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On the origins of theories of compounding and the question of Indian influence on modern linguistics

John J. Lowe 

Faculty of Asian and Middle Eastern Studies, University of Oxford, Oxford, UK

ABSTRACT

The ancient Indian linguistic tradition has been implicated in various ways in the development of modern linguistics. This paper starts from one superficially obvious point of influence: the use of Sanskrit terms for compound classes in modern approaches to compound classification. I show that the use of these terms does not reflect direct influence based on a proper understanding of the Indian tradition, and that in fact many interesting and important aspects of compound theorisation in ancient India have been overlooked in modern linguistics.

KEYWORDS

Compounds; classification; Sanskrit; Indian linguistic tradition; Pāṇini; *bahuvrīhi*

1. Introduction

Modern linguistics, as a discipline aiming at the scientific study of language, has a history of at most around 200 years, if one begins with Bopp and the earliest attempts to carry out systematic comparison of related languages, or little more than 100 years if one begins with Saussure.¹ Yet its history is of course much deeper, stretching back to the Classical (Greek and Roman) traditions of grammar. Another deeper aspect of the history of modern linguistics is the remarkably sophisticated tradition of linguistic analysis developed in ancient India, originating in the first millennium BC, and subsequently elaborated over the following two thousand years. This tradition was sophisticated enough that it warrants the label ‘scientific’ and thus qualifies as linguistics, rather than merely as a tradition of grammar. Bloomfield (1929, 268) describes the most famous product of the Indian linguistic tradition, Pāṇini’s grammar of Sanskrit, the *Aṣṭādhyāyī*, as ‘one of the greatest monuments of human intelligence . . . an indispensable model for the description of languages’. Chomsky (1965, v), too, notes: ‘It seems that even Pāṇini’s grammar can be interpreted as a fragment of such a “generative grammar”, in essentially the contemporary sense of this term’.²

CONTACT John J. Lowe  john.lowe@ames.ox.ac.uk

¹In the nineteenth and early twentieth centuries, Bopp was credited with the foundation of linguistics as a discipline; see e.g. Martineau (1867, 305). Ferdinand de Saussure is now widely referred to as the ‘father of modern linguistics’, but he too referred to his field as ‘la science fondée par Bopp’ (Saussure 1916, 14, 16). The present author has heard colleagues refer to modern linguistics as starting with Chomsky; the notion ‘modern’ is a relative one, it seems.

²On the development of linguistics as a science in ancient India, see also Emeneau (1955).

The Indian linguistic tradition, and in particular Pāṇini's *Aṣṭādhyāyī*, has been implicated in a number of key steps in the development of modern linguistics; however, the degree to which the ancient Indian linguistic tradition has truly influenced, and/or continues to influence, modern linguistics is a matter for debate.³ An optimistic perspective is put forward by Kiparsky (1993, 2918):

Western grammatical theory has been influenced by it [= Pāṇini's grammar] at every stage of its development for the last two centuries . . . Modern linguistics acknowledges it as the most complete generative grammar of any language yet written, and continues to adopt technical ideas from it.

Cardona (2000, 464) offers a different opinion:⁴

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.

In this paper, I approach this question in relation to one specific topic, that of compounding. It is in relation to the theory of compounding, specifically the classification of compounds, where the ancient Indian tradition has, at least superficially, had perhaps its most obvious influence on modern linguistics, in the adoption of terms like *bahuvrihi* and *dvandva* as widespread terms for compound classes. However, I show that the *understanding* of the Indian approaches to compounding in modern linguistics has been highly superficial, more in the realm of 'lip service' than anything more meaningful. Understanding and influence are separate but related notions; one can be influenced by something one has misunderstood or misinterpreted, but such an influence is in an important sense less direct, less real. Modern linguistic treatments of the Indian tradition both misunderstand, and significantly underestimate the complexity of, the Indian tradition, limiting the extent to which any real influence of the latter on the former can be claimed. At the same time, a more complete and detailed understanding of the Indian tradition reveals that issues and notions of major importance in modern linguistics were also debated and foreshadowed in the Indian tradition.

I begin by considering the modern understanding of the Indian approach to compound classification, showing that this understanding is extremely limited, and partly in error. Modern accounts are aware of only a single system of compound classification in the Indian tradition (and then, it appears, only partially); in fact, there were a multitude of such systems, and there was considerable debate not only over how to classify compounds, but even over how such classification systems should be understood.

Even if modern linguistics fundamentally misunderstands the Indian approach to compound classification, it remains the case that there is a degree of influence and therefore historical continuity between the two traditions in this respect. A different aspect of comparison of two linguistic traditions is that of unrelated parallel developments. Beyond a superficial understanding of the theory of compound classification, there is essentially no awareness in modern linguistics of any other aspect of the Indian tradition's theorising on compounds. In fact, the Indian tradition was far more concerned with the compounding process than it was with compound classification. By

³More widely on this question see Lowe (2024).

⁴Both views are more widely found; for example, Scharf (2009) expresses sentiments similar to Kiparsky (1993), while Cardona's (2000) perspective echoes that of W. S. Allen (1953).

comparing the theoretical space entertained for the compounding process in the Indian tradition with the range of options considered in the modern linguistic tradition for the same, I show that there are notable parallels between the traditions, which cannot be attributed to the influence of one tradition on another.

2. Classification of compounds

The importance of the (or rather, an) ancient Indian approach to compound classification in modern linguistics is evidenced by the fact that two recent treatments of compound classification, by Bauer (2017, ch. 5) and ten Hacken (2017, 9–13), both present only two approaches: the ‘Sanskrit classification’ (to use Bauer’s term), which entered the modern tradition through the influential work of Bloomfield (1933); and the approach of Scalise (e.g. Scalise & Bisetto 2009).⁵ Bauer’s justification for giving so central a place to the Indian tradition recognises its influence but also undercuts its value: ‘First the Sanskrit classification will be considered, not because it is a particularly good classification, but because it has been so influential on all later work on compounding’ (2017, 107).

Below, we will see that the presentation of the ‘Sanskrit classification’ in these modern accounts is neither a complete nor entirely accurate representation of the (or an) approach to compound classification actually found in the Indian tradition. But let us begin by considering the system that is presented in these works.

2.1. The ‘Sanskrit classification’

Bauer’s (2017, 107–112) presentation of the ‘Sanskrit classification’ is comparatively full and accurate, at least as a presentation of the traditional terms which have some currency in modern linguistics. Bauer mentions the four major categories of compound: *tatpuruṣa*, *bahuvrīhi*, *dvandva* and *avyayībhāva*. He defines *tatpuruṣa* as ‘endocentric subordinative compounds’, and mentions two important subtypes of *tatpuruṣa*: *karmadhāraya* and *dvigu*. Bauer aligns the former with the attributive endocentric category of Scalise and Bisetto (2009); the only detail given for the latter is that its first member is a numeral.

As for *bahuvrīhi*, Bauer (2017, 65) treats them as a subtype of exocentric compounds and describes them as ‘canonically label[ling] a part of the whole which the compound denotes’.⁶ In two ways, Bauer slightly misunderstands, or misrepresents, the category of *bahuvrīhi* as it was understood in the Indian tradition. First, he claims that adjectival suffixation to a simple *bahuvrīhi* compound, while not changing the meaning, would prevent the resulting adjective from being classed as a *bahuvrīhi*:

if we follow the Sanskrit pattern closely, English *red-eyed* is not a *bahuvrīhi*, because it has the adjective-making suffix *-(e)d*, while *red-eye* (a noun in English, not an adjective) is closer to the prototype.⁷ (Bauer 2017, 109)

⁵There are a wide range of other modern classification systems, as surveyed by Scalise and Bisetto (2009).

⁶Bauer (2017) distinguishes between *bahuvrīhi* as a term used in modern linguistics, and *bahuvrīhi* as the term for the relevant Sanskrit category. I follow that distinction here.

⁷The prototype would be *red-eye* as an adjective meaning ‘red-eyed’.

In the Indian tradition, adjectival suffixation of this kind does not necessarily mean that we are not dealing with a *bahuvrīhi*; certain adjectival suffixes (which do not affect the meaning) are defined as outputting a *bahuvrīhi*, rather than a derived adjective.⁸ Here, Bauer in fact follows the modern principle that derivational affixation by definition does not output a compound.

Secondly, Bauer treats *bahuvrīhi* compounds as being fundamentally adjectival conversions of *tatpuruṣas*; the idea is that, for example, an original *tatpuruṣa* (subtype *karmadhāraya*) *dirgha-kaṛṇa* ‘long ear(s)’ is converted by zero-derivation into a *bahuvrīhi* with an adjectival sense ‘having long ears’. In this, Bauer follows a common misconception, shared also for example by Whitney (1896, 501–502), Kiparsky (1982, 139), and Gillon (2007, 3), as argued by Candotti and Pontillo (2022, 5–9), Mocci (2022, 7–9), and cf. Lowe and Mocci (2022, 252). The most telling evidence against zero-derivation is the fact that it is very rare to find *bahuvrīhis* which have corresponding *tatpuruṣas*: the sorts of *tatpuruṣas* which are assumed to underlie *bahuvrīhis* are in fact not commonly formed, and those that are formed tend not to attest corresponding *bahuvrīhis* (cf. Renou 1961, 114). Moreover, certain subtypes of *bahuvrīhi* would be highly problematic to derive from a theoretically corresponding *tatpuruṣa*.⁹

The third category, *dvandva*, is defined by Bauer (2017, 109) as representing (prototypically) ‘additive coordinative nominal compounds’, a subtype of coordinative compounds. In earlier work, Bauer (2008b) identifies five types of *dvandva* and four types of coordinative compound which are not *dvandvas*.

It is only the three labels *bahuvrīhi*, *tatpuruṣa* and *dvandva* which have any significant currency in modern linguistics. But in the Indian tradition a fourth category, *avyayībhāva*, stands alongside these three. Bauer (2017, 109) briefly mentions this category, describing them as ‘adverbial compounds’ and saying that

This class is not much discussed in later classifications, probably because other languages do not have a distinctive class defined by precisely the features that define it in Sanskrit.

ten Hacken (2017, 9–13) also begins with the Indian system in his briefer presentation of approaches to compound classification. He mentions only the three well-known categories of *dvandva*, *tatpuruṣa* and *bahuvrīhi*. He notes that *tatpuruṣa* is sometimes equated with *endocentric* in modern accounts, but that the category more precisely corresponds with the categories *determinative* or *subordinative*; similarly he notes that the term *bahuvrīhi* is often equated with *exocentric*, but *exocentric* is in fact a broader category.

A general point brought out by both treatments of the ‘Sanskrit classification’ by Bauer (2017) and ten Hacken (2017) is that this classification system was developed for a specific language, Sanskrit, and so cannot cover the full range of compound types attested cross-linguistically. In this sense, then, the categories of the Sanskrit system are a way in to

⁸These suffixes are called *samāsānta* ‘final elements of compounds’; a ‘Pāṇinian’ treatment of English would likely treat *-(e)d* in compounds like *red-eyed* as just such a suffix.

⁹For example, some *bahuvrīhis* are licensed with both possible orders of members, e.g. *āhitāgni* and *agny-āhita* ‘by whom the sacred fire (*agni*) has been kindled (*āhita*)’. Conceivably *āhitāgni* could be derived by zero-derivation from a theoretically corresponding *tatpuruṣa āhitāgni* ‘kindled fire’; but *agny-āhita* could not plausibly be derived (not with any semantic plausibility, anyway) from a *tatpuruṣa agny-āhita* which could only mean something like ‘kindled by the fire’.

compound classification, due to the currency (thanks to Bloomfield) of the Sanskrit category labels, but no more than that. Another point raised is that the use of the Sanskrit terms in modern linguistics is inconsistent: some authors attempt to restrict the use of the terms to only those compounds that would be classed as such in Sanskrit, but other authors are happy to use the Sanskrit terms in an extended sense, to cover a broader range of compounds than would strictly 'count' within the Indian tradition itself.¹⁰ For example, Bauer (2008a) and Arcodia (2010) both make this point for the term *dvandva*. This brings us to the original entry of these terms into the modern tradition. Bloomfield (1933) himself, in first introducing the Indian terms, extended their sense without discussion, for example treating the English compound *turnkey* as a *bahuvrīhi* due to its exocentricity, even though the equivalent of this type of compound in Sanskrit would not be labelled a *bahuvrīhi*.¹¹ Attempts to restrict the use of the Sanskrit terms to their original sense are then secondary attempts to redefine these terms in a historically more accurate way.

In fact, the original presentation of the Sanskrit terms by Bloomfield (1933, 235–237) is remarkably loose, given Bloomfield's close acquaintance with Sanskrit and the Indian grammatical tradition, and shows that he was not attempting to introduce the/an Indian system of compound classification into modern linguistics. Bloomfield defines major categories of compounds, and associates these with Sanskrit categories: 'copulative' = *dvandva*, 'determinative (attributive or subordinative)' = *tatpuruṣa*, 'exocentric' = *bahuvrīhi*. However, in referring to other subcategories he diverges from their treatment in the Indian tradition where this does not align with his own system. For example, he attributes to the Indian tradition a subtype of coordinative compound called *āmreḍita*, a term referring to a construction which in the Indian tradition is not even a compound, let alone a type of *dvandva*; it is a type of whole-word repetition or reduplication. Most tellingly, Bloomfield (1933, 237) mentions *dvigu* 'numerative' and *avyayībhāva* 'adverbial' as subtypes of exocentric compound, although they are definitely not subtypes of *bahuvrīhi* in the Indian tradition; even their semantic analysis within the Indian tradition excludes them from being treated as exocentric, at least insofar as the notion 'exocentric' has parallels within the Indian tradition (see below). Bloomfield's classing of *dvigu* and *avyayībhāva* with *bahuvrīhi* makes no sense from an Indian perspective but does have some rationale given his own definition of exocentricity.

Bloomfield (1933) did not, therefore, introduce the (or a) Sanskrit/Indian classification system into modern linguistics, but developed his own classification system which he partly justified by associating traditional Sanskrit terms with his categories. Being closely acquainted with the Indian tradition, Bloomfield presumably did not misunderstand the Indian system, but consciously repurposed the Sanskrit terms within his own framework.

2.2. The real Sanskrit tradition

The apparently simple 'Sanskrit classification' as presented by Bauer (2017) and ten Hacken (2017) overlooks a number of more complex aspects of the Indian treatment of

¹⁰As noted by a reviewer, this would probably be necessary for any terminology developed for one language to be applied beyond that language.

¹¹Such compounds exist in the earliest stages of the language, e.g. Rgvedic Sanskrit *trasa-dasyu* 'frightening the enemy', but they are not productive in the later language and are not categorised within the compound system in the Indian grammatical tradition.

compound classification. I will treat here three issues in turn: a rich system of subcategorisation of compounds; questions of whether the main categories have a particular functional association; and the existence of competing compound classifications.

On the question of subcategories, we have already seen above, for example, that Bauer (2017) discusses two subtypes of *tatpuruṣa*: *karmadhāraya* and *dvigu*. These are indeed the most prominent of the subcategories in the Indian tradition, but there are many more; Tubb and Boose (2007, 85–145) discuss seven main subtypes of *tatpuruṣa*, several with their own subtypes (there are four types of *dvigu*, for example), two types of *dvandva* and 11 types of *bahuvrīhi*. Yet this eye for detail in distinguishing varieties of compounds in Sanskrit, while evidencing a greater degree of complexity in the Indian tradition than is apparent from the basic ‘Sanskrit classification’ as presented by modern authors, is to some extent of more limited interest to modern linguistics the more detailed it becomes. The finer the details drawn between different (sub)subtypes of Sanskrit compounds, the less potential there is for those details to correspond to any crosslinguistically meaningful subdivision of compound types. It is therefore understandable that this aspect of the Indian tradition is largely overlooked in modern treatments.

Of more relevance to the modern understanding and use of the Sanskrit classification is the question of its association with function. The four main compound labels are introduced in Pāṇini’s *Aṣṭādhyāyī*, but his focus was strictly limited to grammatical (morphosyntactic, morphophonological and phonological and phonetic) derivation, and questions of meaning are not systematically addressed. Patañjali’s *Mahābhāṣya* (c. 150 BC), the most important and influential early commentary on the *Aṣṭādhyāyī*, is where we first find a systematic semantic analysis of the four-way classification of Pāṇini. According to Patañjali, the major categories of compound are distinguished by the relative ‘predominance’ of one or other of the compound members:¹²

- (1) *avyayībhāva*: first member semantically predominant
- tatpuruṣa*: second member semantically predominant
- dvandva*: both members semantically predominant
- bahuvrīhi*: external element semantically predominant

The Sanskrit word *pradhāna* ‘predominant’ has semantic scope here, interpreted with respect to the referent of the compound. So, in an *avyayībhāva* like *bahir-grāmam* ‘outside the village’, the semantic head of the compound is the adposition *bahih* ‘outside’: ‘outside the village’ is semantically a type of ‘outside’. In the same way, in a *tatpuruṣa* like *rāja-puruṣa* ‘king’s servant’, the semantic head is the second member, a king’s servant being a type of servant. Both *avyayībhāva* and *tatpuruṣa* are, therefore, understood as semantically endocentric, in modern terms. The *dvandva* is also, in a sense, understood endocentrically: in a compound like *hasty-aśva* ‘elephant and horse’, both elements are semantically predominant, since the reference of the compound is simultaneously and equally both to an elephant and to a horse.¹³ For *bahuvrīhis*, neither compound member

¹²The classification is presented in Patañjali’s comments on *Aṣṭ.* 2.1.6 (Kielhorn 1880, 378.24), 2.1.20 (Kielhorn 1880, 382.7) and 2.1.49 (Kielhorn 1880, 392.6).

¹³As discussed below, this contrasts with the classification system of Scalise and Bisetto (2009), according to which this type of compound is understood as exocentric.

is predominant in the sense that the compound's reference is to something other than the referents of the distinct compound members. This corresponds both to the Pāṇinian and modern notions of semantic exocentricity.

Patañjali's functional categorisation can be understood in terms of the intersection of two binary features, \pm predominance of the first compound member, and \pm predominance of the second member:

(2)

	+Predom1	–Predom1
+Predom2	Ddv.	Tatp.
–Predom2	Avbh.	Bahuv.

This is, then, a more complex system than the basic binary distinction between endo- and exocentric, and in one way or another subsumes it. Still, following Patañjali's analysis there is some validity in speaking of the category *bahuvrīhi* as broadly equivalent to *exocentric*, and of *tatpuruṣa* as broadly equivalent to *endocentric*.¹⁴

Thus far, everything appears very similar to the presentation of Bauer (2017). However, this is far from the final conclusion of the Indian tradition. Patañjali himself does not explicitly discuss problems with the categorisation presented in (1), although he does in passing acknowledge the existence of compounds which violate these generalisations.¹⁵ But the later Pāṇinian tradition explicitly recognized that the supposed functional associations of the four main compound categories were not absolute. For example, Kauṇḍabhaṭṭa, one of the three major figures in the final flourishing of the Pāṇinian grammatical tradition around the 17th century, rejects the association of the compound categories with any particular function and provides counterexamples to all the claimed functional associations.¹⁶ So, *unmatta-gaṅgam* 'where the Ganges (*gaṅgā*) churns (*unmatta*)' is, according to Pāṇini's classification, an *avyayībhāva*, but in terms of predominance it corresponds to what is expected of a *bahuvrīhi*: neither member of the compound is semantically predominant. Another *avyayībhāva* is the compound *sūpa-prati* 'a bit of soup', in which the second member is predominant, as if it were a *tatpuruṣa*; conversely, the compound *ardha-pippalī* 'half (*ardha*) a pepper (*pippalī*)' is a *tatpuruṣa*, but it is the first member which is semantically predominant. Another contrasting pair offered by Kauṇḍabhaṭṭa is *dvi-trāḥ* 'two or three' and *śāśa-kuśa-palāśam* 'hare, kuśa grass and palāśa tree': the former is classed as a *bahuvrīhi* but understood functionally as having both members predominant, while the latter is classed as a *dvandva* but is understood as having an external element (representing the aggregate) as predominant.¹⁷

One cannot argue that the category labels are wrong in these cases, because the category labels are the given (based on the grammatical analysis of the *Aṣṭādhyāyī*); it

¹⁴Granted that *avyayībhāva*, the other evidently endocentric category, is not widely found outside Sanskrit.

¹⁵In particular, on *Aṣṭ.* 2.4.46 (Kielhorn 1880, 478.8–9) Patañjali notes that a subtype of *tatpuruṣa*, e.g. *ardhapippalī* 'half a pepper', has semantically predominant first member.

¹⁶In the section *Samāsaśaktinirṇaya* 'Determination of the denotative power of compounds' of his *Vaiyākaraṇabhūṣaṇa* and *Vaiyākaraṇabhūṣaṇasāra*. Examples and quotes are here taken from the *Vaiyākaraṇabhūṣaṇa* (Trivedi 1915).

¹⁷This last example represents one of the two major subclasses of *dvandva*, the *samāhāra dvandvas*; the functional pattern assumed by Patañjali for *dvandvas* therefore covers only one of the two subtypes.

is the functional load of the categories which is in question. Kauṇḍabhaṭṭa's conclusion is essentially that the category labels are arbitrary labels of the grammar and have no necessary functional load:

siddhānte tv avyayībhāvādhikārapaṭhitatvam avyayībhāvatvam ityādi draṣṭavyam.

But in the final conclusion, one must see that being an *avyayībhāva* means (merely) being defined (in the grammar) under the heading *avyayībhāva*, and so on (for the other three categories).

That is, Sanskrit compounds are defined in the *Aṣṭādhyāyī* under the series of headings *avyayībhāva*, *tatpuruṣa*, etc., and by virtue of being defined under a particular heading a compound is assigned to the relevant category. These categories may have certain practical consequences for the grammatical derivation, for example in relation to accent, but there is no further significance to the categories than that, and no necessary semantic consequences of a compound being defined under a particular heading.¹⁸ Notions like 'tarpuruṣas show predominance of the second member' are at best generalisations with exceptions. It is therefore strictly speaking incorrect from a modern perspective to say that the category of *tatpuruṣa* corresponds to determinative/attributive endocentric compounds, etc.

Kauṇḍabhaṭṭa further notes that in the Pāṇinian system there are a few compounds which do not fall under any of the four major categories. Again the Indian system has been misunderstood here; so, ten Hacken (2017) claims that the Sanskrit classification system is a 'taxonomy' in the sense of a system which fully categorises all possible members. Since some compounds are neither *avyayībhāvas*, *tatpuruṣas*, *dvandvas* or *bahuvrīhis*, this system cannot be a taxonomy. The examples given by Kauṇḍabhaṭṭa and others are mostly morphologically problematic compounds which cannot be derived by any rule in the *Aṣṭādhyāyī* under the main compound types, and so are treated by recourse to the more general rules defining compounding as the combination of two stems. For example, *bhūta-pūrva* 'previously existing, former' is accepted as a grammatical Sanskrit compound, but cannot be accounted for under any of the four main categories; it is an otherwise underivable variant of the unproblematic *tatpuruṣa* (*karmadhāraya*) *pūrva-bhūta* 'id'.

Finally, we have been discussing thus far only one classification system within the Indian tradition. It is doubtless the most widely known, but it is not the only one, nor indeed, for the reasons discussed above, was it considered the best or most precise means of classifying compounds even in the later Indian tradition itself. So, even among the later authors who held most closely to the authority of Pāṇini (the Pāṇinian tradition), given the problems identified with the four-way division into *avyayībhāva*, *tatpuruṣa* etc., other ways of classifying compounds were advanced. The primary classification offered by Bhaṭṭoji Dikṣita (c. 17th century, uncle of the aforementioned Kauṇḍabhaṭṭa) in his *Vaiyākaraṇasiddhāntakārikā* (VSK) 28,

¹⁸This is, in fact, the correct interpretation of the categories in terms of their function within Pāṇini's grammar, which is concerned only with morphophonological aspects of compound formation and not semantics. Categories labels like *tatpuruṣa* feed into e.g. accentuation rules, and therefore certain compounds which are not functionally parallel to 'ordinary' *tatpuruṣas* but which do share their accentuation are also treated as *tatpuruṣas*.

and adopted without criticism by Kauṇḍabhaṭṭa, is a six-way morphological classification:

- (3) a. *sUP* with *sUP* (e.g. *rāja-puruṣaḥ* ‘king’s servant’, standard nominal compound)
- b. *sUP* with *tiN* (e.g. *pari-abhūṣat* ‘he honoured’, preverb-verb complex)
- c. *sUP* with *nāman* (e.g. *kumbha-kāraḥ* ‘pot-maker’, subtype of *tatpuruṣa*)
- d. *sUP* with *dhātu* (e.g. *kaṭaprūḥ* ‘worm’, subtype of *tatpuruṣa*)
- e. *tiN* with *tiN* (e.g. *pibatakhādātā* ‘place of eating and drinking’)
- f. *tiN* with *sUP* (e.g. *jahistambhaḥ* ‘(repeatedly) striking a post’)

This classification is based on the two-way division of the category of *pada* ‘word’ into a. words ending in *sUP*, that is words suffixed with a nominal case ending (referred to in Pāṇinian parlance as *sUP*), which includes not only nouns and adjectives but in fact every word class except finite verbs, and b. words ending in *tiN*, that is words ending in the finite verbal suffixes, i.e. finite verbs. Taking these two categories, there are four logically possible combinations, as given in (3a–b) and (3e–f). The two additional categories are required due to morphological technicalities in the formation of certain compounds, which necessitate the assumption that the second member of those compounds enter into the compound derivation in stem form, either as a *nāman* ‘noun stem’ or a *dhātu* ‘verbal root’.¹⁹

This approach to compound classification is perhaps not particularly practical, since the vast majority of Sanskrit compounds, including the vast majority of all the four ‘traditional’ classes, fall into the first category, and the final three categories in (3) include only a very few, obscure and largely unproductive, examples. It is, however, a proper taxonomy in the sense of ten Hacken (2017), since all possible compounds are categorised by it. Moreover, it includes within its categorisation composite words which do not standardly, in the Indian tradition, get the label *samāsa* ‘compound’: preverb-verb composites like *pari-bhūṣ* ‘adorn, honour’ are strictly speaking not compounds in the Indian tradition, although from a modern perspective they would naturally be treated as such, but certain such sequences must be treated as compounds for morphophonological reasons, and they can be license as compounds falling outside the four major categories. Bhaṭṭoji’s morphological classification has the advantage of admitting all such composites as compounds without treating them as exceptions to the general principles.²⁰

Within and, particularly, outside the Pāṇinian tradition, a number of other means of classifying compounds were advanced.²¹ Perhaps the most notable, given the discussion thus far, is that attributed to a scholar Vābhaṭa, who proposed a purely semantic classification of compounds, based on the same principles advanced by Patañjali. The most important difference from Patañjali is that Vābhaṭa did not correlate his categories with the Pāṇinian labels. So, his categories are *pūrvapadārthapradhāna* ‘having the meaning of

¹⁹The Indian system otherwise assumes that compounds are formed from two fully inflected words, which lose their inflectional endings during the compounding process, before the compound is given its own inflectional ending.

²⁰Cf. Murti (1974, 66–67). In addition, the type in (3f) covers the exocentric compounds of the *turnkey* type which were not treated by Pāṇini; cf. fn. 11.

²¹These are surveyed by Murti (1974, 77–87).

the first member as predominant', *antyapadārthapradhāna* 'having the meaning of the last member as predominant', *sarvapakadārthapradhāna* 'having the meanings of all members as predominant' and *anyapakadārthapradhāna* 'having the meaning of a different word as predominant'.²² But the category *pūrvapakadārthapradhāna* is not equivalent to *avyayībhāva*; rather, it includes only those *avyayībhāvas* which show predominance of the first member, and it also includes e.g. the *tatpuruṣa ardha-pippalī* 'half a pepper'. This system is therefore closer to the purely functional classifications of modern linguistics, and reflects more closely the assumptions of a purely functional definition accorded to the standard terms *tatpuruṣa* etc. by modern linguistics, but in avoiding those traditional labels it recognises, as discussed above, that those traditional labels have no consistent functional association.

It is also worth noting that some grammatical traditions less closely aligned with the Pāṇinian tradition alter the traditional four-way classification. So the Mugdhabodha and Sārasvata grammars treat *dvigu* and *karmadhāraya* not as sub-types of *tatpuruṣa*, but as separate categories; Jagadīśa suggests that *upapadasamāsas*, that is the type in (3c) above, standardly another subtype of *tatpuruṣa*, may be a separate, seventh, class.

Altogether, then, it is a gross oversimplification to treat the rich and diverse views on compounding in the Indian tradition in terms merely of the basic 'Sanskrit classification' of three or four category labels correlating more or less closely with the basic notions of endo- and exocentricity. In fact, what, for example, ten Hacken (2017) is describing is really not the (or even an) Indian approach to compound classification, but rather the basics of the system advanced by Bloomfield (1933) who, as discussed above, developed his own system of compound classification but associated Sanskrit names with his categories. Interestingly, Bauer (2017) presents neither Bloomfield's system nor any Indian system precisely, but comes up with something of a hybrid: Bauer mentions only the Sanskrit category names mentioned by Bloomfield (1933) but rearranges them into a system which more accurately represents the traditional Indian system (in particular, treating *avyayībhāva* as a distinct class, and *dvigu* as a subtype of *tatpuruṣa*, rather than both as subtypes of exocentric compounds, as Bloomfield 1933, 237 presented them). Yet Bauer misunderstands some aspects of the Indian categories, as discussed under *bahuvrīhis* above, and repeats Bloomfield's erroneous subsumption of *āmreḍita*, that is whole word repetition, under *dvandva* compounding.²³

This partial reconstruction of the traditional Sanskrit classification system by Bauer echoes the secondary restriction, mentioned above, of terms like *bahuvrīhi* and *dvandva* to only those subtypes of exocentric and coordinative compounds which would be labelled as such in the Indian tradition, and evidences a secondary stage of engagement with, and influence of, the Indian tradition on compound classification in modern linguistics, at least insofar as the use of the traditional Sanskrit terms is concerned. Yet

²²In fact, Vābhata proposes five categories, the fifth being *madhyapakadārthapradhāna* 'having the meaning of the middle word as predominant'. This is a technicality necessitated by the Indian approach to the meaning of negation, which must take wide scope and so must be semantically predominant, even in certain cases where it is embedded within a larger compound; see Murti (1974, 84). This need not detain us further.

²³Bauer (1880) does not use the term *āmreḍita*, but clearly refers to the phenomenon as a subtype of *dvandva*, as Bloomfield (1933) does.

even this partially reconstructed ‘Sanskrit classification’ reflects only the starting point of a rich tradition of debate and theorising on compound classification in the Indian tradition.

Does modern linguistics lose anything by not retaining (or gaining) a detailed knowledge of the Indian tradition? In many respects perhaps not, since the goals of modern linguistics are broader, and the methodology stricter, than those of the Indian tradition. Yet there is of course an inherent value in understanding the history of one’s field, since one is then better placed to assess the synchronic state of one’s field. Moreover, ideas present in the Indian tradition may go beyond, or may present refinements on, current ideas in the modern tradition. As we have seen, Bloomfield (1933) drew a major contrast between endocentric and exocentric compounds, and this distinction plays a major role in most modern treatments of compounding; for example, in the system of Scalise and Bisetto (2009), every type of compound has both endocentric and exocentric variants. Yet Bloomfield himself considers that the distinction is not always clear-cut. *Dvandvas* may also raise interesting problems for this distinction; Scalise and Bisetto (2009) list *dvandvas* as exocentric, on the grounds that the reference of a *dvandva* is not to the members of the compound but to the set containing the members, but the Indian tradition recognises two types of *dvandva*, one which they analyse along the same lines as Scalise and Bisetto (2009), but the other type (the more common type, e.g. *hasty-aśvau* ‘elephant and horse’) as being *sarvapatārthapradhāna* ‘having (semantic) predominance of all members’. This distinction cannot be captured with the binary notion of endo- vs. exocentricity, but can be captured using the Indian equivalent, the four-way contrast based on *pradhāna* ‘predominance’.

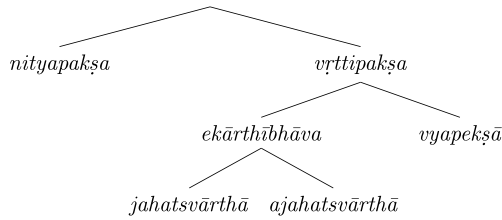
3. The process of compounding

An unfortunate consequence of the focus on the Indian tradition for its contribution to the study of compound classification is that one could easily make the assumption that the Indian tradition did no more than discuss classification. For example, ten Hacken (2017, 13) claims that:

Whereas the tradition of the delimitation and classification of compounding reaches back to the Sanskrit grammarians, the question of the formation of compounds only came up with the emergence of generative grammar.

In fact, the Indian tradition was considerably more interested in the question of the formation of compounds than it was in the classification of compounds. For authors like Kauṇḍabhaṭṭa, discussed in the previous section, questions of classification were an important part of the treatment of compounds, but the real issue, the central point of interest, was the formation of compounds. From a modern perspective, while there are many differences in outlook between the two traditions, it is valuable to observe that in many respects the same sorts of questions and solutions arise in both.

A standard typology of possible approaches to compound formation is set out by Kaiyaṭa (c. 1000 AD), the most important commentator on Patañjali's *Mahābhāṣya*.²⁴
(4)



There are four distinct approaches here, all of which are widely discussed, and advocated by different authors. The primary contrast drawn is between the *nityapakṣa* and the *vṛttipakṣa*. The *nityapakṣa* is in a sense extreme, in that it denies the reality of compound formation: all ‘compounds’ are independent units with under-ived meanings, just like non-compounded words.²⁵ This view is most prominent in the work of Bhartṛhari (c. 500 AD), one of the most important figures in the development of the Indian tradition, who denied not only the divisibility of compounds but even the divisibility of sentences.

The *vṛttipakṣa*, in contrast, treats compounding as a process, *vṛtti*. Compounds are derived from combinations of independent syntactic units, and the meaning of a compound is derived in some way from the meanings of its constituent parts. Within this, the approach which stands most distant from the *nityapakṣa* is referred to by the term *vyapekṣā* ‘syntactic dependence’. The assumption of *vyapekṣā* is that the meanings of compounds transparently reflect the meaning of the syntactic phrases from which they are derived. That is, the syntactic structure underlying the compound directly expresses the meaning of the resulting compound.

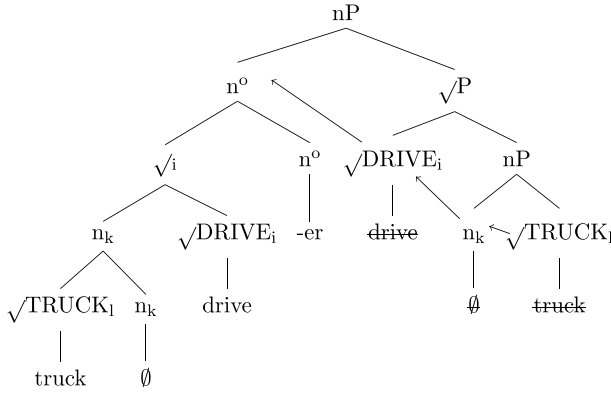
In modern linguistics, the dominant approach to compound formation is fundamentally one that could reasonably be aligned with the notion of *vyapekṣā*. So, Lees (1963), in one of the earliest attempts to model compound formation, proposed that the same Deep Structure derives e.g. *windmill* and also the phrase *wind powers the mill*; later developments by e.g. Levi (1978) and M. R. Allen (1978) retain the basic intuition that there is an underlying structure which derives both a compound and its semantically corresponding phrase. One of the most prominent modern models of morphosyntax, Distributed Morphology, works in essentially the same way: as proposed by Harley (2009), a compound like *truck driver* derives from an underlying structure which could also, in a different context, derive the phrase *drives a truck*.²⁶

²⁴See e.g. Murti (1974) and Joshi (1968, 9–10, 51–52).

²⁵In this way compounds are *nitya* ‘obligatory’; in a slightly looser sense the term *nitya* could also be used to describe compounds treated as derived under *ekārthābhāva*, as discussed below. The use of *nitya* here is entirely distinct from the concept of *nityasamāsa*, which refers to a type of compound (roughly, lexicalised compounds).

²⁶So, in (5) it is the \sqrt{P} (root phrase) on the right of the tree which is the underlying base structure, which by a series of operations produces, in this instance, the compound structure on the left.

(5)



If a position equivalent to *vyapekṣā* is the mainstream in modern linguistics, what about its opposite, the *nityapakṣa*? A promising avenue for such a view of compounding would be in inferential-realizational approaches to morphology (in the terms of Stump 2001), according to which fully formed words are the basis of morphology, with morphological decomposition being essentially an inferential process based on (e.g. paradigmatic) alternations between complete word forms. Inferential-realizational morphology is often associated with lexicalist syntax and should offer an approach to compound formation which emphasises the priority and unity of fully formed compounds, denying any explicit process of compound formation. I am not aware of an existing inferential-realizational account of compounding, however.

The Indian tradition admits two further views on compound formation, which are together the preferred approach in the later Indian linguistic tradition. If one does not treat the compounding process as involving *vyapekṣā*, then it must involve *ekārthībhāva*, the creation of a unitary meaning. That is, the meaning of a compound is not just the sum of the meaning of the constituent members, or identical with the supposed corresponding syntactic phrase, but rather the compounding process results in a unitary and distinct meaning for the compound.

The distinction between *jahatsvārthā* (*vṛtti*) and *ajahatsvārthā* (*vṛtti*) is difficult, but comes down to the question of whether a word can lose its independent meaning when used in a compound. Formally, the four approaches to compound formation can be represented as follows, where words-meaning pairings are represented as ‘word: meaning’:

- (6) (a) Nityapakṣa: *rājan*:R, *puruṣa*:P, *rājapuruṣa*:X
 (b) Vyapekṣā: *rājan*:R + *puruṣa*:P → *rāja-puruṣa*:R+P
 (c) Jahatsvārthā: *rājan*:R + *puruṣa*:P → *rāja-puruṣa*:X
 (wherein *rājan*:{R,X}, *puruṣa*:{P,X}).
 (d) Ajahatsvārthā: *rājan*:R + *puruṣa*:P → *rāja-puruṣa*:X
 (wherein *rājan*:{R,X}, *puruṣa*:{P,X}).

So, under the *nityapakṣa* there exist three words here, *rājan* ‘king’, *puruṣa* ‘man, servant’ and *rājapuruṣa* ‘king’s servant’, but there is no derivational relation between the first two

and the third, and no relation between the meaning of the first two and the meaning of the third. Under *vyapekṣā*, in contrast, there is a derivational relation and the meaning of *rāja-puruṣa* transparently derives from the meanings of its constituent words. Under *ekārthībhāva*, there is a derivational relation, but the meaning of the compound is distinct from the transparent syntactic combination of the meanings of the compound's constituent words. The difference between *jahatsvārthā* and *ajahatsvārthā* depends on how the meanings of the constituent words in the compound are understood to function within that compound, whether the constituent words themselves denote only the meaning of the whole, or whether they retain their own meaning while also retaining the meaning of the whole.

Is there anything in modern theories of compound formation corresponding to the *ekārthībhāva* approach of the Indian tradition? Perhaps closest is the 'onomasiological' approach to word formation (see Štekauer 2016, with earlier references). This approach starts from the idea that word formation is about naming:

This approach lays emphasis on the active role of language users in the process of giving names to objects instead of presenting word formation as an impersonal system of rules detached from the objects named and from language users. (Štekauer 2016, 55)

Crucially, the concept precedes the formation. Therefore, while the formation necessarily involves morphological material which corresponds semantically (in some way) with the concept to be expressed, it is not the case that the meaning of the parts is what produces the meaning of the whole; rather, the meaning of the whole is the precondition for the formation. For example, to express the concept 'person who writes novels (professionally)', using a conceptual analysis template Result – Action – Agent, one forms *novel – write – er*, and thereby the compound *novel-writer*. Since the meaning of the whole has priority and does not derive from the meanings of the compound members, we have an approach broadly equivalent to *ekārthībhāva*; insofar as the members of the compound might be considered to retain their own meanings within the compound (despite those meanings not contributing to the meaning of the whole), it is perhaps closest to *ajahatsvārthā*.

Beyond this four-way division of approaches to compound formation, perhaps the most prominent alternative is that put forward by Kauṇḍabhaṭṭa. He reduces the four views to two, rejecting the *nityapakṣa* as a viable option and rejecting the possibility of *ajahatsvārthā* within *ekārthībhāva*. He therefore aligns *ekārthībhāva* fully with *jahatsvārthā*, and treats *ajahatsvārthā* as fully equivalent to *vyapekṣā*. The details of this go beyond the present scope, but the relevant point is that the Indian tradition kept debating these questions and evolving new approaches to compound formation, many centuries before the emergence of generative grammar (re-)raised these concerns.

4. Conclusion

In the first part of this paper, I explored the apparent influence of the ancient Indian linguistic tradition on modern linguistic approaches to compound classification. Bloomfield (1933) did not, in fact, introduce the, or an, Indian system of compound classification into modern linguistics but developed his own distinct system, and associated Sanskrit terms with his classes. Bloomfield certainly understood, but was not in any great detail influenced by, the Indian classification system whose terms he adopted. Yet

even that system was only a small part of the ancient Indian tradition's treatment of compounding. Beyond the question of classification, the question of the process of compounding was central to Indian theorising, and we have seen that there are interesting parallels between the Indian and modern traditions which deserve more detailed consideration. Overall, while this paper has shown that the Indian tradition has had relatively little direct influence on modern linguistics in relation to the theory of compounding, despite the relative prominence of Sanskrit terms for compound classes, I hope it has also shown that a deeper understanding of the details and breadth of the Indian tradition can provide valuable and interesting insights into the development of linguistic theory.

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Notes on contributor

John J. Lowe is Associate Professor of Sanskrit at the University of Oxford. His research covers Sanskrit and Indo-Aryan linguistics, with particular focus on syntax and semantics. He completed his DPhil at Oxford in 2012, working on syntax and semantics in Rigvedic Sanskrit, and has taught linguistics and Sanskrit at Oxford since then. Dr Lowe's publications include *Participles in Rigvedic Sanskrit: The syntax and semantics of adjectival verb forms* (Oxford University Press, 2015), *Transitive nouns and adjectives: evidence from early Indo-Aryan* (Oxford University Press, 2017), and *Modern Linguistics in Ancient India* (Cambridge University Press, 2024). He is currently the Primary Investigator on the ERC-funded project "Linguistics from India: new ideas for modern linguistics from ancient India (LINGUINDIC)" (2020–2026).

ORCID

John J. Lowe  <http://orcid.org/0000-0003-0131-1575>

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