Abstract

An important executive function in “language design” is marking the boundaries of embedded clauses, and of clauses (and clause sequences) in the scopal domain of operators such as conditional ‘if’ and negation. Crosslinguistic comparison reveals a range of devices that have this effect, facilitating parsing by listeners. These include (i) prosody, (ii) constituent ordering, (iii) coordination, (iv) boundary-marking morphemes, and (v) continuous morphological indexation. The last two are emphasized in this article, with data from Australian and West African languages. Such boundary-marking functions deserve greater recognition in grammatical typology, especially since acoustic analogues have been well-studied by phoneticians.

Keywords: boundary-marking, case-stacking, clause combining, German, Kayardild, non-configurationality, Nunggubuyu, parsing, prosody, scope, Suffixaufnahme, syntax, Tondi Songway Kiini, Verb Second

1. Introduction

Subordinated clauses (here interpreted broadly to include conditional antecedents and relatives) may present processing difficulties due to weak demarcation of clause boundaries. Consider (1a, b), which exemplify ambiguous bracketing of sentences containing a relative clause, even though in any concrete instance one reading may be much more likely than the other for nonlinguistic reasons. For a listener, what cues (if any) point to the intended bracketing?

(1) a. I bought [the girl that was eating] a carrot.
    b. I bought [the girl that was eating a carrot].
Likewise, consider a conditional constructed out of the three clausal ingredients in (2a), where the issue for the listener is to determine whether the break between antecedent and consequent is after the first clause or after the second. A related issue is whether the scope of the negative operator in (2b) extends only to the first clause, or to at least the second clause, before the sequence reverts to positive polarity.

(2) a. If . . . George come to the party . . . Sandie leave . . . You hear about it.

Assuming that the ‘if’ and negative markers occur at the left boundary, how does the listener determine where their scope ends? In the case of (2a), for example, what cues help the listener distinguish the readings (3a) and (3b)?

(3) a. If [George come to the party & Sandie leave], you hear about it.
   b. If [George come to the party], [Sandie leave & you hear about it].

The issue is posed here in terms of the ambiguity of completed utterances, but it is also relevant to the ease of online parsing even of utterances that do not, in the end, have multiple readings.

In this article I identify the major grammatical devices used in languages to facilitate the listener’s identification of boundaries, with special reference to subordinated clauses. Aside from prosodic cues, the mechanisms include constituent (re-)ordering, coordination, boundary-marking morphemes, and continuous indexation of words within the scope of the subordinated clause. Continuous indexation is less familiar due to its rarity, so the article concludes with a relatively detailed discussion of two languages that use this strategy. Most of the other phenomena are individually known to typologists, but have not previously been brought together as a unified object of study. This functional typology, which begins with a communicative task and identifies the various grammatical mechanisms that help resolve it, cuts across conventional typological work, which is almost always organized around crosslinguistically defined categories and constructions (e.g., aspect, coordination, relative clause, conditional construction). It is, however, in the spirit of Hawkins’ processing-oriented typological work (e.g., 2004), with differences to be noted below.
2. **Phonological excursus**

Marking the boundaries of words (and short phrases) is also nontrivial, and it is possible to interpret many phonological processes as having been selected for, in the evolution of the relevant language, because of their efficacy in demarcating the linear spans of stems/words and short phrases. Any linguist who has struggled to process spoken utterances in a foreign language, even after considerable study, realizes how difficult a task this is.

Fortunately, a number of phonological processes and low-level phonetic cues assist a native listener in identifying where boundaries occur and, conversely, where they do not. Trubetzkoy already discussed several types of boundary signal (*Grenzsignale*), including segments (phonemes, allophones) and segment sequences found only at junctures, and word-level processes including vowel harmony (1939 [1958: 241–261]). There is now a large technical literature on how listeners segment continuous speech, and on how this segmentation relates to lexical recognition; see, e.g., Cutler & Norris 1988, McQueen 1998, and Kirk 2000. Indeed, phonologists and phoneticians are far ahead of syntacticians and typologists in appreciating the extent to which utterances are tailored to facilitate processing.

Consider the familiar phonological phenomena in (4) to (6), not in terms of their phonetic motivations, but as cues to stem/word boundaries.

(4) **Continuous indexing**
   a. stem- or word-level harmony, including
      (i) vowel harmony
      (ii) lateral spreading of nasalization or pharyngealization
   b. word-level rhythmical alternations (alternating stress or vowel-lengthening)

(5) **Boundary cue**
   a. word-final devoicing of consonants
   b. stress/accent on the initial or final syllable of the word, or (less reliably) on the $n$-th syllable from the beginning or from the end of the word
   c. spreading or shifting of a tone to, or nearly to, the initial or final syllable of the word

(6) **Non-boundary cue**
   a. word-internal local assimilations involving adjacent or nearby segments
   b. word-internal local dissimilations involving adjacent or nearby segments
In (4), the entire stem (or word, as the case may be) is characterized by a more or less continuous phonological pattern, either by the lateral spreading of one or more features, or by a rhythmical alternation. In effect, the extent of a stem/word is indexed by a continuous phonological pattern extending over its syllables or metrical feet. If the harmonic or rhythmic pattern is interrupted at a given point, a word boundary is indicated.

On the other hand, each operation in (5) is a boundary cue, marking either the left or right boundary of the unit.

In (6), since the operations are local and may occur in various parts of a stem or word, they do not (unless recursive) mark the full linear extent of the unit, nor do they mark its boundaries. However, to the extent that these adjustments do not occur at a boundary, their operation suggests that the relevant string is word-internal, and their failure to operate points to a boundary.

If a sequence of segments or syllables /abcdefghi/ (the letters are variables) is uttered, a listener might successfully identify word boundaries from a combination of cues such as a right-boundary cue ← at /c/ and a multi-syllabic harmonic sequence (italicized) in /ghi/. The resulting sequence abc←defghi points to a segmentation [abc][def][ghi], facilitating lexical recognition and syntactic parsing within each bracket.

The boundary-cue strategy and the continuous indexation strategy in phonology have precise analogues in morphosyntax. In both phonology and morphosyntax, linguists may interpret the phenomena from two quite different perspectives. Consider a harmonic process within a word [ghi] whereby a feature of g (say, high tone, italicized) spreads to the right, so that underlying [ghi] surfaces as [ghi]. A phonetically minded phonologist may see this as being driven by natural articulatory phonetic processes, the basic model being [cause → phenomenon]. From another viewpoint, regardless of the original phonetic motivation, the harmonic spread must have been selected for (in the Darwinian sense) as an artful device to facilitate word-boundary recognition, the key relationship being [phenomenon → function]. This choice of analytical perspectives on the same phenomena should be kept in mind as we turn to morphosyntax.

3. Prosodic marking of phrasal and clausal boundaries

Phonetic cues also mark the boundaries of embedded clauses, as they can of NPs and other multi-word phrases. For example, the two girl-and-carrot examples given above are distinguished in the author’s speech by the prosodic realization of eating. In (1a), this word has phrase-terminal high-then-low pitch

1. Harmony is not a failsafe boundary marker, since the preceding or following word may happen to have the same harmonic value. A switch in harmonic values does reliably indicate a boundary. Similar remarks may apply to rhythmical patterns, depending on the language.
and its final syllable is prolonged. In (1b) it has a lower phrase-medial pitch and its final syllable is not prolonged. For a crosslinguistic discussion of similar prosodic differences in double-relative constructions, see Jun 2003.

Much technical research has focused on listeners’ use of acoustic cues including pitch, intensity, and pre-boundary lengthening for perceptual chunking of intonational phrases into smaller divisions that often correspond to multi-word syntactic phrases or embedded clauses; see, e.g., Yoon et al. 2007. The general point should be uncontroversial and no further commentary is given here.

4. Unusual constituent ordering

Of all the constituent-order issues studied by syntacticians, none has elicited more interest than Germanic V2 syntax and the associated (apparent) rightward movement of the uninflected portion of the verb complex.

In standard German, the main rules (exemplified in Table 1) are these: (i) in simple main clauses, an inflected verb is preceded by exactly one constituent, often but not always the subject (a, b, f); (ii) in imperatives (h), and in conditional antecedents lacking an ‘if’ operator (i), which have in common that they problematize the truth-value status of the underlying proposition and therefore arguably must focalize the verb, no constituent precedes the verb (i, j); (iii) an auxiliary such as ‘must’ or ‘be’ (b, f) requires the basic verb to appear as an infinitive or (non-agreement) participle following all non-verb constituents; (iv) a clause-initial ‘that’ complementizer (COMP) or relative pronoun (REL) requires the inflected verb or inflected auxiliary to appear in absolute clause-final position, following even a participle or infinitive (c–e, g–h); (v) all other constituents, including postverbal subjects, intervene between these initial and final elements.

In a formal analysis, the issue is how to account for the surface patterns in terms of forces that induce constituents to move up in the tree, and therefore (epiphenomenally) to move leftward in surface structure. One common approach to German (and Dutch) is to base-generate SOV (head-final) order, and move the tensed verb to a complementizer node provided that the latter is not already occupied by a real complementizer (one non-verb constituent also moves to a still higher position). The effect is that, in main clauses, the tensed verb appears in second position. By contrast, in ‘that’ complements and in relative clauses, no movement of the tensed verb occurs. (See, e.g., Weerman 1989; there is a vast literature on the subject.)

From the present perspective, the important thing is not that the tensed verb moves in main clauses, but that it fails to move when a clause-initial complementer (‘that’ or Relative) is present. Or rather, the important point is its surface position, regardless of where it is generated. The combination of the
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Table 1. German verb syntax

<table>
<thead>
<tr>
<th>Comp</th>
<th>1st</th>
<th>2nd</th>
<th>...</th>
<th>PTCP/INF</th>
<th>Inflected V</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Er</td>
<td>komm-t</td>
<td>[nach Hause]</td>
<td>[to house]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>he</td>
<td>come-PRES.3SG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘He comes home.’</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Er</td>
<td>is-t</td>
<td>[nach Hause]</td>
<td>ge-komm-en</td>
<td>PTCP-come</td>
</tr>
<tr>
<td></td>
<td>he</td>
<td>be-PRES.3SG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘He came home.’ (lit. ‘He is come to house.’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>der</td>
<td>REL.M.SG</td>
<td>[nach Hause]</td>
<td>komm-t</td>
<td>come-PRES.3SG</td>
</tr>
<tr>
<td></td>
<td>REL.M.SG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>der</td>
<td>REL.M.SG</td>
<td>[nach Hause]</td>
<td>ge-komm-en is-t</td>
<td>PTCP-come</td>
</tr>
<tr>
<td></td>
<td>REL.M.SG</td>
<td></td>
<td></td>
<td></td>
<td>be-PRES.3SG</td>
</tr>
<tr>
<td>(e)</td>
<td>dass</td>
<td>er</td>
<td>[nach Hause]</td>
<td>komm-t</td>
<td>come-PRES.3SG</td>
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<tr>
<td></td>
<td>that</td>
<td>3SG</td>
<td>[to house]</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>‘… that he (may) come home’</td>
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<tr>
<td>(f)</td>
<td>Er</td>
<td>muss-Ø</td>
<td>[nach Hause]</td>
<td>komm-en</td>
<td>come-INF</td>
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<tr>
<td></td>
<td>he</td>
<td>must-PRES.3SG</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>‘He must come home.’</td>
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<td></td>
<td></td>
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<tr>
<td>(g)</td>
<td>der</td>
<td>who.M.SG</td>
<td>[nach Hause]</td>
<td>komm-en</td>
<td>must-Ø</td>
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<tr>
<td></td>
<td>who.M.SG</td>
<td></td>
<td></td>
<td>come-INF</td>
<td>must-PRES.3SG</td>
</tr>
<tr>
<td>(h)</td>
<td>den</td>
<td>whom.M.SG</td>
<td>ich</td>
<td>see-PST-3SG</td>
<td>1SG</td>
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<tr>
<td></td>
<td>whom.M.SG</td>
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<td></td>
<td></td>
<td>[to house]</td>
</tr>
<tr>
<td>(i)</td>
<td>Komm-en</td>
<td>Sie</td>
<td>[nach Hause]</td>
<td></td>
<td>2PL</td>
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<tr>
<td></td>
<td>come-IMP.POLITE</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>‘Come home!’ (polite)</td>
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<tr>
<td>(j)</td>
<td>Käm-e</td>
<td>er</td>
<td>[nach Hause]</td>
<td></td>
<td>3SG</td>
</tr>
<tr>
<td></td>
<td>come-PST.SBJV-3SG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘Were he to come home, …’</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

flanking elements – complementizer at left boundary and tensed verb at right boundary – audibly BRACKETS the remaining constituents of the subordinated clause.

The Germanic V2 system is idiosyncratic in some respects, but typological studies of constituent order suggest a widespread pattern whereby either the verb or the basic tense/aspect/mood marking (if expressed by clitics or participles rather than by affixation on the verb) is at or near a clausal boundary, i.e., either initial, in second position (from the left), or final. This is most transparent with V-initial and V-final orderings, but SVO (really SVOX allowing for fur-
ther constituents) is verb-second, and even the S-infl-O-V-X orderings found in West Africa (Songhay, Mande) have TAM markers in second position. Clause-final position of the verb is notably common in subordinated clauses, where the demarcation of clause-boundaries is especially relevant in processing.

In Basque, for example, the predominant but not obligatory order in main clauses is verb-final. The verb inflected for tense and pronominal arguments (often auxiliary ‘be’ or ‘have’) is immediately preceded by the most focal constituent. The latter is often the object, alternatively a subject, an adverb, or the (pronominally uninflected) verb in a bipartite verb-plus-auxiliary predicate. If no focal constituent is available, a default particle ba- (a sentential truth-value focalizer) precedes the verb. Although verb-final order is usual, in main clauses one or more constituents may follow the inflected verb. This is particularly the case when the latter is preceded by a strongly focused constituent (such as a wh word) or by a polar interrogative particle. Thus in (7) allative ‘to house’ is clause-final (Saltarelli 1988: 138).

(7) berandu_ etorr-i  al z-Ø-en etxe-ra
late come-pfv POLARQ 3.sbj-be-pst house-all
‘Did she get home late?’

In addition, heavy NPs readily appear postverbally in main clauses (Saltarelli 1988: 139–141). In some dialects, even focal constituents may follow the inflected verb in main clauses (Etxepare & Ortiz de Urbina 2003). However, in relative clauses and in various subordinated adverbial clauses, verb-final order is rigorous in Basque (Saltarelli 1988: 30). Therefore in such embedded clauses, unlike the case in main clauses, the position of the verb systematically marks the right boundary.

One way to approach constituent-order typology is to summon the firepower of formal syntax, according to which verbs and entire VPs are raised by quasi-physical forces that nimbly combine the universal and the language-specific. See, for example, Baker (2005), who explains the alternation, in the Nigerian language Lokaa, between positive main-clause SVOX and gerundive-clause or negative main-clause verb-final (SOXV), by positing an SVO (head-initial) base, raising the verb to Agreement, and assuming a language-specific stipulation requiring the (now verbless) VP to move en bloc to an even higher specifier position (remnant movement), while a subject NP avoids being caught in the middle of these upwardly mobile VP chunks by staying at arms-length to the clause (as an adjunct).

Insofar as any formal-syntactic account of linearization patterns in a given language must make use of nonuniversal processes, it is essentially descriptive rather than explanatory. The specific configuration of the language must have been worked out over time, in a speech community, by some kind of natural selection. It is reasonable to think that one relevant selective factor is how
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The ordering patterns assist listeners in processing complex utterances containing embedded clauses, where a listener’s errant attribution of NPs, adverbial phrases, and the like to the wrong clause will result in mis-parsing. If the verb-final order in Lokaa gerundive clauses helps mark clause boundaries, just as in Basque subordinated clauses, this typological comparison is significant, all the more so if verbs occupy this position for different syntactic “reasons” in the two languages.

Another well-developed theoretical approach is the processing-efficiency model of Hawkins (1983, 1994, 2004), whose credo is: “I believe that words and constituents occur in the orders they do so that syntactic groupings and their immediate constituents (ICs) can be recognized (and produced) as rapidly and efficiently as possible in language performance” (Hawkins 1994: 57). He emphasizes online processing of individual sentences, with special reference to the points at which interconstituent grammatical relationships become clear. The efficiency of a grammar is assessed by the extent to which, at various points in the temporal unfolding of a sentence, the listener must leave words or constituents (temporarily) unassigned, or (worse) initially misassign them as in garden-path sentences (Hawkins 2004: 51). He is interested in, for example, the processing interactions between major-constituent linearizations, especially V-initial or V-final, on the one hand, and lower-level orderings (adpositions, NPs including those with relative clauses) on the other.

I am sympathetic to this processing-oriented approach. I suggest, however, that we complement it by additionally considering the marking of clause boundaries, including right as well as left edges. This perspective casts a different light on the linear position of the verb, whose position at or very near the left or right edge of the clause helps to demarcate the clause. The flanking pattern of Germanic V2 clauses, with either a left-edge complementizer or a second-position verb marking the left edge and part of the verb complex marking the right edge, is an especially good example of how both edges need to be considered.2

5. Coordination

At first sight, coordination (‘X and Y’, ‘X or Y’) may seem unconnected to our topic. Indeed, the typological literature on coordination, e.g., the articles in Haspelmath (ed.) 2004, are preoccupied with differences in the internal formal and semantic structure of conjunctions and disjunctions. Typologists (and

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2. Beyond the concerns of this article, and those addressed by Hawkins, the position of the verb has other processing consequences. Typically the verb expresses the core of the sentence’s cognitive scenario, while argument NPs flesh out the reference of argument variables (as in X saw Y). V-initial languages frontload the scenario while V-final language frontload argument reference. This requires listeners to develop parsing strategies adapted to the language type.
grammarians) have been slow to notice the role that coordination plays in facilitating the processing of multiclausal structures. English is an excellent example of how overt coordination of clauses provides crucial cues as to the scope of logical operators. In (8) we see how English resolves the potentially problematic parsing of the conditional construction mentioned earlier (2a).

(8) a. If George comes to the party and Sandie leaves, you’ll hear about it.
   b. If George comes to the party, Sandie will leave and you’ll hear about it.

A pair of clauses combined by and must be interpreted either as part of the antecedent (protasis, ‘if’) or as part of the consequent (apodosis), rather than as straddling the break between the two. In (8a, b), the first clause that fails to be connected to the preceding clause(s) in this way is interpreted as (the first clause of) the consequent. (For more on conditionals, see Section 6, below.)

Typologically, ‘S1 and S2’ (conjunction of clauses) and ‘N1 and N2’ (conjunction of NPs or adverbials) are often expressed by distinct mechanisms. NP conjunction is essentially syntactic-semantic, as a basic device for constructing nonsingular sets, and we find it even in vocatives (Hey George and Sandie!) and in frozen compound-like names (sweet-'n-sour) (cf. Cooper & Ross 1975). There is actually little need for overt conjunction of main clauses, whose linear order may already imply chronological (and causal) relationships: George came to the party; Sandie left; You heard about it. It is precisely when two or more clauses (or VPs) functioning as a unit are embedded in a larger sentence, or constitute the scopal domain of a logical operator (negation, ‘if’) or of an inflectional auxiliary, that overt coordination can play a crucial scopedemarcating role. This applies to disjunction (9) as well as to conjunction.

(9) a. I didn’t [see George] or [hear from him].
   b. If you [see George] or [hear from him], ...
   c. I will shoot anyone [who burns the American flag] or [sings the Cuban national anthem].

6. Boundary-marking morphemes

The most obvious clausal boundary-marking morphemes are subordinators, especially semantically empty factive complementizers (‘that’) and nonreferential relative markers. However, many languages have other morphemes

3. Clausal conjunction expressed in other languages by mechanisms other than an ‘and’ morpheme, such as verb serialization, can also function in this manner.
that demarcate the boundaries of such clauses. A difficulty for analysis is that such morphemes may also express conventional grammatical categories, so the boundary-marking function does not always jump out. However, where the conventional function is redundant or otherwise weak, we should be alert for boundary-marking functions. My claim is that clausal boundary markers are selected for as languages evolve, but so much the better if they also do something else.

In Tondi Songway Kiini, an S-infl-OVX Songhay language (Heath 2005), we find right-boundary markers in relative clauses that do not occur in simple NPs or clauses, and whose conventional grammatical function is usually redundant. Relative clauses in this language have the general form in (10). Linear position 7 is the etcetera zone, encompassing any postverbal elements such as adverbal phrases.

(10) (head) noun kâ subject NP Infl object NP verb ... (Def/Pl)

kâ in position 2 is a relative morpheme that directly follows the head noun; it is weakly nominal in morphological form, to judge by the fact that it is occasionally followed by an indefinite plural suffix. The elements from positions 3 to 7 are identical to their correspondents in a main clause, except that a subject or object NP inside the relative clause, if co-indexed to the head, is zeroed (there is no resumptive pronoun).

Of special relevance is that an unusual definite/plural element is frequently added at the end of the relative clause in position 8 in (10). Its forms are given in (11). The morphemes -∆:, -E, and yów in (11) are recognizable as the definite singular, definite plural, and (indefinite) plural suffixes that occur with nouns and adjectives. However, the n- formative in the definites does not occur in simple NPs, or anywhere else, in main clauses. 4

(11) a. Definite Singular n-∆: Plural n-E
b. Indefinite Singular (zero) Plural yów

Ostensibly, these elements merely specify definiteness and plurality of the head noun. However, this marking is generally redundant since the head noun

4. The linear position of articles (determiners) in relative clauses (e.g., N-Rel-Art, Art-N-Rel, Rel-N-Art) is discussed from clause-intern typological perspectives in Hawkins 2004 and Dryer 2008. The fact that several of the correlations are weak, even when statistically significant, suggests that the causal factors considered in this line of work are only pieces of the puzzle. It would be interesting to know, in the N-Rel-Art cases, whether the article appears just once at the end of a biclausal relative, or at the end of each clause.
in a relative retains its usual form, including the same definite singular, definite plural, and (indefinite) plural endings (the indefinite singular is unmarked). Note the redundancy of definite plural marking by the final n-éy in (12), given that híw-éy ‘the trees’ is already definite plural.

(12) híw-éy kà ñy Ø kà; n-éy tree-DEF.PL REL 1SG Ø remove DEF.PL

‘the trees that I removed’ (Heath 2005: 195)

In theory, the final definite/plural element could be nonredundant if the relative clause were headless. But this would only apply to definiteness, since relative kà is readily pluralized (as ká-ýów) when not preceded by a head noun. In any event, headless relatives are relatively uncommon in this language, since semantically light nouns (‘person’, ‘thing’, ‘place’, ‘time’) are high-frequency relative heads.

A significant function of the definite/plural elements in (11) is to mark the right boundary of the relative clause. Since the head noun and relative kà are at the opposite left edge, the scopal domain is demarcated on both sides.

An example showing this is (13a), which begins with a frozen adverbial element sequence wàr kà ‘(the) time that . . . ’, where wàr is invariant in form5 but is understood to be definite singular. The point to focus on is that n-Ø: (definite singular, agreeing with ‘time’) clearly marks the right boundary of the relative clause. The listener interprets the material following n-Ø: as outside the scope of the relative. In (13b) the relative is biclausal, and (indefinite) plural yów occurs only once, after the second relative clause.6

(13) a. [wàr  tày nà sàa’ n-Ø:  ñy nà [time REL 1SG NEG be.healthy REL-DEF:SG 1SG NEG] gòy work

‘(At the time) when I was not healthy (i.e., was sick), I didn’t work.’ (Heath 2005: 197)

5. Wàr in this combination is a reduced and low-toned variant of the noun wàtì ‘time’.

6. Fully biclausal relatives are somewhat uncommon, since if the two clauses share a subject they can be unified into a single clause by verb serialization. In examples like (13b) with two clearly distinct relative clauses (with different subjects), sometimes the speaker jumps the gun and utters the final determiner at the end of the first clause, then pauses and adds the second as an afterthought. However, (13b) illustrates the normal pattern when the speaker successfully plans ahead.
The typological literature on relativization has focused on internal structural variables, e.g., the accessibility hierarchy, island constraints, external versus internal headedness, gaps versus resumptive pronouns in externally-headed relatives, and the morphosyntactic status of relative morphemes (Keenan & Comrie 1977, Comrie 1998, Basilico 1996). I suggest we also observe how boundaries are marked. Specifically, if the left boundary is marked by a relative morpheme, how is the right boundary marked (bearing in mind that the relative may be biclausal)?

Another common locus for right-boundary markers (when the left boundary is marked by the relevant scope-bearing operator) is conditional antecedents (‘if’ clauses). As with the other constructions discussed here, typological analysis is heavily focused on the semantics and pragmatics of the various types of antecedents that occur in languages, and on their internal structure (e.g., Traugott (ed.) 1986). But antecedents may be mono- or biclausal, so it is also worth exploring how the boundary between the antecedent and the consequent is marked. We have seen (Section 5) that clausal coordination can be put to good use in languages like English. Furthermore, especially in simple hypothetical conditionals, different tense or aspect values are probabilistically correlated with antecedents and consequents, respectively, in many languages. In Tondi Songway Kiini, the boundary between antecedent and consequent is often suggested by the shift from perfective to imperfective aspect. However, tense/aspect correlations are far from reliable, and two explicit right-boundary markers are found in antecedents.

First is n- ¯, identical to the definite singular right-boundary marker just described above for relative clauses. This appears optionally as the final word in the antecedent of a counterfactual conditional (14). It therefore has two functions: (i) distinguishing counterfactual from hypothetical conditionals, and (ii) marking the right boundary of the (counterfactual) conditional antecedent. The ‘if’ morpheme bindé is at the left boundary.

(14) bindé kàmíy̱-n- ¯; nà n- ¯; ...  
if truck-DEF.SG NEG come DEF.SG ...  
‘If the truck hadn’t come, (we’d have died there).’ (Heath 2005: 219)

However, the most important, albeit optional, right-boundary marker in conditional antecedents is hùndéy̱, which functions elsewhere as the universal
quantifier ‘all’. In conditional right-boundary marking function, it is optionally realized prosodically as the first word in the consequent, as in (15), but it functions to finalize the preceding antecedent, with no (other) universal-quantifier sense. (In simple NPs, such as ‘all the dogs’, hündëy is always phrase-final.)

(15)  bindé Žá:ss/á:k; 1áljá:m-á:  há:n-á,
if European-def.sg neg come Friday-def.sg day-on,
hundey áy ’ dirà
all 1sg ipfv go.away

‘If the white man doesn’t come on Friday, I’ll leave.’ (Heath 2005: 220)

The value of a right-boundary marker is greatest when the conditional antecedent is biclausal or otherwise complex, as in (16). 7

(16) a. [ū ’ kā:] yá [ū sí Žá:k]  
[2sg ipfv come] with [2sg ipfv.neg come]  
hundey, ...
all, ...

‘Whether you are coming or not, …’ (Heath 2005: 221)

b. Ždē:nó, bindé Žá:y ná Žá:k-há: [ká:ki:né yá dā]  
so, if 3pl trans 2sg ask [how with]  
ū ’ ikóy góy [fu:ȓ-éy ná] hundey, ū  
2sg ipfv go work [field-def.pl loc] all 2sg
’ kí; ...  
ipfv say ...

‘So, if they ask you (sg) how you go to the fields, you will say ...
’ (Heath 2005: 258)

At the end of a conditional antecedent, hündëy rarely has its literal quantificational meaning, and it is almost always best disregarded in free translations. In an antecedent like ‘if all the dogs are barking, …’, a “real” hündëy will occur as part of the relevant clause-internal NP, whether or not the optional right-boundary marking hündëy also occurs at the end of the clause.

Tondi Songway Kiini is instructive since its right-boundary markers have little or no other nonredundant function. This lends credence to the view that comparable elements in other languages have a boundary-marking function, even if they also have a more obvious grammatical-category value.

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7. The aforementioned optional delay in the pronunciation of hündëy, resulting in its prosodic grouping with the consequent, makes sense when considered in the context of production strategies. Delaying the right-boundary marker allows the speaker to decide (at the last moment) to expand the antecedent by adding an additional clause.
7. Continuous word-by-word morphological indexation

Word-by-word indexation means that multiple words in a given string (either all words, or all words of relevant stem-classes) are independently marked as belonging to a clause or VP that is under the scope of an operator, or that is subordinated to a higher clause. As a strategy for demarcating clauses (or clause-like sequences), such indexation is probably confined to radically nonconfigurational languages, and so it is comparatively rare and poorly understood. It will therefore be described in more detail here than the boundary-marking strategies described above.

Word-by-word indexing is schematized in (17), where Op stands for scope-bearing operator (it could occur at either boundary but is shown here at the left boundary), W for word, and * indicates a morphological index. From the surface string (17a), the listener infers a bracketing reading (17b), and is prompted to seek a scope-bearing operator or matrix clause to complete the parsing.

\[
(17) \quad \begin{align*}
by observing continuities and discontinuities in harmonically sensitive features (Section 2).

8. Morphological indexation of negative and irrealis domains in Nunggubuyu

Nunggubuyu (eastern Arnhem Land, Australia) is a candidate for the most radically nonconfigurational language of Australia (or anywhere else). The language lacks clearly defined clauses (and hence clause boundaries), multi-word NPs, structural case, anaphoric pronouns, and many other familiar features of what, inspired by Whorf, we might call Standard Average Configurational. The data here are from Heath 1984.

Nouns (including “adjectives” and “demonstrative pronouns”, as well as most “adverbs”), have a three-way noun-class prefix opposition, reduced to two-way for human categories (Table 2).

We begin with positive utterances. The zero (i.e., unprefixed) form is used, for common nouns (and adjectives), when a discourse referent is introduced, whether it functions as an autonomous topic (‘as for X’) or as subject or object. The zero form is also regular for place names and noun-like adverbs. What these functions have in common is that the discourse-internal definiteness or givenness of the noun is not foregrounded (either the noun is indefinite or focalized, or the noun is of a semantic type for which definiteness is unimportant). The zero form is also regular for nouns followed by instrumental suffix -miri.

Table 2. Nunggubuyu noun-class prefixation

<table>
<thead>
<tr>
<th></th>
<th>Zero</th>
<th>Cont[inuous]</th>
<th>Pun[ctual]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masculine</td>
<td>Ø</td>
<td>na-</td>
<td></td>
</tr>
<tr>
<td>Feminine</td>
<td>Ø</td>
<td>yara-</td>
<td></td>
</tr>
<tr>
<td>Plural</td>
<td>Ø</td>
<td>wara-</td>
<td></td>
</tr>
<tr>
<td>Nonhuman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>Ø</td>
<td>na-</td>
<td>yi-</td>
</tr>
<tr>
<td>NGARA</td>
<td>Ø</td>
<td>gara-</td>
<td>yi-</td>
</tr>
<tr>
<td>MANA</td>
<td>Ø</td>
<td>mana-</td>
<td>ama-</td>
</tr>
<tr>
<td>ANA</td>
<td>Ø</td>
<td>ana-</td>
<td>a-</td>
</tr>
<tr>
<td>WARA</td>
<td>Ø</td>
<td>wara-</td>
<td>wa-</td>
</tr>
</tbody>
</table>

8. Categories like “subject” and “object” are actually of doubtful validity in a language without structural case-marking or well-defined clause boundaries, and with free order.

9. There are a few morphologically inert adverbial particles like ngas ‘again’ and adaba ‘now’ that do not allow affixation.
Of the two prefixally marked categories, what I call the continuous prefixal form is regularly used with common nouns (and adjectives) that have already been introduced in the discourse, and function as subject (agent), object (patient, theme), or autonomous topic. These grammatical functions do not require a postposition-like case suffix. The punctual prefixal form, on the other hand, is predominant when the noun is followed by one of the postposition-like case suffixes (allative-dative, locative, ablative, similitative, etc.). However, even with such a case suffix, it is possible to use the continuous prefix when the referent is distributed or generalized, as in reports of habitual activities (e.g., ‘we always go [to the pond]’). This aspectual element is the basis for the (admittedly oversimplified) labels continuous and punctual.

The continuous/punctual distinction does not apply to human nouns, which have only a single nonzero prefix.

The above remarks apply to positive indicative utterances. These rules are categorically overridden, in negative and irrealis (conditional) modal contexts, by constraint (20).

(20) The continuous prefix is required of all common nouns, adjectives, demonstrative pronouns, and (nominally inflectable) adverbs under the scope of either
   (i) negation; or
   (ii) an ‘if’ (conditional-antecedent) operator.10

The affinity between negation and the ‘if’ operator is familiar in English from the use of negative-polarity items, like any replacing some.

Because Nunggubuyu subject, object, and topical common nouns (and adjectives) are usually in the continuous prefixal form even in simple positive contexts, the effect of constraint (20) is most striking with place names, adverbs, and case-marked forms of nonhuman nouns, all of which have either zero prefix or the punctual prefix in other contexts.

Nunggubuyu TAM categories are expressed by verbal suffixes with a little help from prefixes. Prefixes primarily express pronominal agreement, but each pronominal prefix complex (e.g., intransitive ‘1sg’ or transitive ‘3pl/2sg’) has two forms, A and B, which are determined by TAM categories plus negation. Verbal suffixes make most of the TAM distinctions and are sensitive to negation, but one must consider both the prefix and the suffix (and any adjoining negative word) in computing the overall inflectional category.

10. The ‘if’ morpheme is an enclitic -majji: added to some word in the antecedent. Negation is expressed by waj-rı (literally a predicate ‘it is absent’) in indicative contexts, and by a particle yagı in potential (irrealis) contexts.
Typology of clausal boundary marking devices

Table 3. Nunggubuyu verbal inflectional suffixes (positive)

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punctual</td>
<td>-ñi</td>
<td>-ñj</td>
</tr>
<tr>
<td>Continuous</td>
<td>-ñi</td>
<td></td>
</tr>
<tr>
<td>Nonpast Positive</td>
<td>-i</td>
<td>-i:</td>
</tr>
<tr>
<td>Continuous</td>
<td></td>
<td>-i:</td>
</tr>
</tbody>
</table>

Table 4. Nunggubuyu verbal inflectional categories (negative/conditional)

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Negative</td>
<td>-ñi</td>
<td>-ñj</td>
</tr>
<tr>
<td>Nonpast Negative</td>
<td>-ñj</td>
<td>-i (N.B. short vowel)</td>
</tr>
</tbody>
</table>

The basic TAM division is into a past system and a nonpast tense system. This is bisected by a modal opposition actual vs. potential (i.e., realis vs. irrealis), with “future” and “imperative” being included in nonpast potential. An aspectual distinction, punctual vs. continuous, is found (in positive utterances) in the past actual and in the nonpast potential, but not in the past potential or in the nonpast actual. Therefore the positive inflections are those in Table 3. The suffixes shown are for the most productive verb class; other verb classes have the same structure but different suffixal forms.

However, when a verb is under the scope of negation, the punctual/continuous aspectual opposition is neutralized, and other idiosyncratic morphological changes occur. The past/nonpast and (in part) the actual/potential oppositions are maintained (Table 4).

In the past system, the effect is that the explicitly punctual suffix -ñ seen in the positive is not allowed under negation. In other words, aspect is neutralized under negation in favor of the continuous form. In the nonpast system, there is a dedicated potential negative suffix -i, which is also neutral for aspect, and the actual negative -ñ is (oddly) identical morphemically to the nonpast potential punctual of the positive paradigm.

11. Somewhat marginal to the inflectional system is a relatively uncommon evitative form, translatable as ‘lest...’, that we disregard here.
12. The changes do not apply to verbs in a conditional antecedent.
13. Although ñ is used for both past actual and past potential under negation in the verb itself, the distinction between (usually preverbal) actual negative and potential negative words, mentioned in an earlier footnote, disambiguates actual from potential at the “clause” level.
Table 5. Forms diagnostic of modal/polarity domain

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Under negation or ‘if’</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td>all postposition-like cases, adverbs</td>
<td>@Continuous</td>
<td>Punctual, zero</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbs</th>
<th>Under negation</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonpast</td>
<td>-i (Potential Negative)</td>
<td>-i; (Actual Positive)</td>
</tr>
<tr>
<td>Past</td>
<td>-ñ (Actual Punctual)</td>
<td></td>
</tr>
</tbody>
</table>

The marking of the scopal domain of negation (and of the ‘if’ operator) by this morphological means is not foolproof from a listener’s perspective. This is because some nominal prefixes, and some verbal inflectional categories, occur both in negative and other contexts. However, several morphological forms are diagnostic. They are summarized in Table 5 (the symbol @ means nearly but not absolutely diagnostic).

Consider (21). It begins with two creole words, which together with the following three words constitute a single negative domain, before shifting to a new positive domain.

(21) no-more anything, ana-waɗawadad-jĩnũŋ wa-ɾi
not any(thing), ANA.CONT-STRONG-REL ANA-NOT.be
ambi-harga-n-di, wu-jadug ... 3PL/ANA-SEND-AUGM-PST.ACT.NEG ANA-finished ...
(‘We had) not anything strong (i.e., sturdy, effective). They (i.e., the whites) did not send that. It (i.e., the mission) was finished...’ (Heath 1980: 507)

The third word ‘strong’, which here modifies an unspecified inanimate abstraction (requiring ANA noun class), begins (as required in a negative or irrealsis domain) with the continuous form of the noun-class prefix (rather than its punctual form or zero). ‘Strong’ could be bracketed either with the preceding ‘(we had) not anything’ or with the following ‘they did not send’, since both are negative (bracketing is often, as here, largely meaningless in a radically non-configurational language). The word wu-ɾi, which is morphologically parsable as ‘it is not’, functions as the actual negative marker. The verb ‘did not send’ is in a form that, when combined with actual negative wu-ɾi, is interpreted as past negative actual (see Table 4), -n-di being the equivalent for this verb class of -ŋi in Tables 3 and 4. The final word wu-jadug ‘it is/was finished’ begins a new positive domain (its counterpart in a negative/irrealis domain is aŋu-.
Typology of clausal boundary marking devices

ja'daug. (21) is a typical example of how morphological indexation provides clues to scopal boundaries.

As noted earlier, Nunggubuyu is radically nonconfigurational, i.e., it lacks any clear evidence for a phrasal syntactic organization above word-level. The lexicon (including particles) and morphology are well-adapted to enable Nunggubuyu speakers to express functional equivalents of the complex syntactic constructions, including those with subordinated clauses, observed in configurational languages such as English. While it turns out to be fairly easy to find nonconfigurational counterparts of many English grammatical constructions, even without structural case-marking, the demarcation of left and right boundaries of scope-bearing operators (‘if’, negation) is the herculean challenge that a less well-designed radically nonconfigurational language might founder on. The use of morphological means to index a noun’s occurrence in an irrealis or negative domain, and a verb’s occurrence in a negative domain, is an effective adaptive solution to this potentially fatal functional conundrum.

Such word-by-word morphological indexing of a modal space would be overkill in configurational languages, which have better ways to mark clausal and phrasal boundaries. The Nunggubuyu system is sharply distinct from the limited, local indexation of negative scope by case switch. Examples of the latter are the Finnish partitive case, which is required of object NPs (even if bounded and definite) under negation (e.g., Kiparsky 2001), and the similar function of the Russian genitive (e.g., Bailyn 1997).

9. Case-stacking in Kayardild

The use of phrase- or clause-wide morphological indexing to specify scopal domains is elevated to a fine art in Kayardild (Mornington Island, Australia; Evans 1995a, b). However, here the morphemes in question are case suffixes, rather than a Nunggubuyu-style combination of aspectually sensitive noun-class prefixes and modally sensitive verbal inflectional affixes. The case suffixes are stackable (double case, Suffixaufnahme), forming up to four suffixal layers.

Kayardild shares with many languages a combination of (i) adnominal cases (ablative and genitive) in possessor-like functions, and (ii) various relational and adverbial (e.g., spatial) cases. Case functions (i) and (ii) are readily combined, in that order, as in (22) where ablative functions as a genitive-like adnominal case for ‘this man’, and instrumental is the case of the entire NP.

14. Evans interprets the relevant strings in terms of (nested) NPs. A reinterpretation recognizing appositional relations within a flat (nonconfigurational) syntax is suggested by the following facts: there is no grammatical distinction between “noun” and “adjective”, each word is morphosyntactically autonomous, word order can be scrambled, and any of the words may be elided.
The example illustrates Evans’s total concord principle, by which “all sub-constituents” (i.e., all words) of the relevant phrase share the case marking assigned to the phrase as a whole (Evans 1995a: 105).

Subjects and objects lack case-marking in the relational/adverbial case system. However, there is also a system of modal (i.e., aspect-mood) cases, which re-uses the same case suffixes found in the adnominal and relational/adverbial systems. All non-subject NPs, including objects (except in imperatives), are marked for a case category that is determined by the aspect-mood domain they are in. For example, when the verb has the past suffixal inflection, the (modal) ablative case is added to all non-subject nouns, including the (otherwise non-case-marked) object and any already case-marked adjunct nouns. The proprietive, allative, locative, and oblique cases are used in other aspect-mood spaces, and zero is used for “the imperative and nominalization of ongoing uncompleted activity” (Evans 1995a: 403). So if the above-mentioned instrumental NP ‘with this man’s good raft’ were to appear in a “prior” space, each word in the string as given above would be followed by an additional ablative suffix: this-ABL-INS man-ABL-INS good-INS raft-INS (MABL stands for modal ablative).

An example including a modal case is (23), where the modal locative (MLOC) indexes two constituents as being in the scope of the (unmarked) “instantiated” verb category. Utilitive case expresses an expected use.

(23) birangkarra bi-l-da mardala-tha dangka-walath-i,
      long time 3-PL-NOM paint-ACT man-a.lot-MLOC
   night-UTIL-MLOC
   ‘They have been painting the men for a long time, getting ready for (the dance) tonight.’ (Evans 1995a: 109)

The modal cases, typologically speaking, carry out three main functions. First, by being repeated on all nouns in the scopal domain of a clause-level inflectional category such as Past, they clearly mark the limits of that domain;

---

15. Or when the verb is marked for “almost” or (in subordinated clauses) “precondition” categories, which also specify a time interval prior to the reference time.
16. Incidentally, the syntactic distinction between subject and non-subject (i.e., VP-internal) nouns, and the existence of an imperative clause type (which also requires a notion of subject NP), force us to posit at least a rudimentary phrase structure. Even these features are absent from Nunggubuyu, which may be the most radically nonconfigurational language attested.
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this is the function that is directly relevant to this article. Second, modal cases help distinguish transitive imperative clauses from “actual” (past/present realis) transitive indicative clauses that have the same inflectional suffix on the verb (in the positive). This is because the object of an imperative remains in unmarked nominative case, while an object in a non-imperative clause takes a nonzero modal case suffix. Third, in non-imperative clauses, modal cases provide the only morphological distinction between subject and object, which are not distinguishable by linear order, and which share the zero nominative form at the relational/adverbial case level. A direct object, but not a subject, gets the modal case suffix appropriate to the clause-level inflectional category. The domain of overt application of modal case-marking corresponds to the traditional notion of VP (i.e., the clause minus the subject).

The modal cases operate clause-internally, and contribute significantly to defining boundaries of clauses (including main clauses). However, there is still another stacking layer of case morphology, found in nominalized or subordinated clauses, though only the oblique and locative suffixes occur in this outermost position. In one construction, an associative use of the oblique case is found with non-subject nouns in a nominalized clause whose verb takes a nominal suffix -n (followed by a case-marker agreeing with that of the clause-mate subject. In (24), the verb ‘drink’ takes -n followed by the modal ablative (mabl) agreeing with the case of the 3rd person singular pronoun. In the final two-word object NP in (24), aobl (i.e., associative use of oblique) follows this modal ablative.

(24) ngada kurri-jarra [niwan-jina kurdama-n-kina
1SG.NOM see-PST [3SG-MABL drink-n-MABL
[nguku-naa-ntha wuruman-urrur-naa-nth]]
[wate-MABL-AOBL billy-ASSOC-MABL-AOBL]]
‘I saw him drinking the water in the billy[can].’ (Evans 1995a: 112–113)

A similar final-position case marking (not combinable with the associative case-marking, thankfully!) is complementizing case marking. This occurs in finite subordinate clauses, which have a wide range of functions and may be translated in various contexts as relative clauses, as adverbial or purposive complements, or as arguments of verbs like ‘see (that . . . )’. Nonzero complementizing case marking occurs on all words in the clause (with some

17. The multi-pronged functionality of the Kayardild case system is remarkable, in spite of its uniqueness. Even the fine details make sense functionally (i.e., synchronically). The existence of this system should not be regarded as merely an accident of history.

18. The associative case (unrelated to the associative use of the Oblique case) in the final word in (24) denotes temporary possession, and is unrelated to the point being made here.
exceptions for pronominal subjects) when the pivot (i.e., the NP in a relative or purposive that is coindexed to the matrix subject) functions as something other than subject in the subordinate clause. An example is the object relative in (25) (coBL stands for complementizing oblique case).

(25)  
\[ \text{dan-da bang-a, [kakuju-ntha raa-jarra-ntha walbu-nguni-nj]} \]  
\[ \text{this-nom turtle-nom, [uncle-coBL spear-pst-coBL raft-ins-coBL]} \]  
‘This is the turtle (which) uncle speared from the raft.’ (Evans 1995a: 489–490)

The choice of complementizing case is this: oblique (coBL) when the subordinated-clause subject is 1st exclusive or 3rd person as in (25), locative when the subject is 1st inclusive, and either of these when the subject is 2nd person (Evans 1995a: 492–493).¹⁹ We might also consider the absence of audible case-markers in finite subordinate clauses with subject pivots to reflect (zero) nominative case, agreeing with the subject(s). However, oblique or locative complementizing case suffixes are also used when the subordinated clause is an argument of a main-clause predicate (‘know that . . .’, ‘be glad that . . .’, ‘see/hear that . . .’), whether or not the subjects of the two clauses are coindexed.

In their typological summaries of the issue, Plank (1995) and Moravcsik (1995) thoroughly analyse NP-level case doubling, found mainly in Australian, Slavic, Indo-Aryan, and ancient Near Eastern languages. They barely mention the Australian supra-NP case-stacking that is described in several intervening articles in the same important collective volume, supporting my contention that conventional typological analysis is challenged by these supra-NP and especially clause-level constructions. Evans, for his part, has argued that the modal and complementizing case markers are best understood as the products of historical transformations. But Kayardild case-stacking patterns are so ubiquitous, and so well-integrated functionally in the wider grammar of the language, that they cannot be dismissed as accidental byproducts of earlier historical shifts.

Whatever other functions stacked case markers have, by virtue of being repeated on all words in the relevant string – all nouns in an NP, all nouns in a VP under the scope of a TAM operator, or all words in a subordinated clause, as the case may be –, they furnish the listener with essential clues as to where the phrases and/or scope domains begin and end. In a language like Kayardild

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¹⁹. Subject pronouns may be omitted from subordinate clauses, leaving the choice of complementizing case as a hint as to the subject’s pronominal category.
that is significantly nonconfigurational, albeit to a lesser extent than Nunggubuyu, this morphological indexing is particularly helpful. It is no accident that case-stacking beyond the level of NP (or NP plus adjuncts) is reported only from Australian languages, which display a degree of nonconfigurationality (flat syntax) surpassing what is observed elsewhere. The modal, associative, and complementizing case-stacking patterns of Kayardild, and their analogues in some other Australian languages not considered here, can be understood as devices to overtly mark clause boundaries. Functionally, the most direct typological comparisons should be with other word-by-word indexing devices such as the Nunggubuyu system described above, in spite of the fact that completely different grammatical categories are involved.

10. Summary

Locating the boundaries of stems, words, low-level phrases, and subordinated clauses is fundamental in processing speech. Vowel harmony and other phonological processes often attributed to phonetic causes can be reinterpreted as results of natural selection of mutations that serve to mark word boundaries. Likewise, we can and should be alert to boundary-marking functions of morphosyntactic phenomena that until now have been classified under distinct rubrics such as clausal coordination, multiple case marking (Suffixaufnahme), or V2 syntax. Without this perspective, such devices as word-by-word morphological indexation will remain typologically uninterpretable.

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Abbreviations: 1/2/3 1st/2nd/3rd person; abl ablative; act actual; all allative; ana a noun class; aobl associative use of oblique; assoc associative; augm augment; compl complementizer; cont continuous; def definite; du dual; imp imperative; inf infinitive; ins instrumental; ipfv imperfective; loc locative; masc masculine; mabl modal ablative; mloc modal locative; neg negative; nom nominative; obl oblique; op operator; pfv perfective; pl plural; polarq polar question; pres present; pst past; ptcp participle; rel relative; sbj subject; sbjv subjunctive; sg singular; tam tense-aspect-modality; trans transitivizer; util utilitive; W word.
References


