CLASSICAL Sanskrit Preverb Ordering: A Diachronic Study

Dissertation

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The Indo-European language family contains many 'small words' with various adverbial meanings and functions, including preverbs. The term 'preverb' is used to label any of a variety of modifying morphemes that form a close semantic unit with a verb, including both words and prefixes (Booij and Kemenade 2003). Some Indo-European languages not only have preverbs, but also allow more than one preverb to modify the same verb root. Sanskrit, the focus of the present study, is one such language. The preverbs in Sanskrit 'stack' onto the verb root, such that all of the preverbs alter the meaning of the verb. In Vedic Sanskrit, only two preverbs are ever combined with a single verb (Macdonell 1975), but in Classical Sanskrit, there are also some, admittedly relatively unusual, cases involving three preverbs.

I show that Sanskrit preverbs exhibit consistent tendencies in their relative positioning. For example, the preverb abhi is most usually found in the position farther from the verb, where the preverb parā is categorically found next to the verb. It has long been believed that where Sanskrit showed multiple preverbs, the ordering of those elements was determined primarily by “the requirements of the meaning” (Whitney 1925: §1080), but I provide numerous counterexamples
to this claim. There are many cases where the order does not influence the
meaning.

There is considerable evidence showing that, rather than being
explainable in purely synchronic terms, e.g. based on phonological or semantic
properties, preverb ordering instead reflects properties inherited from Proto-Indo-
European. I base this claim on two findings. First, my data show strong
correlation between ordering properties of preverbs in Classical Sanskrit and
those found in the older Vedic language, such that the classical situation is
clearly a ‘crystallization’ of the older Vedic patterns. Secondly, I have determined
that there is a relationship between ordering properties of Sanskrit preverbs and
the ordering properties of cognate preverbs in other Indo-European languages
that allow preverb stacking.

While a large number of IE languages have preverbs, a much smaller
number also allow stacking. Greek, Irish, and various Slavic languages are well
known for this; Irish is particularly notorious for preverb stacking. According to
Thurneysen, as many as five preverbs may ‘occasionally be found’. This is many
more than are ever combined in Sanskrit, even in the Classical language.
However, Kim McCone (1987) has presented a relative ordering hierarchy for Old
Irish. By comparing my data with information presented in McCone, I show a
strong correlation between the ordering trends of Sanskrit preverbs and those of
the Irish verbal prefixes.
Additionally, there is a correlation in ordering between certain Greek prepositions and those of both Irish and Sanskrit. This is further evidence that Classical Sanskrit preverb ordering trends are indeed inherited rather than synchronically generated. Particularly, this similarity between the three languages shows that rather than simply being inherited from earlier Indic, as the close similarity between the Vedic and Classical data suggests, these trends are possibly inherited directly from Proto-Indo-European.
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CHAPTER 1: INTRODUCTION

1.1 Defining Preverbs

In Sanskrit, there are small morphological units that, when combined with verb roots, imbue those verbs with new and different meanings. These units-known as preverbs-have been characterized in the literature by various names and assigned to various lexical categories. Nevertheless, they can be defined as a class within Sanskrit, and ultimately in the larger Indo-European language family, according to their basic functional and positioning properties.

1.1.1 Function

Booij and Kemenade (2003) say that the term 'preverb' is used to describe any of a variety of morphemes that form a close semantic unit with a verb, including both words and prefixes. Preverbs in Sanskrit modify verbs and alter their meanings, but not their lexical categories. For example, a common verb \( \sqrt{v\text{gam}} \)-, meaning 'to go') is given in Example 1.1 in combination with various preverbs, showing a range of alteration to the basic meaning of the verb root.
**\( \sqrt{\text{gam}} \)** - to go

- **\( \text{abhi-}\sqrt{\text{gam}} \)** - ‘to go near to, approach’ (to-go)
- **\( \text{sam-}\sqrt{\text{gam}} \)** - ‘to meet’ (with-go)
- **\( \text{ā-}\sqrt{\text{gam}} \)** - ‘to return’ (towards speaker-go)
- **\( \text{ati-}\sqrt{\text{gam}} \)** - ‘to pass by or over’ (over-go)
- **\( \text{vi-}\sqrt{\text{gam}} \)** - ‘to go asunder, separate’ (apart-go)
- **\( \text{adhi-}\sqrt{\text{gam}} \)** - ‘to go up to’ (above-go)
- **\( \text{apa-}\sqrt{\text{gam}} \)** - ‘to go away’ (off-go)
- **\( \text{ni-}\sqrt{\text{gam}} \)** - ‘to settle down upon’ (down-go)

**Example 1.1:** \( \sqrt{\text{gam}} \) with various preverbs

Preverbs have mainly directional or locational interpretations, as with **\( \text{abhi} \)**, meaning ‘toward’ - so that, \( \sqrt{\text{gam}} \), when in combination with that preverb becomes ‘to go toward’ (or ‘to approach’).

**1.1.2 Position**

In addition to being defined by their function, preverbs are usually defined by their position relative to the verb. In various periods of the Sanskrit language, preverbs typically (but not exclusively) appear before the verb they modify. When they are found separated from the verb, a phenomenon called *tmesis*, they tend to appear sentence-initially (Kuryłowicz 1964). Examples from both the Rig Veda (Vedic Sanskrit) and the Mahabharata (Classical Sanskrit) are given below in Example 1.2.
Vedic Sanskrit (RV):
9.103.6 pári sáptir ná vājayūr devó devéhyaḥ sutáḥ I
výānasíḥ pávamāno ví dhāvati II
pari-vi-vdhāv (3sg PAI)
‘he runs through on all sides’

10.17.11 samānām yónim ṣnu samcārantam drapsāṁ juhomyānu
saptá hótrāḥ II
anu-sam-vcar (PAPart, mAsg)
‘walking alongside’

Classical Sanskrit (MBh):
3.234.6a abhikruddhān abhipreksyā gandharvān arjunas tadā
abhi-pra-वकṣ (gerund)
‘having looked at’

2.28.3 jīgāya karadaṃ caiva svarājye samnyaveśayat
sam-ni-viś (3sg ImpACaus)
‘he caused to sit down together’

Example 1.2: Preverbs in Vedic and Classical Sanskrit

Additionally, as is also seen in Example 1.2, preverbs begin in the older
language as words, but by the time of Classical Sanskrit have become bound
prefixes.

1.1.3 Preverbs as a terminological problem

Though the current standard terminology for these items is “preverb”, in
many ways, this is an incomplete or misleading name, for two reasons. First, it is
in many ways inadequately descriptive. “Preverb” implies that these items have
something to do with verbs, and that they appear before verbs which are presumably modified. However, preverbs at some points in the history of Sanskrit have the ability to modify both nouns and verbs, and they may appear in various positions relative to the verb.

Secondly, scholars have not historically been consistent with their terminology, even within the Sanskrit literature, presumably because of functional and positional ambiguity. Delbrück refers to these items as “Praepositionen” (1968). Macdonell, in his *Vedic Grammar* (1910), refers to the elements in question as “adverbial prepositions”. William Dwight Whitney, in his seminal *Sanskrit Grammar* (which deals primarily with the Classical Sanskrit language), refers to them as “words of directions, elements of an adverbial character, the so-called prepositions, or the verbal prefixes”- a more accurate, if not concise, characterization.

When the scope of study broadens to include other Indo-European languages, the problem is compounded: these items are typically called “verbal prefixes” in Slavic literature, but “prepositions” in the literature on Ancient Greek. Much of the confusion over the appropriate name for these items stems from the range of meanings and functions that they encompass, both in Sanskrit and, as I discuss in Chapter 4, in the rest of the Indo-European family. Cuzzolin et. al. (2006), for example, refer to these adverb-adposition-preverbs as a “problematic category”, entirely because of that range of meaning and functions. This class,
which consists of small indeclinable items that modify both nouns and verbs, exists in many IE languages.

Nevertheless, it is necessary to have some term to describe this class of words. The majority (if not the totality) of these elements modify verbs, and appear before the verbs they modify. Even in Vedic Sanskrit, which allows for their appearance after the verb, they occur vastly more often in the position before the verb. Because of this, combined with the standardized use of the term “preverb” both in modern Sanskrit literature and in the Indo-European literature, I use the term (despite some shortcomings) throughout, at least to describe these items in Sanskrit.

1.2 Preverbs in Sanskrit

Sanskrit (which is part of the Indo-Iranian branch of the Indo-European language family) is a language historically spoken in India and some surrounding areas. The older form, which is the Sanskrit of the Vedas, is usually dated to at least 1200 B.C. The newer form, called “Classical” Sanskrit, appears in texts from around the fifth century B.C. until the present (Burrow 1955). It should be noted that all Sanskrit texts were originally oral, making the actual dating of the originals problematic. Sanskrit preverbs appear with verbs in texts of all dates. However, it should be noted that preverbs have very different properties and behaviors in different periods of Sanskrit.
1.2.1 Diachronic notes on preverb behavior

The most notable difference between preverbs in the two periods, as shown briefly in E1.2, is that, in Vedic Sanskrit, preverbs are free words and able to be separated from the verb or even to appear after it (Whitney 1924: §1081a). It was also possible in Vedic for preverbs to appear, typically in elliptical contexts, without a verb, where the preverb-verb complex is represented by the preverb alone. Later on, in Classical Sanskrit, preverbs have become prefixes that are bound to the verbs they modify. This difference is the root of most of the differences in preverb behavior between the two periods.

There are some few cases of preverbs that are not bound to the verb in Classical Sanskrit. Whitney (1924: §1081c) says that “three or four instances have been cited from the later language of a prefix separated from, or following, a verb”, and goes on to speculate that the preverb is actually used adverbially in those cases. There are a few cases of a pure adverbial use of preverbs in the Vedic language, and so it is possible that these separated cases are some sort of retention of that function (Kuryłowicz 1964:171). Although Classical preverbs have largely lost that capacity, even in Classical Sanskrit some preverbs may be made into adverbs using the -tas suffix (Whitney 1924: §1098c).
abhitas near, towards
paritas all around, everywhere

Example 1.3: Adverbs with the -tas suffix

Preverbs in Vedic Sanskrit could also serve as adpositions modifying nouns\(^1\). By the time of Classical Sanskrit, however, preverbs lost the ability to modify nouns as free words, although they do still appear regularly in nouns derived from verbs. Examples of such deverbal nouns can be seen in Example 1.4:

-upa-sam-ny-āsa m. abandonment, giving up (\(\sqrt{vas}\)) (lit: beside-together-down-throwing)

sam-abhi-bhāṣaṇa n. conversation (\(\sqrt{bhāṣ}\)) (lit: with-to-talking)

Example 1.4: Deverbal nouns with preverbs

While there are many of these nominal and adjectival compounds with preverbs in the Classical language, Whitney notes that these sorts of compounds

\(^1\) This is comparable to the Greek preverb, particularly in the Homeric texts (Horrocks 1981)
were not common (but not unheard of) in the older language. This might possibly have been because preverbs were also in the process of being incorporated as nominal modifiers, just as they were incorporated as verbal modifiers. Some of Whitney’s examples of Classical preverb-noun and preverb-adjective compounds are given in Example 1.5.

<table>
<thead>
<tr>
<th>Preverb</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>adhi-danta</td>
<td>m. upper tooth (lit: over-tooth)</td>
</tr>
<tr>
<td>abhi-rucira</td>
<td>mfn. very bright (lit: toward-bright)</td>
</tr>
<tr>
<td>prati-pakṣa</td>
<td>m. the opposing side (lit: against-faction)</td>
</tr>
</tbody>
</table>

Example 1.5: Preverbs combined with nouns and adjectives

Additionally, there are details of preverb behavior in Vedic which have no direct parallel in the Classical language— particularly, the syntax of preverb positioning. The details of the position of preverbs in the sentence and the impact of that positioning on preverb ordering are discussed further in section 3.2.1. However, the question of the position of the preverb relative to the verb root and its associated elements is relevant in both Classical and Vedic Sanskrit, and I now turn to that subject.
1.2.2 Preverb positioning relative to other elements

In Sanskrit, even in the Vedas, preverbs interact with other verbal morphology. They are more external to the root than the inflectional markers—presumably because those markers were affixes in the Vedic language, and even in the classical language remain more strongly incorporated with the verb root than the preverbs. In general, most verbal inflection in Sanskrit is suffixal or even infixal, but there are a number of inflectional categories that are at least partially marked by morphological material occurring in positions which interact with preverbs. Particularly, those categories that are marked with reduplication— the perfect, the intensive, the desiderative, the reduplicated aorist, and the reduplicated present— have reduplication on the front of the root, and all, as would be expected, reduplicate before preverbs are attached.

Additionally, for those categories that are marked by the a- augment (the imperfect, the conditional, the aorist and, mostly in the Vedas, the pluperfect), the augment also appears more internally than preverbs. Examples of both of these cases are given in Example 1.6.
Preverbs with reduplication:
3.143.16c mahadbhiḥ pṛṣatais tūṇaṃ varṣam abhyājagāma ha
abhya-va-gam (3sg PerfAl)
“and a rainstorm arose at once with a torrential cloudburst”

Preverbs with augment:
2.32.5a rājāṃ tu pratipūrtham samjayan samnyayo-jayat
sam-ni-Vyuj (3sg ImperfACaus)
“Samjaya he assigned to the hospitality for the kings”

Example 1.6: Preverbs with reduplication and augment

There are a few exceptions to the general rule that preverbs attach outside reduplication and augment. Whitney notes a few isolated cases where the augment comes “before a prefix, instead of between it and the root” (Whitney 1924: §1087f). All of the cases Whitney cites are given in Example 1.7. It should be noted that in these otherwise anomalous formations, where there are two preverbs, the augment universally appears between them. That is, the augment always appears more externally than one preverb, but not the other.
avaSaTkArSIt (GB)  
vaṣaṭ-vṛṣ (3sg AoristAI)

udaprapatat (AB)  
ud-pra-vpat (3sg ImperfAI)

anvasaMcarat (Mahabharata)  
anu-sam-vcar (3sg ImperfAI)

pratyasaMharat (Mahabharata)  
prati-sam-vṛ (3sg ImperfAI)

pratyavyUhat (Mahabharata)  
prati-vi-vūh (3sg ImperfAI)

anvavIkSetAm (Mahabharata)  
anu-vi-vīkṣ (3du ImperfAOptative)

aprAiSlt (Mahabharata)  
pra-2vīṣ (3sg AoristAI)

asambhramat (Mahabharata)  
sam-vbhram (3sg ImperfAI)

abhyanimantrayat (Har)  
sam-ni-vmantr (3sg ImperfAI)

vyAvasthApi (SDS)  
vi-ava-vśthā (3sg Caus)

Example 1.7: Anomalous cases of augment before a preverb

The placement of the augment in the above cases shows that there is, for those cases, a strong association between root and preverb. Typically, the augment affixes onto the stem form of the verb, and for a preverb to appear more internally than the augment shows that it may be being taken as part of the stem in those cases. One form, aprāiṣīt, is listed only as occurring with an initial pra,
and with the augment outside of the preverb, in Whitney’s book of verb roots (1995:9). Additionally, there is at least one case where the preverb is reduplicated as though it were part of the verb root (*niniyọja*, for *niyuyọja*). There are also a few verb roots Whitney lists as being suspected of deriving originally from a prefixed root, as shown in Example 1.8.

\[
\sqrt{ap} \leftarrow \, \sqrt{a} \, + \, \sqrt{ap} \\
\sqrt{vyac} \leftarrow \, \sqrt{vi} \, + \, \sqrt{ac} \\
\sqrt{tyaj} \leftarrow \, \sqrt{ati} \, + \, \sqrt{aj}
\]

**Example 1.8: Possible preverb-root composites**

However, while it is theoretically reasonable for a preverb to have become inseparable from its root (as seems to be the case for *pra* with 2\(\sqrt{i\,s}\) above, if only for the aorist), none of these examples are convincing as such a case when the etymological information is considered. \(\sqrt{tyaj}\) particularly has a good cognate in Greek \(\sigma\epsilon\betao\mu\alpha\iota\), and none of these examples actually hold up as having originally been composed of a preverb and a verb. (Rix 2001)
1.2.2.1 Interaction with the ‘inseparable prefixes’

There are also numerous other elements which regularly combine with verbal forms, either as prefixes, particles or compound elements. Many of these are part of the class of what Whitney calls ‘inseparable prefixes’. These elements are distinct from preverbs mainly because of their tendency to avoid true verbal forms (although they appear frequently with nominal verb forms, such as participles). Additionally, they do not have the kinds of locational or directional meanings usually associated with preverbs in Sanskrit.

One of the more common of these is *su*, meaning generally ‘good’. *Su* combines as a prefix primarily with noun forms, though there are a number of cases where it is associated with a verb (*suśakyante*, the 3pl passive of the root √śak). Additionally, *su* appears– as Whitney says– “not rarely” as an indeclinable word in the older language (Whitney 1924: §1121h). While cases of *su* combined with a preverb are not common, there are enough forms (in this case, nominal derivatives) to show that, when it does combine, it combines outside the preverb.

Example 1.9: Preverb with *su*

<table>
<thead>
<tr>
<th>susaṁśita</th>
<th>‘well sharpened, very sharp’</th>
</tr>
</thead>
<tbody>
<tr>
<td>(su-sam-व्शि)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>supraśasta</th>
<th>‘greatly praised, excellent’</th>
</tr>
</thead>
<tbody>
<tr>
<td>(su-pra-व्शाम्स)</td>
<td></td>
</tr>
</tbody>
</table>

13
Another inseparable prefix of note is the negative prefix *a* or *an* (the form being determined by the phonological context). This prefix, as is the case with *su*, also primarily combines with nouns and adjectives. Nevertheless, according to Whitney, there are some clear cases of *a/an* before verb forms: *alokayati* ‘he does not view’, *aspṛhayanti* ‘they do not desire’.

Very similar in behavior to *a/an* is the “prefix of dispraise”, *dus*, which very occasionally appears with a verbal form; Whitney gives *duṣcaranti* ‘they behave ill’ (Whitney 1924: §1121g). Again, because these prefixes combine most with nouns, the best cases of combination with preverbs are with participles; in these both *a/an* and *dus* seem to universally combine more externally than the preverbs.

\[
\begin{align*}
\text{aparājīta} & \quad \text{‘unconquered’} \\
\text{(a-parā-ṭī)} & \\
\text{asamkhyāta} & \quad \text{‘uncounted, innumerable’} \\
\text{(a-sam-śkhyā)} & \\
\text{duratyetu} & \quad \text{‘hard to cross’} \\
\text{(dus-ati-ṭī)} &
\end{align*}
\]

Example 1.10: Preverb with *a/an* and *dus*
This description of the facts about preverb/prefix interaction in Classical Sanskrit suffices for now. For a more complete discussion of the syntax of preverbs in Vedic Sanskrit particularly, see section 3.2.

1.2.3 List of preverbs

Just as there is inconsistency between scholars about what the preverb category should be called, there is likewise a certain amount of disagreement as to which items should be included in that category in Sanskrit. As has been discussed, there are a number of different elements that modify verbs in one way or another; it is therefore necessary to determine which elements to consider in a discussion of Sanskrit preverbs. I have used the list that Whitney says “have value as such [as preverbs] throughout the entire history of the language” (Whitney 1924: §1077).
<table>
<thead>
<tr>
<th>Preverb</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ati</td>
<td>beyond, over</td>
</tr>
<tr>
<td>adhi</td>
<td>above, besides</td>
</tr>
<tr>
<td>anu</td>
<td>after, along, alongside</td>
</tr>
<tr>
<td>antar</td>
<td>interior, within</td>
</tr>
<tr>
<td>apa</td>
<td>down, off, back</td>
</tr>
<tr>
<td>api</td>
<td>unto, close upon or on</td>
</tr>
<tr>
<td>abhi</td>
<td>to, towards, into, over, upon</td>
</tr>
<tr>
<td>ava</td>
<td>off, away, down, down from</td>
</tr>
<tr>
<td>ā</td>
<td>near, near to, towards- change of direction</td>
</tr>
<tr>
<td>ud</td>
<td>up, upwards, upon, on, over, above</td>
</tr>
<tr>
<td>upa</td>
<td>towards, near to, by the side of, with</td>
</tr>
<tr>
<td>ni</td>
<td>down, in, into</td>
</tr>
<tr>
<td>nis</td>
<td>out, forth</td>
</tr>
<tr>
<td>parā</td>
<td>away, forth</td>
</tr>
<tr>
<td>pra</td>
<td>forward, onward, forth, fore</td>
</tr>
<tr>
<td>prati</td>
<td>back to, in reversed direction</td>
</tr>
<tr>
<td>pari</td>
<td>round about, around</td>
</tr>
<tr>
<td>vi</td>
<td>apart, asunder, away, out</td>
</tr>
<tr>
<td>sam</td>
<td>along, with, together</td>
</tr>
</tbody>
</table>

Example 1.11: List of preverbs
In addition to the preverbs I list here, there are also other words that some scholars consider to be preverbs. Macdonell particularly includes ácha “towards”, tirás “across”, and purás “before” (Whitney 1924: §1078). In addition to those three, Whitney also gives, separately from the list in (12), āvis “forth to sight” and prādus “forth to view”. I have excluded these words from my consideration for a variety of reasons. First, many of these elements are extremely restricted in their use. The preverb ácha is “tolerably frequent in RV. (used with over twenty roots) but already unusual in AV. (only two roots) quite restricted in B., and entirely lost in the later language.” (Whitney 1924: §1078). It appears in combination with another preverb seven times total in my Vedic data, most with the preverb ā (but also once with pra). As Whitney noted, however, it has virtually disappeared in the later language, making it irrelevant for a discussion of preverbs which has Classical Sanskrit as its focus.

The rest of these preverbs combine only with specific verb roots- āvis only with √bhū, √as and √kr, tiras only with √kr, √dhā and √bhū; puras primarily with √kr, √dhā and √i; and prādus only with √bhū, √as and √kr. More to the point, however, all of these are very rare, and even more rare in combination with other preverbs. While acha may have had enough tokens to make some sort of generalization about (if only a vague one), none of the rest appear in combination often enough in either the Vedic or the Classical data to be analyzed. The preverb antar is also quite rare (4 tokens and 2 types in my Classical data, 5
tokens in my Vedic data) and has been included mainly because Whitney includes it.

As for other elements such as *su, a/an or dus*, their ability to combine with verb forms is sufficiently restricted that they should best not be considered save peripherally in this study; furthermore, they seem to have a different history and (as shown in 1.2.2.1) different ordering properties relative to the verb root.

### 1.2.4 Historical origins

The ultimate origin of the Sanskrit preverb, and indeed the preverb in the rest of the Indo-European family, is a matter of some discussion. Given the use of these elements both as prepositions and as preverbs, Kuryłowicz considers an adverbial origin most likely. As he says, “such an assumption fully accounts for their subsequent functional bifurcation.” (Kuryłowicz 1964:171) However, as Dunkel (1976) points out, Sanskrit preverbs rarely perform purely adverbial functions, even in the oldest language. For that reason, Delbrück prefers to posit Sanskrit preverbs as a continuation of original preverbs.

Many of the Indo-European adverbs came from a number of sources. Cuzzolin et. al. (2006), in their discussion of IE adverbs, give three sources for adverbs. Of the class containing preverbs, they say that they were:
“Lexemes which gave information about space and time of the predication (the so-called circumstantials); in addition, there were focalisers, quantifiers, and intersentential connecting elements. These types of words are invariable, not transparent and their class is not productive; in fact, they are prototypical adverbs... [this group] represents the oldest core of the category ADV/ADP/PREV.”

Other IE adverb/adpositions are derived from other words (like the adverbs in -tas given in Example 1.3) or are case-marked forms given new meaning, as frequently happens with the accusative and instrumental cases in Sanskrit. The adverbial use of the accusative nominal forms sukham ‘happily’ and naktam ‘by night’ is a good example of this. Additionally, there are, as Whitney says, “unlimited numbers” of case-marked adjectives used in this way: accusative satyam ‘truly’ and nityam ‘constantly’, instrumental akhilena ‘wholly’, etc. However, none of those other items have the close- and ultimately affixal-relationship with the verb in Sanskrit that preverbs have.

1.2.4.1 Etymological origins of preverbs

I present here basic etymological information for each of the preverbs listed in Example 1.11. This information is not intended to be exhaustive, but rather to give an idea of the provenance and main cognates for each preverb. Much of the information about cognates in other languages is drawn primarily from Mayrhofer’s Kurzgefasstes Etymologisches Wörterbuch des Altindischen (KEWA) and Etymologisches Wörterbuch des Altindoarischen (EWA) (1976 and 1981-2001 respectively), although some of it is cross-checked in etymological

<table>
<thead>
<tr>
<th>Root</th>
<th>Etymology</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ati</td>
<td>PIE *h₁éti, cf. Greek ἑτί, Latin et ‘and’, Gallic eti ‘also’, Gothic ip ‘also’</td>
<td>Greek ἑτι, Latin et, Gallic eti, Gothic ip</td>
</tr>
<tr>
<td>adhi</td>
<td>PIE *-dʰi, a locative suffix (cf. Greek ὁίκο-θι) but no clear parallel in I-Ir</td>
<td></td>
</tr>
<tr>
<td>anu</td>
<td>PIE *ana? *en(u)? Possible cognate with Latin i-gnosco. Not likely cognate with Greek áva</td>
<td></td>
</tr>
<tr>
<td>antar</td>
<td>PIE *h₁enter, cf. Old Irish eter ‘between’, Latin inter, Oscan anter ‘between’, Old High German untar ‘between’</td>
<td>Greek ἐπιταχθεῖσα, Latin i-ter-er, Gallic anter-antere, Old High German un-tar</td>
</tr>
<tr>
<td>apa</td>
<td>PIE *h₂épo, cf. Avestan apa, Greek ἀπο, Gothic af</td>
<td>Greek ἀπεκκαθαρίζω, Latin ap有一定的atum, Gallic ap-epi, Old High German ap-epi</td>
</tr>
<tr>
<td>api</td>
<td>PIE *h₁épi, cf. Greek ἐπί, Gothic if-tuma ‘later’</td>
<td>Greek ἐπι τοῦ, Latin inter-er, Gallic anter-antere, Old High German un-tar</td>
</tr>
<tr>
<td>abhi</td>
<td>PIE *h₂ebʰi (*mβʰi), cf. Greek ἀμφί, Latin amb-, Gallic ambi-, Old High German umbi ‘about, to’;</td>
<td>Greek ἀμφιλογεῖν, Latin amb-ambulare, Gallic amb-ambulare, Old High German umbi</td>
</tr>
<tr>
<td>ava</td>
<td>PIE *h₂eu, cf. Avestan ava ‘down from’, Greek αὖ ‘again’, Latin au-, Old Irish ṭ, üa, Old Church Slavonic u- ‘away, from’</td>
<td>Greek ἀναπήδησα, Latin aus-, Old Irish ṭ, Old Church Slavonic üa</td>
</tr>
<tr>
<td>a</td>
<td>PIE <em>éh₁~</em>óh₁, cf. Greek o-, ε-, Old High German ä-, Old Church Slavonic ja-</td>
<td>Greek ἀναπήδησα, Latin aus-, Old Irish ṭ, Old Church Slavonic üa</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Preverb</th>
<th>PIE Etymology</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ud</td>
<td>PIE *ud, cf. Greek ὑβρίς, Latin üs-que, Gothic üt, Lithuanian už</td>
<td></td>
</tr>
<tr>
<td>upa</td>
<td>PIE *upó, cf. Old Avestan upā, Greek ὑπό, ὑπό 'under'; Latin sub 'under', Old Irish fo 'under', Gothic uf 'on'</td>
<td></td>
</tr>
<tr>
<td>ni</td>
<td>PIE *ni, cf. Avestan ni-, ny-; Armenian ni-, n- 'down'; Old Church Slavonic nizъ 'down under'</td>
<td></td>
</tr>
<tr>
<td>nis</td>
<td>PIE *nis?, cf. Avestan niš, niž 'out, onto'</td>
<td></td>
</tr>
<tr>
<td>parā</td>
<td>Compare Skt. pára. cf. Avestan parā, possibly also Greek πέρα, Hittite parā</td>
<td></td>
</tr>
<tr>
<td>pra</td>
<td>PIE *pro, cf. Greek πρό 'forward, forth', Latin pro⁰, Old Irish ro⁰, Gothic fra⁰, Lithuanian pra⁰, Old Church Slavonic pro⁰</td>
<td></td>
</tr>
<tr>
<td>prati</td>
<td>PIE *préti, cf. Greek πρότι, προτί, πρός 'to, for', Old Church Slavonic protivъ, protiṿ 'against'</td>
<td></td>
</tr>
<tr>
<td>pari</td>
<td>PIE *péri, cf. Greek πέρι, περί 'around'; Albanian për, pej, pe 'over'; Latin per 'through', Old Irish er, ir 'for, forth', Gothic fair- 'forward'</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>PIE *ui, cf. Gothic wipra 'contrary to, against', Old High German widar, probably also Latin uītō 'avoid'</td>
<td></td>
</tr>
<tr>
<td>sam</td>
<td>PIE *som, cf. Lithuanian san̄-das, Old Church Slavonic sǫ-dę 'ruling'</td>
<td></td>
</tr>
</tbody>
</table>

**Example 1.12: Preverb etymologies**

### 1.3 Preverbs in a wider context

Preverbs exist, of course, not only in Sanskrit. As we have seen, Sanskrit preverbs have cognates in many of the more prominent IE languages.
Furthermore, analogues to the IE “preverb” category exist in languages which are unrelated to those of the Indo-European family.

1.3.1 Preverbs in Indo-European

The meanings and functions of preverbs can be very different in the different daughter languages of Indo-European. One notable example comes from Slavic, where aspectual meanings are associated with preverbs. The basic meanings of most Indo-European preverbs, however, are (as mentioned above) locational or directional. So, the basic meaning of Ancient Greek καλέω is ‘to call, summon’ (Liddell and Scott 1996), but with the addition of the preverb εις, it becomes ‘to call in’ (as seen below in Example 1.13).

<table>
<thead>
<tr>
<th>Language</th>
<th>Preverb</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old English:</td>
<td>wið-sacan</td>
<td>‘oppose, deny’</td>
</tr>
<tr>
<td>German:</td>
<td>ein-laden</td>
<td>‘to invite’</td>
</tr>
<tr>
<td>Ancient Greek:</td>
<td>εἰσ-καλέω</td>
<td>‘to call in’</td>
</tr>
<tr>
<td>Old Irish:</td>
<td>do-beir</td>
<td>‘to give, exchange, bring’</td>
</tr>
<tr>
<td>Russian:</td>
<td>при-шить</td>
<td>‘to sew on’</td>
</tr>
<tr>
<td>Sanskrit:</td>
<td>ā-ruh-</td>
<td>‘to rise up’</td>
</tr>
<tr>
<td>Latin:</td>
<td>per-agrare</td>
<td>‘to wander through’</td>
</tr>
</tbody>
</table>

Example 1.13: Preverbs in different I-E languages
Additionally, in a few Indo-European languages, it is possible to have two or more (many more, in some cases) preverbs modify the same verb. Greek, Irish, Slavic and Sanskrit are particularly notable for having such multiple, stacked, preverbs. Combinations of preverbs appear throughout the Indo-European language family, as shown in Example 1.14.

**Example 1.14: Preverb stacking in I-E languages**

- **Ancient Greek:** ἔξ-ἀπο-βαίνω ‘to step out of’
- **Old Irish:** con-nessa ‘condemns’
- **Russian:** пере-про-дáть ‘to re-sell’
- **Sanskrit:** upa-sam-yuj- ‘to furnish with’

Again, it can be clearly seen that in the cases above, both preverbs modify the meaning of the verb. So, the meaning of βαίνω is ‘to walk, step, go’. ἀπο means ‘from’, and ἔξ means ‘out’. Therefore, ἔξ-ἀπο-βαίνω is ‘to step out of’.
1.3.2 Preverbs outside Indo-European

There is a great deal of information on “preverbs” in the literature on some Amerindian languages, particularly those of the Algonquian language family. It could reasonably be asked whether the Indo-European items called “preverbs” are the same as the “preverbs” described for these various other languages. Pentland, in his 2005 article “Preverbs and particles in Algonquian”, has a fuller description of the difference and similarities between IE preverbs and Algonquian. In large part, they have similar functional properties. One notable similarity between Algonquian preverbs and Indo-European preverbs is that some Algonquian preverbs are able to modify both nouns and verbs, and even particles (which are a particular part of speech as they are defined in the Algonquian literature). This is demonstrated in Example 1.15, where the Ojibwa preverb *mino* ‘good’ modifies a verb (*ayaa*), a noun (*manidoo*), and a particle (*mnik*).

<table>
<thead>
<tr>
<th><strong>verb</strong></th>
<th><em>mino-ayaa</em></th>
<th>‘he is good, well, content’</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>noun</strong></td>
<td><em>mino-manidoo</em></td>
<td>‘good spirit, the Holy Spirit’</td>
</tr>
<tr>
<td><strong>particle</strong></td>
<td><em>mno-mnik</em></td>
<td>‘quite enough’</td>
</tr>
</tbody>
</table>

Example 1.15: Ojibwa *mino* ‘good’
However, Pentland claims that “unlike Algonquian preverbs, their Indo-European counterparts are generally limited to forms with spatio-temporal meanings”. Rather, Algonquian preverbs can have many other meanings. Some examples of preverbs from Severn Ojibwa are given in Example 1.16. (Slavin 2006) The first of these has a meaning not unlike an Indo-European preverb, but the other preverbs have meanings that are clearly not, as Pentland says, spatio-temporal. One has a meaning “skilled at VERB”, and the other seems to have some comparative sense.

\[
\begin{align*}
\text{pimi-} & \text{taacipo} \quad \text{‘crawl along’} & \text{taacipo} \quad \text{‘crawl’} \\
\text{nihta-} & \text{nikamo} \quad \text{‘skilled at singing’} & \text{nikamo} \quad \text{‘sing’} \\
\text{ishi-} & \text{naakosi} \quad \text{‘look like this’} & \text{naakosi} \quad \text{‘be visible’}
\end{align*}
\]

Example 1.16: Ojibwa preverb meanings

Additionally, Pentland finds the term ‘preverb’ to be an even less precise term for Algonquian languages than it is for Indo-European. Among Indo-Europeanists, there is at least a general agreement as to the existence and general membership of the class most often referred to now as “preverbs”. In Algonquian studies, however, there is a certain amount of disagreement as to which elements should be considered to be preverbs; some scholars consider
any element which appears before a verb to be a preverb, where others restrict the definition either semantically, functionally, or positionally.

In sum, these preverbs are semantically different from Indo-European preverbs, but basically function in the same way— that is, they attach to a verb and modify its meaning without altering its other qualities. However, another classification for preverbs comes from Craig and Hale’s 1988 article on the preverbs of various languages, including Chibchan Rama. In this article, they define “relational” preverbs, which are functionally distinct from the preverbs in Sanskrit and other Indo-European languages.

1.3.2.1 Satellite vs. Relational Preverbs

According to Imbert (2008), there are two kinds of preverbs, which are distinguished by their function and ordering tendencies rather than their meanings. The elements under discussion in this study are, according to Imbert, primarily satellite preverbs; that is, they modify verbal meanings, but not the other qualities of a verb. Additionally, she says of satellite preverbs that “satellites are not linked to any particular argument; instead, they relate to the verb and complement its lexical and/or semantic content; in a verb + satellite construction, the verb is the head”. That is to say, satellite preverbs modify only the verb and do not relate in any way either semantically or syntactically to the rest of the sentence.
She contrasts these preverbs with *relational* preverbs, which may have similar semantic properties but may retain the ability to modify or govern other elements in a sentence than the verb. This is particularly relevant for preverbs (including Indo-European preverbs) that have the ability to modify other parts of speech in addition to verbs. Adpositions, which are inherently relational, can be incorporated onto the verb as preverbs. These elements, which already have an adpositional sense, sometimes then retain their relational capacity even when used as verbal modifiers. (Imbert 2009) The following example from Imbert and Grinevald (2004) shows the relational preverb *yu*. It attaches to the verb, but modifies both the action (making) and the instrument (*kiskis*, ‘tongs’).

```
nainguku kiskis nsu-kuaakar-i
so tongs 1PL-have-PRESENT
That’s why we have the kiskis

ung-i yaadar tkua yu-nsu-uung-kama
pot-PSP/in thing hot RP/with-1PL-make-SUB
for us to make hot things in the pot with (it)
```

Example 1.17: Instrumental marking with an RP in Rama

Sanskrit preverbs are generally considered to be satellite preverbs, and not relational preverbs. This is, therefore, a case where Sanskrit and Algonquian preverbs are different. Imbert, however, argues that some Homeric preverbs can
be relational, and so relational preverbs seem to be within the scope of what preverbs can do generally.

1.4 Preverbs and ordering

As mentioned above, it is possible in Sanskrit for more than one preverb to modify the same verb. In Vedic Sanskrit, a maximum of two preverbs can modify the same root. In Classical Sanskrit, however, as many as four preverbs can stack onto the same root, although this is extremely rare. It is more usual—if one finds stacking at all—to find two, or to a lesser degree, three preverbs attached to a single root.

This stacking is the focus of this study, and the root of my central question. If stacking is possible, what (if any) principles govern it? In the course of this study, I attempt to answer two specific questions: first, in cases of multiple preverbs, what order do the preverbs occur in? Second, is there some systematicity to the ordering of preverbs, or is the combinatorics of preverbs simply random?

1.4.1 Ordering in Sanskrit preverbs: framing the problem

Given that there are 19 preverbs, there are in theory, 342 possible combinations of two preverbs. That is, 19*19 combinations, subtracting the 19
combinations which consist of a preverb combined with itself\(^2\). If preverb ordering were random, we might expect to see many or most of these combinations. However, only 161 of these combinations, less than half, are known to appear in Classical Sanskrit. This could be a result of an accident of attestation, and one must always be cautious about making assumptions based on a lack of data when working on historical languages. Additionally, the absence of some of these combinations may be semantically motivated (e.g. combinations meaning DOWN-UP or IN-OUT might be difficult). However, even if the 181 unattested orderings are not considered to be significant omissions, the attested combinations may still give us insight into questions of preverb ordering: why any particular item is ordered in the way it is, and what general principles about preverb ordering might be relevant.

1.4.1.1 Terminology

For the purposes of my discussion of preverb ordering, it is necessary to define certain terms. I discuss two ways of analyzing preverb order. One method is relative order, which is the position of preverbs relative to other preverbs. For this analysis, no special terminology is necessary. However, because Sanskrit primarily allows only two preverbs before a root, I focus on absolute order— that is, which position the preverb occupies relative to the root. Where two preverbs

\(^2\) This happens, but it is exceedingly rare, and I have chosen to treat it as a separate phenomenon.
modify the same root, I refer to the preverb position closer to the verb (the second position, from left to right) as “interior”, and the position which is separated from the verb by another preverb (the first position) as “exterior”, as seen in Example 1.18.

Example 1.18: Preverb positioning

Similarly, when a preverb appears after the root (as is infrequently the case in Vedic Sanskrit only) I refer to this as the “posterior” position. In Example 1.19, I give an example from the Rig Veda of a verb (the past passive participle of \( \sqrt{vî} \)) with the preverb \( pari \) directly before the verb, and the preverb \( antar \) directly after.

Example 1.19: A preverb appearing after the verb
I use these terms both to refer to the position, or “slot” that the preverb appears in, and also to refer to the class of preverbs that preferentially appear in that slot. This mainly applies only to “interior” and “exterior”, however, as *antar* is the only preverb that seems to appear preferentially in the posterior slot, and that only rarely, and (of course) only in the Vedic language.

1.4.2 Affix ordering

There are many cases in the languages of the world where the ordering of morphemes—words, clitics and affixes— is relevant. Much work has been done, for example, on morpheme ordering in English, particularly as it relates to suffixes. Since preverb ordering is essentially a problem of affix ordering, some of this research may prove useful for analyzing the Sanskrit problem.

Jennifer Hay, for example, has done notable work on the separability of affixes in English (particularly suffixes) and the effect of separability on ordering. In her 2002 work “From speech perception to morphology: affix ordering revisited”, she hypothesizes the following: “*more separable affixes will occur outside less separable affixes*”. This may ultimately shed light on facts about the ordering of preverbs in multiple preverbation. Minimally, it may help explain the ordering relationship that pertains between preverbs and other prefixal elements modifying verbs.

Bybee’s work on the ordering tendencies of verbal morphemes cross-linguistically is well known, and may provide another useful point of reference.
Her work refers to inflectional morphemes, but some of her observations may be useful for the study of preverb ordering. Particularly, she makes the argument that the more relevant the meaning is to the meaning of the verb, the closer the morpheme will appear relative to the verb stem (Bybee 1985). Her order of morphemes is Stem-Aspect-Tense-Mood-Person.

This is not directly relevant to Sanskrit ordering. Preverbs do not alter the grammatical properties of a verb, and they are part of a single functional category. In contrast, the morphemes that Bybee studies in *Morphology* have different functions relative to the verb. Nevertheless, the basic observation that cognitive relevance governs order of verbal morphemes is again pertinent for preverb ordering in relation to other morphemes, and may be relevant for ordering of preverbs relative to each other.

Vendler’s work on English adjectives (*Adjectives and Nominalizations*, 1968) provides a closer example of items with the same or similar functions combining in specific orders. He discusses the “natural orders of adjectives in unbroken prenominal strings”, that is, the principles that govern the ordering of strings of adjectives in English. These strings have strict requirements as to acceptable and unacceptable orders, as is shown in Example 1.20.
Acceptable orders:
big beautiful white wooden house
comfortable red chair
big rectangular green Chinese silk carpet

Unacceptable orders:
*white wooden beautiful big house
*red comfortable chair
*Chinese big silk green rectangular carpet

Example 1.20: Good and bad adjective orders in English

Vendler’s solution to this problem is that adjectives are part of semantic classes, which ultimately determine the unmarked order of adjective strings. His analysis of the way different adjective meanings and their relation to the modified noun influences their ordering is, of course, not directly translatable to Sanskrit. Nevertheless, it provides insight to the sort of analyses that might apply to the Sanskrit situation.

In Chapter Five, after my discussion of the data for various periods of Sanskrit and other related languages, I revisit affix-ordering and evaluate the usefulness of various of these concepts.

1.5 Dissertation overview

The purpose of this dissertation therefore is to provide a clear and, as much as is possible, complete account of preverb ordering in Classical Sanskrit, drawing on data first in Classical and then, as it becomes relevant, in Vedic
Sanskrit. I also make reference to connections between Sanskrit preverbs and the preverbs of other languages, particularly Indo-European languages. I consider here what is essentially a synchronic question— that is: what (if any) is the reason that, in Classical Sanskrit, preverbs are put in any particular order? Ultimately, however, I must look at the diachronic roots of the synchronic phenomenon in order to answer that question, hence the need to consider Vedic and other branches of Indo-European.
CHAPTER 2: PREVERBS IN CLASSICAL SANSKRIT

2.1 Methods

The data that I present for Classical Sanskrit in this dissertation comes from two sources: first, I did a survey of the Monier-Williams dictionary (hereafter MW) (Monier-Williams 1899). Most of the data on the meanings of preverb-verb clusters comes from that survey, and the initial results were based on the MW data as well.

The ordering data from the MW was augmented by a second survey; a search of the Mahābhārata using a digital search algorithm that allowed me to pull out lines from the text containing double preverb strings.

2.1.1 Search of the Monier-Williams dictionary

The initial study was a type count, and the MW was a good dictionary to use for that purpose. It is the most authoritative of the English language dictionaries of Sanskrit, and it specifically lists many preverb-verb clusters as individual entries. This made it much easier to find many examples of these clusters than it might have been in a differently-organized dictionary.
In my initial survey, I conducted a search of the entirety of the dictionary and recorded all instances of verbs with two or more preverbs. Each verb with two preverbs was entered into a two-dimensional matrix to record the ordering of the preverbs. I collected 2,182 examples in all. I searched the dictionary by hand. Every page was read over to check for cases of multiple preverbs, and every relevant example was recorded in a spreadsheet. I created a two-by-two matrix, and tallied each case of stacking in the appropriate box. In order to minimize the possibility of human error, I conducted the search twice, comparing my results for each combination of preverbs. Where my results showed a discrepancy between the two searches, I did a third count of that particular combination in order to make certain that I had the correct numbers. I was then able to extract the numbers from my matrix in order to produce the analyzed results I present here.

It is not uncommon in Classical Sanskrit for up to three preverbs to stack on a single root\(^3\). There are 126 types with three preverbs in the MW dictionary. While I made note of all such triplets, and have a list of them (given in Appendix A), I have not included them in my basic data on ordering. I have done this partly because they are so much rarer, but also because they require a different form of analysis; proximity to the verb is still relevant, but there are not just two possible positions to be concerned with. Where I have analyzed the data according to

\(^3\)It is possible to have up to four, but I have found only a single case.
relative ordering— that is, which preverbs occur before or after other preverbs always or almost— I have included the triplets.

The MW dictionary has entries on verbs in the Classical Sanskrit corpus, and also some of the Vedic corpus. In order to use this source only for Classical Sanskrit, I ignored any verb which was marked only as appearing in a Vedic text. While the MW dictionary marks its entries as to the source text, it is not marked exhaustively. Each entry may represent one or many occurrences in an actual text. Because of this, all of my Classical Sanskrit data from the MW dictionary represent a type count.

A type count is a count of how many different verbs are listed in the MW dictionary with each particular preverb combination; a token count is a count of how many actual instances of any verb with each preverb combination appear in a given text. Type counts and token counts give us very different information about the frequency of an item in a text. As an example, in English, the segment /ð/ has a relatively low type count in word-initial position. There are only a few words in the language that contain it. However, because it appears in several extremely common words (the, there, this), any token count of a segment of English speech will show a disproportionately high occurrence of /ð/.

While a type count is useful for certain applications, it gives an incomplete picture of the commonness of certain combinations. This is one of the main reasons I felt it was so important to also conduct a token count in a large, representative Classical Sanskrit text.
2.1.2 Search of the Mahābhārata

In order to conduct a token count, an appropriate text was required. The text needed to be large enough to get a reasonable sample of stacked preverbs. While the use of preverbs is quite common, stacking preverbs is much less common. Furthermore, because a text of any length would make a manual survey like the one I conducted on the MW dictionary impossible, I needed access to a text that had been rendered into a reliable digital format. After researching the problem, I found that the best candidate was John Smith’s revision of Professor Muneo Tokunaga’s version of the Mahābhārata, which is available for download from his website (http://bombay.indology.info/).

This particular digital text was ideal for computerized searching for two reasons. Firstly, although the text is in originally in 8-bit CSX encoding, a version of the text rendered into the Harvard-Kyoto Convention was available. Because the Harvard-Kyoto Convention (hereafter HK) uses only basic ASCII characters, this made it easier to write the search algorithm; there were no special characters to account for. Also, it was one of the easier transcription systems to read and write quickly, which became very important during the analysis stage of the project. For the most part, HK uses relatively intuitive case-sensitive replacements for the usual transliteration symbols. So, long vowels are capitalized (ā is A in HK, etc), as are retroflex consonants (ṭ is T in HK). A complete list of HK symbols is given in Table 2.1.
<table>
<thead>
<tr>
<th>a</th>
<th>a</th>
<th>ā</th>
<th>E</th>
<th>ņ</th>
<th>G</th>
<th>dh</th>
<th>Dh</th>
<th>p</th>
<th>p</th>
<th>ś</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
<td>c</td>
<td>c</td>
<td>l</td>
<td>W</td>
<td>ph</td>
<td>ph</td>
<td>ś</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>u</td>
<td>u</td>
<td>ch</td>
<td>ch</td>
<td>lh</td>
<td>Wh</td>
<td>b</td>
<td>b</td>
<td>s</td>
<td>s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>R</td>
<td>āi</td>
<td>j</td>
<td>j</td>
<td>N</td>
<td>bh</td>
<td>bh</td>
<td>h</td>
<td>h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>L</td>
<td>au</td>
<td>au</td>
<td>jh</td>
<td>jh</td>
<td>t</td>
<td>t</td>
<td>m</td>
<td>m</td>
<td>m</td>
<td>M</td>
</tr>
<tr>
<td>ā</td>
<td>A</td>
<td>k</td>
<td>k</td>
<td>ņ</td>
<td>J</td>
<td>th</td>
<td>th</td>
<td>y</td>
<td>y</td>
<td>ṭ</td>
<td>H</td>
</tr>
<tr>
<td>ĩ</td>
<td>I</td>
<td>kh</td>
<td>kh</td>
<td>t</td>
<td>T</td>
<td>d</td>
<td>d</td>
<td>r</td>
<td>r</td>
<td>m</td>
<td>&amp;</td>
</tr>
<tr>
<td>ū</td>
<td>U</td>
<td>g</td>
<td>g</td>
<td>ŭh</td>
<td>Th</td>
<td>dh</td>
<td>dh</td>
<td>l</td>
<td>l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ġ</td>
<td>q</td>
<td>gh</td>
<td>gh</td>
<td>d</td>
<td>D</td>
<td>n</td>
<td>n</td>
<td>v</td>
<td>v</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: The Harvard Kyoto Convention for Sanskrit transcription

An additional feature of this particular version of the text is that it has a system of unique identification numbers on each line. These numbers give the book, chapter, stanza and pada for each line. This is useful because it allows for the quick and accurate sourcing of every line, even after the search program has removed it from its original context.

Aside from the properties of the digital version of the text, the Mahābhārata is a good candidate for the sort of search I needed to conduct. The
Mahābhārata is the longest ancient epic poem that survives into the modern day. It is, by some counts, roughly ten times longer than the Iliad and the Odyssey combined. This means that it is a good text in which to find many cases of preverb stacking. It also means that there is a massive amount of data to search through, much more than could ever be sorted by hand.

Because of the specific needs of the project, existing search tools—the search tools in a standard text file reader, for example, or the tools for the Titus text reader—were inadequate. Specifically, Sanskrit sandhi made it impossible to use one of these simple tools. Sandhi transforms the form of a word based on the words surrounding it. This means that each word or series of words may have up to a dozen possible forms in a text. Because of this, I was faced with generating and searching for thousands of strings in a massive text.

In collaboration with a programmer, Richard Hopkins-Lutz, I designed a search tool that has allowed me to do an exhaustive survey of portions of the text of the Mahābhārata looking for cases of preverb stacking. We designed the tool to account for sandhi changes both at the boundary of the two preverbs and at the boundaries between the preverbs and the surrounding words. The tool is also capable of recognizing that sandhi variants of stacked preverbs are variations of a single item.
2.1.2.1 Sandhi

Sanskrit is well known for its sandhi (from the preverb *sam* and the verb *dhā*, meaning “put together”). Languages in general show assimilatory effects for sound segments that are close to each other. Sanskrit is notable because it indicates some of these assimilatory changes in the orthography. As mentioned above, there are 342 preverb combinations to search for. However, because sandhi produces different variants of the same lexical item, this means that there are not just 342 strings to be searched for. In actual practice, there are 1674 possible outcomes of one preverb with another as they would actually occur in a text.

As a single example, the combination of the preverb *abhi* and the preverb *ava* can have 12 possible forms, depending on the words that precede and follow it. In order to determine what the correct possible forms for a given combination are, the search program first produces a list of possible strings based on the rules of sandhi as it applies to the outer boundaries of the preverb combination. In order for the program to do this, I created a list of possible variants for the preverb in the exterior position (sandhi variation only at the word-initial boundary) or the interior position (sandhi variation only at the word-final boundary) as shown in Table 2.2. I generated these lists based on the rules of sandhi given in Whitney’s *Sanskrit Grammar*. It should be noted that I make no special consideration for the generation of the diphthongs *ai* and *au* from sandhi. This is because they are represented in the HK convention by the strings <ai> and
<au>. Because the search algorithm does not consider multicharacter representations of sounds to be a single unit, a search for <ava> will also find <avai> and <avau>.

<table>
<thead>
<tr>
<th></th>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABHI</td>
<td>abhi</td>
<td>abhi</td>
</tr>
<tr>
<td></td>
<td>Abhi</td>
<td>abhiL</td>
</tr>
<tr>
<td></td>
<td>'bhi</td>
<td>abhy</td>
</tr>
<tr>
<td>AVA</td>
<td>ava</td>
<td>ava</td>
</tr>
<tr>
<td></td>
<td>Ava</td>
<td>avA</td>
</tr>
<tr>
<td></td>
<td>'va</td>
<td>ave</td>
</tr>
<tr>
<td></td>
<td></td>
<td>avo</td>
</tr>
</tbody>
</table>

Table 2.2: Sandhi variants for ABHI+AVA family

Once the program has list of possible variants for each preverb individually, it is possible for it to generate a list of possible variants for the two preverbs together. Because I want the order /abhi+ava/, the program selects the exterior list for abhi and the interior list for ava. The program then produces a new list of all possible combinations of the two sets of variants (Example 2.1).
abhi+ava    Abhi+ava    ‘bhi+ava
abhi+avA    Abhi+avA    ‘bhi+avA
abhi+ave    Abhi+ave    ‘bhi+ave
abhi+avo    Abhi+avo    ‘bhi+avo

Example 2.1: List of combinations for abhi+ava

These steps account for sandhi at the beginning and end of the preverb combination. However, sandhi also applies between preverbs. Once the list of combinations is generated, as in Example 2.1, the program applies any relevant sandhi to the boundary between the two preverbs using a list of relevant sandhi rules (Example 2.2). Again, I generated this list on the basis of the rules given in Sanskrit Grammar (1924). This is, of course, not a complete list of sandhi rules, but only a list of the rules that apply where two preverbs come into contact.

a+A=A    u+a=va    s+p=Hp
A+a=A    u+A=vA    s+s=Hs
a+a=A    s+a=ra    r+p=Hp
a+u=o    s+u=ru    r+s=Hs
A+u=o    s+n=rn    m+v=Mv
i+a=ya   s+A=rA    m+n=Mn
i+A=yA   s+v=rv    m+p=Mp

Example 2.2: Sandhi at the boundary between two preverbs
In this particular case, the program recognizes that each of the combinations in Example 2.1 would be realized as a string with the sequence \( ya \) at the boundary between the two preverbs, yielding \( abhyava, Abhyava, \) etc.

The reason for this two-fold approach (first applying sandhi on the outer edges, then in between the two preverbs) is that it allows the program to categorize the resulting group of strings as a single “family”; that is, each of those strings should be categorized as an example of /abhi+ava/. A complete listing of the output of search strings for the family ABHI+AVA is given in Example 2.3.

\[
\begin{align*}
\text{abhyava} & \quad \text{Abhyava} & \quad \text{‘bhyava} \\
\text{abhyavA} & \quad \text{AbhyavA} & \quad \text{‘bhyavA} \\
\text{abhyave} & \quad \text{Abhyave} & \quad \text{‘bhyave} \\
\text{abhyavo} & \quad \text{Abhyavo} & \quad \text{‘bhyavo}
\end{align*}
\]

Example 2.3: ABHI+AVA Family

The practical benefit of this approach is that if I instruct the program to search for “abhi+ava”, it understands that command as a request to search for the 12 strings shown in Example 2.3. It then returns all the results grouped
together. In actual practice, of course, the program generates not just a single group, but all 342 “families” (with all their possible variants) at the same time.

While sandhi complicates the search process by increasing the number of search strings drastically, it is ultimately easy to translate sandhi rules into computer commands. Because sandhi is such a well-studied phenomenon (even back to ancient times), it is not difficult to generate clear, exceptionless rules that the program can utilize.

2.1.2.2 Results

Once the program has generated the list of search strings, it performs the actual search, and produces a series of html files containing the results. One file is produced for each family. If there are no results for a given family, there is no file produced. The format of the files is as shown in Example 2.4:

```
03025022c vanaukasaz cApi narendraMhaM; manasvinaM saMparivArya tashuH
03037023c yat te bhayaM amitraMgraH hRdi saMparivartate
03112017a gatena tenAsmi kRto vicitA; gAtraM ca me saMparitapyatIva
03118021c yudhiSThiraM saMparivArya rAjann; upAvizan devaMganaNA yathendram
032000034c jIvAH saMparivartante kamabandhanibhandhanAH
03219002a RSibhiH saMparityaktA dharmayuktA mahAvratAH
03221053a te tAm ghanaIrvAdityaM dRSTvA saMparivAritam
03239010c utthApya saMperiSvajya prityAjighrata mURdhani
03252003c tapasvinaM saMparipUrtNavidyaM; bhaSanti haivaM zvanarAH svuIra
03299020a tathA dhaumyena dharmajIo vAkyaiH saMparioSitAH
03299021c rAjAnaM balinAM zecSTho girAI saMparisharSayan
11 results found for SAM+PARI families
```

Example 2.4: Screen shot of search results
For each hit, the program returns the entire line. Again, because the text has unique line numbers, it is easy to identify each line as to its source. It is also possible to check lines against an analog text if there is any concern about the accuracy of the digital version. The actual search string is highlighted so that it is clear which part of the line was returned. If there are multiple hits in a single line, they are returned as separate entries with different highlighting.

2.1.2.3 Exclusions

Many of the search strings found by the program are false hits, meaning that they match the search string but are not true examples of two preverbs attached to a verb root. Examples of true and false hits are given in Example 2.5:

**True hit:**
02066013a gadAM gurvIM samud¥amyaatvaritaz ca vRkodaraH (sam+ud+¥yam, gerund)

**False hit:**
02045028a gRhlvtA tat tu gacchanti samudrau pUravadakSiNau (sam+udra, m NVA dual, from ¥ud)

Example 2.5: True and false search hits
Some families (ABHI+PRA, for example) produce strings that are more unique in the text than others. Because the program finds well over 100,000 hits when searching the entire text, it is not possible for one person to go through the text by hand in a reasonable amount of time to determine which results are true hits and which are false ones. In order to make the task manageable, we added a function to the program which would always exclude a hit which I had once determined to be false.

Because the falseness of a particular string depends on which preverb combination the program was searching for, it was necessary for the program to only exclude false hits on a family-by-family basis. This was particularly relevant for preverbs *nis* and *ni*, and *pra* and *prati*, because any search for *pra* will necessarily return results for *prati*. These may be true hits for the PRATI families, but are false hits for the PRA families. For each family, I went through the list of results. I then generated lists of result strings that I determined were not possibly true hits. As an example, a partial list of exclusions for the ABHI+AVA family is given in Example 2.6.
bhyavarta  augment+stem vart-
bhyavarSa  augment+stem varS-
bhyavoc  augment+stem voc-
bhyavadat  augment+stem vad-
bhyavadad  augment+stem vad-
bhyavadan  augment+stem vad-
bhyavardh  augment+stem vardh-
bhyavAdayat  augment+stem vAday-

Example 2.6: ABHI+AVA family exclusions list

After it has generated results, but before it generates the final reports, the program compares each hit to the exclusions list for its family. It includes five to seven characters surrounding the search string. The number of characters was limited as much as was possible in order to reduce the chance of falsely excluding a hit. For most families, five characters was sufficient. However, for a few families, there was the possibility of confusion with common Sanskrit words, so that more characters were required to create a list item that would exclude the correct false hits but not also exclude true hits.

In addition to the family-specific exclusions lists, a single general rule was instituted excluding any result where the search string was 0 or 1 characters before a space, either between words or at the end of a line. Also, as with the type count, triplets were excluded from the analysis. A complete list of these triplets is found in Appendix B.
Finally, I have chosen to entirely exclude any family where ā is in the exterior position (Ā+UD, Ā+ABHI, etc.). While I would rather have been more complete, I made this decision based on several factors. First, according to Whitney: “Ā is almost never allowed, either earlier or later [that is, in either Classical or Vedic Sanskrit] to be put in front of any of the others.” (1924: §1080)

Furthermore, the initial investigation of the MW dictionary corroborated Whitney’s statement. In my results, the preverb ā was categorically interior, save for two single examples of exterior ā in rare nominal forms. Given Whitney’s statement about ā, and the lack of examples in MW, it would be surprising to find any true ā-exterior hits.

Additionally, because of the nature of Sanskrit sandhi as it pertains to vowels, the preverb ā presents particular difficulties for a search of this kind. Regular sandhi between ā and other preverbs produces strings that are incredibly common in the text, such as od, ābhi and āva. That is, ā is swallowed up very easily by other vowels, which may partially or completely obscure it. In any case, these strings produce a massive number of hits; over 17,000 among all the families, meaning that Ā-exterior families produce about 46% of the total hits for a complete search. In deciding to exclude those hits, I processed over a thousand lines of results from Ā-exterior families, and found no true hits. Ultimately, while I would prefer to be as exhaustive as possible, the unlikely possibility of discovering a true hit led me to believe that it was both reasonable and logistically desirable to exclude these families from my consideration.
2.1.2.4 Working towards final results

Once the results had been pared down to a more reasonable number of hits (19,778 for a complete search of the entire text), I still had to make certain that I was definitely not including false hits in my data. In order to be sure, I went through each line and identified each hit. In order to identify the verbs accurately, Whitney’s *Roots, Verb-Forms and Primary Derivatives of the Sanskrit Language* was used, in conjunction with the sections on verb forms from his *Sanskrit Grammar*. In addition, the digital version of the MW dictionary was used (http://www.sanskrit-lexicon.uni-koeln.de/mwquery/). I accepted any form that was a verb or listed as a nominal derivative of a verb in either the MW or Whitney entries for the verb root in question.

In order to make certain that a verb did not have to be identified twice, we created a list of positive hits, such that future searches marked with boldface any positive hits in the report file. This allowed me to check only hits that had never been checked, streamlining the process of checking what ended up being an incredibly large number of hits to be identified by hand.

Ultimately, however, because of the time it takes to do the final check of the data, I have not been able to survey the entirety of the Mahābhārata. Instead, I have completely searched the first three books. Bias in ordering data from an incomplete survey of the text was a concern. The divergent results for word ordering from two surveys by Friedrich and Fischer of separate parts of Book 5 of
Homer’s *Iliad* provide a cautionary tale for the danger of taking one small part of a text as representative of the whole⁴ (although my sample size is already much larger than those studies). In order to avoid the possibility that preverbs might behave differently later on in the text, I created a composite file of random lines from books 4-18. Each book was represented roughly equally in the sample. I then ran the search algorithm on the composite file, and gathered the data as I have just described. In total, the data I present from this analysis represents 50,399 lines of the Mahābhārata, about a third of the total text. Even this third, however, represents a data pool much larger than both the *Iliad* and the *Odyssey* combined.

2.1.2.5 The next step: Analysis

Once the data were gathered and checked, the results were put into a spreadsheet and a simple comparison was performed for each preverb of the number of times that that preverb appeared in the interior position vs. appearances in the exterior position. When I report the data, I typically report it both as a simple percentage (so that the data is more easily understood) and as a token count (so that it is clear how many tokens there are for each preverb). Even with such a large text, there are still many preverbs which show up so

⁴ As discussed in Watkins 1976, Friedrich and Fischer came to divergent conclusions regarding the basic word order of Homeric Greek (SVO and SOV respectively) on the basis of two separate samples of several hundred lines, both from the same book of the *Iliad.*
rarely as to have token counts too low to make any real analysis of their ordering possible. Providing the count numbers makes it clear when data is reliable or unreliable because of low numbers.

2.2 Preverb ordering

The basic question that I set out to answer with this investigation was this: when there are stacked preverbs in Classical Sanskrit, is there some pattern to which order they appear in? The results of the type and token counts provide an answer to this question.

2.2.1 Type count of Classical preverbs

The results from the type count of the MW dictionary show that some preverbs show a marked tendency to appear in the exterior position. Notably, 70% or more of the appearances of *antar, prati, abhi, anu, sam,* and *adhi* are in the exterior position (highlighted in dark grey). Other preverbs, however, tend to appear most often in the interior position. In my data, *pāra, ā, ni, ava, ud, nis* and *pra* appear in the interior position more than 70% of their total types (highlighted in light grey). It is worth noting that there are also a large group (*vi, api, upa, pari, ati* and *apa*) that show no clear trends either way. Again, it should be noted that some of the preverbs have very few types.

While I have found it useful for purposes of my analysis to classify preverbs as interior, exterior or intermediate, it should be clear that these
ordering tendencies are better seen as a gradient than as three distinct
categories. I chose a cutoff of 70% because it seemed to best describe the
patterns in the data. However, it is a somewhat artificial designation.
<table>
<thead>
<tr>
<th>Preverb</th>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>antar</td>
<td>100% (2)</td>
<td>0</td>
</tr>
<tr>
<td>prati</td>
<td>87% (198)</td>
<td>13% (30)</td>
</tr>
<tr>
<td>abhi</td>
<td>80% (370)</td>
<td>20% (91)</td>
</tr>
<tr>
<td>anu</td>
<td>78% (233)</td>
<td>22% (65)</td>
</tr>
<tr>
<td>sam</td>
<td>73% (593)</td>
<td>27% (216)</td>
</tr>
<tr>
<td>adhi</td>
<td>70% (33)</td>
<td>30% (14)</td>
</tr>
<tr>
<td>vi</td>
<td>63% (275)</td>
<td>37% (161)</td>
</tr>
<tr>
<td>api</td>
<td>60% (3)</td>
<td>40% (2)</td>
</tr>
<tr>
<td>upa</td>
<td>57% (160)</td>
<td>43% (119)</td>
</tr>
<tr>
<td>pari</td>
<td>54% (80)</td>
<td>46% (69)</td>
</tr>
<tr>
<td>ati</td>
<td>43% (44)</td>
<td>57% (58)</td>
</tr>
<tr>
<td>apa</td>
<td>42% (34)</td>
<td>58% (47)</td>
</tr>
<tr>
<td>pra</td>
<td>23% (89)</td>
<td>77% (300)</td>
</tr>
<tr>
<td>nis</td>
<td>21% (18)</td>
<td>79% (69)</td>
</tr>
<tr>
<td>ud</td>
<td>13% (34)</td>
<td>87% (223)</td>
</tr>
<tr>
<td>ava</td>
<td>5% (9)</td>
<td>95% (161)</td>
</tr>
<tr>
<td>ni</td>
<td>5% (7)</td>
<td>95% (144)</td>
</tr>
<tr>
<td>ā</td>
<td>0</td>
<td>100% (402)</td>
</tr>
<tr>
<td>parā</td>
<td>0</td>
<td>100% (13)</td>
</tr>
</tbody>
</table>

Table 2.3: Classical Sanskrit type data
In Chart 2.1, I present the data graphically in order from most exterior to most interior. This graph is intended to make clear the extent to which some preverbs show a preference for one position or the other.

The purpose of this phase of the study was to get a first-approximation idea of preverb ordering in Classical Sanskrit generally. Again, these data refer to a type count, rather than a token count. There were two benefits of doing a dictionary-entry type count for my study. First, it was a relatively quick way to get
a large amount of data about preverb ordering. As stated above, I found over 2,000 cases of stacked preverb pairs. Additionally, there were a hundred or more hits for most of the preverbs on my list. This represents a fairly reasonable sample from which to make judgments about preverb ordering.

However, while there were many hits for most of the preverbs in this study, some of the above bars represent a very small number of types. Specifically, parā (13 types), api (5 types) and antar (2 types) all have an extremely low count. I have included them here for the sake of completeness, and also because, despite the low numbers, they may still prove illuminating in the context of the other data that I present. These counts should not, however, be given a great deal of weight on their own.

The second benefit to performing a type count was that it gave a much broader view of the Classical Sanskrit picture than a single text could have offered. Monier-Williams drew from a very large number of sources in compiling the Sanskrit Dictionary (1899). This means that the type count includes preverb ordering information from many different texts and texts which represent many different genres. This reduces the likelihood of these results being due to any particular qualities of any individual work.

2.2.2 Token count of Classical preverbs

The results from the token count of the Mahābhārata are different in some particulars from the type count data, but they show the same basic trends. Again,
there is a group of preverbs that shows a preference for the interior position (here ā, ava, ati, ud, ni, apa, and pra) and a group that shows a preference for the exterior position (abhi, sam, prati, adhi and vi). Note that I give no data for exterior hits for the preverb ā, as discussed in Section 3.1.2.3.
<table>
<thead>
<tr>
<th>Preverb</th>
<th>Exterior</th>
<th>Interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>antar</td>
<td>100% (4)</td>
<td>0</td>
</tr>
<tr>
<td>sam</td>
<td>92% (992)</td>
<td>8% (83)</td>
</tr>
<tr>
<td>prati</td>
<td>89% (76)</td>
<td>11% (9)</td>
</tr>
<tr>
<td>abhi</td>
<td>88% (166)</td>
<td>12% (22)</td>
</tr>
<tr>
<td>vi</td>
<td>85% (364)</td>
<td>15% (64)</td>
</tr>
<tr>
<td>adhi</td>
<td>77% (27)</td>
<td>23% (8)</td>
</tr>
<tr>
<td>pari</td>
<td>61% (47)</td>
<td>39% (30)</td>
</tr>
<tr>
<td>upa</td>
<td>55% (130)</td>
<td>45% (106)</td>
</tr>
<tr>
<td>anu</td>
<td>40% (61)</td>
<td>60% (91)</td>
</tr>
<tr>
<td>nis</td>
<td>38% (49)</td>
<td>62% (81)</td>
</tr>
<tr>
<td>pra</td>
<td>24% (97)</td>
<td>76% (301)</td>
</tr>
<tr>
<td>ati</td>
<td>20% (12)</td>
<td>80% (49)</td>
</tr>
<tr>
<td>ud</td>
<td>20% (19)</td>
<td>80% (75)</td>
</tr>
<tr>
<td>ni</td>
<td>18% (33)</td>
<td>82% (149)</td>
</tr>
<tr>
<td>apa</td>
<td>16% (5)</td>
<td>84% (27)</td>
</tr>
<tr>
<td>ava</td>
<td>1% (1)</td>
<td>99% (115)</td>
</tr>
<tr>
<td>api</td>
<td>0% (0)</td>
<td>100% (2)</td>
</tr>
<tr>
<td>ä</td>
<td>--</td>
<td>(871)</td>
</tr>
</tbody>
</table>

Table 2.4: Classical Sanskrit token data
Note also that, although I give data in this table for exterior *antar* and interior *api*, I consider them to have too few tokens to make a reliable judgment about ordering for those preverbs. Also, the preverb *parā*, which was included in the type count for Classical Sanskrit, did not appear with another preverb in any of the parts of the Mahābhārata that I analyzed, and is not therefore included here.

Chart 2.2: Classical Sanskrit token data
The data for the token count show, if anything, a greater polarization between preverbs than for the type count as regards their likelihood of appearing in either slot before the verb. Of seventeen preverbs represented in any numbers in the Mbh, thirteen prefer one position or the other 75% of the time or more when in combination with another preverb. This is likely because the combinations with the preferred order for any given preverb are disproportionately common in the text.

2.2.3 Comparison of the two counts

It is to be expected that there would be differences between the type and token counts. Some preverb-verb combinations are just more common than others—sam-ā-gam (‘to come together’) shows up very frequently, but sam-ā-ślīṣ (‘to cling to’) less often. The question at hand, however, is whether some preverbs have different ordering tendencies in the type and the token counts. A visual reference is given in Chart 2.3 of only the exterior type and token numbers for the preverbs.
Indeed, there are several notable differences between the two counts. In the type count, for example, *vi* shows a preference for the exterior position, but not a drastic one. In the token count, however, roughly 80% of the actual appearances of *vi* in a stacked preverb complex are in the exterior position. On the reverse side, *anu*, which is markedly exterior in the type count, shows no ordering preference in the token count. There are similar (though smaller) differences for *ati* and *api*.

These differences are likely because of very frequent verb complexes which produce more tokens than average for a type. For example, with *anu* and
vi, this may be due to the very common occurrence of preverb-verb groups with 
*anu* in the interior position, such as *sam-anv-i* (‘to follow’) and *sam-anu-jña* (‘to 
consent’). As a point of reference, there are 67 cases of *sam-anu* with any verb in 
my data. There are nine different verb roots represented in those 67 tokens. 
Combinations with *jña* make up 12 of those 67 (18%), and combinations with *i* 
make up a full 47 (70%) of the total number. The remaining seven verbs account 
for only eight tokens.

2.2.4 Implications of ordering

One of the most notable implications of the data I have just presented is 
that ordering may be based on some property of these preverbs, rather than on 
the semantic requirements of the verb complex. One of the facts that points in 
that direction is the particular interiority of the preverb *ā*. It seems difficult to posit 
anything so basic about the meaning of “to, toward” that makes *ā* incorporate so 
notably more closely onto the verb than other preverbs, nor would we suspect 
that the only reasonable meanings of preverb groups naturally exclude exterior *ā*. 
Given a non-semantic motivation for the ordering of *ā*, at least, it is necessary to 
attempt to determine whether other preverbs that show strong ordering 
tendencies might also lack semantic motivation for ordering.
2.3 Ruling out synchronic accounts for preverb ordering

In investigating the behavior of preverbs in Classical Sanskrit, then, we must begin by looking to synchronic explanations and mechanisms. To that end, I have examined two avenues of possible synchronic accounts of preverb ordering in Sanskrit. Preverbs, like any morpheme, are a linking of form (that is, phonology) and meaning (semantics). Therefore, it seems natural to investigate whether either of those features of preverbs (or the preverb-verb complex) might influence their ordering.

2.3.1 Semantic accounts for ordering

The usual explanations for ordering are semantically based— as is no surprise, since preverbs in Sanskrit have an essentially semantic function. In particular, since preverbs modify the meaning of the verb root, it makes sense to assume that ordering is somehow a direct result of expressive need. However, in Classical Sanskrit, the ‘story’ of preverb ordering is more complex than this.

2.3.1.1 The traditional explanation for ordering

Whitney writes the following about order and meaning of preverbs in Classical Sanskrit:

“More than one prefix may be set before the same root. Combinations of two are quite usual; of three, much less common; of more than three, rare. Their order is in general determined only by the requirements of the meaning, each added prefix bringing a further modification to the
combination before which it is set. But ā is almost never allowed, either earlier or later, to be put in front of the others.” (Sanskrit Grammar 1924, §1080)

Essentially, Whitney claims that order of preverbs is determined by the meaning to be expressed, so that the scope of each more exterior preverb consists of the combination of the verb and the preverbs more interior to it; as shown in Example 2.7.

VERB ‘verb’
X-VERB ‘x’+‘verb’
Y-[X-VERB] ‘y’+‘x+verb’
Z-[Y-[X-VERB]] ‘z’+‘y+x+verb’

Example 2.7: Whitney’s claim about order and meaning

Whitney is certainly correct in his statement that the order is frequently determined by the meaning. However, while this explanation for preverb ordering accounts for some stacked preverb-verb complexes, it fails to explain the tendency of certain preverbs, both in type and token, to show a marked preference for one position or the other. Furthermore, there are (as Whitney himself recognizes) problematic exceptions which call the above rule of meaning-based ordering into question.
2.3.1.2 Compositionality and ordering

As shown above, the traditional explanation for ordering of stacked preverbs in Sanskrit is that it is determined by the meaning of the preverb-verb combination. However, it is difficult to reconcile this explanation with the data presented in section 2 of this chapter. After all, if the order of stacked preverbs is determined only by the meaning, then why should *ni* ‘down’ (for example) appear so consistently in the interior position? We might expect to find a more even spread of orders.

Additionally, even if it were possible to show that those ordering properties were the happenstance result of the particular words that are instantiated in the historical record, there would still be questions about the viability of the above as a rule for determining the order of stacked preverbs. There are inconsistencies in the relationship between order and meaning in preverbs. If Whitney’s ordering model in E2.7 holds true, we would expect that we would find cases where one preverb order gives one meaning, and the opposite order gives an entirely different meaning. If it does not hold true (or does not always hold true), we would expect to find examples where the ordering of preverbs is not related to the meaning of the complex as a whole. In order to test this, I present some cases of stacking where both orders appear in the MW, along with their listed meanings (also from the MW).
| i) | vṛt | ‘turn’ |
| vi-vṛt | ‘apart’+‘turn’=‘sever’ |
| ati-[vi-vṛt] | ‘beyond’+‘sever’=‘separate too far’ |
| ii) | vṛt | ‘turn’ |
| ati-vṛt | ‘beyond’+‘turn’=‘cross’ |
| vi-[ati-vṛt] | ‘apart’+‘cross’=‘escape’ |
| iii) | sṛ | ‘flow, go’ |
| vi-sṛ | ‘apart’+‘flow’=‘spread out’ |
| anu-[vi-sṛ] | ‘along, after’+‘spread out’=‘extend over’ |
| iv) | sṛ | ‘flow, go’ |
| anu-sṛ | ‘along, after’+‘go’=‘go after’ |
| vi-[anu-sṛ] | ‘apart’+‘go after’=‘roam, pervade’ |

Example 2.8: Examples that match Whitney’s claim

As can be seen in Example 2.8, Whitney’s description of preverb ordering holds true in many cases in Classical Sanskrit. In the above examples, ordering makes a clear difference in meaning. Here, the same preverbs on the same root have different meanings in a very predictable way due to the order. Thus, ati-vi-vṛt ‘separate too far’ is composed of vi-vṛt, meaning ‘sever’ and ati, meaning ‘beyond’. Conversely, vi-ati-vṛt is ‘escape’, composed of ati-vṛt ‘cross’ and vi ‘apart’.

There are many examples where order matters for the meaning. It is notable that all three of the preverbs in Example 2.8 are preverbs that show an interior or exterior preference. The fact that they appear here in both orders (their
dominant order, as well as their minority order) reinforces the idea that compositional meaning can correlate with preverb ordering. However, it does not cover all cases of multiple preverbation in Sanskrit. There are also many cases for which Whitney’s brand of preverb meaning composition simply does not hold, as seen in Example 2.9.

Example 2.9: Examples that oppose Whitney’s claim

| iii) i) ud-i abhy-[ud-i] | ‘go’ ‘up’+‘go’=‘go up’ ‘towards’+‘go up’=‘rise over’ |
| iv) i) abhi-i ud-[abhi-i] | ‘go’ ‘towards’+‘go’=‘approach’ ‘up’+‘approach’=‘rise over’ |

These are cases where the presence of both preverbs matters, but the order is not relevant for determining the meaning of the entire complex. It may be with some of these (and Example 2.9i and ii might particularly be one of these
cases) that my necessary reliance on dictionary definitions is failing to capture some subtlety of meaning that these combinations might originally have had. Nevertheless, there are enough clear cases to show that Whitney’s statement about order and meaning simply does not hold for all cases of multiple preverbation in Classical Sanskrit.

2.3.1.3 Lexical semantics and ordering

However, while there is insufficient support for meaning as the sole motivation for preverb ordering, there is more to be said about the semantic properties of Classical Sanskrit preverbs in combination. Another question we might ask in the domain of meaning is whether some semantic attributes of the preverbs can predict their ordering behavior. Some Algonquian languages, for example, seem to show a relationship between ordering and meaning. In Menominee, preverbs can be divided into four classes according to their semantic qualities: modal, aspectual, spatial and adverbial. These classes generally determine the order of preverbs in that language (Cook, 2003).

Additionally, according to Imbert (2008) there are ordering constraints of this type for Homeric Greek preverbs. She divides the Greek preverbs (which, as is discussed more fully in section 4.3, are cognate with many Sanskrit preverbs) into three classes: Direction, Location, and Orientation. Essentially, preverbs of direction have meanings involving motion (to, towards, forward). Preverbs of location establish the action at a point in space (in, on, beside). Preverbs of
orientation provide other information about the directionality and movement of the verb (out, off, around). In Sanskrit, preverbs also primarily express one of these three categories.

According to Imbert, in Homeric Greek, these categories help to determine the order of preverbs when multiple preverbs modify a single root. So, as shown in Example 2.10, a preverb of orientation generally appears in the more interior position relative to preverbs of location (or direction).

en-kata-pe:gnumi
PV2/in-PV1/down-thrust
Location-Orientation-V

Example 2.10: Semantically influenced ordering in Homeric Greek

While this may be the case in Greek, it does not seem to be the case in Sanskrit. Below in Table 2.5, I provide a chart dividing the preverbs according to their directional, locational, and orientational meanings. For comparison with their ordering properties, preverbs which are mainly interior are highlighted in light grey, and preverbs which are mainly exterior are highlighted in a dark grey.
No particular pattern emerges when looking at Sanskrit preverbs in this way. As a notable example of this lack of pattern, there are three preverbs with the same meaning (“on”), but one (ud) is interior, one (abhi) is exterior, and one (api) is neutral with regard to positioning. Likewise, in the Direction column, there is neutral apa and interior prati, both meaning “back”.

All of this leads to two conclusions: first, preverb ordering is not clearly or, at least, completely explained by reference to meaning. Second, the ordering
classes recognized in section 2.2 cannot be defined with reference to the semantic properties of the preverbs.

2.3.2 Phonological accounts for ordering

The phonology is another possible source of a synchronic motivation for preverb ordering. It is sometimes the case that phonological facts about elements motivate their ordering, and it might be that some facts about the phonological makeup of the preverbs might explain the facts that were established in section 2.2 about relative ordering.

2.3.2.1 The influence of metrical weight

Weight (or syllable length) and number of syllables were relevant for word placement in the Rig Veda, because it is a metrical text. In the Indic tradition, poetic form is made up of specific combinations of syllables according to their weight and numbers. While many of the Classical texts surveyed in the MW dictionary are prose and thus not subject to those constraints, several large and important texts (including the Mahābhārata) are metrical. With that in mind, I investigated whether syllable length or syllable count might influence the ordering properties of preverbs in Classical Sanskrit.

The first determiner of metrical position is the number of syllables. All preverbs are either monosyllabic or disyllabic, and so I compared the ordering tendencies of each preverb with its number of syllables. As can be seen in Chart
2.4, all exterior preverbs are disyllabic. However, since the majority of preverbs are disyllabic, and half the interior preverbs are also disyllabic (including the categorically interior preverb parā), there is no evidence that disyllabicity is a cause and not a consequence– or that this relationship is not simply a coincidence.

<table>
<thead>
<tr>
<th>Monosyllabic</th>
<th>nis sam ud vi ã ni pra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disyllabic</td>
<td>abhi adhi anu apa prati upa antar ati pari api ava parā</td>
</tr>
</tbody>
</table>

Chart 2.4: Comparison of ordering and syllabicity

The second relevant factor in determining metrical weight is whether a syllable is light, or heavy. I have compared the final sound of these preverbs with their ordering properties. Most preverbs end with vowels, and all those that end in consonants are of the variety that show no firm preference in the type data.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>abhi adhi anu apa prati upa pari vi ati ã ni pra api ava parā</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consonant</td>
<td>nis sam ud antar</td>
</tr>
</tbody>
</table>
While one can again make some sort of generalization from these results ("if a preverb is exterior, it is vowel-final"), this link between final sound and preverb positioning is not useful, because all interior preverbs are also vowel-final. This means that there is no clear evidence that the final sound (whether vowel or consonant) of a preverb influences its ordering properties in any way.

2.3.2.2 Coalescence

As discussed in section 2.1.2.1, Sanskrit is well-known for its sandhi. Of particular interest for preverb ordering is the set of sandhi alternations that pertain to combinations of vowels. Since, as just noted in Figure 2.6, most preverbs end in vowels, it is possible that the Sanskrit sandhi that affects vowels might interact in some way with their ordering. For reference, a list of possible vowel combinations is given in Example 2.11.

\[
\begin{align*}
a+a=\text{ā} & \quad a+i=e & \quad i+a=\text{ya} \\
u+u=\tilde{\text{ü}} & \quad a+u=o & \quad u+a=\text{va} \\
i+i=\text{i} & \quad a+e=\text{ai} \\
& \quad a+o=\text{au}
\end{align*}
\]

Example 2.11: Vowel sandhi combinations
Combinations of two vowels at a word boundary “coalesce” into a single vowel, a diphthong, or a vowel with an onglide. In theory, coalescence could make it harder to recognize words, because it creates ambiguity about the parsing of some strings, as shown in Example 2.12. It is possible for sandhi to “swallow” certain words, making it only possible to reconstruct them only in context. This is shown in Example 2.12, where upa can combine with either avocam (the first singular aorist active indicative) or ā+avocam to produce the same result. However, most cases of sandhi with preverbs are more like the examples in 2.12, which are fairly easy to decompose.

**Ambiguous strings:**

/upa+avocam/ ➞ [upāvocam]

/upa+ā+avocam/ ➞ [upāvocam]

**Easily reconstructible strings:**

/ati+anu+ā-/ ➞ [atyanvā-]

/upa+ā-/ ➞ [upā-]

Example 2.12: Examples of coalescence
Because of the ambiguity of strings like those in Example 2.12, it is conceivable that the ordering behavior of preverbs might be explainable with reference to a desire for greater transparency— that is, a preference for orders that avoid coalescence. Nevertheless, we would not actually expect coalescence to be important for ordering. Most cases involving preverbs involve sandhi that is clearly reconstructible. It is, in fact, relatively rare that a preverb is entirely obscured by coalescence, so, while a form may be less transparent, it is usually still easily understood. Also, as mentioned previously, sandhi in Sanskrit is a regular and nearly automatic phonological process, so it would be difficult to claim that there is some larger tendency for transparency. Additionally, the preverb ā is virtually always in the interior position, despite the fact that this means that it is more likely to undergo coalescence, and even possibly disappear because of it.

To determine whether coalescence might indeed have an influence on the properties of preverb ordering discussed in section 2.2, I looked at the set of preverb combinations that could cause coalescence between the preverbs, and compared that to the number of types that were in the reversed (and thus uncoalesced) order. I excluded cases where both orders would cause coalescence, and also cases where neither order would cause coalescence, on the grounds that they would be irrelevant to the question at hand. A partial list of
the ordering pairs used in my calculations is given in Example 2.13 by way of example.

<table>
<thead>
<tr>
<th>coalesced</th>
<th>uncoalesced</th>
</tr>
</thead>
<tbody>
<tr>
<td>pra-abhi</td>
<td>abhi-pra 70</td>
</tr>
<tr>
<td>pra-ud</td>
<td>ud-pra 1</td>
</tr>
<tr>
<td>pra-anu</td>
<td>anu-pra 39</td>
</tr>
<tr>
<td>pra-upa</td>
<td>upa-pra 15</td>
</tr>
<tr>
<td>pra-ava</td>
<td>ava-pra 0</td>
</tr>
<tr>
<td>pra-ati</td>
<td>ati-pra 20</td>
</tr>
<tr>
<td>pra-apa</td>
<td>apa-pra 3</td>
</tr>
<tr>
<td>pra-adhi</td>
<td>adhi-pra 2</td>
</tr>
<tr>
<td>pra-api</td>
<td>api-pra 0</td>
</tr>
<tr>
<td>anu-ud</td>
<td>ud-anu 0</td>
</tr>
</tbody>
</table>

Example 2.13: Example of ordering pairs

Once the data were tabulated as shown in (11), each of the pairs was evaluated to see whether there were more coalesced or more uncoalesced examples, as seen in Chart 2.6.
On first glance, it seemed that there was a preference for orders that prevented coalescence over orders that caused it. In order to find out whether this was a true generalization or just an artifact of my analysis, I conducted a Wilcoxon test on my pairs. The Wilcoxon test evaluates whether the differences between measurements are as a group significant— in this case, the differences between the coalesced/uncoalesced pairs. Given the data available, a Wilcoxon test did not show that this preference was significant (p=0.1018).

A non-significant result is not, in itself, compelling evidence that coalescence is not a factor in preverb ordering. My data is— as all historical language data must be— limited by what is actually instantiated, and it is always possible that more data would reduce the p value of the test into the significant
range. However, a non-significant result only supports the conclusion we had already reached: coalescence is irrelevant for preverb ordering.

2.3.3 Summary and evaluation of synchronic accounts

In sum, we find that none of the proposed synchronic explanations for preverb ordering fully account for the patterns of preverb ordering that we find in Classical Sanskrit. On the phonological side, the sound structure of the individual preverbs has no relevant relationship to their ordering tendencies. Furthermore, coalescence (the collapsing of vowels together at word boundaries according to the principles of sandhi) does not seem to have any effect on ordering.

On the meaning side, semantic properties of the preverbs as individual lexical items have no discernible influence on their ordering properties, at least for the two semantic features (direction and dynamicity) that seemed most relevant to Sanskrit preverbs. The compositionality of preverb groups, however, comes quite close to explaining the determining principles of preverb ordering. Nevertheless, there are enough examples where preverb ordering is irrelevant to the meaning of a preverb-verb combination to show that semantic compositionality cannot be the sole determiner of order. Even if it were, it would still fail to explain the strong tendency of some preverbs to appear in one position or the other.
Because none of these synchronic accounts adequately explain the tendency of preverbs to appear in particular positions relative to the verb, we are left with two possibilities. The first is that there is some synchronic property that governs the placement of preverbs that I have failed to account for. The second possibility is that the ordering of preverbs in Classical Sanskrit is, at least partially, lexically idiosyncratic. That is, there is no synchronic governing principle for the ordering of many preverb combinations; rather, they are learned as entire lexical items, with the preverbs included. Monier-Williams himself believed this, and this is perhaps the reason he chose to present preverb-verb combinations as individual items in his dictionary, rather than subsuming them under the entry for the verb root in question.

If it is the case that preverb-verb combinations are partly or wholly lexicalized in Classical Sanskrit, and that there is no consistent synchronic pattern to their ordering, then the next step in explaining preverb ordering is to look at the older language.
3.1 Methods

My Vedic data were obtained from a manual search of Grassmann’s Wörterbuch zum Rig-Veda. Grassmann’s dictionary contains hymn and verse references for nearly every instance of every word in the Rig Veda. This means that, by recording examples from his dictionary, I was essentially performing a token count of the Rig Veda. While this has the disadvantage of being one step removed from the text (and certainly there are reference errors here and there in the dictionary), it has the benefit that it draws on Grassmann’s judgments about which preverbs modified which verbs. Because preverbs are free words in Vedic Sanskrit, and because they can modify nouns as well as verbs, it is quite difficult to determine grammatical relationships without a close analysis of the text. I did not have the resources to conduct a search of the Rig Veda from scratch, but because the Rig Veda is so well studied, I was able to rely on the judgments of other scholars in that matter.

In order to find cases of preverb stacking, I went through the dictionary page by page and recorded every instance where Grassmann indicated that a verb was modified by two preverbs. I then located each verse that Grassmann
listed and copied it from the Sacred Texts digital version of the Rig Veda (http://www.sacred-texts.com/hin/rvsan/index.htm). In order to make certain that I was not simply replicating any possible errors in the Grassmann dictionary, I placed each verse into a marked digital file, and checked the text against the Van Nooten and Holland text of the Rig Veda (1994). In cases where there was some mismatch, I also checked the verses against Lubotsky’s *A Rgvedic Word Concordance*.

Once the data were checked, I tallied every example as to the placement of the preverbs in relation to one another, their place in the verse, and their placement relative to the verb they modified. Each of those configurations was then classified as “interior”, “exterior” or “posterior”. The “posterior” classification—meaning that the preverb appears after the verb—is a necessary addition for the Vedic data, although it is still most usual for preverbs to appear before the verb. Additionally, I also made note of the proximity of the preverbs to the verbs they modified, and whether there was any intervening material between a preverb (or preverbs) and the verb.

### 3.2 Preverbs in Vedic

Preverbs in Vedic Sanskrit have notably different properties from their later counterparts in Classical Sanskrit. In Vedic, preverbs are independent words, which can appear separate from the verbs they modify. Additionally, some preverbs can also modify nouns. The ability of preverbs to modify nouns as
adpositions is mainly of interest to a study of Vedic ordering from a methodological standpoint; it means that wherever a preverb occurs in the text, it cannot be assumed that it modifies some verb. This makes the correct identification of instances of preverb stacking more difficult. In addition to the differences between Classical and Vedic Sanskrit, the nature of the Rig Veda itself must also be taken into account. The Rig Veda is a poetic text with certain metrical requirements, and this influences the positioning of words, at least within a line.

3.2.1 *Tmesis and positioning*

A large part of what makes the Vedic situation more complex to analyze than the Classical situation is so-called “tmesis”—that is, the fact that Vedic preverbs are independent lexical items rather than verbal prefixes, which is their status in the later language. *Tmesis*, etymologically, means “cutting apart”; this is problematic as a term to describe the Vedic Sanskrit situation because it implies that the preverbs were originally incorporated on the verb and were then “cut apart”, which is the opposite direction of the historical development of preverbs in Sanskrit. (Whitney 1924: §1081)

In any case, regardless of the appropriateness of the terminology, in Vedic Sanskrit, preverbs can appear separated from the verb they modify. Generally, this means that the preverb can appear sentence-initially in addition to the position directly before the verb. However, preverbs can appear after the verb—
the posterior position, as previously mentioned— as well as in the interior and exterior positions. Some examples of tmesis, including a preverb in the posterior position, are shown in Example 3.1.

4.56.5ab: prá-abhí-√bhr
[prá vām māhi dyāvī abhy úpastutim bharāmahe] l
‘Earth, Sky, we fling our praise to you’

4.30.13ab: prá-ábhi-√mṛś
utá sūṣṇasya dhṛṣṇuyā [prá mṛkṣo abhī] védanam l
‘And you boldly grab the property of Susna’

Example 3.1: Tmesis

Although I refer to the “interior and exterior positions” for Vedic Sanskrit, tmesis makes the situation somewhat more complex. Preverbs may appear directly in contact with the verb, or separated by other words. Additionally, under certain circumstances, preverbs may actually compound with the verb as prefixes (Macdonell 1910:§111). As is discussed more fully in the next section, the ordering of preverbs is very much influenced by whether the verb they modify is in a main or a subordinate clause, as is the tendency for preverbs to “compound”, that is, affix to the verb both positionally and accentually.

While it is true that preverbs in Vedic are more capable of appearing separate from their verbs than in Classical Sanskrit (where, of course, they are
fully affixed) it is also true that preverbs in Vedic frequently appear in direct proximity to the verb. Preverbs can appear before the verb they modify, or after; can appear directly next to the verb, or separated from it by other words; and can appear directly next to the other preverb, or separated from it by other words.

The most common positioning is both preverbs occurring in front of the verb. The possibilities for both preverbs in front of the verbs are given in Example 3.2:

1.11.2: PVPVB
\[tvām[abhī práṇonumo] jētāramāparājitam ॥
“We glorify with praises thee, the never-conquered conqueror.”

5.19.1: PV X PVVB
\[abhī àavasthāḥ prá jāyante] prá vavrēr vavriś ciketa ॥
“They are born for retirement. Out of the cover he has shone forth, being a cover himself.”

1.74.8: PV X PV X VB
\[tvóto vājī áhrayo[’bhī pūrvasmādāparaḥ ॥
prá dāśvānagne asthā}] ॥
“When guarded by the the racer becomes fearless; the worshipper, O Agni, who is behinds, gains the advantage over him who is ahead.”

8.49.1: PVPV X VB
\[abhī prá vah surādhasamīndramarca] yāthā vidé ॥
“Agni, come hither with thy fires; we choose thee as Invoking Priest.”

Example 3.2: Preverb positions in front of the verb
In terms of numbers of tokens, the most usual situation for a verb with two preverbs is to have both preverbs directly in front of the verb, as in line 1.11.2 (153 out of 387 total tokens). The second most common situation is to have the first preverb separated, and the second preverb directly in front of the verb (127 tokens). It is not uncommon, however, to have both preverbs separated from the verb. In that situation, they are most usually separated from each other (38 tokens). In the rarer case, they occur together while separate from the verb (7 tokens).

<table>
<thead>
<tr>
<th>Position</th>
<th># of tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV_PV_VB</td>
<td>153 (40%)</td>
</tr>
<tr>
<td>PV  PV_VB</td>
<td>127 (33%)</td>
</tr>
<tr>
<td>PV  PV  VB</td>
<td>38 (10%)</td>
</tr>
<tr>
<td>PV_PV  VB</td>
<td>7 (2%)</td>
</tr>
</tbody>
</table>

Table 3.1: Token count for positions before the verb

Tmesis, as mentioned above, also allows for posterior positioning. This positioning is not so common as preverbal positioning, but it is by no means rare in the Rig Veda. There are four possible positions in cases where one preverb appears after the verb:
1.31.18: **PVVBPV**

उता [प्राणे ष्याभ] वास्यो अस्माण साम नाह ष्या ष्या समति वाजवत्याः ‡

“And lead us forward to better things. Let us be united with thy favor, which bestows strength.”

10.113.4: **PVVB X PV**

जाज्ञानाव वी अबाद्हता स्प्रदहा [प्राप्तयाद विरो अभ] पाउंस्याम् रान्मि

“Soon as he sprang to life he forced asunder hosts: forward the Hero looked to manly deed and war.”

8.51.8: **PV X VBPV**

[प्रायो ननक्षे अभ] जोसः क्रिविं वाद्हाइण नुभष्म निग्नोश्यान्

“Praised, Indra, is this might of thine, best for the service of the Gods”

3.9.5: **PV X VB X PV**

[आयनम् नायन मातरि:वा परावातो देवेभ्यो माधितम् पार] ‡

“Him Matarisvan brought hither from afar, from the gods, when he had been produced by attrition (of the woods).”

Example 3.3: Preverb positions after the verb

In my data, preverbs appear in the posterior position 62 times (15% of 387 total tokens). Even when one preverb appears in the posterior position, however, the majority of the time, one or both preverbs remain in close combination with the preverb. Both preverbs appear in direct proximity to the verb (one before and one after) 21 times in the Rig Veda. There are 15 times where a preverb still
appears directly before the verb while the posterior preverb is separated. However, there are 23 more instances of posterior preverbs with the preverb before the verb separated—12 with the posterior preverb directly after the verb, and 11 with the posterior preverb separated from the verb.

<table>
<thead>
<tr>
<th>Position</th>
<th># of tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV_VB_PV</td>
<td>21 (5%)</td>
</tr>
<tr>
<td>PV_VB PV</td>
<td>15 (4%)</td>
</tr>
<tr>
<td>PV VB_PV</td>
<td>12 (3%)</td>
</tr>
<tr>
<td>PV VB PV</td>
<td>11 (3%)</td>
</tr>
</tbody>
</table>

Table 3.2: Token count for positions after the verb

In addition, there are three cases where both preverbs appear after the verb. There is no trend as to whether the preverbs appear close to the verb they follow, or removed from it. However, each of these examples contains the preverb ā. The three cases and their positioning are given in Example 3.4.
Example 3.4: Cases with both preverbs after the verb

These cases, were there more of them, might potentially clarify our perception of the internal structure of the preverb-verb complex. They directly address the question of whether preverb ordering is left-to-right (in which case, we would expect to find interior preverbs further away from the verb when both are postverbal) or relative to the verb (in which case, we would expect to find interior preverbs closer to the verb when both are postverbal). However, these three examples yield inconclusive data. The preverb ā, which is very interior, appears in both positions, and even if the data were more consistent, it would be difficult to make a generalization on the basis of three data points.

In general, preverbs appear most commonly directly next to the modified verb, even where one of the preverbs appears after the verb. It is by no means unusual to have one or both preverbs separated from the verb (either before or
after it), but at least one preverb most often appears directly with the verb it modifies. This is in Vedic Sanskrit related to facts about accent and subordination (discussed in Section 3.2.1.1). Nevertheless, the existence of so many tokens where the preverb is in the prefix position (that is, directly in front of the verb) played a role in the eventual incorporation of the preverb onto the verb by the time of Classical Sanskrit.

3.2.1.1 Accent and preverbs

One notable difference between Vedic and Classical Sanskrit generally is the presence of accent in Vedic. Vedic accent was pitch accent—“of an essentially musical nature”, as Macdonell says in his *Vedic Grammar* (Macdonell 1910:§83). According to Macdonell, Vedic accent was likely also accompanied by some stress.

There are three pitches that are distinguished in Vedic Sanskrit: *udātta* (high pitch), *svarita* (falling pitch), and *anudātta* (low pitch). In the Rig Veda, *udātta* is not directly marked orthographically. Instead, *anudātta* is marked just before an *udātta* syllable by a horizontal line below the syllable, and *svarita* is marked by a vertical stroke above the syllable. Since a *svarita* always directly follows an *udātta*, the syllable with the high pitch can be inferred. In transliteration, however, the converse is true. The high pitch is marked by an acute accent, and *svarita* and *anudātta* go unmarked.
In general, every word is accented, and every word has only one accent. The accent is a useful tool in Vedic for determining whether an item is a separate word (as opposed to being an affix, or perhaps a clitic), and for figuring out how to correctly decompose strings of text. There are words that do not take accent. They fall into one of two categories (Macdonell 1910:§85):

1. enclitics- pronouns, and many particles (ca, u, iva, etc.)
2. words that lose their accent based on “their position or function in the sentence”

Preverbs, being free words, have their own accent independent from the verb. They, are, however, subject to the loss of accent under certain circumstances. Preverbs behave slightly differently when they stack with verbs which are the main verb of the sentence, as opposed to with verbs that appear in subordinate clauses.

Verbs in “principal sentences”– that is, main clauses– are generally unaccented, except when they are in either the sentence-initial or pāda-initial positions. When there are two preverbs modifying a verb in a main clause, both have accent. So, as seen in Example 3.5, both úpa and ā are accented, but agatam has no accent. Likewise, úpa and prá both have accents, but yāhi does not.
1.2.4
índravāyū imē sutā [úpa práyobhirā gatam] | “O Vayu and Indra, come near to the work of the sacrificer”

1.82.6
yunājmi te brāhmaṇā keśīnā hārī [úpa prá yāhī] dadhiṣe gābhastyoḥ | “With holy prayer I yoke thy long-maned pair of Bays: come hitherward; thou holdest them in both thy hands.”

Example 3.5: Two preverbs in a main clause, both accented

There is a notable exception to this general rule, however. When the preverb ā immediately follows another preverb, the other preverb loses its accent. If the other preverb ends in i, however, both preverbs retain their accent.

There is also a single example of this phenomenon with áva.

Preverb ā with sam, accent on ā only:
10.25.6
{samākrṇos}i jīvase vi vo máde
“Our herds thou guardest, Soma, and the moving world spread far and wide.”

Preverb ā with práti, accent on both ā and práti:
4.4.4
úd agne tiṣṭha [práty ā tanusva] ni amitrāṃ oṣatāt tigmahete |
“Rise up, O Agni! Spread out against (all foes)! Burn down the foes, O (god) with the sharp weapon!”

Preverb áva with upa, accent on áva only:
10.110.10
{upāvasṛj}a tmányā samañjān devānāṃ pāthā rūthāhavīṃsi |
“Send to our offerings which thyself thou balmeest the Companies of Gods in ordered season.”

Example 3.6: First preverb loses accent
In subordinate clauses, Vedic verbs generally take accent. Preverbs frequently lose their accent in these clauses, and are considered to be compounded with the verb. When there are two preverbs, one of two outcomes is likely. Both preverbs can be positioned directly before the verb and lose their accent. Alternately, only the preverb in the interior position may lose its accent and be compounded with the verb. In this case, the preverb in the exterior position would appear separate from the verb, and retain its accent. Examples of these possibilities are given in Example 3.7.

4.51.5- both incorporated
yūyām hí devīr ṛtāyūghbhir āśvaiḥ [pariprayāthā] bhūvanānī sadyāḥ l
“For you, O goddesses, with your steeds yoked in due time, proceed around the worlds in one day”

5.6.2- exterior preverb separate and accented
só agnír yó vāsūr grṇ̣ [sāṁ yām āyānti] dhenávah l
“He is Agni who is praised as the Vasu, he to whom the milch-cows come together”

Example 3.7: Preverb positioning in subordinate clauses

These examples of incorporation are notable because they may represent either an early stage of the progression of preverb incorporation as affixes, or at
the least, a basis for the generalization from word to affix. We do not always find this preverb incorporation in cases of multiple preverbation in subordinate clauses, however. It is also possible, but much more rare, to find both preverbs in a subordinate clause separate from the verb and accented.

3.52.5
\[ \text{[ prá yat stotā jaritā tūrṇyartho vrṣāyāmāṇa úpa gīrḥhirīte]} \| \]
"What time the lauding singer, keen of purpose and eager as a bull, with hymns implores thee."

Example 3.8: Two preverbs accented in a subordinate clause

In nominal verb forms (the participles), preverbs are generally affixed onto the participle stem. However, when there are two preverbs, it is possible for the exterior one (presumably in its prepositional function) to appear separate from the participle and to be accented independently.

9.22.5
\[ \text{etē prṣṭhānī rōdasorviprayānto vi ānāṣuḥ} \]
"Advancing they have travelled o’er the ridges of the earth and heaven"

Example 3.9: Preverbs separate from a participle
Ultimately, while it is correct to say that preverbs were free words in Vedic Sanskrit, there were still many cases where preverbs acted both positionally and accentually as prefixes. These cases may represent either the beginning stages of the change that would eventually yield Classical Sanskrit verbal prefixes, or it may have served as the model for that change.

3.2.1.2 Preverb positioning relative to other elements

As discussed in section 1.2, preverbs appear in combination with various other elements in both Vedic and Classical Sanskrit. However, due to tmesis, preverbs have a somewhat different relationship to these elements in Vedic than they do in Classical Sanskrit.

Many of the items (a/an-, su-, dus-) that Whitney for Classical Sanskrit classifies as “inseparable prefixes” are classified by Macdonell as ‘particles’, which, according to him “for the most part have no independent existence” (1910:§251). That is, they are mainly prefixes in the Vedas just as they are in Classical Sanskrit. However, in the earlier language, these elements more exclusively modify nouns only (or, at most, the nominal forms of verbs), and so their combination with preverbs is irrelevant.

The prefix su- is notable for appearing in the Rig Veda as an independent particle, although according to Macdonell its positioning in the sentence is
restricted (it does not appear first in the sentence). It appears as a particle about 250 times in the Rig Veda, but only 14 times in the Atharva Veda, and “rarely” in the Saṃhitās (Macdonell 1910: §251.2). The particle su (and other particles, like the negative/comparative marker na) have no particular order in the sentence relative to the verb and preverbs.

3.2.2 Metrics

Metrics in the Rig Veda interact with the positioning of elements in the line. The Vedas are divided into verses, and then stanzas, and then hymns. Verses are distinguished by the number of syllables, so that an eight-syllable verse is called dimeter, and an eleven- or twelve-syllable verse is called trimeter. A verse may be further divided into parts called ‘feet’, or pādas. Stanzas may be composed of various regular combinations and numbers of verses. The most common are the Gāyatrī stanza, which consists of three dimeter verses; the Anuṣṭubh, which is composed of four dimeter verses; and the Trisṭubh, which is composed of four eleven-syllable trimeter verses. Examples of these stanzas are given in 3.10, all taken from Macdonell (1916:439).
**Gāyatrī stanza:**
agním īḷe I puróhitam I
— — I — — I — — — I
yajñásya de I vām ṛtvījam I
— — I — — I — — — I
hótāram ra I tnadhātamam II
— — — — I — — — — II

**Anuṣṭubh stanza:**
ā́yás te sar I pirāsute I
— — — — I — — — I
āgne sáṃ as I ti dhāyase II
— — — I — — — — II
āiṣu dyumnám I utā śrávah I
— — — I — — — I
ā cittāṃ mār I tieṣu dhāh II
— — — — I — — — — II

**Triṣṭubh stanza:**
anāgāstvē, aditi I tvé turāsah I
— — — , — — — — — I
imāṃ yajñām, dadhatu I śrōśamānāḥ II
— — — , — — — — II
asmākaṃ santu, bhūva I nasya gōpāḥ I
— — — — — , — — — — I
pibantu sōmam, āva I se nō adyā II
— — — — — — — I — — — — II

Example 3.10: Gāyatrī, Anuṣṭubh and Triṣṭubh stanzas

There are many other stanza forms which have more or fewer verses or verses of different lengths. Stanzas may even combine dimeter and trimeter verses; these are called lyric meters. A hymn is composed of any number of
stanzas, but “usually it consists of not less than three or more than fifteen
stanzas, generally uniform in character”. (Arnold 1967:§28)

As shown in the stanzas above in (10), syllables (particularly as regards
their length and number) are the essential units of Vedic meter. In general, an
iambic rhythm predominates, although there are, as Arnold says “few parts of the
verse in which the poets do not consider themselves free at times to depart from
the usual rhythms” (1967:§31). However, there are generalizations about
positions where short or long quantity is preferred. A summary of these
(according to Arnold 1967) is given in Example 3.11.

\[
\begin{array}{cccccccc}
\text{dimeter verse:} & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
\text{trimeter verse:} & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12
\end{array}
\]

Example 3.11: Positions that favor short or long quantity

In addition to these generalizations about positioning and quantity, there is
also a tendency for the second and third places in either kind of verse to
alternate; that is, where one is short, the other is likely to be long. As can be seen
from the examples in Example 3.10, however, this is by no means always the case.

In principle, preverb ordering could be influenced by the requirements of the meter, particularly for those preverbs that are disyllabic (since monosyllabic preverbs may go in any position that allows for their quantity). However, in actual practice, the positioning of preverbs is not closely determined by the meter. Because most disyllabic preverbs end in short vowels, which can easily be made into long (heavy) syllables by sandhi combination with the following word or by occurrence before a consonant cluster, they are relatively flexible as to their positioning in the verse. Furthermore, even if they were constrained within the verse, it would not necessarily dictate their position relative to the verb or to each other.

Even for the preverb pārā, which is unique in being a disyllabic preverb with a long vowel at the end, metrics have little influence on the preverb’s position relative to the verb. There is a tendency for pārā (as also in Classical Sanskrit) to appear before the verb it modifies, in the most interior position relative to other preverbs. According to Lubotsky’s concordance (1997), it is the case that pārā is very likely to appear in the first and second positions, the fifth and sixth positions in a dimeter verse, and in the ninth and tenth positions in a trimeter verse. As can be seen in Example 3.11, these are all positions that favor a short-long alternation. However, in every case, pārā still appears in the most
interior position for the verb it modifies, and it is not clear that the meter has influenced that relative ordering in any way.

3.2.2.1 The preverb ā: the influence of metrics on ordering

Even though there is no clear tendency for preverbs to alter their position relative to the verb according to the requirements of the meter, it is still possible for metrical structures to influence preverb ordering. The preverb ā provides an interesting case. This preverb is notable in both Vedic and Classical for being strongly interior. However, where ā is categorically interior in Classical, it only appears in the interior position 74% of the time in Vedic. However, it shows a particular tendency, when not interior, to gravitate toward the pāda-initial position— that is, to be the first syllable of a pāda. In the majority of cases where ā is not in the interior in the Rig Veda, it is pāda-initial. Most of the time, it appears at the beginning of the same pāda as the verb it modifies, but there are several cases where it appears at the beginning of an earlier pāda. In any case, as seen below in Table 3.3, 86% of the cases where ā is not interior have it at the pāda boundary (and 15% of interior cases as well).
<table>
<thead>
<tr>
<th></th>
<th>Interior</th>
<th>Exterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>132</td>
<td>42</td>
</tr>
<tr>
<td>pāda-initial</td>
<td>20 (15%)</td>
<td>36 (86%)</td>
</tr>
</tbody>
</table>

Table 3.3: Positioning of ā relative to the pāda

This is likely because of the generally tendency of preverbs, when separated, to gravitate towards the initial position. In cases of preverb stacking, one or the other preverb appears in pāda-initial position 288 times out of a total 386 pairs (75%). However, of 442 cases involving the other monosyllabic preverbs (ví, prá, úd, ní, nís, sám), the monosyllabic preverb appears in pāda-initial position 110 times (25%). Given that, ā seems drawn to the pāda boundary more than other monosyllabic preverbs.

3.3 Vedic preverb ordering

In Vedic Sanskrit, as in Classical Sanskrit, there are also preverbs that show preference in their ordering, as can be seen below, in Chart 3.1. In the earlier language, abhi, anu, práti, apa and ádhi show a particular preference for the exterior position (70% or higher of tokens exterior). Likewise, ni, ā, prá, api and párā show a preference for the interior position (70% or higher of tokens...
The preverb *antar* shows a slight preference (55% of tokens) for the posterior position.

These data confirm a statement made by Macdonell on the subject. In footnote 7 to section 593 of his *Vedic Grammar* (1910), he notes that:

“Where there are two [preverbs], párā always immediately precedes the verb; ā and áva nearly always; úd, ní, prá usually. On the other hand, abhi is all but invariably the first of the two; ádhi and ánū are nearly always so, úpa and práti usually.”
I provide numbers here for the trends that Macdonell recognized. The preverb *pārā* is categorically interior. The preverb *ā* has a robust tendency (74%) to appear next to the verb, and *āva, úd, ní,* and *prá* also show notable trends towards interiority (all >60%). Likewise, *abhí, ánù* and *ádhi* indeed show a marked preference for the exterior position (80%, 85%, and 70%, respectively). The preverb *práti* also appears almost always in the exterior position (85%); *úpa,* however, shows a less strong tendency (59%)- as Macdonell says, it appears in the exterior position “usually”.

There is not always conclusive data about preverb ordering in this text, however. Five of the 19 preverbs have fewer than ten tokens in the Rig Veda, at least as part of stacked preverb complexes. This extremely small number of tokens makes any conclusions about the ordering properties of those preverbs extremely suspect, at least insofar as it is based only on these data. Despite the very small number of *n,* I have included the results from those preverbs for the sake of completeness, and also because they may ultimately be useful, when considered in combination with the data on Classical ordering.
<table>
<thead>
<tr>
<th>Preverb</th>
<th>Total # tokens</th>
<th>Exterior</th>
<th>Interior</th>
<th>Posterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>áva</td>
<td>8</td>
<td>3</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>apa</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>nis</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>parā</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>api</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3.4: Preverbs with fewer than ten tokens

The other reason for this inconclusiveness is the inclusion of posterior tokens. The preverb *antar* is particularly notable for appearing more in the posterior position than in any other position. In general, the posterior position is rarer than the other positions, appearing only in about 17% of the total verses that contain multiple preverbs. Because the numbers are generally so small, and because the possibility for posterior positioning does not carry over to Classical Sanskrit, it is difficult to say anything meaningful about those data. It is probably most appropriate to simply say, as Macdonell does, “occasionally the preposition [preverb] follows the verb” (1910:§593a).

### 3.4 Comparison to Classical Sanskrit

The Vedic ordering data are of use to us not just because of their inherent interest. They may also help to explain the Classical Sanskrit data that has
already been considered. If (as shown in previous sections) synchronic information about the semantics and the phonology of preverbs cannot adequately account for the trends in preverb ordering that we saw in Chart 3.1, then we are left with preverb ordering as a lexically idiosyncratic phenomenon.

Frequently, phenomena that appear synchronically to be idiosyncratic are the relics of something that was clearly motivated in an older stage of the language. For example, Germanic umlaut was originally phonetically motivated (the fronting of back vowels before high front vowels or semivowels in the next syllable), but is entirely lexicalized in the modern language (Robinson, 1975). With this in mind, the Vedic data give us an important insight to Classical ordering of preverbs. As can be seen in Table 3.5, there is a strong similarity between Classical ordering patterns and the ordering of preverbs in Vedic Sanskrit. In this table, I show the comparison between the Classical and Vedic token count data. For most of the preverbs, the data for Vedic and Classical are very similar. However, some of the preverbs are either unclear as to their ordering, or they show a significant alteration to their ordering preference between the two periods. These exceptions are highlighted in the table. It should also be noted that the Vedic percentages may not add to 100%, because of the posterior tokens (which have no Classical analogue and have therefore been excluded from consideration here).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ā</td>
<td>--</td>
<td>24% (42)</td>
<td>100% (425)</td>
<td>74% (131)</td>
</tr>
<tr>
<td>abhī</td>
<td>90% (91)</td>
<td>80% (92)</td>
<td>10% (10)</td>
<td>7% (8)</td>
</tr>
<tr>
<td>ádhi</td>
<td>87% (26)</td>
<td>70% (7)</td>
<td>13% (4)</td>
<td>10% (1)</td>
</tr>
<tr>
<td>antar</td>
<td>100% (2)</td>
<td>27% (3)</td>
<td>0</td>
<td>18% (2)</td>
</tr>
<tr>
<td>anu</td>
<td>48% (43)</td>
<td>85% (29)</td>
<td>52% (46)</td>
<td>6% (2)</td>
</tr>
<tr>
<td>apa</td>
<td>21% (3)</td>
<td>80% (4)</td>
<td>79% (11)</td>
<td>0</td>
</tr>
<tr>
<td>api</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100% (2)</td>
</tr>
<tr>
<td>ati</td>
<td>30% (7)</td>
<td>25% (3)</td>
<td>70% (16)</td>
<td>58% (7)</td>
</tr>
<tr>
<td>áva</td>
<td>0</td>
<td>38% (3)</td>
<td>100% (49)</td>
<td>63% (5)</td>
</tr>
<tr>
<td>nī</td>
<td>20% (17)</td>
<td>30% (8)</td>
<td>80% (69)</td>
<td>70% (19)</td>
</tr>
<tr>
<td>nis</td>
<td>37% (28)</td>
<td>60% (3)</td>
<td>63% (47)</td>
<td>40% (2)</td>
</tr>
<tr>
<td>parā</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100% (5)</td>
</tr>
<tr>
<td>pari</td>
<td>57% (17)</td>
<td>69% (25)</td>
<td>43% (13)</td>
<td>8% (3)</td>
</tr>
<tr>
<td>prá</td>
<td>24% (55)</td>
<td>16% (21)</td>
<td>76% (174)</td>
<td>82% (105)</td>
</tr>
<tr>
<td>práti</td>
<td>88% (37)</td>
<td>85% (11)</td>
<td>12% (5)</td>
<td>15% (2)</td>
</tr>
<tr>
<td>sam</td>
<td>90% (490)</td>
<td>31% (16)</td>
<td>10% (57)</td>
<td>65% (34)</td>
</tr>
<tr>
<td>úd</td>
<td>18% (9)</td>
<td>36% (5)</td>
<td>82% (41)</td>
<td>64% (9)</td>
</tr>
<tr>
<td>upa</td>
<td>59% (67)</td>
<td>55% (44)</td>
<td>41% (47)</td>
<td>26% (21)</td>
</tr>
<tr>
<td>vi</td>
<td>79% (166)</td>
<td>19% (7)</td>
<td>21% (43)</td>
<td>69% (25)</td>
</tr>
</tbody>
</table>

Table 3.5: Comparison of Classical and Vedic token data
Notable among the preverbs that show a change between Vedic and Classical is *antar*, which is exterior in Classical, but shows a preference for the posterior position in Vedic. The preverb *apa* shows inconsistent results, but has such small numbers for both periods that those data should be considered inconclusive. The preverb *nis* likewise seems to show a reversal, but the small number of tokens in the Vedic period means that this is not a solid difference. Two other preverbs (*sám* and *ví*) do seem to show a reversal of ordering preference. Interestingly, Macdonell omits *ví* and *sám* from the list of interior preverbs, despite the fact that both appear in the interior position more than 65% of the time in the Rig Veda. It may be that, because Macdonell was aware of more of the Vedas than I (my data being restricted to the Rig Veda), his omission is intentional and represents a more accurate picture of the overall Vedic (not just Rig Vedic) situation.

In order to more closely examine the development of preverb ordering from Vedic to Classical, in Chart 3.2 a subset of the preverbs is presented graphically. These are specifically the preverbs that Macdonell refers to in section 593 (1910) as having a particular preference for either the exterior or the interior position.
In sum, it is clear that there is a strong persistence in the ordering from Vedic into the Classical period. The preverbs that are interior in Classical (párah, prá, á, úd, ni and áva) are also primarily interior in Vedic. In fact, these preverbs are even more likely to appear in the interior position in Classical than their Vedic predecessors; this may possibly be an artifact of the influence of the posterior position on my Vedic data. On the other side, the exterior preverbs (upa, ádhi, anu, abhi and práti) are nearly exactly as exterior in Vedic as they are in Classical.
3.4.1 Implications of inheritance and permanence

The obvious implication of this comparison of the Vedic and Classical ordering data is that the Classical preverb ordering trends were inherited from the Vedic. This provides more support to my conclusion that the Classical patterns of ordering I have discussed here were not, in fact, synchronically motivated.

Since the time difference between Vedic and Classical Sanskrit is a gap of several centuries, this similarity is worth noting. Additionally, preverbs themselves had, in that span of time, undergone a serious set of changes in their status and structure; they had become incorporated as bound verbal affixes. The preservation, for the most part, of Vedic preverb ordering shows that there is considerable stability in Sanskrit preverb ordering generally.

3.5 Origins of Vedic preverb ordering

Since Classical Sanskrit preverb ordering seems to be inherited from Vedic Sanskrit, then we must look for an explanation of ordering synchronic to Vedic. To that end, I have applied many of the same tests used for Classical Sanskrit in Chapter 2 to my data on Vedic preverbs.

3.5.1 Semantic accounts for ordering

In investigating explanations for preverb order in Classical Sanskrit, I looked at both semantic and phonological influences. On the meaning side, I
looked at compositionality and the possibility of lexical ordering classes based on meaning. Again, the first assumption about preverb ordering is that the order is determined by the meaning, such that different orders yield different meanings. For Classical Sanskrit, I presented many cases where the same verb-preverb combination appeared with the preverbs in different orders, and compared their meanings. This is more problematic to do with the Vedic data because there are very few examples like those presented in section 2.3.1.2; in the Vedic data, there are a total of five pairs of this kind (Example 3.12).

Example 3.12: Five cases with preverbs in both orders

1) sam abhī/abhī sam with √ī
   1.125.7
   anyāś tēśāṃ paridhir astu kāś cid āprṇantam [abhī sāṃ yantu] śōkāḥ ll
   “Let every man besides be their protection, and let affliction fall upon the niggard.”
   6.15.12
   [sāṃ tvā dhvasmanvād abhī etu] pāthaḥ sāṃ rayī sprṇayāiyaḥ sahasrī ll
   “Here let the place of darkening come upon thee: may wealth be ours, desirable in thousands.”

2) úpa prá/prá úpa with √ī
   1.40.1
   [úpa prá yantu] marūtaḥ sudānava indra prāsūrbhavā sācā ll
   “May they who give good gifts, the Maruts, come to us. Indra, most swift, be thou with them.”
   1.139.1
   ádha [prá sū na úpa yantu] dhītāyo devāṁ āchā nā dhītāyāḥ ll
   “Then may our holy songs go forward on their way, our songs as ‘twere unto the Gods.”
ii) úpa á/á úpa with vyā

1.135.3
[ā no niyūdbhī satīnībhī adhvarām sahasrīnībhī úpa yāḥ] vītāye vāyo havyāni vītaye ī
“Come thou with hundreds, come with thousands in thy team to this our solemn rite, to taste the sacred food, Vāyu, to taste the offerings.”

1.171.2
[úpem ā yāta] mánasā jūṣānā yūyām hi śthā nāmasa id vṛdhāsah ī
“Come to it, pleased in your mind, for you give increase to (our) worship.”

iv) abhī prá/prá abhī with vṃṛś

1.140.5
yāt sīṃ mahīm avānīm [prābhī mārmṛsad] abhiśvasān stanāyann ēti nānadat ī
“When he stroking his wide course proceeds panting, thundering, roaring”

8.81.6
ā no bhara dákṣiṇen[ābhī savyēna prá mṛśa] ī
“When he hath drunk its gladdening drops, the God with vigour of a God”

v) abhī prá/prá abhī with ḍhṛ

4.56.5
[prā vām máhi dyāvī abhī úpastutim bharāmahe] ī
“To both of you, O Heaven and Earth, we bring our lofty song of praise”

8.89.4
[abhī prá bhara] dhṛṣatā dhṛṣanmanah śrāvaś cit te asad bṛḥāt ī
“Here am I, look upon me here, O singer. All that existeth I surpass in greatness.”

Example 3.12: Five cases with preverbs in both orders

Of the five listed above, Grassmann marks only the first pair as having a different meaning because of its order. For sam abhī ṛī, Grassmann lists the meaning as herankommen, or “to approach”. For abhī sam ṛī, however, he gives the meaning zusammentkommen, or “to meet, gather”. Monier-Williams also
gives the same meanings for the two orders, although MW lists only Vedic citations for *abhī sam*, and that order never appears in my Mahābhārata data with with the verb ví.

For the other four pairs, Grassmann at least makes no distinction of meaning based on the ordering. The pair given in Example 3.12ii is, in fact, listed under the same heading, both as *úpa prá*. It is difficult to make any assertion about the way meaning determines order in Vedic based on a lack of data, but minimally, it seems as though the Vedic situation is similar to the Classical situation. That is, some orders are determined by the meaning, but many are not, and meaning is not a sufficient explanation or motivation for ordering.

If we cannot determine a solid pattern of meaning-based order, then reference to the semantic properties of the preverbs also fails to provide us with a clear-cut synchronic explanation for ordering. As I have shown, there is little difference in the properties of ordering between Vedic Sanskrit and Classical Sanskrit. There is also no significant difference between the meanings of the preverbs between the two periods. Given that I found no evidence for semantically-based ordering classes for preverbs in Classical Sanskrit, it is no surprise that I similarly find no evidence for them in Vedic. In Table 3.6, I have marked preverbs which appear in either the interior or exterior positions 70% or more of the time. Unsurprisingly, there is no significant correlation between positioning and whether a preverb is a marker of Direction, Location or Orientation.
3.5.2 *Phonological accounts for ordering*

The question of the influence of the phonology on ordering might seem to be considerably more complex for Vedic than it was for Classical Sanskrit. Both tmesis and meter are complicating factors for the study of Vedic preverbs. However, as discussed in 3.2, we would expect neither factor to strongly influence the ordering properties relative to the verb. Tmesis might affect coalescence. However, coalescence was not an issue in Classical. Furthermore,
because of the possibility for an “interior” preverb to appear in a variety of more or less coalesced positions in Vedic, it is clearly even less of an issue in Vedic than it is in Classical.

3.5.2.1 Syllable count

The issue of the influence of meter on ordering (with particular attention to *parā*) is discussed in 3.2.2.1. However, one can also address the relationship between metrically relevant features and ordering for other preverbs.

<table>
<thead>
<tr>
<th>Monosyllabic</th>
<th>nis sam úd vi ā ni prá</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disyllabic</td>
<td>abhi ādhi anu apa práti upa antar ati pari áva api parā</td>
</tr>
</tbody>
</table>

Chart 3.3: Comparison of ordering and syllabicity for Vedic

As in Classical Sanskrit, there is no clear relationship between number of syllables and ordering relative to the verb root. We would expect monosyllabic words, particularly those that end in short vowels, to be very easy to place anywhere in the meter. Disyllabic preverbs are not especially difficult either, however, given the flexibility of Vedic meter and the ability of the final syllable of
most disyllabic preverbs to scan either short or long, depending on what follows it.

3.6 Summary and evaluation

Preverbs in Vedic (and in the Rig Veda in particular) have ordering properties which show clear differentiation. These are very similar to ordering properties in Classical Sanskrit, despite the fact that there are several significant differences between preverbs in Vedic Sanskrit and in Classical Sanskrit (tmesis being the largest one). Again, there are not clear synchronic explanations for these ordering properties within Vedic.
4.1 Introduction

In this chapter, I compare preverb ordering in Sanskrit with preverb ordering in the larger Indo-European language family. I begin by discussing the reasons for looking to Proto-Indo-European for a better understanding of preverb ordering in Sanskrit. I then give a fuller introduction to preverbs in different languages, and conclude by presenting a comparison of Sanskrit preverb ordering with preverb ordering in Old Irish, another I-E language notable for preverb stacking.

The goal of this chapter is to take advantage of the scholarship of specialists in these other languages to further inform the understanding of Sanskrit preverb ordering. Each language shows its own uniquely interesting facts about preverbs and their ordering. Each of these situations could thusly be topic for a monographic treatment on its own; however, I touch on them relatively briefly, and only as they are relevant for comparison with Sanskrit.
4.1.1 Indo-European and Sanskrit

As established in sections 2.2 and 3.3, preverbs in Sanskrit have ordering properties which are not based solely on synchronic grammatical features, but, at least for Classical Sanskrit, are inherited. Additionally, preverb ordering shows a great deal of stability, as evidenced by how little change in preverb ordering there is between the Vedic and Classical periods. Preverb ordering seems already to be at least partially lexicalized in the Vedic period. If ordering cannot be explained with reference to synchronic facts about Vedic, the question of the origins of preverb ordering remains. In this section, I investigate the possibility that those properties may be an Indo-European phenomenon, or at least have parallels elsewhere in the Indo-European family.

4.1.2 Methods

In order to present a comparison between Sanskrit preverb ordering and the ordering of preverbs in other languages, I refer mainly to the data presented previously in Chapters 2 and 3. However, I also present a new analysis of those same data. Because Old Irish in particular allows many preverbs before a single root, an analysis based on only two possible positions is inadequate for a comparison with the Irish data. To produce a more appropriate comparison, I did an analysis of the relative order of Sanskrit preverbs. That is, I wanted to discover if there were any generalizations that could be distilled from my data about the order of one preverb when in combination with another.
I based the analysis on the type, and not the token data for Classical Sanskrit (I used Classical Sanskrit for the reasons outlined below in 4.1.3). My purpose in determining a relative order was to discover which preverbs always or almost always appeared either before or after other preverbs. To this end, I created a table with each of the 342 possible preverb pairs displayed next to its opposite ordered pair, with data. Any pairs with no data were discarded entirely. Once this was done, I checked to see if there was an overwhelming preference for one of the two ordering pairs; that is, if there were a reasonably large number of types in one order, and none or only one in the other order.

In Table 4.1, I give an example of how this was done, with a segment of the data pertaining to the preverb abhi. Data that were incorporated into the final analysis are highlighted in light grey.
<table>
<thead>
<tr>
<th>E</th>
<th>I</th>
<th>#</th>
<th>E</th>
<th>I</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>abhi</td>
<td>ava</td>
<td>24</td>
<td>ava</td>
<td>abhi</td>
<td>0</td>
</tr>
<tr>
<td>abhi</td>
<td>ā</td>
<td>36</td>
<td>ā</td>
<td>abhi</td>
<td>0</td>
</tr>
<tr>
<td>abhi</td>
<td>ud</td>
<td>27</td>
<td>ud</td>
<td>abhi</td>
<td>1</td>
</tr>
<tr>
<td>abhi</td>
<td>upa</td>
<td>23</td>
<td>upa</td>
<td>abhi</td>
<td>0</td>
</tr>
<tr>
<td>abhi</td>
<td>ni</td>
<td>20</td>
<td>ni</td>
<td>abhi</td>
<td>0</td>
</tr>
<tr>
<td>abhi</td>
<td>nis</td>
<td>13</td>
<td>nis</td>
<td>abhi</td>
<td>1</td>
</tr>
<tr>
<td>abhi</td>
<td>pra</td>
<td>70</td>
<td>pra</td>
<td>abhi</td>
<td>1</td>
</tr>
<tr>
<td>abhi</td>
<td>prati</td>
<td>6</td>
<td>prati</td>
<td>abhi</td>
<td>13</td>
</tr>
<tr>
<td>abhi</td>
<td>pari</td>
<td>10</td>
<td>pari</td>
<td>abhi</td>
<td>12</td>
</tr>
<tr>
<td>abhi</td>
<td>vi</td>
<td>39</td>
<td>vi</td>
<td>abhi</td>
<td>1</td>
</tr>
<tr>
<td>abhi</td>
<td>sam</td>
<td>79</td>
<td>sam</td>
<td>abhi</td>
<td>60</td>
</tr>
<tr>
<td>abhi</td>
<td>parā</td>
<td>2</td>
<td>parā</td>
<td>abhi</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4.1: Data for relative analysis

In most cases where there were only one or two types for both possible orders combined, I discarded the data as being inconclusive. However, I made one exception to this rule. As shown in the table above, I did use the data for the preverb *parā* despite the very few types. For *parā*, there is very little data either in Classical or in Vedic. However, what data there is shows *parā* to be categorically
interior in its positioning. Because of the very consistent data in this case, I felt it was appropriate to use the data despite the very small number of $n$.

The final relative analysis for Classical Sanskrit is shown in Table 4.2. The more rightward a preverb appears, the closer to the verb root (the more interior) it tends to appear. When two preverbs are in the same column, it is impossible to determine their order relative to each other because of a lack of data, or a lack of preference in ordering.

![Table 4.2: Classical Sanskrit relative order](image)

The preverb $upa$, then, is in the same column as $anu$, $vi$, $ati$, $pari$ and $apa$; $pra$ and $nis$ are also in the same column as $apa$, but are definitely more interior than $upa$. 
4.1.3 Classical and Vedic Sanskrit in comparison

In the course of this chapter, I compare Sanskrit preverb ordering with preverb ordering in other languages. In various places, I have found it useful to use my Classical Sanskrit data rather than my Vedic Sanskrit data. Ordinarily, this would be considered methodologically problematic. It is important to use the oldest possible data when making comparisons to sister languages (and therefore attempting to derive facts about the mother language) in order to minimize differences from the natural progression of language change. In the case of Sanskrit, the oldest possible data is found in the Vedic texts.

However, in this case I find it useful to use the Classical data for two reasons. First, I have far more tokens in my Classical Sanskrit data. My Vedic data include only a few hundred tokens; my Classical data include several thousand. There are several preverbs that have so few tokens in the Vedic data that it is difficult to make any statement about their ordering properties. The Classical data, where they are a consistent continuation of the Vedic ordering properties, give us larger and therefore hopefully more reliable numbers.

Secondly, the nature of the Rig Veda makes the data more complicated in several ways. Mainly, as discussed at length in Chapter 3, the postverbal position is possible in the Rig Veda. Because posterior positioning is absent by the time of Classical Sanskrit, those data are more easily comparable with other languages where the posterior position is also disallowed for preverbs.
It is only possible to use the Classical data because they show essentially the same results as the Vedic data for all the preverbs that I present for comparison here. If that were not the case, then it would clearly be necessary to use the older data. However, the stability of preverb ordering properties in Sanskrit means that the data are functionally equivalent, at least for the preverbs in question here.

4.1.4 Preverb stacking in Indo-European languages

As discussed in the introduction, preverbs appear throughout the Indo-European language family. However, preverb stacking– that is, two or more preverbs modifying the same root– is more rare. Because my object is to study preverb ordering, however, languages where stacking is possible are required; otherwise, ordering is irrelevant.

There are only a handful of ancient I-E languages besides Sanskrit that allow preverb stacking. Slavic is generally known for preverb stacking (Istratkova 2004, Svenonius 2004, etc.). Greek is also well known for multiple preverbs, and the comparison between Sanskrit and Greek tmesis is well established (Bortone 2000). Old Irish is exceptionally permissive as regards preverb stacking, allowing many more preverbs than other languages (Kuryłowicz 1964). Stacking is also found in Baltic, in Lithuanian (Nevis & Joseph 1992).
4.2 Preverbs in Slavic

Slavic is well known for its preverb system, and for the extensive stacking in its daughter languages. According to Lunt, in his *Old Church Slavonic Grammar*, there were in OCS 20 preverbs (or prefixes, as they are generally called in the Slavic literature). They are listed in Example 4.1. Slavic prefixes act in the daughter languages as aspectual markers, and this was the case even in OCS (Lunt 1974:§5.31).

```
vě
věz
do
za
iz

mimo
na
nadě
nizě
pro

ot(ѣ)
po
podѣ
pri
pro

prě
prědѣ
raz
sѣ
u
```

**Example 4.1: List of Old Church Slavonic preverbs**

There are many examples of prefix stacking in the Slavic daughter languages. Bulgarian has a particularly productive capacity for stacking; Istratkova gives examples with as many as seven prefixes on a root (2004). Most of the examples from other languages, however, allow only two prefixes on a single root.
<table>
<thead>
<tr>
<th>Phrase</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>po-raz-kaža</td>
<td>‘narrate a little’</td>
</tr>
<tr>
<td>iz-po-raz-kaža</td>
<td>‘narrate completely, little by little’</td>
</tr>
<tr>
<td>iz-po-pre-raz-kaža</td>
<td>‘narrate again completely little by little’</td>
</tr>
<tr>
<td>iz-po-na-pre-raz-kaža</td>
<td>‘narrate again many stories completely little by little’</td>
</tr>
</tbody>
</table>

Example 4.2: Bulgarian (Istratkova 2004)

Po-vy-táhl po-raz-kaža z píkopu.

‘He pulled the cart partly/incompletely out of the/a ditch.’

od-po-sednout po-raz-kaža

‘to sit down a small distance away from’

Example 4.3: Czech (Filip 2003)

po-vy-brasyvat po-raz-kaža

‘throw out one by one’

Example 4.4: Russian
Again, the main reason why scholars have found Slavic prefixes interesting is their use as aspectual markers. The traditional view of prefixes is that they combine with verbs in order to make imperfective verbs into perfective verbs (Filip 2003). However, Svenonius and Filip (among many others) point out that this is not true for all prefixes, or all verbs (Svenonius 2004). According to Schuyt (1990:290), prefixes have three semantic functions:

1. They can denote spatial orientation and movement. According to Schuyt, prefixes of this type are sometimes called “qualifying”, “full”, or “lexical”.

2. They can express stages of verbal action, “such as beginning, completion, limited duration or a certain or satisfactory amount”. These are called “modifying” or “procedural”.

3. They are solely markers of perfective aspect: these are called “empty” or “aspectual” prefixes.

In general, the ability of Slavic prefixes to combine with other prefixes, and the order in which they combine, is determined by the semantic properties of the prefix. According to Filip, in Czech, aspectual prefixes may combine with some lexical prefixes, but not with other aspectual prefixes. As for the historical development of preverb stacking in Slavic, very little work has been done on the subject. There are many examples of multiple prefixation from Old Church Slavonic. Some of these examples are given in Example 4.5 (Цейтлин 1994).
Other scholars have not done a great deal of work on the subject of preverb stacking in the older Slavic languages. Because of this, and also because of the way that aspect has influenced prefix ordering, I have not tried to compare the Slavic system of prefixes (which is rich and interesting in its own right) to Sanskrit’s preverb ordering trends.

4.3 Preverbs in Ancient Greek

The oldest extant form of Greek is Homeric Greek, which is the language of the Iliad and the Odyssey. It dates from the 8th or 9th century BCE. Of Homeric preverbs (called “prepositions” in the Greek literature generally), Horrocks says “The Homeric poems display a wide range and variety of prepositional and preverbal constructions and uses, many of which do not reappear in the later dialects of Greek other than the more artificial literary forms. This freedom is in fact one of the most noteworthy features of the Homeric

<table>
<thead>
<tr>
<th>amphí</th>
<th>around</th>
<th>en</th>
<th>in</th>
<th>perí</th>
<th>around</th>
</tr>
</thead>
<tbody>
<tr>
<td>aná</td>
<td>up</td>
<td>epí</td>
<td>at</td>
<td>pró</td>
<td>forth</td>
</tr>
<tr>
<td>anti</td>
<td>against</td>
<td>hupér</td>
<td>above</td>
<td>pros</td>
<td>forth</td>
</tr>
<tr>
<td>apó</td>
<td>off</td>
<td>hupó</td>
<td>under</td>
<td>apék</td>
<td>out_off</td>
</tr>
<tr>
<td>diá</td>
<td>through</td>
<td>katá</td>
<td>down</td>
<td>diék</td>
<td>out_through</td>
</tr>
<tr>
<td>eis</td>
<td>to</td>
<td>metá</td>
<td>amid</td>
<td>hupék</td>
<td>out_under</td>
</tr>
<tr>
<td>ek</td>
<td>out</td>
<td>pará</td>
<td>beside</td>
<td>parék</td>
<td>out_beside</td>
</tr>
</tbody>
</table>

Example 4.6: List of Homeric Greek preverbs

Preverbs in Ancient Greek behave similarly to preverbs in Sanskrit in that they have multiple functions. They can be used as prepositions- more properly, adpositions- modifying nouns. Furthermore, they can also be used as preverbs modifying the meaning of verbs. Additionally, they have the capacity for “pure adverbial use” (Bortone 2000). In this, the Homeric Greek situation as regards preverbs is very similar in many ways to that of Vedic Sanskrit; tmesis is in effect, for example, and where multiple preverbation occurs, it is overwhelmingly only two preverbs. However, unlike with Sanskrit, there is, as Imbert mentioned, a
possibility in Greek for one of these elements to continue to be linked to a noun, and to be linked to the extent that the preverb continues to govern case. Imbert (2008) describes their behavior in Homeric Greek as follows:

“The syntactic behavior of these Path morphemes is as follows: (a) when adverbs, they are independent from any particular argument; (b) when adpositions, they are linked to an argument and command its case; and (c) when preverbs, they are satellites of the verb.”

In this case, “satellite” refers to the semantic relationship between a preverb and its modified verb, such that the preverb modifies the meaning of a verb in a close way, but not its functional properties, as in Sanskrit. Imbert is here referring to the distinction between satellite and relational preverbs, as discussed in 1.3.2.1. In her 2009 study, Imbert links this distinction to preverb ordering. She shows that, per Bybee’s statements about the influence of relevance on the ordering of verbal elements, traditional preverbs used in a “satellite” function incorporate more closely on the verb than preverbs used in the “relational” function. Therefore, she believes that, in cases in Homeric Greek where there are two preverbs, “only the preverb closest to the verb stem behaves as a bona fide satellite.” (2009)

4.3.1 Comparison to Sanskrit

In Imbert’s 2008 dissertation, she presents an inventory of cases of multiple preverbation in the Iliad and the Odyssey. I reproduce her distilled list of types and tokens of different preverb combinations for consideration in Table 4.2.
<table>
<thead>
<tr>
<th>Combination</th>
<th>Gloss</th>
<th>Type Count</th>
<th>Token Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>ek-ápó-</em></td>
<td>out-off-</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td><em>eis-aná-</em></td>
<td>to-up-</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td><em>ek-aná</em></td>
<td>out-up-</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td><em>apó-pró-</em></td>
<td>off-forth-</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><em>amphi-perí-</em></td>
<td>around-around</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><em>eis-apó-</em></td>
<td>to-off-</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td><em>ek-pró-</em></td>
<td>out-forth-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><em>en-katá-</em></td>
<td>in-down-</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><em>epí-aná-</em></td>
<td>at-up-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><em>epí-pró-</em></td>
<td>at-forth-</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><em>apó-aná</em></td>
<td>off-up-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>eis-katá-</em></td>
<td>to-down-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>ek-diá-</em></td>
<td>out-through-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>ek-katá-</em></td>
<td>out-down-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>epí-apó-</em></td>
<td>at-off-</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><em>epí-en-</em></td>
<td>at-in-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>hupér-katá-</em></td>
<td>above-down-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>pará-katá-</em></td>
<td>besides-down</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>perí-pró-</em></td>
<td>around-forth</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4.3: Homeric Greek type and token data
<table>
<thead>
<tr>
<th>Combination</th>
<th>Gloss</th>
<th>Type Count</th>
<th>Token Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>hupék-pró-</td>
<td>out_under-forth-</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>hupék-aná-</td>
<td>out_under-up</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>parék- pró-</td>
<td>out_besides-forth</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ek-hupó-aná-</td>
<td>out-under-up</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4.3: Homeric Greek type and token data

There are several factors, however that make a direct comparison to Sanskrit difficult. First, while there are certainly enough cases in this count to make it clear that multiple preverberation is a possible and utilized phenomenon in Homeric Greek, there are still only about half as many tokens as in my data for Vedic Sanskrit. The small number of tokens makes it difficult to be sure whether any particular ordering preference similar to the ordering preferences for Sanskrit is real or a trick of attestation.

Additionally, there is a problem of correlation. While many Greek preverbs are cognate with Sanskrit preverbs, many of the more common preverbs in the data above have no direct cognates to Sanskrit preverbs. This makes comparison difficult, and compounds the problem of small token counts. I present a list below in Example 4.7 of those relevant preverbs which are cognate.
according to Beekes (2010) and Mayrhofer (1976 and 1986-2001):

- amphí ~ abhi
- aná ~ anu?
- apó ~ apa
- en ~ adhi?
- epí ~ api
- hupó ~ upa
- perí ~ pari
- pró ~ pra

Example 4.7: Greek and Sanskrit cognates

I used two methods in comparing Sanskrit and Greek preverbs. First, each of the cognate preverbs in the inventory in Example 4.7 was evaluated as to how many times it appeared in each position, regardless of which other preverb was in the other slot. This analysis had the advantage of making it possible to ignore the non-cognate preverbs. In Table 4.3 I present tokens of interior and exterior positioning for Homeric and Vedic preverbs. The number of tokens is given in parentheses, and percentages are given for the sake of comparison. Note that the Vedic percentages do not add up to 100% in most cases because of the
appearance of preverbs in the posterior position. Cases where the Homeric and Vedic preverbs do not match with regard to ordering are highlighted.

<table>
<thead>
<tr>
<th>Greek</th>
<th>Ext. Tokens</th>
<th>Int. Tokens</th>
<th>Vedic</th>
<th>Ext. Tokens</th>
<th>Int. Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>apó</td>
<td>20% (7)</td>
<td>80% (28)</td>
<td>apa</td>
<td>100% (4)</td>
<td>0</td>
</tr>
<tr>
<td>amphí</td>
<td>100% (2)</td>
<td>0</td>
<td>abhi</td>
<td>80% (92)</td>
<td>7% (8)</td>
</tr>
<tr>
<td>aná</td>
<td>0</td>
<td>100% (25)</td>
<td>anu</td>
<td>85% (29)</td>
<td>6% (2)</td>
</tr>
<tr>
<td>pró</td>
<td>0</td>
<td>100% (28)</td>
<td>pra</td>
<td>16% (21)</td>
<td>82% (105)</td>
</tr>
<tr>
<td>epi</td>
<td>100% (14)</td>
<td>0</td>
<td>api</td>
<td>0</td>
<td>100% (2)</td>
</tr>
<tr>
<td>perí</td>
<td>33% (1)</td>
<td>67% (2)</td>
<td>pari</td>
<td>69% (25)</td>
<td>8% (3)</td>
</tr>
<tr>
<td>en</td>
<td>100% (1)</td>
<td>0</td>
<td>adhi</td>
<td>70% (7)</td>
<td>10% (1)</td>
</tr>
</tbody>
</table>

Table 4.4: Comparison of Homeric and Vedic ordering

It is clear that there is no good correlation between the two sets. Of the three preverbs that match, only one has a good correlation, a clear etymology, and a reasonable number of tokens in the Greek (pró~pra). If Greek preverbs show no absolute preference for one slot or the other, however, there might still be a relative ordering hierarchy. Because of the lack of Sanskrit cognates for several common Greek preverbs (notably eis, ek, and katá), this is a difficult comparison to make; there are only seven ordering pairs in Imbert’s data where
both preverbs are cognate to Sanskrit preverbs and thus give comparative insight into relative ordering. A comparison of those seven pairs with the cognate pairs, given Sanskrit relative ordering, is shown in Table 4.4. The ordering information for this section is based off of the analysis described in section 4.1.2. Where the Sanskrit relative ordering for two preverbs is unknown, usually because those preverbs do not appear together often enough to make a determination, there are question marks.

<table>
<thead>
<tr>
<th>Greek</th>
<th>Sanskrit</th>
</tr>
</thead>
<tbody>
<tr>
<td>perí-pró-</td>
<td>pari-pra-</td>
</tr>
<tr>
<td>epí-apó-</td>
<td>?</td>
</tr>
<tr>
<td>epí-aná-</td>
<td>?</td>
</tr>
<tr>
<td>apó-pró-</td>
<td>?</td>
</tr>
<tr>
<td>apó-aná-</td>
<td>anu-apa-</td>
</tr>
<tr>
<td>epí-pró-</td>
<td>?</td>
</tr>
<tr>
<td>amphí-perí-</td>
<td>abhi-pari-</td>
</tr>
</tbody>
</table>

Table 4.5: Comparison of Greek and Sanskrit relative ordering

It is impossible to make any clear claim of correlation or non-correlation on the basis of this ordering comparison. There are two cases where the ordering in Greek is the same as the ordering in Sanskrit: the ordering of *amphi-perí*
corresponds with Sanskrit cognates abhi-pari-, as does peri-pró- with pari-pra-.

There is in contrast a third pair which does not match with Sanskrit relative ordering properties: apó-aná- does not match the typical Sanskrit order anu-apa-.

However, because aná ~ anu may be a dubious correlation (Mayrhofer lists it, but Beekes says that he thinks the two are probably not related), this particular ordering mismatch may or may not be relevant. None of the other four pairs can be correlated with Sanskrit, because there is not enough Sanskrit data to determine relative ordering for api with any other preverb or for pro with apa.

In sum, there is no good data suggesting a correlation between Sanskrit preverb order and Greek preverb order. However, the data and the ordering correlations are sketchy at best, and it is not clear that there are enough tokens, and particularly tokens of cognate preverbs, to show a good correlation, if one indeed exists. In the absence of evidence for such a correlation, it must be assumed that it does not. It may be that the use of preverbs in Homeric as “relational” prepositions interfered with the transmission of an order that solely involved “satellites”. It may also be that this is evidence showing that the peculiarities of Sanskrit preverb ordering originated in Indo-Iranian, or even in Sanskrit itself. In either case, it is not conclusive evidence.

4.4 Old Irish

Old Irish is the name given to the oldest Celtic texts, which date from the eighth and ninth centuries (Thurneysen 1946). Preverbs in Irish, as in Sanskrit
and Greek, can modify both nouns and verbs. Thurneysen, who refers to these elements as “prepositions”, recognizes four possible positions in which they can appear, each of which alters the phonological form considerably:

A. In close composition, i.e. in all nominal compounds and in verbal compounds under or after the stress.

B. Pretonic, as the first element of a deuterotonic verb.

C. Pretonic before a dependent case.

D. Before a suffixed personal pronoun.

There are many more of these elements in Old Irish than in Sanskrit, and they have a slightly broader range of meanings, although they seem to basically have locative and directional meanings in general. Thurneysen also notes that the underlying form is best preserved in the first position above, and that some preverbs only occur in some of the above positions. A list of these “prepositions” and their meanings is given in Examples 4.8-4.11, separated according to which positions they can occur in.
| air (er, ir) | before, for | frith | against |
| com | with | iar, iarm | after |
| di, de | of, from | imb, imm | about, mutually |
| ess | out of | in, ind, en | in, into |
| etar, eter | between, among | re ri, rem- | before, pre- |
| fo | under | tar, dar, taim | across, over |
| for | on, over |

Example 4.8: All positions

| ad | to, towards |
| aith | re-, ex- |
| os(s), (uss) | up, off |
| ro | intensive |
| to (do) | to, towards |

Example 4.9: Positions A and B only
Example 4.10: Positions C and D only

cét- found with the substantive verb
echtar outside, without
ne (ni) down

Example 4.11: More limited composition

4.4.1 Ordering

As mentioned previously, Old Irish is notable for its extensive use of
preverbs. Thurneysen (1946) says that “there is no restriction on the number of
prepositions that may be employed in composition.” He cites cases of up to five
on one root, as seen in Example 4.12.
This degree of preverb combination is unusual among the ancient Indo-European languages. Sanskrit will generally only allow three (barring near-unique cases of four), and that only in the later language. However, while it may have been possible for up to five preverbs to modify a single root in Old Irish, it seems to have been unusual to find more than three. According to Lewis and Pedersen (1974:§432): “Accumulation of preverbs is exceedingly common in Celtic ... but groups of more than three preverbs are rare.”

Regardless of the number that accumulate, Old Irish allows more preverb stacking than Sanskrit does, and is in general notable for allowing many verbal prefixes of various types. Stacking in any number is not common in Sanskrit (although, clearly, it is not entirely unusual), but it is quite common in Old Irish. This quantity of stacking provides enough data to allow for a reasonable comparison with Sanskrit.

Kim McConne states, in The Early Irish Verb (1987), that Irish preverbs have a “rough positional hierarchy below from left to right within the chain of preverbs”, as seen in Table 4.5, such that some preverbs usually appear in a

<table>
<thead>
<tr>
<th>Preverb</th>
<th>Translation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>tautat</td>
<td>to-ad-uss-tét-</td>
<td>‘comes near’</td>
</tr>
<tr>
<td>intururas</td>
<td>ind-to-air-uss-ress-</td>
<td>‘incursion’</td>
</tr>
<tr>
<td>comtherchomracc</td>
<td>com-to-er-com-ro-icc-</td>
<td>‘assembly’</td>
</tr>
</tbody>
</table>
certain position relative to other preverbs. On the basis of these ordering preferences, McCone identified five positions for preverbs modifying a verb, and marked which preverbs occupy which slot. Preverbs in the same column should not necessarily be considered equal to each other; rather, their ordering properties relative to each other cannot be determined (in the same way that certain Sanskrit relative orders could not be determined in section 4.1.2).

McCone’s slot 5 refers to the most interior position, and his 1 to the most exterior, so that *to* appears in the more exterior position and *ne* appears more interior. It should be noted that McCone here gives underlying or reconstructed forms for the preverbs; they undergo considerable alteration in the surface and even the dictionary forms.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>for</td>
<td>ad</td>
<td>cum</td>
<td>uss</td>
<td>VERB</td>
</tr>
<tr>
<td>fris</td>
<td>ath(e)</td>
<td>ar(e)</td>
<td>ro</td>
<td>ne</td>
<td></td>
</tr>
<tr>
<td>eter</td>
<td>de/di</td>
<td>ess</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>imb(e)</td>
<td>fo</td>
<td>in(de)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6: Relative ordering of Irish preverbs
According to McCone, this hierarchy refers only to what he calls “primary composition” of preverbs, which he contrasts with “secondary composition”. According to him, primary composition is likely a continuation of an older form of the language, and is therefore the most appropriate comparison for us to make, cross-linguistically. As McCone says:

“Primary composition presumably reflects an older stage at which the hierarchy in [Table 4.5] was still operative and compounding with up to three or four preverbs was still an active process, whereas secondary composition belongs to a later stage in which one of a restricted range of preverbs could be prefixed where appropriate to inherited compounds now perceived as relatively inflexible units.” (1987:95)

McCone’s ordering hierarchy reflects similar facts to my observations about preverb ordering in Sanskrit. That is, there are some preverbs that prefer an exterior position (here to, for, fris, eter and imb(e)), and also some that prefer the interior position (cum, ro, uss and ne). Finally, there are some that group in the middle (ad, ath(e), ar(e), de/dí, ess, fo and in(de)). Also, as with Sanskrit ā and parā, there are some preverbs that are more markedly inclined to the interior position than others.

4.4.2 Comparison to Sanskrit order

In order to compare Old Irish preverb ordering to Sanskrit preverb ordering, it is first necessary to identify cognates between Sanskrit and Irish so
that, where possible, one is comparing like to like. Thurneysen lists as possible
cognates the preverbs in Example 4.13. This list includes preverbs that, in
Sanskrit, prefer the exterior position (antar, abhi), and preverbs that appear more
frequently in the interior position (pra, ud, ni). Cognate relationships that
Thurneysen considers possible but perhaps dubious I list with a question mark
after the cognate pairing.

- eter ~ antár
- imb(e) ~ abhi
- ar(e) ~ pári ?
- fo ~ úpa
- ro ~ prá
- uss ~ úd ?
- ne ~ ní

Example 4.13: Irish ~ Sanskrit cognates

Mayrhofer in general confirms these comparisons, although he makes no
mention of a connection between imb(e) and abhi, or between ne and ni.
Pokorny confirms imb(e) ~ abhi, but not ne ~ ni, so it may be a less secure
comparison. If one accepts these cognate relationships, however, there are
striking similarities between the ordering properties of Irish preverbs, as given by
Mc Cone, and the Sanskrit preverb ordering properties that are presented in this study. I give (as much as is possible) a comparison of the absolute order of preverbs Vedic Sanskrit with the relative ordering of Old Irish.

<table>
<thead>
<tr>
<th>Proto-Irish</th>
<th>Position</th>
<th>Sanskrit</th>
<th>Interior</th>
<th>Exterior</th>
<th>Posterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>eter</td>
<td>2</td>
<td>antár</td>
<td>2 (18%)</td>
<td>3 (27%)</td>
<td>6 (55%)</td>
</tr>
<tr>
<td>imb(e)</td>
<td>2</td>
<td>abhi</td>
<td>8 (7%)</td>
<td>92 (80%)</td>
<td>15 (13%)</td>
</tr>
<tr>
<td>ar(e)</td>
<td>3</td>
<td>pári</td>
<td>3 (8%)</td>
<td>25 (69%)</td>
<td>8 (22%)</td>
</tr>
<tr>
<td>fo</td>
<td>3</td>
<td>úpa</td>
<td>22 (27%)</td>
<td>45 (55%)</td>
<td>15 (18%)</td>
</tr>
<tr>
<td>ro</td>
<td>4</td>
<td>prá</td>
<td>106 (83%)</td>
<td>20 (16%)</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>uss</td>
<td>5</td>
<td>úd</td>
<td>9 (64%)</td>
<td>5 (36%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>ne</td>
<td>5</td>
<td>ní</td>
<td>19 (70%)</td>
<td>8 (30%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 4.7: Comparison of Irish and Sanskrit preverb ordering

The Irish preverb eter, which tends to be exterior in Irish, corresponds to Sanskrit antar. As mentioned before, antar has the curious property in the Rig Veda of appearing unusually often in the posterior (after the verb) position—however, it is more exterior than interior in Vedic, and is categorically exterior in Classical. Here, Irish eter is associated with a slot farther from the verb, just as antar is exterior in Sanskrit. Furthermore, the preverb abhi corresponds to Irish imb(e), both of which are exterior.
On the interior side, there are Irish *ro, uss*, and *ne*, which are in positions 4 and 5. They correspond to Sanskrit *pra, ud*, and *ni*, which are also interior. Lastly, Irish *fo* corresponds to Sanskrit *upa*. Neither shows a marked preference for the interior or the exterior position. The preverb *pari* (corresponding to Irish *ar(e]*) is the only Sanskrit preverb whose order does not closely match the order of the cognate Irish preverb, and even that is not far off, since *pari* is exterior and *ar(e)* is in the middle.

The Irish data, however, are not really comparable to the data that I have been working with thus far. They represent a relative order; that is, the ordering relationships between preverbs, rather than simply between the preverb and the verb it modifies. To present a more appropriate comparison, I again used the analysis of relative ordering described in detail in section 4.1.2. The relative orderings for Sanskrit and Irish are compared more directly in Table 4.7.

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sanskrit</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VERB</td>
</tr>
<tr>
<td>abhi</td>
<td></td>
<td></td>
<td>pra</td>
<td></td>
<td>ni</td>
</tr>
<tr>
<td>pari</td>
<td></td>
<td>upa</td>
<td></td>
<td>pari</td>
<td>ud</td>
</tr>
<tr>
<td><em>Irish</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VERB</td>
</tr>
<tr>
<td>imb(e)</td>
<td></td>
<td>fo</td>
<td></td>
<td></td>
<td>ne</td>
</tr>
<tr>
<td>ar(e)</td>
<td></td>
<td></td>
<td>ro</td>
<td></td>
<td>ne</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>uss</td>
</tr>
</tbody>
</table>

Table 4.8: Comparison of Sanskrit and Irish relative ordering
Again, there is an extremely strong correlation between the ordering of preverbs in Sanskrit and the ordering of cognate preverbs in Irish. Sanskrit *abhi* always appears exterior relative to all other preverbs in comparison, just as Irish *imb(e)* does, according to McCone. Conversely, Sanskrit *ni* and *ud* (which do not appear together in either my type or token data for either Classical or Vedic Sanskrit) overwhelmingly appear in the interior position relative to the other preverbs in the list.

Notably, while *pari* and *ar(e)* did not appear to be close matches in the data shown in Table 4.6, in this analysis, they appear in the same slot relative to the other preverbs. Ultimately, of the seven preverbs that Thurneysen identifies as cognate with Sanskrit, all of them show similar ordering properties in both languages. This is a striking correlation between Irish and Sanskrit.

### 4.5 Summation and conclusions

In this chapter I have addressed the major language groups that allow preverb stacking: Greek and Irish primarily, and some small discussion of Slavic. There were difficulties in comparing Imbert’s Homeric Greek data to my Sanskrit data, mainly stemming from small numbers of stacked preverb groups in the Homeric data and also from a lack of verified cognates between Sanskrit preverbs and Greek prepositions. However, the Irish data, as presented by McCone, suffer from neither of these problems. Furthermore, we find, upon
making the comparison, that there is a strong correlation between ordering properties of Sanskrit preverbs and equivalent properties for Old Irish.

Despite the general conclusion that it is impossible to establish a good correlation between Greek preverb ordering and Sanskrit preverb ordering, there are two interesting points of similarity. Specifically, the following relative ordering pertains to both Greek and Irish:

<table>
<thead>
<tr>
<th>Greek</th>
<th>amphí</th>
<th>perí</th>
<th>pró</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanskrit</td>
<td>abhi</td>
<td>pari</td>
<td>pra</td>
</tr>
</tbody>
</table>

Table 4.9: Comparison of Greek and Sanskrit

In light of the other ordering data for Greek (particularly a robust difference in order for aná/anu and apó/apa), this seemed as though it was likely to be a chance correlation, especially given the fact that the amphi-perí ordering is established on the basis of two tokens. However, if we consider also the relative ordering for Irish, we find the following:
That is, in each of these languages, these three preverbs have the same order relative to one another. The correlation just between Old Irish and Sanskrit ordering is significant (as just discussed in 4.4.2), especially given how distinct the two languages are. The addition of the Greek data, however, suggests that it may be possible to reconstruct an original ordering for Indo-European, at least for these three preverbs.

<table>
<thead>
<tr>
<th></th>
<th>Greek</th>
<th>Sanskrit</th>
<th>Irish</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>amphí</td>
<td>peri</td>
<td>pró</td>
</tr>
<tr>
<td><strong>Sanskrit</strong></td>
<td>abhi</td>
<td>pari</td>
<td>pra</td>
</tr>
<tr>
<td><strong>Irish</strong></td>
<td>imb(e)</td>
<td>ar(e)</td>
<td>ro</td>
</tr>
</tbody>
</table>

Table 4.10: Comparison of Greek, Sanskrit and Irish
CHAPTER 5: CONCLUSIONS

5.1 Summation

The overall results of this study are threefold. First, preverbs in Classical Sanskrit have inherent ordering properties. That is, some preverbs have a lexically-determined tendency to prefer either the interior or exterior position. The traditional explanation for preverb ordering is that preverbs are stacked in a productive way, which is motivated by need to express a particular meaning. However, I have shown that neither semantics nor phonology (always a less likely possibility) are sufficient to completely explain the positional preference of preverbs in Classical Sanskrit.

Secondly, the ordering tendencies of Classical Sanskrit preverb stacking are very similar to, and can presumably be derived from, ordering tendencies for Vedic Sanskrit preverb stacking. Whatever the mechanism for transmission of preverb ordering across generations, this shows considerable stability in preverb ordering, to the extent that the transition between preverbs as free words and preverbs as bound affixes had little effect on ordering.

Thirdly, preverb stacking exists not only in Sanskrit, but also in several other Indo-European languages. There is a striking correlation between the
ordering trends of Sanskrit and those of Old Irish. This correlation is notable both for the high degree of consistency in ordering trends between the two languages, and also for the distance between the two languages. As I discussed in Chapter 4, the correlation between these two languages is good evidence for these properties of preverb ordering being an inheritance from Proto-Indo-European. Additionally, there is even better evidence for the inheritance of at least some preverb ordering from PIE in the correlation of relative ordering for three preverbs between Sanskrit, Old Irish, and Homeric Greek.

Having established these three facts, we are left with the following concerns:

1. If preverb ordering has its origins in Proto-Indo-European, how did it get transmitted into Sanskrit, Irish and Greek, over a time depth of so many centuries?

2. Even if Classical Sanskrit preverb ordering is inherited, what is the best description of the synchronic situation?

In the course of this chapter, I address these concerns, and attempt to provide satisfactory explanations for the facts about Sanskrit preverb ordering which I have established.

5.2 The Indo-European roots of preverb ordering

Kuryłowicz says the following about preverb stacking in Proto-Indo-European: “cumulation of verbal prefixes, though theoretically possible, does not seem to have been a favoured procedure in the old I.E. languages. Verbs with
two prefixes are not frequent in Indo-Ir., Greek, Balto-Slav." (1964: 174) My data support this, and are relevant to developing a clearer picture of the situation with PIE preverb stacking. Additionally, these results—particularly my data for Irish and Greek—illuminate what at least some preverb orders may have been, and perhaps what the original constraints on ordering were.

5.2.1 Motivations for ordering in Proto-Indo-European

Throughout, I have argued that Sanskrit preverb stacking is not a fully productive process at either of the synchronic periods (Classical and Vedic) that I have studied. However, it seems clear that if preverbs and preverb stacking indeed derive from an earlier stage of the language, even from Proto-Indo-European itself, that there must originally have been a fully productive system of preverb stacking. Originally, this was likely a semantically-motivated process, but lexicalization and semantic drift caused such combinations to no longer be fully compositional.

Because Greek, Irish, and Sanskrit all function in more or less the same way with regard to the semantic modification of verb roots by preverbs, the best assumption is that PIE also originally functioned in this way—that is, that the verb combined with a preverb, which then became a unit available for combination again. This was discussed thoroughly for Sanskrit in section 2.3.1.1. For reference, another example from Classical Sanskrit of a preverb-verb complex that combines in this way is shown in Example 5.1. The verb root $i$ combines with
the preverb *abhi* to form a new meaning, which is then available for combination with another preverb. (Monier-Williams 1899)

\[ \sqrt{vī} \]  
\[ \text{‘to go’} \]

\[ \text{abhi-} \sqrt{vī} \]  
\[ \text{‘to approach’ (toward-go)} \]

\[ \text{ud-} \text{abhi-} \sqrt{vī} \]  
\[ \text{‘to rise over’ (over-[approach])} \]

Example 5.1: Sanskrit preverb combination

Similarly, in Greek, the verb *baíno*, which means ‘to walk’ becomes ‘to walk up’ when combined with *ana*, and ‘to walk towards and up’ when further combined with *eis*. (Imbert 2008)

\[ \text{baíno} \]  
\[ \text{‘to walk’} \]

\[ \text{ana-} \text{baíno} \]  
\[ \text{‘to walk up’ (up-walk)} \]

\[ \text{eis-} \text{ana-} \text{baíno} \]  
\[ \text{‘to walk towards while walking up’ (to-[walk up])} \]

Example 5.2: Greek preverb combination
And again, in Old Irish, there is in Example 5.3 a case of McCones’s “primary composition”, which he considers to be a relic of an old productive system in Irish. The verb *gairid*, ‘call’ combines with the preverb *com* ‘with’ to yield ‘shout loudly’. With the addition of *for*, the complex gives ‘command’, which can be taken to mean ‘call out over’. (Marstrander 1952)

```
gairid    ‘call’
congair (com-gairid) ‘call out, shout loudly’ (with-call)
forcongair (for-com-gairid) ‘command, ordain’ (over-[call out])
```

Example 5.3: Irish preverb combination

Each of these languages shows exceptions to this pattern of ordering and meaning, but each also shows cases where the pattern holds. Kuryłowicz discusses this question in *The Inflectional Categories of Indo-European* (1964). That is, is the underlying structure of a verb complex better described as [preverb₂+(preverb₁+verb)] or as [(preverb₂+preverb₁)+verb]? Kuryłowicz himself does not definitively answer this question. He does, however, consider several pieces of evidence which impact the issue.

First of all, he points out facts about accentuation in the daughter languages, such that the prefix or syllable immediately preceding the verbal stem
can take the accent in certain contexts (ne in Lithuanian is the negative marker, but it functions like the more directional/spatial preverbs).

<table>
<thead>
<tr>
<th>Language</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vedic</td>
<td>upa-ā-gahi</td>
</tr>
<tr>
<td>Greek</td>
<td>συμ-πρό-ες</td>
</tr>
<tr>
<td>Lithuanian</td>
<td>ne-pá-kelia</td>
</tr>
<tr>
<td>Russian</td>
<td>pere-'iz-brannyj</td>
</tr>
</tbody>
</table>

Example 5.4: Prefix accented immediately before verb

This is clearly, as Kuryłowicz says, “the outcome of independent and relatively late developments”. This is interesting, and it may show the close association between stem and preverb. He then goes on to point out the facts of Vedic word order with respect to multiple prefixation, as I outline in more detail in section 3.2. These are worth revisiting here. Briefly, in principal clauses, the following positions are possible (wording from Kuryłowicz (1964)):

1. $P\hat{v}_2 \ldots P\hat{v}_1$ Verb (preverbs distanced, the second preceding the verb)
2. $P\hat{v}_2 P\hat{v}_1 \ldots$ Verb (preverbs in immediate contact, removed from the verb)
3. $P\hat{v}_2 P\hat{v}_1$ Verb (both preverbs preceding the verb immediately)
4. $Pv_2P\hat{v}_1$ Verb (preverbs forming a compound with the verb, second preverb stressed)
In subordinate clauses, however, the following positions obtain:

1. \( P_{v2} \ldots P_{v1}V\text{erb} \) (preverbs distanced, the second prefixed)
2. \( P_{v2} P_{v1}V\text{erb} \) (preverbs in contact, the second prefixed)
3. \( P_{v2}P_{v1}V\text{erb} \) (both preverbs prefixed)

In other words, there are positions (such as 1 in both main and subordinate clauses) which would suggest that preverbs modify the existing verbal complex, rather than combining with each other. For the most part, the other positions are ambiguous as to the internal structure of the complex. Note that there is no position such as \([P_{v2}P_{v1} \ldots \text{Verb}]\), which would certainly suggest preverbal combination before addition onto the verb. Position 4 in main clauses is similar to this; however, that position, as Kuryłowicz himself notes, is a relatively late development, and not reflective of an original system. In any case it is vastly outnumbered by cases which suggest either a \((\text{preverb}+\text{verb})\) original constituent or are ambiguous.

In light of the data presented in this study, I favor the \([\text{preverb}_2+\text{preverb}_1+\text{verb}]\) analysis for the verb complex in the preverb-stacking languages that I have studied. Furthermore, given that in these three languages where stacking is likely to be an inherited phenomenon, the semantic structure of the complex follows the same pattern (at least some of the time), it seems that semantic and functional requirements were likely the original motivation for preverb stacking. I posit the following semantic pattern for preverb stacking in Indo-European:
Example 5.5: Semantic stacking pattern

<table>
<thead>
<tr>
<th>VERB</th>
<th>‘verb’</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-VERB</td>
<td>‘x’+‘verb’</td>
</tr>
<tr>
<td>Y-[X-VERB]</td>
<td>‘y’+‘x+verb’</td>
</tr>
</tbody>
</table>

It should be noted that I have only addressed the possibility for two preverbs before a root. Because both Vedic Sanskrit and Homeric Greek allow only for the possibility of two preverbs (though more are possible later) it seems most likely that the same was true in PIE, and that Irish is therefore an extension of the original system. This is my deduction on the basis of the textual evidence; it is possible that the lack of higher order stacking in other IE languages is a problem of attestation, and that more preverbs were allowed in speech than appear in the texts (as the extreme productivity of preverb stacking in modern Bulgarian might suggest, as it has a highly colloquial feel to it, essentially pushing the limits of what is grammatically possible in the language).

5.2.2 Incorporation and lexicalization

Given that stacking can indeed be reconstructed for PIE, and that (as I argue) at least some facts about ordering in Sanskrit show a strong likelihood of
also being inherited from the proto-language, I must now account for how word order could be so fixed that it would survive the centuries to be passed into Old Irish, into Vedic (and Classical) Sanskrit, and to a very limited extent, into Greek. Minimally, I must account for the extreme stability of ordering between Vedic and Classical Sanskrit, which is a gap of many centuries on its own.

I argue that the transmission of ordering occurs because of a process of lexicalization, which may ultimately play a part in the incorporation of preverbs which occurs independently in Greek, Sanskrit, and Irish. As discussed in the section on positioning and accent in Vedic Sanskrit (section 3.2.2), preverbs in Vedic at least are only free words in some grammatical contexts; in others, they are already essentially affixes. If preverbs in PIE were already in close combination with their verbs (in a semantic sense) then stacking might have resulted from a tendency of preverb-verb combinations to become fixed.

Specifically, if the system of preverb modification was largely productive, but with a certain number of lexicalized, fixed preverb-root combinations, then those fixed combinations would eventually have been available for semantic compounding with new preverbs. Once that was possible, then a new pattern of stacking would have been established, which might have been perceived by speakers as examples of a synchronically productive stacking process, and therefore the basis for new compounds of stacked preverbs. Ultimately, lexicalized preverb-verb compounds, with the preverb order fixed, could have
been transmitted through the generations as vocabulary items or idiomatic expressions.

This process is probably the root of the triplets in Classical Sanskrit (which are an innovation, and not found in the older language), and the larger-order combinations in Irish. In Sanskrit, there are (as shown in Example 5.6) several cases where we find the two more exterior preverbs alternating before a single root.

Example 5.6: Triplet ordering in Classical Sanskrit

\[ \text{upa-sam-ā-kṛ} \quad \text{“to combine together, connect”} \]

\[ \text{sam-upa-ā-kṛ} \quad \text{“to satisfy, pay off, MBh”} \]

There are, however, no cases where the most interior preverb alternates— that is, you may get A-B-C-VERB and B-A-C-VERB, but never C-A-B-VERB or A-C-B-VERB. This is evidence that, where there are triplets in Sanskrit, it is as a result of a process of lexicalization with the verb root and the preverb. Once the process is complete, the unit becomes available for further compounding. For example, the single case of four preverbs before a single root in the MW dictionary is \textit{sam-abhi-vy-ā-hṛ} ‘mention together’, which is listed as appearing in the Nyāyamālā-vistara. The combination \textit{vy-ā-hṛ} is clearly lexicalized and has the
purely unpredictable meaning ‘utter’ (from apart-to-carry). So, if vy-ā-hṛ is considered to be a single unit (equivalent to the root bhāṣ ‘speak’, perhaps), then the addition of two preverbs in front is less surprising.

Furthermore, given the extreme opacity of Irish forms with more than two or three preverbs, it seems likely that a similar process accounts for the innovation of extremely productive preverb stacking in Old Irish.

5.2.2.1 Syntax vs. lexicon: tests

Smirniotopoulos and Joseph (1998) discuss the difference between syntactic and lexical rules as relates to adverb incorporation (a similar issue) in modern Greek. They cite Wasow’s definitions for whether a rule is syntactic or lexical. The first is as follows:

“A syntactic rule should be generally quite productive, with at most just a handful of exceptions (or only motivated exceptions, e.g. involving whole classes of elements over which a generalization is possible). By contrast, a lexical rule need not be productive and can show a significant number of arbitrary exceptions.”

Originally, the relationship between verbs and preverbs would have been syntactic (because of preverbs’ original status as words), and the pattern we see in the older languages shows a great deal of productivity. However, the number of unmotivated gaps in Sanskrit preverb orders may be evidence for a lexical, rather than a syntactic process for the earlier language. Specifically, I refer to the fact that fewer than half of possible combinations with two preverbs actually occur, even in the larger Classical data sample. While some of these omissions
are likely because of the happenstance of attestation, it is still likely that many of the 181 missing orders simply never existed in Sanskrit. Furthermore, the predominance of interior ā and of exterior abhi show clear reference to the lexicon rather than the syntax, given the many semantic and morphological overlaps between the two preverbs.

Wasow’s second criterion is as follows:

“The second criterion is compositionality. The output of a syntactic rule should show compositional semantics, so that the meaning of the whole is composed from the meaning of its parts. By contrast, the output of a lexical rule can be noncompositional in its semantics and thus can show meanings that differ in ways that are unpredictable in relation to the meanings of the individual parts composing it.”

As discussed in section 2.3.1, Classical Sanskrit clearly shows many wholly or partly unpredictable meanings for preverb-verb combinations. Vedic Sanskrit, however, also shows some cases of such unpredictability, and also at least several cases where meaning and order seem unrelated. This evidence suggests that, in Sanskrit at least, these preverb-verb combinations were determined lexically. This helps account for the transmission of preverb ordering from Vedic to Classical Sanskrit.

5.2.2.3 The role of incorporation

It might seem odd to have a study of Sanskrit preverbs dealing with both the Vedic and Classical languages that does not touch heavily on tmesis (other than to give a simple description of it, as I do in section 3.2.1), or on the process
of incorporation. For the most part, however, in the course of this study, I have considered incorporation irrelevant to the main focus of my research. My data show that preverbs have essentially the same ordering patterns regardless of whether they are morphologically incorporated or not.

Likewise, I consider incorporation to be irrelevant to the process of lexicalization that allows the transmission of both the ordering and the meaning of preverb-verb combination, for the simple reason that if it were important, I would not expect to have found the correlation between Vedic Sanskrit and Irish or Greek.

5.3 Classical Sanskrit: in light of the diachronic results

The central purpose of this study is to explain a synchronic phenomenon in Classical Sanskrit. Even if I have shown that preverb ordering is inherited from an older period, the synchronic facts about the Classical language still require some discussion. Ultimately, Classical Sanskrit preverb ordering seems synchronically to be a partially productive system. That is, there was a productive preverb stacking process (as Whitney describes), but many preverb combinations were lexically determined and no longer grammatically generated.

Certainly, there are enough examples that show semantically predictable differences for different preverb orders for speakers to extrapolate a system, even if it was no longer fully productive. However, while the system is able to be extrapolated, many or most stacked preverbs are lexically determined, either in
part or in whole—by which I mean that single or double preverbs that have been lexicalized as a single unit may offer a base for the addition of further preverbs. The result of this is verbal compounds that are not easily decomposable. Some are new creations that follow the inherited system, some are fully lexicalized, and some are likely compounds on a lexicalized base. Some of the examples where preverb ordering and meaning are linked are also attested in the Rig Veda (abhi-ud-i and ati-vi-vṛt, among others), and others are mainly attested later (Monier-Williams 1899).

5.3.1 Classical Sanskrit preverbs as an affix-ordering problem

The question of whether Sanskrit preverb ordering can be fully described by any synchronic process is discussed in section 2.3. As has been discussed at length, there are not clear or obvious reasons for the tendency of some preverbs in Classical Sanskrit to generally appear in one position or the other. This is why it was necessary to look for a diachronic explanation. However, it may be that some of the work that has been done on affix ordering generally may be of use in explaining or further describing the ordering phenomena I have identified for Classical Sanskrit preverbs. To that end, I return to some of the work discussed in the introduction.
5.3.1.1 Relevance and preverbs

Bybee’s argument about the impact of cognitive relevance on morpheme ordering is probably not much help in explaining the ordering of preverbs relative to each other (1985). She defines “relevance” in the following way:

“A meaning element is relevant to another meaning element if the semantic content of the first directly affects or modifies the semantic content of the second.”

Preverbs are relevant in this sense to verbs in Sanskrit. This relevance is probably part of the motivation for lexicalization of preverb-verb combinations. However, given that we have been unable to make any semantic distinction between interior an exterior preverbs, it would be difficult to claim that either group of preverbs is more relevant to the meaning of the verb than the other. Certainly, any argument about the greater relevance of morphemes that are as semantically and functionally similar as, for example, \textit{abhi} ‘to, towards, into’ and \textit{upa} ‘towards, near to, with’ is difficult to justify.

Nevertheless, relevance probably plays a part in the larger ordering of morphemes relative to the verb root. Sanskrit has the following structure before the root (the order of morphemes after the root being somewhat beyond the scope of this study):

\begin{quote}
prefixes+preverbs+augment+reduplication+√root
\end{quote}

Example 5.7: Sanskrit order of morphemes
As discussed in 1.2.2.1, prefixes like su ‘good’, a/an ‘not’, and dus ‘bad, ill’ appear most externally (both in the rare cases where they attach to real verb forms and also when they, as is more common, attach to nominal verb forms), followed by a preverb or preverbs (should one be used), followed by augment, followed by reduplication. The most usual cause of reduplication is, of course, the perfect, which never takes the augment in Classical Sanskrit, making it difficult to determine a relative ordering. However, there are other cases where reduplication and the augment interact— the third conjugation class, some aorists, and the intensive/desiderative forms— and in those circumstances, the augment appears outside reduplication (Whitney 1924). Additionally, the past perfect (the pluperfect) does in some few forms in Vedic. In those cases, the augment appears outside the reduplication, as in ajagrabham (Macdonell 1910:§494). The assumption about preverbs, then, is that they are more relevant to the verb than prefixes like su etc., but less relevant than tense or mood marking.

5.3.1.2 Separability

Hay, in her 2002 paper, attempts to explain facts about affix stacking. She is referring primarily to English suffixes, but she has been cited by researchers working on a variety of other unrelated languages, so her generalizations about affix stacking may hold for Sanskrit as well. Hay gives a number of constraints on
English affix separability. The most basic of Hay’s constraints for Sanskrit (and likely for other languages as well) is stated as follows: “More separable affixes will occur outside less separable affixes”. This is probably a better explanation than Bybee’s relevance for the fact that prefixes like a/an, su, and dus seem to generally appear outside preverbs. Because these prefixes are mainly nominal prefixes, the argument for their greater separability compared to preverbs is fairly strong. That is, because preverbs accompany the roots they modify into nominal derivation, they could be considered to be more tightly bound onto those roots than elements like su etc. which would be affixed later. Therefore, according to Hay, it is no surprise that (as shown in Example 5.6 and extensively in 1.2.2.1) we typically find these prefixes outside preverbs, both in rare verb forms and derived nominal forms.

Another possibly relevant observation for Sanskrit is as follows: “The same suffix will be differently separable in individual words depending on the frequency”. Hay goes on to explain:

“Words that are frequent relative to their bases are prone to whole-word access. Affixes that appear in such words (government is more frequent than govern) are likely to be less separable than the same affix in words that are less frequent than the bases they contain (discernment is less frequent than discern).”

If this is also the case for Classical Sanskrit, then we might expect that, for a given preverb, it would appear in the exterior position more often in less common words. However, this is the opposite of what we observe for the preverb sam at least. In the type count, sam is somewhat less exterior than it is in the
token count, in large part because of types like *sam-anu-i*, which (as discussed in section 2.2.3) have disproportionately more tokens than do most types in the MBh. This is evidence that in preverb combinations, the most exterior preverb is not necessarily separable.

5.4 Conclusion

Preverb ordering in Classical Sanskrit is best described as an inheritance from Proto-Indo-European via Vedic. Ordering in PIE was likely originally based on the semantic requirements of the verbal complex, but processes of lexicalization, incorporation and semantic drift obscured that system. This fossilization of lexically-specific preverb-verb combinations accounts for the transmission of preverb ordering from PIE into some of the daughter languages, including Sanskrit.

Ultimately, this study of multiple preverbaton gives a clearer view of the behavior of preverbs synchronically in Vedic and Classical Sanskrit, and also gives some hints as to the Indo-European origins of preverb stacking.


Ljubljana, August 2003 (Robert A. Maguire and Alan Timberlake, eds.): 113-124.


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APPENDIX A: TRIPLET TYPES

From the Monier-Williams Dictionary:

<table>
<thead>
<tr>
<th>ANU+PARI+Ā</th>
<th>ABHI+PARI+Ā</th>
<th>abhi-sam-pra-vṛt</th>
</tr>
</thead>
<tbody>
<tr>
<td>anu-pany-ā-gā</td>
<td>abhi-pany-ā-dhā</td>
<td>abhi-sam-pra-ap</td>
</tr>
<tr>
<td>anu-pany-ā-dhā</td>
<td>abhi-pany-ā-vṛt</td>
<td>abhi-sam-pra-ikṣ</td>
</tr>
<tr>
<td>anu-pany-ā-vṛt</td>
<td>abhi-pany-ā-sic</td>
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<td>abhi-pany-ā-i</td>
<td></td>
</tr>
<tr>
<td>ABHI+UD+AVA</td>
<td>abhy-ud-ava-so</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANU+SAM+Ā</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>anu-sam-ā-car</td>
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<tr>
<td>apa-pany-ā-vṛt</td>
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<tr>
<td>APA+VI+Ā</td>
<td></td>
<td></td>
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<tr>
<td>apa-vy-ā-dā</td>
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<tr>
<td>apa-vy-ā-hṛ</td>
<td></td>
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</tr>
<tr>
<td>ABHI+SAM+PRA</td>
<td>abhi-sam-pra-pad</td>
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<td>abhi-sam-pra-yā</td>
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</table>

171
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<th>SAM+APA+Ā</th>
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<tbody>
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<td>praty-upa-ā-dhā</td>
<td>sam-apa-ā-vṛ</td>
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</tr>
<tr>
<td>upa-sam-ā-hṛ</td>
<td></td>
<td></td>
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<tr>
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<td>SAM+ABHI+VI</td>
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<tr>
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<td>pari-sam-ā-i</td>
<td>sam-abhi-vi-iks</td>
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<tr>
<td>upa-sam-pra-āp</td>
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<td>VI+PARI+Ā</td>
<td>SAM+ABHI+AVA</td>
</tr>
<tr>
<td>upa-anv-ā-ruh</td>
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<td>sam-abhy-ava-i</td>
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<td>VI+ANU+Ā</td>
<td>SAM+ABHI+Ā</td>
</tr>
<tr>
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<td>vy-anv-ā-rabh</td>
<td>sam-abhy-ā-gam</td>
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<td>sam-abhy-ā-dā</td>
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<td>VI+APA+SAM</td>
<td>SAM+ABHI+AVI</td>
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<tr>
<td>nir-abhi-ava-iks</td>
<td>vy-apa-sam-sr</td>
<td>sam-abhy-ā-nī</td>
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<td>VI+UPA+Ā</td>
<td>SAM+ABHI+UD</td>
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<td>SAM+UD+VI</td>
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<td>sam-ud-vī-iks</td>
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<td>SAM+ANU+PRA</td>
<td>SAM+UPA+NI</td>
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<tr>
<td>praty-abhi-pra-sthā</td>
<td>sam-anu-pra-āp</td>
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<tr>
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<td>sam-anv-ā-ruh</td>
<td></td>
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</table>
SAM+UPA+Ā
sam-upa-ā-kr̥
sam-upa-ā-gam
sam-upa-ā-yā
sam-upa-ā-ruh
sam-upa-ā-viī
sam-upa-ā-vṛ/nsam-upa-ā-sthā
sam-upa-ā-hṛ

SAM+PRA+Ā
sam-pra-ā-dru

SAM+PRA+VI
sam-pra-vi-hṛ
sam-pra-vi-car

SAM+PRA+Nī
sam-pra-nī-dhā

SAM+ABHI+VI+Ā
sam-abhi-vy-ā-hṛ
APPENDIX B: TRIPLET TOKENS

Presented in HK transcription:

PRATI+ABHI+PRA 01003018B sa tathA bhrAtqan saMdizya takSazilAM pratyabhiprasthe

PRATI+ANU+NI 01003134B bhavatAham annasyAzucibhAvam Agamayya pratyunItaH

PRATI+SAM+AA 01003087A sa evaM pratisamAdizyo ttaGkaM vedaH pravAsaM jagAma

ABHI+SAM+PRA 01017026c parasparaM bhRzam abhigarjatAM muhU; raNAjire bhRzam abhisaMpravartite
01068023c bhartAram abhisaMprekSya kruddhA vacanam abravlt
01139023a sAhA tvAm abhisaMprekSya devagarbhasamaprabham
03255057a saindhavaM tvabhisaMprekSya parAkrAntaM palAyane
03263027a sa rAmam abhisaMprekSya kRSyate yena tanmukham
05092041a tatas tAn abhisaMprekSya nAradapramukhAn RSIn

ABHI+UPA+AA 01046003a brahmANaM so ’bhupAgamyA muniH pUjAM cakAra ha

ABHI+VI+AA 01218025a teSAm abhivyAharatAM zastravarSaM ca muJcatAM

SAM+ANU+AA 01090075A tatraинаM citAsthA MmAдрI samAnvAruroha

SAM+ANU+PRA 01154013c brahmAstraM samanuprApya nareSv abhyadhiko ’bhavat
02042051a sAmrAjyaM samanuprAptAH putrAs te ’dyA pitRSvasaH
03042007c kuberaH samanuprApto yakSair anugataH prabhuH
03069025c mAnuSaM samanuprApto vapuH paramazobhanam
03101003a idaM ca samanuprAptaM lokAnAM bhayam uttamam
03268014c tad idaM samanuprAptaM phalaM tasyAnayasya te
03186033c yugAnte samanuprApte vRthA ca brahmacAriNaH
03297001c yugAnte samanuprApte zakrpratimagauravAn
05157004a idaM tat samanuprAptaM varSapUgAbhicintitam
08004056c tad idaM samanuprAptaM vyasanaM tvAM mahAtyayam
11012005c ApadaM samanuprApya sa zocaty anaye shtitaH
14077030c gRhltvA samanuprAptA tvAm adya zaraNaiSiNI
16009011c nidhanaM samanuprAptaM samAsAdyetaretaram

PARI+ANU+AA
01036012c anvagacchad dhanuSpANiH paryanveSaMs tatas tataH

ANU+VI+AA
01166033a dvir anuvyAhRte rAjJaH sa zApo balavAn abhUt

ABHI+PRA+AA
01130012c abhiprAyasya pApatvAn naitat tu vivRNomy aham

SAM+ABHI+AA
01092020c purA mAM strl samabhyaAgAc chaMtano bhUtaye tava
01124015c darzanepsu samabhyaAgAt kumArANAM kRtAstraTAm
01136007c annArthinI samabhyaAgAt saputrA kAlacoditA
02027004a tato himavataH pArzve samabhyetya jardgavam
02070014a vyasanaM vaH samabhyaAgAt ko 'yaM vidhiviparyayaH
09040035c vasiSThApavAhaM mahAbhlmavegaM; dhRtAtmA jAtmA
samabhyaAjagAma

SAM+UD+AA
01033006a nUnaM sarvavinAzo 'yam asmAkaM samudAhRtaH
01073008c samudAcArahInAyA na te zreyo bhaviSyati
02011059c ratnaughatarpitais tuSTair dvijaiz ca samudAhRtam
02040011a tryakSaM caturbhujaM zrutvA tathA ca samudAhRtam
13044037a ahaM vicitravIryAya dve kanye samudAvaham

SAM+UPA+AA
01016019c vilayaM samupAjagmuH zatazo lavaNAmbhasi
01179013c sukhAmaM duHkhaM mahad dhrasvaM karma yat samupAgataM
01096005a tatra rAjJaH samudiTAn sarvataH samupAgatAn
01177004c karNena sahitA vlrAs tvadarthaM samupAgatAH
01196001a mantrAya samupAniltair dhRtarASTrahitair nRpa
02054007a etac chrutvA vyavasito nikRtI samupAzritaH
02054015a etac chrutvA vyavasito nikRtI samupAzritaH
02054018a etac chrutvA vyavasito nikRtI samupAzritaH
02054023a etac chrutvA vyavasito nikRtI samupAzritaH

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02054027a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02054029a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058004a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058006a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058008a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058010a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058015a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058021a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058025a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02058028a etac chrutvā vyavasito nikṛtiṃ samuṇḍaṛitaḥ
02031004c saṃpuṇḍārāya ratanani vividhāni mahānta ca
02042039a rājānaḥ sarva evaite prītyaṃṣaṃ saṃpuṇḍārataḥ
02048025c kuṭjarāṇaṃ sahasre dvē mṛtaṃ saṃpuṇḍārataḥ
02013053c saṃarthyaṃvantāḥ saṃbhadhāṃ bhavantaṃ saṃpuṇḍārataḥ
02018001c jarāsaṃdhāsya nidhane kālo 'yaṃ saṃpuṇḍārataḥ
04017018c dyutajena hy anarthena mahatā saṃpuṇḍārataḥ

SAM+UPA+NI
01192001a tato rājjaṃ carair Aptaiz cAraḥ saṃpuṇanlyata

SAM+UPA+VI
01150002c rathaḥ saṃpuṇḍaviṣayakas tataḥ papraccha mAtaram
01212015a teSAM saṃpuṇḍaviṣṭaṃḥ vAṃm sadhaṃ iva saṃnaye

SAM+NI+AA
01002228c dharmārajaṃ saṃsāsādyā saṃnayaṃ saṃnayaṃ saṃnaye

VI+PRA+SAM
01096050a evam uktas tayA bhīṣmaḥ kanyayā vīprasaṃsadi
15026022a tathaḥ sarve nāradaṃ vīprasaṃghaḥ; saṃpuṇḍārataḥ

VI+PRA+AA
01155036c kathāṃ kāmaṃ na saṃmadhyāt sā tvāṃ vīpraiḥ tiṣṭha vA

SAM+AVA+AA
01180005a asmin rājaṃ saṃpuṇḍārataḥ devanām iva saṃnaye

ANU+SAM+PRA
01096026c vAṣitaṃ anuṣmaṇprāptaḥ yuṭaḥ po balāṃ varaḥ
APPENDIX C: SEARCH ALGORITHM CODE

Written in PHP 5, by Richard Hopkins-Lutz for Julia Porter Papke:

```php
<?
/*Startup - Pull Session name (assigned by start up page. This is the
unique directory name assigned to this run
Also start the echo log.*/
$session = $argv[1];
touch("runs/$session/debug/echolog.htm");
/* Setting Up Initial Variables
Variables are passed from the setup page as a serialized array with the
following keys:
files- array of file names to be searched (locates in source/)
comments- comments assigned to this run by the user
linenumbers- whether to generate line numbers or not (on/off)*/
$vars = unserialize(file_get_contents("runs/$session/passvars"));
/*
Generate Wordlist, organized by family groups.
Generates a word list from which the PCRE is generated. it's
organization is thus:
Array
[Family1 + Family2]
- [Word1]*/
$wordlist = wordlist();
writearray ($wordlist,"runs/$session/debug/wordlist.htm");
$exclusions = unserialize(file_get_contents("data/exclusions.ser"));
writearray ($exclusions,"runs/$session/debug/exclusions.htm");
$positives = unserialize(file_get_contents("data/positives.ser"));
writearray ($positives,"runs/$session/debug/positives.htm");
/*Start the main display file, which is the first file displayed when
looking at a run. This sets up all the headers and titles for that
file. */
foreach ($vars[files] as $filename){
$fline .= " $filename, " ;
}
$fline = substr ($fline, 0, -2);
file_put_contents("runs/$session/index.htm", "<html><body><h1>View
the Results of run</h1><h2>Comments: $vars[comments]</h2><h2>Files:
$fline</h2><a href=$session_results.tar>Download Results (TAR File)</a><hr><a href=debug/echolog.htm>Expanded Logs</a><table border=0><td>
unset ($fline);
/*Logging function -
```
```
start gets the initial timestamp
addlines adds lines to the counter
finish gets the final timestamp, calculates total time and speed then
outputs them using echolog*/
//Percent. Used to monitor status on the View Status page*/
$percentfactor = 100/(count($vars[files]) * count($wordlist));
$percentcount = 0;
/*Main loop to loop through each file. Parses each file into lines and
filters through the search function. Includes logging/output*/
foreach ($vars[files] as $file){
set_time_limit(60000);
file_put_contents("runs/$session/debug/echolog.htm", "<h2><FONT
color=DarkGrey>" . date ('H:i:s') . "</font>
Start <FONT
color=OliveDrab>$file</font></h2>
"; echo "<h2><FONT color=DarkGrey>" . date ('H:i:s') . "</font>
Start <FONT color=OliveDrab>$file</font></h2>
";
$receivedtext = file_get_contents ("source/$file");
$receivedtext = explode("\n", $receivedtext);
remove_comments($receivedtext);
if ($vars[linenumbers] === "on"){
    foreach ($receivedtext as $linenum => $line){
      $receivedtext[$linenum] = "<font color=Blue>$file:
      $linenum</font> $line";
    }
}
record("addlines", count($receivedtext));
record('fstart');
record("faddlines", count($receivedtext));
foreach ($wordlist as $wordfam => $words){
  file_put_contents("runs/$session/debug/echolog.htm", "<h3>Results found for word family <a name="$file.$wordfam"></a><a
href="reports/$wordfam.htm"><FONT color=Maroon>$wordfam</FONT></a></h3>
"; foreach ($words as $searchstr => $junk){
    unset ($wordtotal);
    foreach ($receivedtext as $text){
      if (strpos($text, $searchstr) !== FALSE){
        $wordtotal[2]++;
        unset ($off);
        while (strpos($text, $searchstr, $off) != =)
          $word[1] = strpos($text,
          $searchstr, $off);
      } else {
        $off = strlen($text) - dbov$word[1] - strlen($searchstr);
      if (preg_match("/(\s|\w|\s|\w|\s|\Z|\w|\w|\Z\w\w\Z)\$text) != 0){
          $wordtotal[1]++;
          $word[0] = $searchstr;
          $foundex = FALSE;
          $foundpos = FALSE;
      if (isset ($positives
[$wordfam])}{
($text, $word[1]-5, strlen($searchstr)+15); $checktext = substr
foreach ($positives
    $foundpos =
    if ($foundpos !==
        break;
    }
}
isset ($exclusions[$wordfam]){ if ($wordfam == "UD
    $len=7;
} else {
    $len=5;
}
$checktext = substr
($text, $word[1]-$len, strlen($searchstr)+($len*2));
foreach ($exclusions
    $foundex = strpos
    if ($foundex !==
        break;
    }
}
if ($foundex == FALSE){
    $start = substr ($text,
    $opentag = '<FONT
    $insertword = substr
    $closetag = '</FONT>'/;
    $close = substr ($text,
    $foundtext = $start .
    if ($foundpos !==
        file_put_contents
    ("runs/$session/debug/echolog.htm", "<li><font color=seagreen>Positive
        found</font> for <FONT color=Green>&quot;$searchstr&quot;</font> in:
    $foundtext </li>", FILE_APPEND);
    $foundtext =
    "<strong>$foundtext</strong>";
} else {
    file_put_contents
    ("runs/$session/debug/echolog.htm", "<li><font color=darkseagreen>Non-
Exclusion found for "$searchstr" in: $foundtext

$index[$wordfam][$searchstr][] = $foundtext;
$wordtotal[0]++;
else {
    $start = substr($text, 0, $word[1]);
color=ForestGreen<$u'>;
$opentag = '<FONT color=ForestGreen><u>';
$insertword = substr ($text, $word[1], strlen($word[0]));
color=Coral</u>' for "$searchstr" in: $tmptext
$closetag = '</FONT>'</u>';
$close = substr($text, $word[1]+strlen($word[0]));
$opentag . $insertword . $closetag . $close;
file_put_contents
("runs/$session/debug/echolog.htm", "<li><font color=darkorchid>Exclusion found</font> <FONT color=Coral>"$term"</font> for <FONT color=Green>"$searchstr"</font> in: $tmptext</li>", FILE_APPEND);
}

if ($wordtotal[0] > 0) {
    $result = TRUE;
    $gtotal[0] += $wordtotal[0];
    $gtotal[1] += $wordtotal[1];
    $gtotal[2] += $wordtotal[2];
}

if ($result === TRUE) {
    echo "<h3>Results found for word family <a href="/reports/$wordfam.htm">$wordfam</a> <a href="/debug/echolog.htm#$file.$wordfam">expand</a></h3>");
file_put_contents("runs/$session/debug/echolog.htm",
elog, FILE_APPEND);
    echo $slog . "\r"
    unset ($result, $slog, $elog);
}
$percentcount++;
file_put_contents("runs/$session/percent", round($percentcount*percentfactor,2));
}
file_put_contents("runs/$session/debug/echolog.htm", "<h3><FONT color=DarkGrey>"). date ('H:i:s') . "</FONT> <FONT color=OliveDrab>
$file</FONT> finished</h3>\r", FILE_APPEND);
echo "<h3><FONT color=DarkGrey>" . date ('H:i:s') . "</FONT> <FONT color=OliveDrab>$file</FONT> finished</h3>\r";
record('finish');
foreach ($index as $wordfam1 => $word){
    $count = 0;
    $report = ""
    foreach ($word as $strings){
        if (count($strings) > 0){
            foreach ($strings as $string){
                $count++;
                $string = "<li>" . $string . "</li>";
                $report = $report . "$string\r"
            }
        }
    } if ($count >0){
        global $counter;
        $counter[$wordfam1] += $count;
        file_put_contents("runs/$session/reports/$wordfam1.htm", $report, FILE_APPEND);
    }
}
unset($index);

/*Dump results count in a readable format.*/
echo "<h3><FONT color=DarkOrchid>$gtotal[0]</FONT> (of <FONT color=DarkMagenta>$gtotal[1]</FONT>/<FONT color=DarkMaroon>$gtotal[2]</FONT> found) Matches found</h3><hr>";
record('finish');

//Print totals for each word family
foreach ($wordlist as $wordfam =>$junk){
    if ($counter[$wordfam] >= 1){
        file_put_contents("runs/$session/debug/echolog.htm", "<li><FONT color=BlueViolet>$counter[$wordfam]</FONT> results found for <FONT color=Blue>$wordfam</FONT> families</li>", FILE_APPEND);
        echo "<li><FONT color=BlueViolet>$counter[$wordfam]</FONT> results found for <FONT color=Blue>$wordfam</FONT> families</li>";
    }
file_put_contents("runs/$session/reports/$wordfam.htm", "$counter[$wordfam] results found for $wordfam families \r", FILE_APPEND);
    if ($counter1 % 38 == 0)
        file_put_contents("runs/$session/index.htm", "</td><td>

", FILE_APPEND);
file_put_contents("runs/$session/index.htm", "<a href=reports/$wordfam.htm>$wordfam</a><br>
", FILE_APPEND);
$counter1++;
}
file_put_contents("runs/$session/index.htm", "</td></table><hr><a href=../../loggedin.php>Return to main page</a><br><a href=../../viewstatus.php>Return to View Status page</a>");
exec("tar -czf runs/$session/$session" . "_results.tar runs/ $session/");
file_put_contents("runs/$session/done","Done!");

// FUNCTIONS
function writearray ($array, $file, $append = NULL){
    file_put_contents ($file, arraylist($array), $append);
}
function echoarray ($array) {
    echo(arraylist($array));
}
function arraylist ($array){
    foreach ($array as $key=>$data){
        if (is_array($data)) {
            $data = arraylist($data);
            $return = $return . "\n<li>$key</li><\n" . $data;
        } else {
            $return = $return . "\n<li>[$key]: $data</li>";
        }
    }
    return "<ul>$return\n</ul>\n";
}
function record($func, $data = NULL){
    global $session;
    switch ($func){
        case "addlines":
            global $linenumber;
            $linenumber += $data;
            break;
        case "start":
            global $starttime;
            $starttime = time();
            file_put_contents("runs/$session/starttime", $starttime);
            break;
        case "finish":
            global $starttime, $linenumber;
            break;
    }
function remove_comments (&$text){
  foreach ($text as $key => $data){
    if ($data[0] === "%")
      unset ($text[$key]);
  }
}

function wordlist () {
  /*
  Import preverb lists, organized by family.
  Format is
  */
}
Family
"preverb
*/
$listA = unserialize(file_get_contents("data/pvblista.ser"));
$listB = unserialize(file_get_contents("data/pvlistb.ser"));

/*
Generate Wordlist, organized by family groups.
Generates a word list from which the PCRE is generated. It's organization is thus:
Array
[Family1 + Family2] - [Word1]
*/
foreach ($listA as $prefam =>$pre){
    foreach ($listB as $suffam =>$suf){
        if ($prefam != $suffam ){
            foreach ($pre as $p){
                foreach ($suf as $s){
                    $word = correct_spelling($p, $s);
                    if ($word != FALSE){
                        $wordlist [$prefam . "+" .
                        $suffam][$word] = array();
                    }
                }
            }
        }
    }
}
return $wordlist;
}

function correct_spelling ($pre, $suf){
    if ($pre == $suf){
        return FALSE;
    } else {
        $rulestmp = file_get_contents ("data/Rules.txt");
        $rulestmparr = explode ("\n", $rulestmp);
        foreach ($rulestmparr as $tmp){
            $tmp = trim ($tmp);
            $tmp2 = explode (" ", $tmp);
            $rules [$tmp2[0]] = $tmp2[1];
        }
        $check = $pre[strlen($pre) -1] . $suf[0];
        if (array_key_exists($check, $rules)){
            $pre = substr($pre, 0, -1);
            $suf = substr($suf,1);
            $mid = $rules[$check];
        }
        $str = $pre . $mid . $suf;
    }
}
return $str;
}