (1953), as quoted at the start of this chapter, and similarly Cardona, below, consider Pāṇini's influence on modern linguistics more debatable:[9]

I also think one should avoid overestimating the influence of Pāṇini on modern linguistics, where it is customary to pay little more than lip service to that brilliant grammarian. (Cardona 2000)

The truth lies somewhere in between. It is certainly not true, as Kiparsky (1993) claims, that modern linguistics widely, or as a whole, 'acknowledges [Pāṇini's *Aṣṭādhyāyī*] as the most complete generative grammar of any language yet written, and continues to adopt technical ideas from it', though that may be true of Kiparsky himself. Yet it is true that ancient Indian linguistic thought has influenced modern linguistics at multiple points in its development, in particular in the latter's genesis in the early nineteenth century, in the work of arguably the most important pre-generative linguist, Leonard Bloomfield, and in the work of one of the most important linguists of the generative era, the aforementioned Paul Kiparsky.

To start at the beginning, the birth of modern linguistic analysis in the West was, arguably, the direct result of early Western encounters with Indian linguistic thought. The very earliest grammatical descriptions of Sanskrit to reach the West were all based on or influenced by native Indian grammars.[10]

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[8] On the wider influence of Sanskrit and the encounter with India on Western thought, see Rabault-Feuerhahn (2008) and Turner (2015).

[9] Compare also Pontillo (2021).

[10] On the 'discovery' of Sanskrit in the history of the development of linguistics, see Morpurgo Davies (1992: 59–82).

Probably the earliest grammatical account of Sanskrit to reach the west was the *Grammatica linguae Sanscretanae Brachmanum Indiae Orientalis*, written in the 1660s by Father Heinrich Roth, SJ (1620–1668), and based on Anubhūti Svarūpācārya's *Sārasvatavyākaraṇa*.[11] The early English language grammars of Sanskrit, in particular those by Henry Colebrooke (1805) and Charles Wilkins (1808), likewise derived their insights from the Indian grammarians they learned the language from.[12] It was from these early grammars that the early nineteenth-century linguists, most prominently the pioneering Indo-Europeanist Franz Bopp, learned about Sanskrit.

It was Franz Bopp's first publication, Bopp (1816), which inaugurated the academic field of comparative grammar, that is, which first established the comparison of the linguistic systems of related languages as a serious academic undertaking carried out in a systematic and scientific way.[13] Crucially, Bopp's method involved the morphological segmentation of words into their parts, a procedure not familiar to traditional Western linguistics, but central to Indian grammar, and it was from Colebrooke (1805) and Wilkins (1808) that Bopp took this procedure.[14] Thus it was not simply the 'discovery' of Sanskrit which brought about the birth of comparative linguistics, but specifically the 'discovery' of Sanskrit as analysed (with morphological segmentation) by the Indian grammatical tradition.[15] That the Indian grammatical tradition was the catalyst for the development of comparative linguistics in the West (and therefore of modern linguistics in general) has been recognized by certain prominent authors over the last two hundred years, but largely remains forgotten.[16]

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[11] See, e.g., Filliozat (2011), Schneider (2022), Wielińska-Soltwedel (2022). Other early Jesuit grammars of Sanskrit were likewise based on native, primarily non-Pāṇinian, grammatical texts. So the *Grammatica Grandonica* of Father Johann Ernst Hanxleden, SJ (1681–1732) was based on the *Siddharūpa* and Dharmakīrti's *Rūpāvatāra*, while the *Grammatica Sanscritica* (1730s) of Father Jean-François Pons (1698–1752) was based on Vopadeva's *Mugdhabodha* and Kramadīśvara's *Saṃkṣiptasāra* (Filliozat 2020). Further on the early history of Indology, see Petit and Rabault-Feuerhahn (2019).

[12] Other early grammars contemporary with those of Colebrooke and Wilkins were by Forster (1810) and Carey (1806).

[13] As described by Thieme (1983: 3).

[14] See in particular Chapter 4. Bopp commented that Colebrooke (1805) was as instructive as an introduction to the native grammarians as it was unsatisfactory and impenetrable as a manual of the language!

[15] Technically, the Indian grammars which had most influence on the early European grammars were 'non-Pāṇinian', in the sense discussed in §1.3.4. In particular, Vopadeva's *Mugdhabodha*, which was the basis of most of Pons' *Grammatica Sanscritica*, was very popular in Bengal at the end of the eighteenth century when Colebrooke, Wilkins, and others were learning Sanskrit in Calcutta. Colebrooke was the first to move away from Vopadeva to Pāṇini, and it was he who promoted the first publication of Pāṇini's grammar in 1809 in Calcutta (Bābūrāma 1809). On Colebrooke's importance in the early history of Indology, see Rocher and Rocher (2012).

[16] E.g. Bloomfield (1929: 268–270; 1933: 11–12) notes that it was specifically acquaintance with Indian grammar which enabled Western linguistics to advance towards a science in the nineteenth century. The same point is made by Emeneau (1955: 149–150). For a more moderated view of Pāṇini's influence, see Bronkhorst (2017: 34–35).

Bopp's comparative work, in particular Bopp (1833–1852), was central in the development of Indo-European comparative linguistics, and more generally the science of language, in the nineteenth century.[17] Through the work of Indo-Europeanists like Jacob Grimm and Karl Verner, systematic 'sound laws' were established for the Indo-European language family, enabling linguistic study to be treated as a scientific discipline where principles and laws of linguistic change could be derived systematically from linguistic data. The nineteenth-century tradition of comparative linguistics culminated in the work of the so-called 'Neogrammarians', who pushed this scientific approach to comparative linguistics to its logical culmination. Alongside the development of comparative historical linguistics, the development of phonetic science in the West has been clearly linked to the encounter with Indian linguistic thought, for example by Emeneau (1955: 149–150) and especially Firth (1946: 118–120), who says (p. 119), 'Without the Indian grammarians and phoneticians whom he [=Sir William Jones] introduced and recommended to us, it is difficult to imagine our nineteenth-century school of phonetics.'[18]

The next major step in the development of modern linguistics was in the work of Ferdinand de Saussure, sometimes called the 'father' of modern linguistics. Although direct influence of the Indian grammatical tradition on Saussure is hard to prove, indirect influence, at least, is clear.[19] As Professor of Sanskrit and Indo-European at the University of Geneva from 1896, Saussure taught Sanskrit and Indo-European regularly. Saussure had taught himself Sanskrit in 1874 using Bopp's Sanskrit grammar (Morpurgo Davies 2004: 14). He studied Indo-European linguistics between 1876 and 1880, around the time of the 'Neogrammarian revolution', during which time he published a highly influential book *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* ['Dissertation on the primitive vowel system in the Indo-European languages'] (Saussure 1879) and completed his doctorate, *De l'emploi du génitif absolu en Sanscrit* ['On the use of the genitive absolute in Sanskrit'] (Saussure 1880); both these works make reference (albeit obliquely) to Pāṇini. The Neogrammarian focus on rules and laws is likely to be at least partially influenced by Indian grammar, given the foregoing

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[17] Martineau (1867: 305): '[Bopp], one of the greatest Philologists of our time, without whose life and labours, indeed, the Science of Language might not have been…Bopp must, more or less, directly or indirectly, be the teacher of all who at the present day study, not this language or that language, but language itself.' Saussure (1916: 14, 16) refers to 'la science fondée par Bopp' ['the science founded by Bopp'], and says that 'il est douteux que Bopp eût pu créer sa science – du moins aussi vite, – sans la découverte du sanscrit' ['it is doubtful that Bopp could have created his science – at least so quickly – without the discovery of Sanskrit'].

[18] See also Hock (2014), who discusses connections between the Indian phonetic/phonological traditions and Western linguistics in some detail, and Ciotti (2019), who traces the history of Indian influence in the development of Western linguistic thought all the way from Colebrooke through to Bloomfield, specifically in relation to the term *sandhi*.

[19] On the possible influences on Saussure in his contemporary intellectual environment, see Seuren (2016).

discussion, and this in turn influenced Saussure, who was envisaging algebraic expressions of linguistics by 1894 (Staal 2005). As discussed below, there are close relations between Saussure's theory of the linguistic 'sign' and Indian conceptions of language. It has even been suggested that the Indian conception of language can be implicated in Saussure's radical refocusing of linguistics on synchrony.[20]

Saussure (1916) inaugurated the era of Structuralist linguistics, which held sway until the (supposed) generative revolution brought about by Chomsky. The most important figure in American Structuralism, and again one of the most important figures in the history of modern linguistics, was Leonard Bloomfield. Bloomfield was a great admirer of Pāṇini[21] and even published a paper on a section of the *Aṣṭādhyāyī* (Bloomfield 1927). It seems likely that Bloomfield was introduced to Pāṇini by the great Neogrammarian Jacob Wackernagel, and in a 1919 letter (Bloomfield 1919), he claims Pāṇini and the work of Wackernagel as his models for linguistic analysis. Pāṇini's influence on Bloomfield's approach to linguistics was considerable and has been well-researched, for example by Rogers (1987) and Emeneau (1988), in particular in his approach to word formation and his use of ordered rules and morphological zero.[22]

The rise of generative linguistics, initially in the work of Chomsky (1957, 1965), is often presented as a revolution in linguistic thought which rendered obsolete all or most of the linguistic theorizing that preceded it. Yet it is worth noting that the central aspect of Chomsky's early work was the use of substitution rules. Far from being an innovation which overturned the Structuralist approach to language, substitution rules for syntactic and morphological analysis were familiar within the American Structuralist tradition, prominently appearing in important papers by Zellig Harris (1946) and Rulon Wells (1947); the initial contribution of Harris' student Chomsky (1957) was simply to formalize and popularize such substitution rules.[23] The use of substitution rules can be traced back, through both Bloomfield and the Neogrammarians, to the Indian tradition.[24]

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[20] The question of the influence on Saussure's linguistic theory from the ancient Indian grammatical tradition was explored in detail by Vajpeyi (1996).

[21] Bloomfield (1929: 268): The *Aṣṭādhyāyī* is 'one of the greatest monuments of human intelligence . . . an indispensable model for the description of languages.' Bloomfield (1929: 274): 'For no language of the past have we a record comparable to Pāṇini's record of his mother tongue, nor is it likely that any language spoken today will be so perfectly recorded.' Similarly Bloomfield (1933: 11).

[22] See also Wujastyk (1982).

[23] And of course more importantly, and most prominently in Chomsky (1965), to integrate a psychological perspective on language into the application of formal analyses; this too had Structuralist precedents, particularly in the work of Edward Sapir.

[24] On the origins of generative grammar and the influences on Chomsky, including from Bloomfield, see especially Encrevé (2000), who also makes valuable observations regarding

Indian influence, and Pāṇinian influence in particular, on modern Western linguistics has continued in the generative era, most notably through the work of Paul Kiparsky, who has been both one of the most prominent theoretical linguists in the last fifty years, and at the same time one of the most important Western scholars of Pāṇini. As we will discuss in Chapter 3, Kiparsky's influential theory of Lexical Phonology shows clear influence from Pāṇinian grammar; and modern approaches to rule systems and rule interaction in grammar are likewise heavily indebted to the Indian tradition, most famously in the notion of 'Pāṇini's principle' or the 'elsewhere condition', popularized by Kiparsky (1968b, 1973b).[25] Furthermore, as discussed in more detail in Chapter 5, Pāṇini's *kāraka* system was the inspiration for what Kiparsky (2009: 50) calls 'the first modern formulation of linking theory', by Ostler (1979), a student of Kiparsky's at MIT.[26]

This brief survey will in certain respects be fleshed out in later chapters, but at this point aims merely to demonstrate the pervasive and ongoing influence of the Indian tradition on modern Western linguistics. In the next section, I turn to a survey of the Indian tradition itself, seeking to set in their historical and intellectual contexts the various texts and authors, and their approaches to language, which we will treat in the rest of this book.

1.3   The Ancient Indian Linguistic Tradition

In Western discussions of ancient Indian linguistics, it is usually Pāṇini who gets the accolades, and (too) often Pāṇini, and specifically his *Aṣṭādhyāyī*, which receives the primary or sole focus of Western linguists. In many respects, this is for good reason and accords with Pāṇini's status in much of the Indian tradition itself. But as Bronkhorst (2002) says, in agreement with Houben (1999), we should not treat Pāṇini as an 'isolated genius', nor his grammar as the product of 'pure science' ex nihilo, but should understand him in his historical and cultural context. Pāṇini's work was the culmination of centuries of linguistic analysis in ancient India; at the same time, it became the single greatest influence on all later Indian linguistics, which nevertheless extended in a variety of new directions. In this book most of our focus on the Indian tradition will be on Pāṇini and the *Aṣṭādhyāyī*, but in places other parts of the Indian tradition will take centre stage. In the following sections, I provide an overview

the importance of understanding the cumulative history of academic theorizing. On the Structuralist nature of Chomsky's generative grammar, see also Moro (2017: 85–88).

[25] See also Anderson (1969). Anderson (2001) attributes the origins of the 'elsewhere condition' in modern linguistics to Anderson (1969) and not to Kiparsky (1968b), so I refrain from saying that Kiparsky definitely introduced the notion himself.

[26] That Pāṇini inspired Ostler (1979) is directly claimed in Kiparsky (2009), though it is not explicitly acknowledged in Ostler (1979); Ostler (p.c., 2017) has agreed with Kiparsky's claim.

of the Indian traditions of linguistic analysis, from the very beginnings to the start of the modern period.[27]

1.3.1   Early Origins

Evidence for linguistic awareness and developing linguistic analysis can be found throughout the earliest Sanskrit literature, the Vedas.[28] The first clear indications of linguistic awareness are the use of names for poetic metres, Gāyatrī and Triṣṭubh, in the *Ṛgveda*, a collection of the oldest surviving Sanskrit material, likely dating to the second half of the second millennium BC. That different poetic metres were already distinguished by name at this early period implies an existing tradition of metrical analysis (for which the Sanskrit term is *chandas*, the word Pāṇini uses to refer to the Vedas themselves). Although metrical analysis is not linguistic analysis, metrical analysis (of the types of metre used in the *Ṛgveda*) requires recognition of syllables, and of the distinction between heavy and light syllables, and may well have served as a precursor to more strictly linguistic analysis.

Linguistic thought in India ultimately developed in the context of understanding, analysing, and preserving the earliest Vedic texts, including the *Ṛgveda*, which were central to the religious and ritual activity of the culture.[29] These 'texts' were not written but composed and transmitted orally, and alongside metrical analysis sophisticated recitation patterns were developed to ensure precise and error-free memorization and transmission of the Vedas. The earliest known recitation system is the *Padapāṭha* of the *Ṛgveda*, attributed to Śākalya: this is a word-by-word breakdown of the *Ṛgveda*, which in standard 'continuous' (*saṃhitā*) recitation only distinguished word boundaries at the end of hemistichs and larger metrical units.[30] For example, on the basis of the saṃhitā recitation of RV 2.12.8ab as given in (1a), the *pada* (word-by-word) recitation is as given in (1b):[31]

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[27] For surveys of the Indian linguistic tradition, see Scharfe (1977), Staal (2005), Scharf (2013), and Aussant (2018), with further references.

[28] For a detailed survey of the origins of linguistics in ancient India, see Liebich (1919: 3ff.).

[29] As noted by Jacobsen (1974: 41), the concern for preserving a classical literature composed in an increasingly obsolete language likewise underlies the rise of grammatical study in ancient Mesopotamia and ancient Greece; the same can be said also of ancient China.

[30] The historical development from analysis of verse lines to words is attested in the terminology: the original meaning of *pada* 'word' was 'verse line', and this is the only sense known to Mahidāsa, compiler/editor of the first six books of the *Aitareya Brāhmaṇa* (Liebich 1919: 4). The use of the term *pāda* 'foot' to mean 'verse line' is secondary, after the metaphor of a four-footed animal.

[31] This hemistich can be translated 'Whom the two war-cries, clashing together, call upon in rivalry – the enemies on both sides, here and over there –' (Jamison and Brereton 2014: 417). The meaning is not relevant to the point at hand, of course.