Chapter 14

Preliminaries to the investigation of clitic sequencing in Greek and Indo-Iranian

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Beginning with Wackernagel (1892), scholars have dedicated a great deal of attention to the question of the placement of enclitic elements within their clause, particularly those which (tend to) appear in so-called "Second Position". Anderson (2005) summarizes the honorand's long-standing interest in and contribution to the critical "interface" issues which arise for linguistic theory from these elements. As has been well known, again since at least the time of Wackernagel's writings on the matter, several archaic Indo-European languages enjoy particularly rich inventories of relevant elements. Greek, in particular, has a set of toneless ("enclitic") and tonic ("postpositive") so-called "second position" lexemes. Since only one entity can technically occupy "second position" in any given string, an obvious empirical issue arises regarding clauses which contains multiple "second position" elements. This matter has received significantly less careful attention than has "second position clisis" generally in the past 125 years. In this paper I present a detailed analysis of what happens when multiple elements seem to have a demand on "second position" in the Attic Greek clause (focussing on the Plato and Euripides corpora), and demonstrate that in developing an account for why the ordering is the observed one, a richer understanding of the actual mechanisms behind our (ultimately epiphenomenal) Wackernagel's Law can be developed.

1 Introduction

In Anderson (2005) the honorand of this volume presented a detailed analysis of clitic placement, including the positioning of so-called "second position" (henceforth, 2P) clitics. I have neither the competence nor the space to fully engage with his insightful and intriguing proposals in this venue. However, given that his analysis was developed against the backdrop of a consideration of empirical data from a broad set of languages, we can all recognize that it is necessary for such cross-linguistic approaches to abstract away from a certain number of seemingly low-level technical matters which arise in individual linguistic systems so as to not impede the development of a general theory. In

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some cases, one is leaving to one side matters which are both well described and well understood in the specialist literature on the language in question. However, in the case of what is perhaps the most famous data on 2P clitics – the Greek and Indo-Iranian data made use of by Wackernagel (1892) in the grounding document for so-called "Wackernagel's Law" – this is not the case. Surprisingly, the empirical data for these languages is relatively poorly understood, in my view, even in the specialist literature.

It should be clear that building a general theory of clitic behavior in human linguistic systems is only going to be as successful as the quality of the empirical data on individual languages used as input to the theory construction process allows. The more poorly such data is described, or understood, the potentially weaker the resulting general theory. In this paper I focus on one aspect of clitic behavior in systems of the Greek/Indo-Iranian type:[1] the sequencing of 2P clitics. I argue that the weakness in our capacity to insightfully account for observed sequencing of 2P clitics highlights the shortcoming of our understanding of the phenomenon in these languages generally, and point toward some ways we might, in my opinion, approach these issues so as to improve our understanding. This would allow the Greek and Indo-Iranian data to play their rightful role in the evaluation of more broadly-based theories such as that of Anderson (2005).

2 Wackernagel's so-called Law

The literature on so-called "second-position" clitics goes back at least to Bartholomae (1886). Wackernagel's Law universally recognizes a *tendency* for certain types of prosodically deficient element to occupy "second position" in the clause in Ancient Greek and Indo-Iranian (at least). A very clear statement of Wackernagel's own version of his "law" can be seen at the beginning of his famous *Vorlesungen über Syntax* (Wackernagel 1920: 7).

> Z. B. im ältesten Griechisch, in sehr hohem Masse bei Homer, auch noch bei Herodot, ist das Gesetz lebendig, dass schwach betonte Wörtchen, welches immer ihre syntaktische Beziehung sei, unmittelbar hinter das erste Wort des Satzes gestellt werden.[2]

In spite of the 130 years which has passed since Bartholomae first posited the tendency, and the heaps of follow-up scholarly literature, work which addresses the specific issue we will concern ourselves with today – the sequencing of 2P clitics – in any serious way is quite sparse. Early work was impeded by the descriptive goals of traditional Indo-European studies: after all, if you only need to catalogue observed sequences of 2P clitics, the task simply involves gathering and reporting on the data provided by one's corpus.

[1] I think it is widely recognized that these two systems are very similar to one another, in an Indo-European context, both in terms of the richness and diversity of their clitic inventory and in the syntax of these elements.

[2] "For example, in the earliest Greek the law is active – to a very large extent in the case of Homer, also still in the case of Herodotus – which holds that weakly stressed 'little words', whatever their syntactic relationship might be, are placed directly after the first word of the clause."

However, when we try not to describe the superficial properties of a string, but to view that string as the epiphenomenal *output* of a computational device (the grammar), the system needs to be imbued with powers which will enable it to bring the linear order of the output string into existence, rather than just describe that order after the fact (the way the researcher does).

3 The "clitic cluster"

The various modern Indo-Europeanist approaches to Wackernagel phenomena in Greek and/or Indo-Iranian reference different methods for dealing with the sequencing problem. One approach, commonly seen in work that takes a "prosody-centric" view of things, posits a "second position" clitic "cluster" (or "chain") into which the clitics are placed, and assumes some kind of (usually stipulative) ordering algorithm which arranges the clitics within this cluster. This is my understanding of the general approach (though, of course, they differ in detail) of Keydana (2011), Lowe (2014) and Goldstein (2016). A rough graphical representation of such approaches is presented in Figure 1.

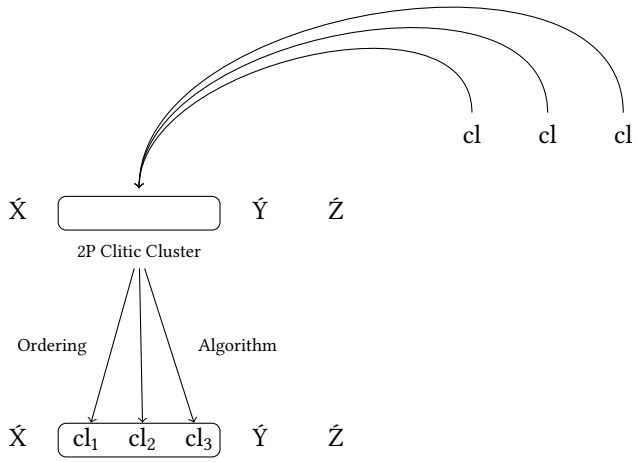


Figure 1: The "Clitic Cluster"

Typically, the domain within which 2P is defined is taken in these approaches to be prosodically defined, and the entities which undergo 2P placement (the clitics) are taken to be a prosodic class, but I have never seen an empirically-grounded proposal claiming that the observed ordering *within the clitic cluster* is determined by prosodic considerations alone. I imagine that this is because it is pretty hard to see any trace of the domination of such a factor in the observed clitic sequences in these languages.

But in general these authors have not yet ventured a systematic hypothesis about the sequencing, so it is hard to determine in any detail the nature of the envisioned system. For example, Keydana (2011: 108, fn. 3) says "[a]nother issue not to be addressed in this paper is the internal structure of clitic clusters." Goldstein (2016: 88) says that because the matter is a "difficult issue", he will "leave it for future research, and for the moment assume templatic ordering…"[3] Lowe (2014: 28) writes that "there are regular (though not inviolable) orders when more than one element from any one of those categories occurs…It is beyond the scope of this paper to account for those patterns."

Interestingly, each of the authors does seem to feel that the observed ordering is related to "classes" into which the clitics fall. Thirty years ago (Hale 1987: 73), I argued that there were three distinct classes of 2P clitics, taking distinct 2Ps for distinct reasons. Although these are not the labels I would use if I were creating them today, and the mechanisms described in 1986 for *how* the categorization of the clitic relates to its placement are woefully antiquated, the classes were: (1) "emphatic" clitics, (2) "sentence connective" clitics, and (3) "sentential" (usually pronominal) clitics. The first I took to involve word-level attachment and the second clause-level. The third were constrained to appearing in a very low position in what we would now call the CP domain, or, indeed, at the top of the IP domain.

I wrote then that "[t]he position of these elements relative to one another follows naturally from this account of their origins: the regular sequence is emphatic + sentence connective + sentential…" It is hard to see this statement as anything more than either wishful thinking or blissful ignorance, both of which I possessed in spades back in those days. From my crankier contemporary perspective, it is pretty easy to see that no explicit characterization of the membership in these classes was provided (though I gave isolated examples of each), nor was any mechanism even hinted at for what might trigger any specific ordering in cases of multiple instantiations of one of these categories in a single clause. In these matters, unfortunately, I have been largely followed by more recent work.

I think it is clear enough, however, what we would all like to see. Overt stipulation is in essence an admission of explanatory failure, and all principles of the scientific pursuit demand of us that we attempt to minimize the role of stipulation in our models. So, our hope must be that the clitics fall into non-arbitrarily-defined classes, and that these clitic classes occupy well-motivated positions (relative to the functions the clitics instantiate) in the linguistic representation. Since it is safe to assume that no two clitics do exactly the same work and co-occur in a single clause, if order falls out in some way from function, we should always be able to generate a predicted ordering for any pair of clitics. It is the "in some way" that I want to explore today. As a step in that direction, though, I must dwell a little longer on previous work.

[3] No explicit template is provided which accounts for the cited data.

4 The Hock template

Around the same time as I was writing the account discussed above, Hans Hock was working out the details of an overtly "templatic" approach to clitic sequencing in Vedic Sanskrit (e.g., Hock 1996, with earlier literature). The Hock system was not a model of internal consistency. In this system, the 2P clitics fall into three classes, P, Ṕ, and D:

(1) P: atonic non-"deictic" (i.e., non-pronominal) clitics
Ṕ: tonic non-"deictic" clitics (sometimes called "postpositives")
D: atonic "deictics" (i.e., pronominal clitics)

Clearly, the classification is based on *both* prosodic (tonic vs. atonic) and functional considerations (deictic vs. non-deictic). The template is basically stipulative, but in its most common instantiation, shown in (2), it is supposed to be partially motivated: non-deictics precede deictics (thus P, Ṕ before D, D́) and atonic elements from each class precede the corresponding tonic elements (thus P before Ṕ, D before D́).

(2) X́ P Ṕ D D́ …

The template is often described as "phonological" or "prosodic" (including by Hock himself), but that, of course, is not accurate. It is important to note that no motivation is cited for either of the two ordering principles: no reason for why non-deictics should come earlier in the clause than the deictics is given, nor for why the atonic element of each category should precede the tonic one.[4]

The graphical representation of the template in (2), especially when coupled with the claim that the template is "prosodic", invites the inference that the "goal" of the system is have an alternating strong vs. weak tonicity sequence. But since P, Ṕ and D can all double, and since any of those elements can be absent in any given clause, no such alternating pattern is observed in the vast majority of utterances in the actual corpus. The prosodic motivation for the template is thus highly abstract (not that that determines whether it is accurate or not).

My actual point in discussing the Hock system, however, is to point out that the mechanisms involved are quite distinct from that which we saw in our discussion of "clitic cluster" approaches to clitic sequencing. We can visualize the system as seen in Figure 2 below.

There is no "second position" in this conception of things, but a variety of ordered positions into which clitics are placed based on their properties (prosodic and functional). We can see the differences between the two general models if we imagine a clause with only a single 2P clitic in it. In the "clitic cluster" approach that clitic will be "in 2P", plain and simple. The ordering algorithm will have no work to do. In an approach such as that found in the Hock template, we can (and must) still ask the question: where is the clitic?

[4] In fact, D́ elements may appear in the X́ position and, for Hock's version of the Rigvedic template, also in the Ṕ position, and thus come earlier in the clause than D elements, indicating that there isn't much content to this latter principle in any event.

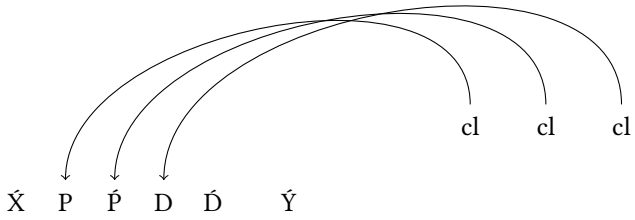


Figure 2: The "Hock template"

It could be in P (with Ṕ and D empty), or in Ṕ (with P and D empty), or in D (with P and Ṕ empty).

There is, of course, an inherent advantage, given that we are seeking to develop a non-stipulative account of ordering, if we assume that specific clitics map consistently to specific positions in the string, and that whether that position ends up being "second" or "third" or "fourth" is simply the epiphenomenal by-product of the mapping algorithm. A model which, by contrast, dumps the clitics unordered into a 2P cluster and then must impose an order on them has, in some sense, missed a chance to impose that ordering earlier in the initial mapping. Particularly if that mapping is prosody-driven, only a general slackening of constraints on the relationship between position (at the point of insertion) and interpretation – constraints which seem to hold of the linguistic representation generally – can allow a set of unordered elements, placed by a prosodic algorithm, to be realigned in an interpretationally-relevant manner (i.e., on the basis of the "functional class" of the clitic).

Hale (1996) represents an attempt to link the "positions" in the Hock template to specific structural elements within the clause (a similar orientation is found in other syntax-centric but prosody-sensitive approaches). I will not dwell on that reinterpretation of Hock here, but instead turn to one more modern model of 2P placement.

5 Wackernagel's optimality-theoretic approach

Wackernagel himself pretty clearly conceived of the 2P phenomenon as a kind of a compromise between a clitic element representing the kind of information which should come early in the clause (generally because of its "linking" function to the preceding context) and that same element being atonic, and thus not particularly suitable for initial position. This traditional conception is very closely followed by modern Optimality Theoretic approaches to 2P placement, as reflected, for example, in Anderson (2005).

The basic idea of such approaches, as with Wackernagel's, is that there is a drive for 2P clitics to be initial (captured by an AlignLeft constraint, which incurs one violation

for each step away from the left edge a clitic is) and a prohibition against the clitic appearing in initial position (captured by a NonInitial constraint). Obviously, both of these constraints cannot be satisfied in the same string. As always in OT, the conflicting demands are resolved via a ranking of the constraints. As long as NonInitial outranks AlignLeft, the clitic will appear *as close as possible* to string-initial position, but not *in* initial position – hence the 2P effect.

We can see this with a tableau fragment concerning the positioning of Greek *gár* 'because, since' relative to two tonic lexical items, which I designate simply as X́ and Ý. Greek *gár* is a standard example of a "Wackernagel's Law" element in the language.[5]

(3)

a. X́, Ý, gár	NonInitial	AlignLeft(gár)
b. X́ Ý gár		*!*
c. X́ gár Ý		*
d. gár X́ Ý	*!	
e. gár Ý X́	*!	
f. Ý gár X́		*
g. Ý X́ gár		*!*

Wackernagel believed that the drive towards initial position was of different strength for different enclitic objects. As long as we make the AlignLeft constraints clitic (or clitic class) specific, a strict ranking version of OT will require us to decide for each clitic just how strong the demand is that it be aligned left. For example, if we take the Greek focus-marking enclitic *mén,* we are *compelled by the model* to ask: is it more important for *mén* to be on the left, or for *gár* to be on the left? (In Wackernagel's terms, is the "drive for initial position" stronger for *mén* or for *gár*?)

The tableau in (4) below shows how such a system generates – again by necessity – a sequencing of clitics. We should always be attentive, I think, when our modern models seem to converge on the ideas of important scholars like Wackernagel, who could not have envisioned the workings of OT, and thus independently had a similar conception of a certain class of linguistic phenomena. If Wackernagel and Anderson agree, it would be wise to not dissent too quickly! But is OT the happy confirmation of Wackernagel's less formal and more intuitive analysis?

The model in some sense combines properties of the two earlier approaches I sketched: there is a sense of a "fixed stipulative order" (as seen in the Hock Template) in the relative rankings of the AlignLeft(x) constraints, but there is no sense of fixed stipulative positions in the resulting representation (as that model implies), thus making it more like the "clitic cluster" analysis. It has the advantage, over the "clitic cluster" analysis, of not adding a new object to our model of the grammar (the "clitic cluster"), nor requiring a distinct computational process which is responsible for explicitly ordering the elements within the cluster (the "ordering algorithm" mentioned above).

[5] The reader will notice that this tableau fragment does not select between two "winning" outputs: X́ *gár* Ý and Ý *gár* X́. Obviously other constraints will determine the ultimate optimal output form with respect to the relative ordering of the tonic elements to one another.

(4)

	Ẋ, Ý, gár, mén	NonInitial (cl)	AlignLeft (mén)	AlignLeft (gár)
a.	Ẋ Ý gár mén		**!*	**
b.	Ẋ Ý mén gár		**!	***
c.	Ẋ mén Ý gár		*	***!
d.	mén Ẋ Ý gár	*!		***
e.	Ẋ gár Ý mén		**!*	*
f.	Ẋ gár mén Ý		**!	*
g. ☞	Ẋ mén gár Ý		*	**
h.	mén Ẋ gár Ý	*!		**
i.	gár Ẋ Ý mén	*!	***	
j.	gár Ẋ mén Ý	*!	**	
k.	gár mén Ẋ Ý	*!	*	
l.	mén gár Ẋ Ý	*!		*
m.	gár Ý Ẋ mén	*!	***	
n.	gár Ý mén Ẋ	*!	**	
o.	gár mén Ý Ẋ	*!	*	
p.	mén gár Ý Ẋ	*!		*
q.	Ý gár Ẋ mén		**!*	*
r.	Ý gár mén Ẋ		**!	*
s. ☞	Ý mén gár Ẋ		*	**
t.	mén Ý gár Ẋ	*!		**
u.	Ý Ẋ gár mén		**!*	**
v.	Ý Ẋ mén gár		**!	***
w.	Ý mén Ẋ gár		*	***!
x.	mén Ý Ẋ gár	*!		***

I have both conceptual and empirical concerns about the model. At the conceptual level, stipulation is built into the model pretty deeply: the so-called "factorial typology" argument says that we could just as easily have AlignLeft(gár) outrank AlignLeft(mén), and indeed that every ordering of every available AlignLeft(x) constraint should be, in principle, observed. This does not seem to me to be very consistent with the data I have seen from archaic Indo-European languages (which often involves etymologically unconnected, but functionally similar enclitics showing the same ordering principles).

Empirically, one of the great challenges to this model holds, in my view, for all of the other models we have treated to this point as well. The domain over which the AlignLeft(x) constraint must be assessed is, in the model, a pure stipulation (i.e., there are no principles regulating what a given enclitic might be "aligned" to). The same problem, in my view, plagues the so-called "prosody-centric" approaches which have become popular: the clitic is said to move into the "clitic cluster" in second position of some domain, but none of the approaches I have seen (Keydana 2011; Lowe 2014; Goldstein 2016) present a non-stipulative characterization of how the appropriate domain is established.

A clitic is said to take 2P within (some) Intonational Phrase, but the question of which one (when there are multiple IPs in the string) is left unclear. It also seems like the "Intonational Phrase" portion of the specification (and, in non-OT approaches, the 2P part as well) is purely stipulative: could one place a clause-conjoining clitic in 2P of (some) Utterance Group or (some) Phonological Word? How about in 3P in the Intonational Phrase? The models proposed are so inexplicit it is difficult to determine precisely what their allowable elements and operations are – the models are thus both highly stipulative and poorly constrained.

As mentioned above, my concerns about the Hock Template have been spelt out in considerable detail in Hale (1996), where I attempt to reduce the empirically valid aspects of the template to the interaction of (1) normal syntactic placement of the relevant entities and (2) Halpern's (1995) "prosodic inversion". I won't go through these details here, except to note that in this conception of things enclitic elements can be in a variety of structural positions (in the syntax) and may (or may not) undergo "prosodic movement" in the phonology (depending on whether they are "properly hosted" without such movement).

It is obvious that a system which leverages both syntax and phonology to account for observed clitic placement is in some sense more complex than either a purely syntactic or a purely phonological one. But the evidence that the process is not *purely syntactic* is, as far as I can tell, universally accepted. The 2P clitics often interrupt manifest syntactic constituents (in a manner the syntax does not allow) and are quite regularly placed in positions in the string from which appropriate scope relations could not possibly be established. "Prosodic" rearrangement allows the syntax to be mundane rather than strikingly bizarre (with all of the implications such bizarreness would have, if allowed, for our theories of grammar).

That the syntax is involved is, in my view, absolutely required if we are to solve the "domain" problem. Sanskrit *ca* and Attic *te* are 2P clitics, but they appear in clause-second position only when their domain is the clause. They appear in "DP-second" position when their domain is the DP, and in VP-second position when their domain is the VP. Their domain simply cannot be defined with respect to *prosody* alone.

6 Sample application: Enclitic subordination

Both of these observations can be seen to be at work in a set of examples involving enclitic subordinators. Before examining this data, which will also display the mechanisms I believe are at work in clitic placement (and thus what we might use to explain clitic sequencing), I will remind the reader that Hale (1987) showed that there was a process manifest in the language of the Rigveda, in Avestan, and in Greek, whereby a single constituent could be fronted to the left of a WH-element. Obviously, this analysis extends (though the matter was not overtly discussed – but rather implicitly assumed – in that earlier work) to other subordinators present in C ('if', 'when', 'because'). I will call that fronting process "topicalization" (and the position into which the fronting takes place Top), with no particular commitment to the discourse functions involved.

Familiar examples of this fronting looks like this:

(5) a. [áśmānam cid] yé bibhidúr vácobhiḥ
rock-Asg Emph.*cl* Rel-NPlM smashed-IIIPl words-ISgN
'who smashed even rock with (mere) words…' RV 4.16.6c

b. [idhmáṃ] yás te jabhárac
kindling-ASg Rel-NSg you-DSg.*cl* would bear-IIISg
chaśramāṇáḥ
exerting himself-NSg
'who, exerting himself, would bear the kindling to you…' RV 4.12.2a

Armed with the following assumptions, then, let us see what some structures look like, and how they might impact the development of a theory of clitic sequencing:

- enclitic elements are placed in "expected" syntactic position
- "prosodic inversion" is triggered when they are not properly hosted on their left edge

Wackernagel proposed long ago that there were traces in the Rigveda of a reflex of IE *k^we which (like OLat. *absque me esset* 'if it were without me', some uses of Gothic *nih*, and, although not known to Wackernagel, Hittite *takku*) is subordinating in function, generally rendered 'if, when.' As might be expected, the verb in such clauses, as in subordinate clauses in Vedic generally, is accented. This has given rise to some anxiety that the true subordination marker is the verbal accent, and that *ca* is simply (weakly) coordinating. Typical examples are:

(6) a. níuptāś ca babhrávo vā́cam ákrataṁ̄
scattered-down **ca** brown-NPl voice-ASg they made
émī́d eṣāṃ niṣkr̥tā́ṃ jāríṇīva
I go=PTCL their$_{cl}$ appointed place-ASg paramour-NSg=like
'And as soon as, scattered down, the brown (dice) have raised their voice, I just go to their appointed place, like a girl with a lover.' (SJ/JB) 10.34.5cd

b. tuvā́ṃ ca soma no vā́śo
you-NSg **ca** Soma-VSg us$_{cl}$ you should wish
jīvā́tuṃ ná marāmahe
to live Neg we will die
'And if you will wish us to live, Soma, we will not die.' (SJ/JB) RV 1.91.6ab

I have provided the translation of Jamison & Brereton (2014) because it reflects directly the unease that some Vedicists feel about "subordinating" *ca*: they have translated 'and as soon as (=when)' and 'and if', leaving it unclear whether they believe that *ca* is coordinating ('and') and the verbal accent subordinating ('as soon as', 'if'), or whether perhaps they believe that this *ca* actually means 'and as soon as/if'.

As one can imagine, determining whether or not such clauses are weakly connected to the preceding discourse – i.e., whether the 'and' should be in the English translation – is no easy task. And from this example, and other widely accepted ones (such as RV 8.21.6ab below), in which *ca* occupies second position, it doesn't seem likely that our approach to clitics is going to be much help in this task.

(7) áchā ca tvainā́ námasā vádāmasi
PV **ca** you$_{cl}$=this-ISg homage-ISg we address
kím múhuś cid ví dīdhayaḥ
Q-marker for a moment even$_{cl}$ PV you will think
'When we address you with this homage, will you hesitate even for a moment?'
RV 8.21.6ab

Hettrich (1988: 252) notes overtly on subordinating *ca* that *ca* stands "wie nach Wackernagels Enklisengesetz[fn deleted] zu erwarten, überwiegend an zweiter Stelle im Satz."[6]

It is somewhat striking to see the *überwiegend* in this statement, because coordinating *ca* is extremely regular in its "second position" behavior, being postponed only in cases in which there is a "phonological word" at the start of the conjoined domain. Are there actually cases of "late *ca*" in subordinating function? The following examples seem to answer this question "yes".

(8) a. asyá ślóko divíyate pr̥thivyā́m
his call-NSg heaven-LSg=speeds earth-LSg
átyo ná yaṃsad yakṣabhŕ̥d
steed-NSg like will control bringing-wondrous-apparitions-NSg
vícetāḥ
discriminating-NSg
mr̥gā́ṇāṃ ná hetáyo yánti cemā́ bŕ̥haspáter
wild beasts-GPl like charges-NPl they go **ca**=these-NPl Brhaspati-GSg
áhimāyāṁ abhí dyū́n
having-snake-wiles-APl to heavens-APl
'The discriminating one [=Bṛhaspati?], like a steed, bringing wondrous apparitions, will control it when these (words) of Brhaspati, like the charges of wild beasts, go to the snake-wiles-possessing heavens.' RV 1.190.4

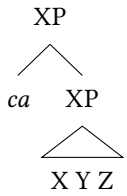
b. ubháyaṃ śr̥ṇávac ca na
twofold-ASg will hear **ca** us$_{cl}$
índro arvā́g idáṃ vácaḥ
Indra-NSg nearby this-ASg speech-ASg
satrā́ciyā maghávā sómapītaye
fully-focussed-ISg benefactor-NSg soma-drinking-DSg

[6] '…as would be expected according to Wackernagel's Law, overwhelmingly in the second position in the clause.'

dhiyā́ śáviṣṭha ā́ gamat
thinking-ISg most-powerful-NSg PV will come
'When Indra nearby will hear this twofold speech of ours, the most powerful benefactor will come here to the soma-drinking by reason of our fully focussed insight.' RV 8.61.1

To understand this data (and there are one or two more examples), we need to ask the following question: how does conjunctive *ca* end up in "second position" when it conjoins clauses, and how would we expect a "subordinating *ca*" to behave given the assumptions outlined above?

The behavior of coordinating *ca* is fairly straightforward. No matter what kind of syntactic (or prosodic!) entity *ca* is coordinating, it appears in this configuration:

(9)


[X Y Z] can be a clause, as in the case under discussion, or an DP or VP or PP or whatever. Obviously, *ca* sits at the left edge of the XP-domain and thus does not have a proper prosodic host to its left. It therefore must undergo the "prosodic flip", and, assuming X is a "phonological word", the resulting operation will give rise to this string:

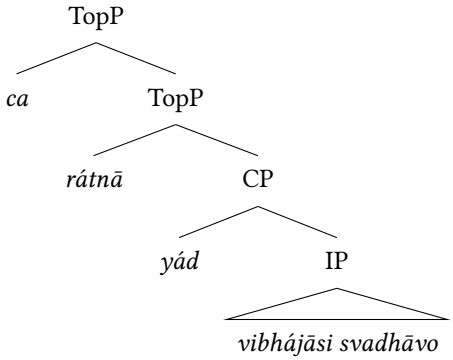
(10) *ca* X *ca* Y Z

It should be clear that one thing that *ca* can bring into a coordination relationship with what precedes it is a clause introduced by a *topicalized* phrase. Here's an example.

(11) yád agna eṣā́ sámitir bhávāti
when Agni-VSg this-NSg assembly-NSg will become
devī́ devéṣu yajatā́ yajatra
godly-NSg gods-LPl sacrifical-NSg sacrificial one
rátnā ca yád vibhájāsi
treasures-APl and$_{cl}$ when you will share out
svadhāvo
having-independent-will-VSg
bhāgáṃ no átra vásumantaṃ vītāt
share-ASg us$_{cl}$ then rich-in-goods-ASg pursue
'When, o Agni, this assembly will become godly among the gods, a sacrificial one, o sacrificial one, and when you will share out treasures, o you of independent will, then pursue a share for us rich in goods.' (SJ/JB)
RV 10.11.8

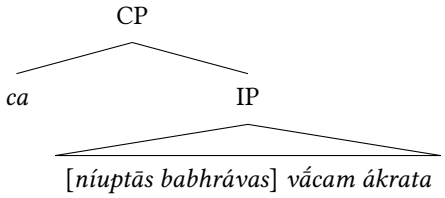
The c-pada of this verse arises from a *syntactic* structure of the form:

(12)



So where do we expect **subordinating** *ca* to be *syntactically*? Well, it is *isofunctional* with *yád* in the clause above. So the structure of the subordinate clause in (6a) at the end of *syntactic* computation would presumably be:

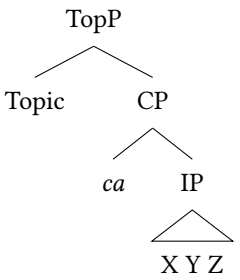
(13)



Since *ca* is alone up there in the left periphery, it must undergo the "prosodic flip" in the phonology to be properly hosted.

What would happen if we were to have a Top element in such a clause? In the case of coordination, it of course is the entire clause, including its initial Topic-phrase, which gets coordinated to a preceding (or following) clause, and *ca* thus dominates TopP. But topicalized material appears to the *left* of the subordinator (relative pronouns, *yádi* 'if', etc.), so if *ca* is a subordinator, we predict a structure such as (contrast coordinating *ca* in (12)):

(14)



If the proper "hosting domain" for *ca* is the CP, then it is unhosted on its left, and we predict the *phonology* to restructure this to:

(15) Topic [*ca* X *ca* Y Z]

Note that, if there are such examples, since coordinating *ca* won't act this way, but subordinating *ca* should, we would have clear and unambiguous evidence for the *syntactic separation* of *ca* into two distinct types of grammatical element. And of course there are such examples. We saw them above in (8ab), whose structures are:

(16) a. [$_{\text{Top}}$ *mṛgā́ṇāṃ ná hetáyo*] [$_{\text{CP}}$ *ca* [*yánti ca imā́ bṛ́haspáter áhimāyāṁ́ abhí dyún*]]

b. [$_{\text{Top}}$ *ubháyaṃ*] [$_{\text{CP}}$ *ca* [*śṛ́ṇávac ca na índro arvā́g idáṃ vácaḥ*]]

The construction as a whole is rare, but confirmation for this analysis is provided by the reflex of subordinating *ca* in later Vedic texts (and, rarely, already in the Rigveda) – the subordinating particle *céd* (etymologically from *ca* + *íd*). The "normal" position for this particle is, of course, in second position.

(17) a. ná vā́ araṇyānír hanti
NEG PTCL Lady of the Wilderness-NSg slays
anyáś cén nā́bhigáchati
another-NSg **céd** NEG=attacks
'In truth, the Lady of the Wilderness does no slaughter, if someone else does not attack.' (SJ/JB) RV 10.146.5ab

b. yó asyā údho ná veda-
who-NSg her-GSg$_{cl}$ udder-ASg NEG knows
-atho asyā stánān utá
thereto=PTCL her-GSg$_{cl}$ teats-APl as well
ubháyenaivā́smai duhe
both-ISg=PTCL=him-DSg$_{cl}$ she yields milk
dā́tuṃ céd áśakad vaśā́m
to give **céd** he was able cow-ASg
'Whoever knows not the udder of her, and likewise the teats of her, to him she yields milk with both, if he has been able to give the cow.' (Whitney) AVŚ 12.4.18

But, as with subordinating *ca*, we find unexpectedly "late" instances of *céd* as well.

(18) a. [arthíno] yánti céd ártham
having-a-task-NPl proceed **céd** task-ASg
gáchān íd dadúṣo rātím
they will go to PTCL giver-GSg generosity-ASg
'If those having a task proceed to their task, they will attain the generosity of the giver.' RV 8.79.5ab

b. [abandhv éke dádataḥ prayáchanto]
kinless-NPl some-NPl giving-NPl bestowing-NPl
dā́tuṃ céc chíkṣānt sá svargá evá
to give **céd** they are able this-NSg heaven-NSg indeed
'If some, without kin, giving, bestowing, are able to give, this is truly heaven.'
AVŚ 6.122.2cd

c. héḍaṃ paśūnā́ṃ ny èti
wrath-ASg cattle-GPl PV comes
brāhmaṇébhyó 'dadad vaśā́m
Brahmans-DPl not-giving-NSg cow-ASg
[devā́nāṃ níhitaṃ bhāgáṃ]
gods-GPl deposited-ASg portion-ASg
mártyaś cén nipriyāyáte
mortal-NSg **céd** keeps (for himself)
'The mortal not giving a cow to the Brahmans goes down to the wrath of the cattle, if he keeps to himself the deposited portion of the gods.'
AVŚ 12.4.21

And note that we can use our analysis of these "late" instances to make our interpretations of certain Vedic passages more precise. Look at the AB passage (from the Śunaḥśepa legend) in (19).

(19) ṛ́nam asmin saṃnayaty
debt-ASg him-LSg$_{cl}$ he pays
amṛ́tatvaṃ ca gachati
immortality-ASg and$_{cl}$ he goes to
pitā putrasya jātasya
father-NSg son-GSg born-GSg
paśyec cej jīvato mukham
he should see **ced** living-GSg face-ASg
'A debt he payeth in him, and immortality he attaineth, that father who seeth the face of a son born living.' (Keith) AB 7.13.4

Keith, whose translation I have provided, takes [putrasya jātasya… jīvato mukham] '(the) face of a son born living' as a (discontinuous) constituent, the direct object of the verb *paśyet*. That is, his analysis (ignoring for a moment the *ced*, to which we will turn momentarily) is that the subject and predicate divide like this:

(20) [*pitā*] [*putrasya jātasya paśyet jīvato mukham*]

There are two possibilities for where *pitā* could be under Keith's interpretation: it could have been fronted into the Topic position, or, of course, it could be in some position lower than C (in Focus, or in IP, e.g.). If it were below C, the output of the syntax (now with *ced* reintroduced) would have been as below, with the "prosodic flip" indicated:

(21) [$_{CP}$ *ced* [*pitā ced putrasya jātasya paśyet jīvataḥ mukham*]]

If *pitā* were in Topic, we would have instead expected:

(22) [$_{Topic}$ *pitā*] [$_{CP}$ *ced* [*putrasya ced jātasya paśyet jīvataḥ mukham*]]

Neither of these is the sentence in the text. It is clear what the structure must be if the placement of *ced* is to fit with all the other evidence for the use of this particle in early Vedic:

(23) [$_{Topic}$ *pitā putrasya jātasya*] [$_{CP}$ *ced* [*paśyet ced jīvataḥ mukham*]]
'when the father of a (just) born son$_i$ sees the face of (him$_i$) living'

7 *hí*, *gár*, and clitic sequencing

In my dissertation (Hale 1987), I dealt fairly extensively with the data from Vedic *hí* 'because, since'. I noted that while the vast majority of instances of *hí* are in "second position" (appropriately defined), there were a number of counterexamples. Note that *hí* occupies, at the end of the syntactic computation, the very same position ("C") as subordinating *ca* and *céd*.

I won't bother citing second position instances of *hí* – as I said, the vast majority of the approx. 630 attestations of the particle are in that slot, properly defined. Some of the not terribly numerous exceptions are given in (24) below. Several interesting issues arise, so I cite a healthy number of the exceptions.

(24) a. urukramásya sá hí bándhur itthấ
wide-striding-GSg this-NSg **hí** bond-NSg thus
'for exactly that is the bond to the wide-striding one' (SJ/JB) RV 1.154.5c

b. asmấñ ca tấṃś ca prá hí néṣi vásya ấ
us-APl and$_{cl}$ them-APl and$_{cl}$ PV **hí** lead better-ASg PostP
'lead both us and them forth to a better state.' (SJ/JB) RV 2.1.16c

c. tribhíḥ pavítrair ápupod dhí arkáṃ
three-IPl purifiers-IPl he purified **hí** chant-ASg
'Since he [=Agni?] purified the chant with three purifying filters,' (SJ/JB) RV 3.26.8a

d. ákṣetravit kṣetravídaṃ hí áprāṭ
not-knowing-the-field-NSg knowing-the-field-ASg **hí** asked
'Because the one not knowing the field asked the field-knower,' (SJ/JB) RV 10.32.7a

In all of the "exceptions" I will cite here, we can analyze the data just as we did in the case of *ca* and *céd*: the first constituent of the clause is in the Topic position above the CP, *hí* is in C itself, and is not "properly hosted" by a tonic element *within its domain* on its left, and thus undergoes inversion. Thus we have [$_{\text{Top}}$ *urukramásya*] in (24a), [$_{\text{Top}}$ *asmā́ñ ca tā́ṃś ca*] in (24b), [$_{\text{Top}}$ *tribhíḥ pavítrair*] in (24c), and [$_{\text{Top}}$ *ákṣetravit*] in (24d).

In my dissertation, I rather unwisely said, regarding examples such as these, that the poets were able to treat the *caesura* as equivalent to a clause-boundary, and thus place *hí* in second position after the caesura, rather than after the actual start of the clause. This is a not a particularly good idea, giving the meter far too much power to determine the data – certainly far more than I would be willing to concede at this stage of my research on the matter.

We can give a much more sensible assessment of this data if we instead note that the boundary between the element in Topic and the start of the CP-domain is marked by an intonational reset (or pause), and that the natural place to align this pause within the rhythmic structure of the verse line is at the caesura. In all of the examples above, the Topic ends at the caesura of a trimeter line (this will be true of the examples I cite below as well).

As usual, there are many other interesting things going on with these examples as well. For example, in support of the topicalization analysis, we see in an example such as (24a) a discontinuity (*urukramásya…bándhur*). We need to account for this discontinuity, and movement is the way to do it in our model – topicalization provides the relevant explanation for that movement. We will see additional examples of this type below.

Finally, and returning to the matter of clitic sequencing, we may be able to learn something important about how exactly the "prosodic flip" works to trigger specific orderings from examples such as those in (25).

(25) a. índro vidvā́m ánu hí tvā cacákṣa
Indra-NSg knowing-NSg PV **hí** you-ASg$_{cl}$ kept an eye on
ténāhám agne ánuśiṣṭa ā́gām
this-ISg=I-NSg Agni-VSg instructed-NSg have come hither
'Because the knowing Indra has kept you in his sights, instructed by him have I come here, o Agni.' (SJ/JB) RV 5.2.8cd

b. sadyó jajñānó ví hím iddhó ákhyat
at once being-born-NSg PV **hí**=them$_{cl}$ kindled-NSg he observed
'for immediately upon being born, he, kindled, observed them'
RV 10.45.5c

Recall that pronominal clitics occupy the lowest position in the C-domain (or the highest in IP), so one possible structure for what the *syntax* would have sent to the prosody for (25a) would be:

(26) [$_{\text{Top}}$ *índro vidvā́m*] [$_{\text{CP}}$ *hí* [*tvā* [*ánu cacákṣa*]]]

In this structure, neither *hí* nor *tvā* can be properly hosted on their left, with the expected "prosodic inversion" being thus triggered:

(27) [$_{\text{Top}}$ *índro vidvā́m̆*] [$_{\text{CP}}$ *hí* [*tvā* [*ánu hí tvā cacákṣa*]]]

However, as we all also know, there are many "exceptions" to the syntactic "weak pronoun fronting" that seems to be responsible for making pronominal clitics targets for Wackernagel's Law-type effects in archaic IE languages. If the *tvā* of (25a) were to represent one of these exceptions, and thus be unfronted, the most likely input structure for the prosody would have been:

(28) [$_{\text{Top}}$ *índro vidvā́m̆*] [$_{\text{CP}}$ *hí* [*ánu tvā cacákṣa*]]

Which would have been operated on by the prosody so as to create:

(29) [$_{\text{Top}}$ *índro vidvā́m̆*] [$_{\text{CP}}$ *hí* [*ánu hí tvā cacákṣa*]]

These two possible analyses have quite different implications for how the system I have assumed gives rise to clitic sequencing. In the analysis in (26) we would be looking at the effects of *iterative prosodic inversion* events, and the examples would reveal an (as far as I can see somewhat unexpectedly) "outside-in" processing (*hí* flips in first, then *tvā*).

Under the analysis in (28), we are looking at the relationship between the resolution of the hosting needs of an unmoved *tvā* relative to the ability of an inverting *hí* to "slip in" between *tvā* and *tvā*'s potential (and ultimate) host *ánu*. The details of the processes involved under the latter set of assumptions are too complex for me to deal with in this context, but there is evidence that that approach does represent the correct analysis of examples such as (25ab).

Recall our earlier discussion of the Attic Greek *mén gár* clitic sequence. *gár* is of course essentially isofunctional with Rigvedic *hí*. In addition, Thomson's (1939) well-known paper on the "postponement of interrogatives" in Attic drama supports the idea that one could still front into a high Top position in this language. This has a specific entailment, since the WH-elements Thomson talks about are in CP, and the topics he deals with are higher, and since *gár* is in C, there should be Attic drama cases exactly like the "postponed" subordinating *ca*, *céd*, and *hí* examples we walked through earlier. And there are.[7]

(30) a. pròs taũta mὲ̀ psaúsēi tis Argeíōn
in light of these-APl NEG should touch any-NSg$_{cl}$ Greek-GPl
emoũ·
me-GSg

[7] Note that in (30c) the articular infinitive construction has a proclitic article, and the first prosodic word after which *gár* 'flips' is thus tõi=plouteĩn.

[sp^{h}agẽi paréksō gàr dérēn eukardíōs.
knife-DSg I submit to **gár** neck-ASg bravely
'In light of these things, no one of the Greeks need touch me, because I will bravely submit my neck to the knife.' Eur. IphA 1559–1560

b. hõn g' oúte métron oút' arit^{h}mós estí moi·
which-GPl PTCL NEG measure-NSg NEG number is me-DSg$_{cl}$
[kakõi kakòn gàr eis hámillan érk^{h}etai.
trouble-DSg trouble-NSg **gár** to competition-ASg comes
'Of which (woes) there is neither measure nor number for me, because woe comes into competition with woe.' Eur. Tro 620–621

c. kaì nè dí' eí tí g' ésti lampròn kaì
and by Zeus-ASg if something-NSg PTCL is splendid-NSg and
kalòn
beautiful-NSg
è k^{h}aríen ant^{h}rṓpoisi, dià sè gígnetai·
or elegant-NSg men-DPl through you-ASg it comes about
[hápanta] tõi=plouteĩn gár est^{h}' hupḗkoa.
everything-NPl Art-DSg=being rich-INF **gár** is subservient-NPl
'and, by Zeus, if something is splendid and beautiful, or elegant for men, it comes about through you (=Wealth), because everything is subservient to being rich.' Ar. Plutus 144–146

In cases involving both *mén*, which marks focus,[8] and *gár*, meaning 'because', the interpretation of scope within the clauses indicates that we are dealing with a structure such as 'BECAUSE (*gár*) *one the one hand* (*mén*) … *on the other hand* (*dé*) …' When there is nothing for the *gár* to lean leftwards on, we get the surface order *mén gár*. This indicates sequential "prosodic inversion" of the form:

(31) [$_{CP}$ gár [mén [X́ mén gár Ý Ź]]]

But this is an "inside-out" (*mén* first, then *gár*) resolution of the hosting needs of these elements. If the Vedic mechanisms are the same – and all indications are that they are – then this is clear evidence against the analysis in (26), favoring the (28) analysis. The implications of this prosodic "tucking in" have not been explored in any significant detail.

8 Conclusions

If we tie the domain of a clitic like *hí* or *gár* to its semantic scope – which we can easily do by positioning it via the syntax, whose job, after all, is to create precisely these kinds

[8] The particle *mén* normally has a contrasting element, marked by the particle *dé*. I translate the contrastive relationship between these two elements as 'on the one hand X, on the other hand Y' below.

of scope relations – we need not worry about finding the structure for it to be in "second position" in. If the clitic cannot be hosted on its left *in situ*, that structure will be the one which provides the nearest prosodic host to the right of the *syntactic position* of the clitic, regardless of what entity that is.

As with other syntactic entities that take arguments, we sometimes do have to specify the nature of those arguments. But it doesn't follow from that that we need to do it *stipulatively* – it isn't chance that there is no word-level *hí* or *gár* 'because' clitic. A word doesn't express the kind of things 'because' needs to take as an argument to generate a coherent semantics.[9] But that same word would work fine as an argument of 'and'.

Given a sufficiently rich understanding of the semantics of a particular enclitic or postpositive, we should be able to deduce the nature of the kinds of syntactic entities it can take as an argument. No stipulation should be needed. Of course we are far from having this kind of understanding of the meaning of many Vedic and Attic Greek enclitics.

To the extent we can determine with some degree of confidence the *syntactic* position of the enclitic elements we are interested in, we are in an excellent position to examine their *surface position* (which may be the same as their syntactic position, but may be perturbed by the "prosodic inversion" process) with a view to determining the detailed mechanics of the interactions involved when multiple 2P elements are present in a string. The more explicit a conception we have of the relevant algorithms, the easier this task will be. One of the strengths, in my view, of the model assumed here is that its parts are all clearly enough defined that it should be easy to discover those instances, if any, in which stipulation may be, unfortunately, required.

By contrast, approaches which leave vague the processes that give rise to clitic sequencing are revealing in that shortcoming their general inadequacy. Getting prosodic positioning to interact in the required way with, on the one hand, syntactic positioning (which all grammatical theories require) and, on the other, with semantic interpretation (ditto), is a very non-trivial problem: it goes to the core architecture of the grammar. Working out the details of one's assumptions in this domain cannot be left as an exercise to future work – one needs to be formulate a clear notion about such things going in. When there are multiple clitics we see overtly the failure of inexplicit models (such as Hale 1987, and a lot of subsequent work), but those same problems are present, if obscured, in the case of simple clitics as well.

[9] Yes, I know about the prepositional 'because' phenomenon. If you think about what such strings *mean*, and assume that their meaning is representationally present (but not all pronounced), as in

Q: Who slew Vrtra?

A: Indra.

in which 'Indra' *means* 'Indra slew Vrtra' (because it can be a lie, and only propositions can be false, not nouns), then you'll see why I don't think this is a problem. Anyway, there's no evidence that the speakers of Rigvedic Sanskrit could say: 'Indra slew Vrtra. Because, the waters.'

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