A Person First constraint on the linearization of clitics

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Abstract

In this paper, I examine person and case discontinuities in the pronominal clitics of Yulparija, a Pama-Nyungan language. I argue that these discontinuities arise from syntactic movement. This movement creates parallel sets of discontinuities at the clausal level and within individual clitics, and suggests that the motivation for this movement applies equally across multiple levels of structure. To capture this, I propose Person First, a condition on syntactic movement that causes highly-ranked person features to move leftwards during Spellout. Unlike competing alternatives, Person First is able to capture flanking and non-flanking orders (cf. Harbour 2008) while also predicting strong person-left tendencies. For Yulparija, this analysis explains why person discontinuities only arise in second-person duals and exclusives. This account thus provides a way to connect the morphological composition of pronominal clitics to their clausal behavior, suggesting that the order of clitics may not be not as arbitrary as previously thought.

1 Introduction

In this paper, I examine the distribution of person in the pronominal clitics of the Australian language Yulparija (Western Desert, Pama-Nyungan). Clitics in Yulparija are ordered according to a person hierarchy: first persons must go first, followed by second, then third. In the clitic cluster, this results in high persons appearing at the left, regardless of their thematic role. This on its own is not typologically unusual. However, the interesting thing about Yulparija is that clitics cross-referencing a single DP must obey the same restriction. That is, that person features must occur at the left. These overlapping person hierarchies induce discontinuities of a kind that has not been discussed in previous literature. By discontinuities, I mean constructions where morphemes exponing closely-related phi features are not adjacent. I argue that these discontinuities (and their hierarchies) arise from predictable syntactic movements that occur during Spellout.

I propose Person First, an output restriction on trees of phi-features that I argue can drive syntactic movement (cf. P-Constraint, Zubizarreta and Pancheva 2017; relativized EPP, Hammerly 2020). Person First requires that the morphemes exponing person occur first in their local domain, and will force these morphemes to pied-pipe or move during Spellout. This movement has the effect of creating discontinuities at multiple levels of structure: at the clausal level (as in the clitic cluster) and in individual Ds (as in the internal composition of clitics cross-referencing a single argument). The alternative to Person First would be to hard-code the person hierarchy as separate projections in the DP and CP structure. While such parallelisms have been proposed before, I argue that that approach is inappropriate for Yulparija. This paper thus demonstrates how to implement person hierarchies as a syntactic output filter, using Yulparija as a case study.

1.1 Roadmap

The paper is organized as follows: Section 2 introduces the core data and outlines the proposal in comparison to the major alternatives. Section 3 applies the analysis to discontinuities within individual Ds and the clitic cluster. Section 4 then discusses alternatives and typological predictions. Section 5 discusses an extension to the analysis that captures various morphological facts, and Section 6 concludes.

The analysis is complex, primarily because the data is complex. On a first pass through the paper, the reader may wish to read the beginning and interim conclusion of each section, then return back to get the details.

*This is a draft. All comments are welcome. Feel free to get in contact with me at mooney@nyu.edu

2 The puzzle

2.1 Discontinuities: a problem from the start

Person discontinuities are fairly common phenomenon cross-linguistically. Broadly construed, person discontinuities are any construction where the phi-features cross-referencing a single argument are not linearized as adjacent morphemes. In generative morphosyntax, this is puzzling because these morphemes are assumed to originate as constituents (either via agreement or as D elements base-generated in argument positions). For some examples of person discontinuities, see (1), where two morphemes cross-referencing the same DP (marked in boxes) are not adjacent.

(1) a. Catalan (Bonet 1995: 611)

De pomes, als nens, **=ə*lz*ə** **=*n*** **=*i*** *donaré demà* **ə*lzi-n, *n-ə*lzi*
GEN apples DAT.the children =3PL.DAT =3.GEN =3PL.DAT will-give(1st) tomorrow

'I will give apples to the children tomorrow'

b. Warlpiri (Hale, 1973)

nganimpa-rlu ka **=*rna*** **=*ngku*** **=*lu*** *nyuntu nya-nyi*
we-ERG PRES =1(PL).NOM =2SG.ACC =PL.(NOM) 2 see-NONPST

'We (plural exclusive) see you singular.'

c. Zamudio Basque (Arregi and Nevins, 2012)

bixitze bi-∅ ego-n **=*s*** **=*intz*** **=*e*** **=*n*** *suo-k*
life two-ABS be-PRF 2(PL.ABS) PST.2.PL (2)PL.ABS C.PST 2PL-ABS

'You (pl) were there for a very long time.'

Person discontinuities are rarely regular, which poses a challenge for linguists. One approach ("the lexical approach") involves using lexically-specific reordering rules to derive the correct surface order (e.g. Basque ergative metathesis Arregi and Nevins 2012: 279). However, these rules present overgeneration issues. Typologically, person discontinuities almost always involve a "person left, number right" type pattern (Harbour, 2008; Trommer, 2003). The fact that other discontinuities are unattested (e.g. #$_i$-X-Person$_i$) indicates that there is some sensitivity to abstract morphosyntactic features, and therefore that we should not model this splitting behavior as an arbitrary lexical effect.

Another approach ("the syntactic approach") is to say that Person heads its own functional projection in the clausal periphery ("PersonP Hypothesis" Martinović, 2019; Shlonsky, 1989). Shlonsky (1989) proposed such a PersonP projection above T, which is meant to capture why Arabic person agreement is prefixal even when gender and number agreement is suffixal. How would we apply this to Yulparija? For Yulparija, a PersonP projection would attract clitics with highly-ranked person features, moving high persons to the left and stranding number/case clitics low. However, only certain clitic combinations yield discontinuities, and thus the syntactic approach overgenerates discontinuities for Yulparija.

If only morphosyntactic features were responsible, then we might expect these patterns to be more regular than they are. We would expect splitting in all cases, not only in certain specific combinations. On the other hand, if all discontinuities were the result of lexically-specific rules, we wouldn't expect to see these broad typological tendencies in what can split. The answer to this puzzle, I argue, lies in appealing to post-syntactic movement, governed by Person First as a constraint on output structure.

2.2 Yulparija data

I now present data on the pronominal clitics of Yulparija, a Western Desert (Pama-Nyungan) language spoken in Western Australia. Unless otherwise cited, all data come from unpublished field notes from Geoff O'Grady, collected between 1960-1967 in Bidyadanga, Western Australia.[1] The field notes were a collection of texts and

[1] The corpus contains 676 transcribed sentences (3650 words): 181 from extended texts and 495 from elicitation.

elicited sentences from four speakers.[2] Yulparija has second-position pronominal clitics that obligatorily double all argument DPs in a clause. As in (2), a person hierarchy causes high person clitics to go first.[3]

(2) Person hierarchy – high person clitics first (1 > 2 > 3)

a. *waru* ***=la*** ***=jana-mpa*** ***=lura*** *wirika-nganya kangkuru-ku*
fire =1PL.NOM =3PL-DAT =3SG.ABL light.fire-FUT kangaroo-DAT
'We will spread fire across-wind for kangaroos.' B-33

b. *ngayu-lu* ***=rna*** ***=nyurra-mpa*** *waru* *ka-ngku-ra* *wuri-ku*
1-ERG =1SG.NOM =2PL-DAT wood.ABS bring-IRR-OPT many-DAT
'I'll bring wood for you (pl.)' G2-122

c. *wanyjal-marlu-rta* ***=ngku*** ***=ya*** *jiji-rti*
how-NUM-EMPH =2SG.DAT =3PL.NOM child-PL
'How many children do you have?' B-131

In second-person dual clitics, the person hierarchy triggers *splitting*, where person and number portions of a clitic are discontinuous. In (3), the morpheme exponing person (*-nta*) separates from the morpheme exponing number (*-pula*):

(3) Clitic *-nta-pula* '2DU.ACC' splits

a. *pu-nganya* ***=nta*** ***=ya*** ***=pula***
hit-FUT =2ACC(DU) -3PL.NOM =(2ACC)DU
'They will hit you.'

b. *ka-ngu* ***=nta*** ***=ya*** ***=pula***
carry-PST =2ACC(DU) -3PL.NOM =(2ACC)DU
'They took you.'

Crucially, splitting only applies with second-person dual clitics (e.g. *=nta-pula* '2ACC-DU'). In other clitic combinations, clitics that cross-reference a single DP argument act as a constituent.

(4) No splitting in other clitic combinations

a. *pu-nganya* ***=li-ju*** ***=nta-pula*** *(*=li =nta =ju =pula)*
hit-FUT 1DU.NOM-EXCL 2.ACC-DU
'We (excl) will hit you…'

b. *pu-ngku-la* ***=la-nya*** ***=ya*** *pawu-lku-rta* *(*=la =ya =nya)*
hit-IRR-IMP =1PL-ACC =3PL.NOM cook-IRR-EMPH
'They might kill us and cook us.'

c. *tiyi* ***=rna*** ***=li-mpa*** ***=lura*** *kuja-n-pa* *(*=li =rna =mpa =lura)*
tea.ABS 1SG.NOM 1INCL.DU-DAT 3SG.ABL prepare-FUTMIN
'I'll brew tea for both of us.' B-34

d. *kakarra* ***=ya*** ***=pula-nya-ra*** *yala kujarra-ngka warinyka-ngu rtuju-kujarra-ngka*
east =3PL.NOM =3DU-ACC-LOC DEM two-LOC meet-PST woman-two-LOC
matu-kujarra-ngka
widow-two-LOC

[2] A reviewer asks about the broader language background of the consultants, given the porous boundaries of usage found between many Western Desert languages. The four consultants were all fluent in Nyangumarta, Kriol, Walmatjarri, and Yulparija. Elicitations were conducted in a mixture of English, Kriol and Nyangumarta. On the whole, it does seem that the speakers treated Yulparija as distinct from both Nyangumarta and Walmatjarri, since they can also be seen correcting each other when code-switching into Walmatjarri in the field notes. This is further confirmed when comparing with existing grammars on Yulparija (Burgman, 2008; Burridge, 1996), which also draw from the O'Grady data. Insofar as it makes sense to describe any of these Western Desert languages as individual languages, we can be certain that this pattern is a part of the Yulparija grammar and not a passing contact effect.

[3] The data is presented in the standard orthography for Western Desert languages: *rC* indicates a retroflex consonant, *Cy* indicates a palatal consonant, *ng* = ŋ, *rr* = ɾ, *r* = ɹ, *y* = j, and *j* = ɟ.

'They came east to meet his two widows.'

This pattern is similar to person discontinuities in other languages, as Catalan, Warlpiri, and Basque shown in (1). In certain combinations, the morpheme that expones person appears farther to the left than the morpheme that expones number.

The exceptional thing about Yulparija is that parallel discontinuities also occur within clitics cross-referencing a single DP. To illustrate, take the sample of Yulparija clitics in (5). The structure of these clitics is PERSON-CASE-(CLUSIVITY)-CASE. Person features are exponed at the left: *-li* for first person dual, *-la* for first person plural, and *-nyurra* for second person plural. The interesting thing here is that clusivity (*-ju*) is not marked adjacent to other person features. Instead, it surfaces after the accusative (*-nya*) or dative (*-mpa*). This is a type of person discontinuity, because first-person *-li* and *-la* are not linearized adjacent to the morpheme *-ju* that restricts their interpretation to exclude the addressee.[4]

(5) Person morphemes (underlined) are separated from clusivity (bolded) (Burgman 2008: 24)

		NOM/ERG	ACC	DAT/GEN	LOC/COM
du	1 incl	-li -1DU	-li-nya -1DU-ACC	-li-mpa -1DU-DAT	-li-nya-ra -1DU-ACC-LOC
	1 excl	-li-**ju** -1DU-**EXCL**	-li-nya-**ju** -1DU-ACC-**EXCL**	-li-mpa-**ju** -1DU-DAT-**EXCL**	-li-nya-**ju**-ra -1DU-ACC-**EXCL**-LOC
pl	1 incl	-la -1PL	-la-nya -1PL-ACC	-la-mpa -1PL-DAT	-la-nya-ra -1PL-ACC-LOC
	1 excl	-la-**ju** -1PL-**EXCL**	-la-nya-**ju** -1PL-ACC-**EXCL**	-la-mpa-**ju** -1PL-DAT-**EXCL**	-la-nya-**ju**-ra -1PL-ACC-**EXCL**-LOC
	2	-nyurra -2PL	-nyurra-nya -2PL-ACC	-nyurra-mpa -2PL-DAT	-nyurra-nya-ra -2PL-ACC-LOC

In summary, the underlined and bolded clitics in (5) ought to be adjacent given the standard assumption that phi-features form a constituent to the exclusion of case features. The fact they are not is puzzling and typologically unusual. This person-left pattern holds for all individual clitics in the language; see Section 8.1 for the full paradigm.

From these data, I draw two parallels between φ-feature order in the clitic cluster and φ-feature order in clitics cross-referencing single DPs:

i. Person Generalization: (High) person features go first.

- In clitics cross-referencing a single DP, person-exponing morphemes go first. Examples of this include *-li* '1.DU', *-la* '1.PL', and *-nyurra* '2.PL', underlined in (5).
- In the clitic cluster, this corresponds to the person hierarchy from (2).

ii. Discontinuities. Closely related φ-features are not always adjacent.

- In clitics cross-referencing a single DP, person features are not always adjacent. Examples of this occur with the exclusive morpheme (*-ju*), which can be separated from other person features by case (e.g. ***la**-mpa-**ju*** '**1PL**-DAT-**EXCL**').
- In the clitic cluster, φ-features corresponding to a single DP are also not always adjacent. This is seen in the splitting pattern from (3), where φ-features of one DP are separated by φ-features of another (e.g. ***=nta**=ya=**pula*** '**=2ACC**=3PL.NOM**=DU(ACC)**').

In a generative analysis, these patterns are easy to describe, but difficult to derive. This is largely because clitics and clitic clusters are usually assumed to be different types of syntactic objects. Individual clitics are often treated as simplex D heads, which are base-generated low in the clause (Anagnostopoulou, 2003; Torrego, 1988; Uriagereka, 1988, 1995). On the other hand, second-position clitic clusters are located high in the left periphery,

[4]This pattern can be understood as a non-flanking discontinuity (cf. flanking, Harbour 2008), because we see interleaving of phi-features (X_π-Y_{case}-X_π-Y_{case}) rather than nesting (X_π-Y_{case}-Y_{case}-X_π). Harbour (2008)'s theory predicts flanking/nested orders to be universal, and thus the Yulparija exclusives are a counterexample to this claim.

and are either treated as complex heads or as sequences of functional heads that do not form a syntactic constituent (see Nevins 2011 for clitic clusters as complex heads; Sportiche 1993, 1996 for clitic projections above Voice).

In my analysis, I use the person and discontinuity generalizations to motivate treating individual Ds and clitic clusters as the same type of syntactic object: subtrees of phi-features. Like any other syntactic structure, these phi-feature subtrees (or elements therein) may undergo movement. I therefore claim that the mechanisms that induce person-left orders and discontinuities are exactly the same: they are genuine syntactic movements, driven by a persistent need to preserve person hierarchies at all levels of syntactic structure.

2.3 The proposal

In this paper, I contend that person discontintuities emerge from genuine syntactic movements that occur during Spellout. I argue that there is no need to appeal to clitic-specific projections at the clausal periphery, nor is there a need for lexically-specific readjustment rules. Rather, clitic order emerges naturally from predictable movements within φ-feature subtrees that occur cyclically as features spell out.

The core proposal is an output restriction I call Person First. Person First requires that the highest-ranked person features are contained in the leftmost lexical item of their syntactic domain. (Exactly which phi-features are highest on hierarchy – first or second – is a language-specific parameter.) This is stated in (6), which I will formalize in Section 4.

(6) *Person First Requirement* (informal): The highest-ranked person features must be contained in the leftmost lexical item of a spelled-out syntactic domain. To accomplish this, Person First will induce movement.
   a. Marked person will pied-pipe with other moving constituents whenever possible
   b. Person will move leftwards if necessary

Person First is a persistent condition on syntactic outputs that induces movement. This has some similarities to Zubizarreta and Pancheva (2017) (agreement in Paraguayan Guaraní) and Hammerly (2020) (agreement in Ojibwe). It is also conceptually related to proposals like Fox and Pesetsky (2005), who argue that successive cyclic movement is driven by global preferences for hierarchy preservation. I compare these theories in detail in Section 4.

I assume that Person First is evaluated cyclically for each syntactic head. Thus, Person First effects only arise when there is more than one person-exponing morpheme on a single syntactic head. This is essentially equivalent to assuming that all syntactic heads are phases, and that Spellout occurs inside each head just as it does at the clausal level. Person discontinuities arise when Person First movement strands other material.

Person First is thus a way to implement person hierarchies as a persistent well-formedness requirement on syntactic trees. In Yulparija, we can see Person First in multiple places in pronominal clitics. Within clitics cross-referencing a single DP, morphemes realizing person features always precede morphemes realizing number or case. In the clitic cluster, morphemes realizing high persons are also realized before clitics of lower persons. In Section 3, I show how these parallelisms between individual Ds and the clitic cluster are captured uniformly by Person First. I briefly summarize the three main generalizations this analysis will cover in (7):

(7) Four main generalizations the analysis will explain:
   a. Clitics exhibit a person hierarchy at multiple levels of structure
      → Person hierarchies are implemented as an output condition on phi-feature subtrees (Person First)
   b. Non-flanking orders are possible (X-Y-X-Y) in double discontinuities (contra Harbour 2008)
      → Non-flanking patterns arise from how Person First interacts with Spellout
   c. Splitting is limited to second-person duals
      → Second-person duals need movement to spell out, giving them a special syntactic structure
   d. Not all Western Desert languages show splitting
      → Person First will trigger different movements depending on where clitics are base-generated

2.4 Past accounts

There are three main ways that generative morphosyntax has implemented person hierarchies in previous work: as narrow syntax, as morphological effects, or as the result of Spellout.

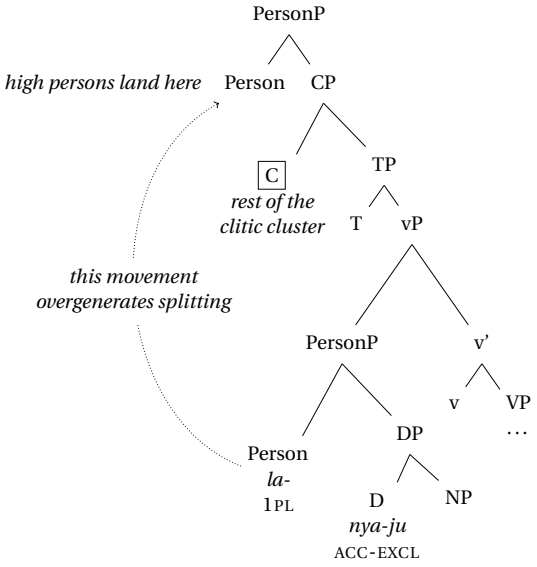
2.4.1 Narrow syntax

In a narrow syntactic approach, discontinuities are generated via syntactic movement to a higher functional projection. This approach is particularly common in Cartographic approaches to clitics (Cattaneo, 2009; Ciucivara, 2009), but has also been proposed elsewhere (e.g. PersonP Hypothesis, Shlonsky 1989, Martinović 2019; see Harbour 2007 for arguments against).

There are two core problems with a narrow syntactic approach. The first is that it tends to predict discontinuities to be more regular than they actually are. For example, in Yulparija only second-person dual clitics split; all other clitics behave as constituents. A PersonP hypothesis will generally predict that any clitic that bears second person features should split regardless of number. However, in Yulparija this prediction is false: even polymorphemic clitics like *nyurra-nya* '2PL-(PL)ACC' or *la-nya-ju* '1PL-ACC-EXCL' cannot split. To be successful, a narrow syntactic approach would need to say that second-person dual clitics (e.g. *-nta-pula* '2ACC-DUAL') have a different structure than non-splitting clitics (e.g. *-nyurra-nya* '2PL-ACC'). While not fatal, this presents a complication to most syntactic approaches, which generally assume that clitics are atomic D heads.

Another issue for a narrow syntactic approach is that in Yulparija we need the same hierarchy at multiple levels of structure. Person features occur at the left of Yulparija clitics, both in the clitic cluster and within clitics cross-referencing a single argument. To capture this in a narrow syntactic perspective, we would need to stipulate that there is a high person projection both within the DP and at the clausal periphery.

(8) PersonP in DP and CP layers overgenerate splitting for *-la-nya-ju* '1PL-ACC-EXCL'



While such parallelisms between nominal and clausal structure form the basis of the DP hypothesis (Szabolcsi 1983, 1989; Fukui and Speas 1986; Abney 1987), it is far from a resolved issue (cf. Bruening 2009, Bruening et al. 2018). A serious open question is exactly how these parallelisms are maintained: Is there a finely-articulated universal spine that just happens to repeat certain hierarchies? Or are there external constraints that act on syntactic structures to preserve certain hierarchies? For Yulparija, hard-coding these hierarchies into the syntax overgenerates splitting (as discussed above).

2.4.2 Postsyntactic rules

Another option is to derive discontinuities using some type of postsyntactic rule. This is the general approach taken in Distributed Morphology (Halle and Marantz, 1993), where discontinuous constructions often modelled as the result of *fission*, a postsyntactic operation that splits feature bundles into two positions of exponence. Fission is implemented in two main ways in DM: (i) as a morphological copy-and-split operation that feeds vocabulary insertion (Arregi and Nevins, 2012; Hewett, 2020), or (ii) as a process where subsets of morphosyntactic bundles are matched to vocabulary items (Halle, 1997; Noyer, 1992; Trommer, 1999). In the copy-and-split approach, fission is unpredictable and must be memorized; whereas in the subset-matching approach, fission is fed by the inventory of vocabulary items available.

For both of these approaches, the final position of the split morphemes must be stipulated by some other displacement mechanism. Displacement rules of this type are problematic on empirical and formal grounds. Empirically, displacement mechanisms are unconstrained, and there is virtually no order that morphological metathesis rules cannot generate. This does not match up with the typology, where we see robust "person left, number right" discontinuities, but not the reverse.

Formally, displacement rules also raise an architectural question about the post-syntactic component. If such postsyntactic displacement rules exist, are they best understood as late versions of ordinary syntax, or early versions of phonology? On the whole, DM tends to cast its postsyntactic operations as morphological equivalents of phonological rules, including phonological metathesis (e.g. Arregi and Nevins 2012: 133). However, recent work in phonology contests the existence of regular metathesis rules (Mooney, 2021; Takahashi, 2018, 2019). Without going into detail on the phonological arguments, the claim goes that if phonology could transpose sounds for purely phonotactic reasons, then phonological typology would look different than it is.[5] Transposition rules thus are argued to not exist as a phonologically regular phenomenon, but are always indexed with a particular morpheme in mind. The problem here is a deep one: the use of morphological metathesis rules in DM thus does not come for free, and the addition of such rules must be carefully weighed against similar displacement mechanisms such as movement.

2.4.3 Spellout and linearization

A last approach derives discontinuities via universal principles of Spellout. One of the more explicit proposals is Harbour (2008), who argues that person discontinuities emerge from conflicting pressures during linearization. Harbour proposes that phi features are arranged into subtrees that (i) want to be linearized from the root outwards, but (ii) do not want to disrupt existing adjacency relations.

The unique prediction of Harbour's proposal is *flanking*, a nesting pattern for double discontinuities. Harbour argues that flanking is universal, drawing on data from two languages, Yimas and Walmatjari:

(9) Flanking discontinuities (person$_a$ -**person$_b$** -**number$_b$** -number$_a$), via Harbour (2008: 186)

a. *ta-* *pu-* ***nan-*** ŋan *r-* ŋ***kan*** *-um*
NEG 3 2PL give -PF -PAUC PL

'You few didn't give (it) to them.' (Yimas, Foley 1991: 260)

b. *nyurra-warnti ma* *-rna* ***-n -ta*** *-lu* *nyany-a nganampa-rlu*
2-PL AUX -1SG(.NOM) -2 -SG -PL see-PRS 1.PL-ERG

'We all (exclusive) saw you.' (Walmatjari, Hudson 1978: 60)

However, flanking is not a universal. In Djaru (Pama-Nyungan) for instance, we have person$_i$-*person$_j$*-number$_i$-*number$_j$*, where phi features of different arguments are interleaved rather than nested (see Section 5.4). To predict these types of facts, Harbour must either (a) stipulate a different starting structure for these cases, or (b) use a morphophonological metathesis rule to derive the correct order. While descriptively adequate, both of these solutions dramatically expand the predicted typology. For instance, if we can stipulate different starting structures depending on the phi-features present, this begs the question of how these different structures would diachronically emerge to begin with. As already discussed, the problem with morphophonological rules is that they are both unconstrained and offer similar empirical coverage as movement, and therefore the grounds supporting their existence are uncertain.

2.5 Interim conclusion

To sum up, previous approaches generally force the burden of reordering onto only one of the following three areas: particular lexical items, morphosyntactic features, or phonological features. Yet, it appears that all three of these factors are at play in determining clitic order. What I propose is that the mechanisms for reordering are syntactic: all discontinuities arise from movement. This allows us to eliminate broader predictions of reordering in morphophonology because reordering is movement, not a morphophonological mechanism.

[5] Note that reordering in infixation is not clearly phonological under this view – infixation is displacement of a morpheme, not an arbitrary unit of sound, and the infix placement occurs to satisfy idiosyncratic lexical requirements rather than global phonotactics.

Additionally, as we have seen, Western Desert languages display both flanking and non-flanking discontinuities (see previous subsection). This will turn out to be important, since only the present analysis derives both flanking and non-flanking discontinuities using the same system.

3 Formal Analysis

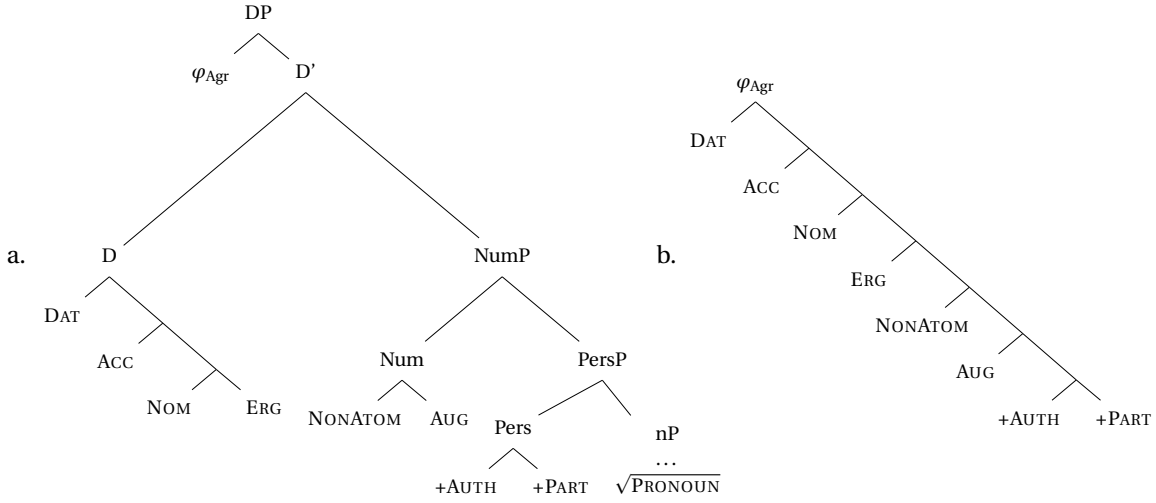
3.1 Framework

3.1.1 Agreement

I assume that clitics are generated by Agree (Sportiche, 1993, 1996; Suñer, 1988). I assume this Agree probe originates in the spec of DP (Anagnostopoulou, 2003; Torrego, 1988; Uriagereka, 1988), and explain the reasoning behind this in Section 4.3. I treat the output of Agree as a phi feature subtree. This departs somewhat from previous work, which either represents phi-features as unstructured (see discussion in Anderson, 1992) or as feature geometries that are distinct from (clausal) syntactic objects (Harley and Ritter, 2002; McGinnis, 2005). Treating the output of agreement as syntactic subtrees will allow us to manipulate phi features using syntactic movement.

I assume that Agree creates a copies of features that preserve the hierarchy of the DP, but removes all branching nodes and roots. To illustrate, the Agree probe in the spec of DP in (10a.) would copy features to create the subtree in (10b.).

(10) Agree that targets DP (a.) will yield subtree in (b.)



Agreement substitutes the simplex φ_{Agr} in (10a.) for the complex head in (10b.)

3.1.2 Spellout

Phi feature subtrees are matched to lexical items using *spans* (Brody, 2000; Svenonius, 2012). During Spellout, a spanning algorithm proceeds up the tree from bottom to top, checking at each node if there is a vocabulary item that matches a contiguous substring of terminal nodes. Following Nanosyntax (Caha, 2009; Starke, 2002, 2009; Taraldsen, 2010, a.o.), I assume this spanning algorithm optimizes for two things: maximizing the size of the span ("Biggest Wins") and minimizing unused features ("Minimize Junk"). I will return to these in Section 6.1. In practice, maximizing the size of the span is more important.

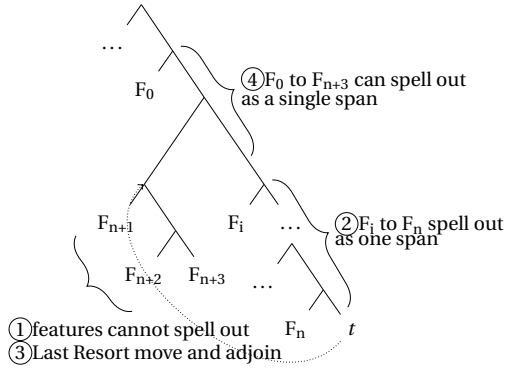
I also assume Last Resort movement. When spans cannot undergo Spellout locally, features without a local match will move in order to find other features to spell out with (11). In these cases, the derivation will spell out the lowest span that has a local match, and move all unmatched features to an adjunct position above it.

(11) *Last Resort Movement*
Features that have no matching lexical item locally may move and spell out with a higher span (Starke 2018: 245).

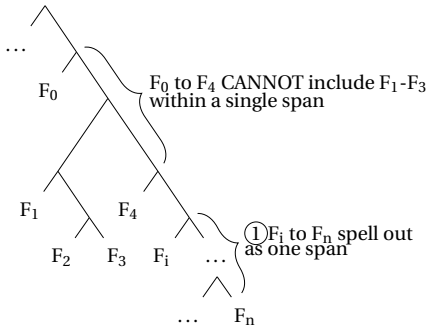
I allow adjuncts created via Last Resort movement to be included as part of a higher span as in (12). These sequences do not constitute a traditional span, but the alternative would be to allow sidewards head-movement so that the moved features end up directly in the featural spine. In favor of more restrictive syntactic operations, I allow Last Resort movement to create new lexicalizable spans.

To illustrate, take the example in (12) and assume that [F_{n+1} F_{n+2} F_{n+3}] cannot spell out locally. The derivation spells out the lowest lexicalizable span, which is [$F_i \dots F_n$]. The leftover features [F_{n+1} F_{n+2} F_{n+3}] undergo Last Resort movement, and are spelled out in the span [F_0 F_{n+1} F_{n+2} F_{n+3}]. In contrast, ordinary adjuncts cannot be included in spans like in (14). This suggests that there is a special relationship between a span and a adjunct/specifier at its edge.

(12) Last Resort moved features can be spelled out with higher spans



(13) Ordinary adjuncts cannot be included in larger spans



I also assume that all syntactic structures are left-headed (Kayne, 1994). The primary reason I adopt this is because it is unclear how Last Resort movement and spans would interact with right-headed structures. For instance, if in (12) above we had right-headed structures, and last-resort moved [F_{n+1} F_{n+2} F_{n+3}] to spell out, it is not immediately clear where the the lexical item should spell out – before or after the item matching [$F_i \dots F_n$]. I discuss reasons why we may not want high generation of person (so that it spells out in-situ) in Section 5.2.1.

In sum, this means that some features must move in order to spell out. This will occur any time person and case are portmanteau to the exclusion of number, which later on will be crucial in defining splittable clitics. Person First movement is evaluated phasally, and so Last Resort movement always occurs before Person First movement.

3.1.3 Differences with Classic Nanosyntax

This framework takes much inspiration from Nanosyntax, but there are several major differences. For one, classic Nanosyntax assumes the Superset Principle, which allows overspecified vocabulary items to be inserted when no better match exists (Starke 2009: 3). The Superset Principle is generally applied as a way of deriving syncretism, since it allows a vocabulary item to spell out any subtree it *contains*. In my analysis, I do not adopt the Superset Principle, largely because this principle would be in conflict with Last Resort movement. I will instead adopt the use of disjunctive lexical items to derive some syncretisms (see "peripheral spans", cf. pointers in Blix 2020; Pantcheva 2011), discussed in Section 6.

A second difference is the usage of Last Resort movement. In Starke (2018), Spellout proceeds by matching syntactic *constituents* with lexical items, not spans. Last Resort feeds Spellout by moving out all features not contained in the matching lexical item. In my analysis, the role of Last Resort is different. Last Resort is only needed when features cannot spell out locally. By contrast, in Starke (2018) Last Resort is needed for almost every lexical item, because we will need to move out all spelled-out vocabulary items from lower in the tree. Given these substantive differences with Nanosyntax, I provide formalized Spellout algorithm in the Supplemental Materials (8.2).

A last, but not insignificant difference is that I also assume that features may be privative or binary. Standard Nanosyntax assumes that only privative features exist. Given morphological and semantic evidence in favor of bivalent features for person (see arguments in Harbour 2016 and references therein), I have decided to dispense with this assumption.

To summarize, the framework adopted here proposes that clitics are formed via Agreement, and that Agreement subtrees are spelled out via spanning. The Spellout algorithm generally tries to insert the largest spans possible, and features may undergo Last Resort movement if they cannot spell out locally. In the next section, I briefly summarize the featural assumptions, and then I show a sample derivation using the spanning mechanisms introduced here.

3.2 Featural assumptions

I assume that these phi features are arranged in a fixed hierarchy, CASE ≫ NUMBER ≫ PERSON. Note here that I base generate person quite low (following Harbour 2014). Because person is low, local persons will always move to satisfy Person First requirement. Discontinuities occur when non-local or non-person features are stranded during Person First driven movement. In Section 5.2.1, I discuss how base-generating person high fails to derive the correct set of discontinuities for Yulparija.

3.2.1 Case features

I adopt Caha (2009)'s case containment hypothesis, which assumes a universal case hierarchy of ABL ≫ LOC ≫ DAT ≫ ACC ≫ NOM. In terms of spans, higher cases structurally contain those below. For example, a dative clitic will contain a subtree of [DAT[ACC[NOM]]] features, whereas an accusative will contain only [ACC[NOM]]. This accounts for the generalization that larger, more peripheral cases will often share or contain vocabulary items from smaller cases. In Yulparija, we see this in locatives, which are composed of an accusative clitic with the morpheme *-ra* (e.g. *=la-nya-ra* '1PL-ACC-LOC' vs. *=la-nya* '1PL-ACC').

3.2.2 Number features

For number, Yulparija has a distinction between singular, dual, and plural clitics. Given an absence of detailed semantic data on the language, my assumptions about the number system are derived from purely morphological arguments. Without going into these in detail, I assume that Yulparija has three number features: NONATOM(IC), MIN(IMAL) and AUG(MENTED) (cf. [±ATOMIC, ±MINIMAL] in Harbour 2014; [±AUGMENT] in Harbour 2003). The singular is featurally unmarked, the dual is composed of NONATOM and MIN, and the plural is NONATOM and AUG.[6]

3.2.3 Person features

For person, I adopt two features, [±AUTHOR] and [±PARTICIPANT] (cf. Hale 1973, Silverstein 1976). Yulparija encodes a clusivity distinction in first person, and so I assume that inclusive is [+AUTHOR, +PARTICIPANT] and exclusive is [+AUTHOR, -PARTICIPANT]. Second person is [-AUTHOR, +PARTICIPANT], and third person is [-AUTHOR, -PARTICIPANT]. Following Harbour (2016), I assume that this four-way distinction comes along with [AUTHOR] being higher than [PARTICIPANT] in the underlying hierarchy.

Generally, [±AUTHOR] and [±PARTICIPANT] are realized in a portmanteau morpheme in Yulparija, but in exclusives they are spelled out in separate morphemes. To illustrate, see the exclusive paradigm in (14). The exclusive clitics differ from the inclusive ones in the presence of the morpheme *-ju*:

(14) Clusivity distinction in Yulparija 1PL clitics

	INCLUSIVE [+AUTH, +PART]	EXCLUSIVE [+AUTH, -PART]
1PL.NOM	-la	-la-**ju**
1PL.ACC	-la-nya	-la-nya-**ju**
1PL.DAT	-la-mpa	-la-mpa-**ju**
1PL.LOC	-la-nya-ra	-la-nya-**ju**-ra

Typologically, this pattern is unusual because the exclusive morphologically contains the inclusive. This goes against traditional analyses of clusivity: Zwicky (1977: 726) for instance treats the inclusive as having both author and addressee features ([+I, +II]), but the exclusive lacks addressee ([+I]). Under this view, the inclusive contains

[6] These features are binary in Harbour (2003, 2014), but I use privative versions here because the clitics only encode [-ATOMIC, +AUG] and [-ATOMIC, +MIN] numbers (plurals and duals, with unmarked singular).

the exclusive. Yulparija therefore presents an inversion of the expected containment relationship, because it is the exclusive that is built from the inclusive.

For the purposes of this analysis, I capture Yulparija clusivity by having *-ju* spell out [-PART], while inclusive clitics like *-la* may match with *either* [+AUTH] or [+AUTH, +PART] spans. I discuss this type of disjunctive Spellout in Section 6.

An anonymous reviewer asks if *-ju* must encode the exclusive directly, or if it might be some other kind of oblique marker. Diachronic data suggests *-ju* does encode person, since *-ju* is derived from the Proto-Pama-Nyungan pronoun **ngatyu* '1SG.DAT' (Jones 2011: 148). To resolve this issue synchronically, we would need more detailed semantic data than what is available on any of the Western Desert languages. I therefore table this issue, and refer to whatever feature corresponds to *-ju* as [-PART] for ease of reference. In the analysis, it is not crucial that this is semantically an exclusive — the only thing that matters is that it is a distinct feature that attaches below [±AUTH] in the hierarchy. This is a broad feature of most Nanosyntactic analyses: the semantic identity of each feature is unimportant, only the number of features and their location in the universal spine matters for the analysis.

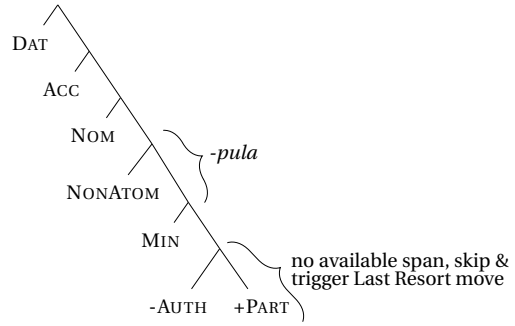
3.3 A toy example of the spanning algorithm

To illustrate the spanning algorithm, I provide a small sample derivation here. Suppose we have the vocabulary entries listed in (16). The first important thing to note is that there is only one vocabulary item that spells out [MIN], which is *-pula*. The second thing to note is that there is no way to spell out [±AUTHOR, ±PARTICIPANT] on their own – a lexical item containing person is always portmanteau with case or number in Yulparija.

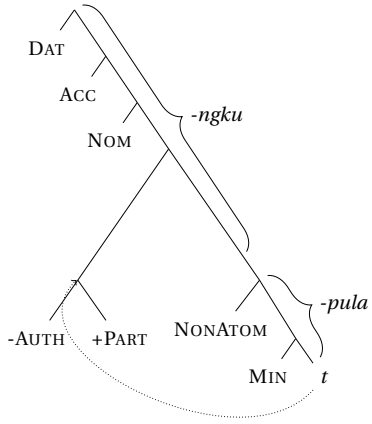
In the derivation of a second-person dative dual, an agreement probe in the specifier of DP targets the internal D', and creates a subtree of features as in (15a.). The Spellout algorithm first finds the lowest non-spelled out head (the feature [+PART]), and then searches upward for the largest span that has [+PART] as its anchor and a matching vocabulary item in the lexicon.

(15) Derivation of 2DU.DAT *-ngku-pula*

a. Step 1: Spell out *-pula*



b. Steps 2 & 3: Last Resort move person, spell out *-ngku*



(16)

-n	⇔	[NOM [-AUTH [+PART
-nta	⇔	[ACC [NOM [-AUTH [+PART
-ngku	⇔	[DAT [ACC [NOM [-AUTH [+PART
-nyurra	⇔	[AUG [-AUTH [+PART
-pula	⇔	[NONATOM [MIN

No vocabulary item from (16) matches [+PART] or [-AUTH [+PART on its own. The Last Resort condition is triggered, and so the algorithm seeks out the lowest span given this underlying feature order, in this case *-pula* ⇔ [NONATOM [MIN]]. The derivation spells out [NONATOM [MIN]] as *-pula*, and Last Resort moves the person features to an adjunct position above the newly-spelled out span. This makes new spans available in (15b.). The largest span available is *-ngku*, spelling out [DAT [ACC [NOM [-AUTH [+PART]]]]], and so Biggest Wins selects *-ngku* over smaller candidates like *-n* or *-nta*. The derivation converges, yielding *-ngku-pula*.

At this point, the phi feature subtree is fully spelled out, and so the derivation will evaluate the tree in (14b.) for Person First. The morpheme lexifying person (*-ngku* '2.DAT') is leftmost, and so Person First is already satisfied.

3.4 Defining clitics versus ordinary agreement

Before continuing on to discontinuities, there is one more loose end to tie up: the difference between clitics and agreement. In this analysis, clitics are created via Agree. Therefore, an important question is what difference, if any, the analysis needs to make between ordinary phi agreement and pronominal clitics. For this analysis, I claim that clitics must move to be licensed. I propose Clitic Licensing, as in (17):

(17) *Clitic Licensing*

a. Upon Spellout, a span associated with a clitic lexical item receives a ☐ feature. This feature can only be checked by the spelled out clitic span moving to an adjunct position immediately above another clitic lexical item. Upon this movement, the moved item's ☐ feature is checked to ☑.

b. If there is no ☐ feature to move to by the end of the derivation, the ☐ feature will be checked by right-adjoining to the nearest prosodic word

As movement, Clitic Licensing is both goal-driven and greedy (in the sense of Bošković 2002, 2007; Chomsky 1995), meaning that movement satisfies the needs of the moved item. In most instances of Clitic Licensing in Yulparija, this ☐-driven movement takes place inside a complex head. The clitic originates in a complex head formed via morphological φ-Agreement, and undergoes movement inside that head to another clitic.

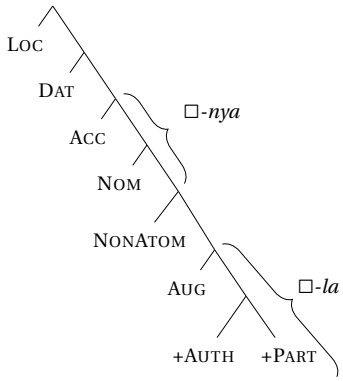
Clitic movement can be non-local. When there is only one span in a syntactic head (with no opportunities to satisfy Clitic Licensing locally), then I assume that clitics can escape the head and move to any ☐ feature in the clausal spine. Formally, this is similar to proposals involving greedy movement of *wh*-items escaping phase edges (e.g. Bošković, 2007). However, clitic movement lands inside a complex head. I adopt a first-in, first-out approach to greedy movement: the earlier a ☐ feature is introduced, the sooner it must be satisfied.

3.4.1 Sample derivation

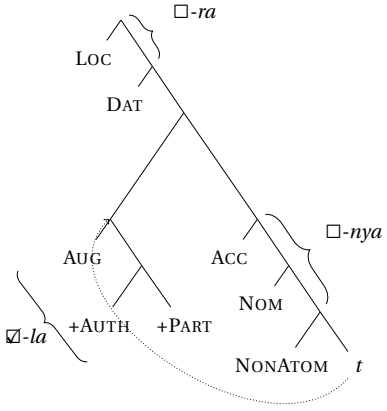
To illustrate a derivation for an individual clitic, let's now turn to the derivation of *-la-nya-ra* '1PL-ACC-LOC'. The spans *-nya* and *-la* are spelled out, and receive ☐ features because they are clitic vocabulary items. Clitic Licensing forces roll-up movement so that the lower span *-la* moves up to an adjunct position above *-nya*, checking its clitic ☐ feature to ☑. Spellout continues, and so the LOC and DAT features are spelled out as *-ra*. Now *-nya* moves to check its ☐ feature, this time pied-piping along *-la*. (Recall, Person First requires obligatory pied-piping of person, see (6a.).) This yields *-la-nya-ra*.

(18)

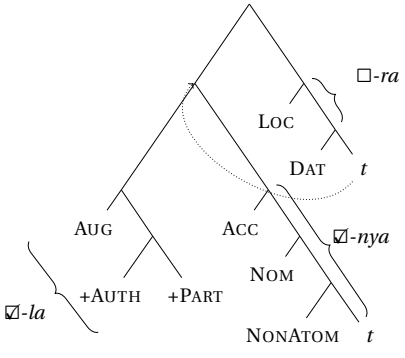
Step 1: Spell out *-la*
Step 2: Spell out *-nya*



Step 3: Move *-la* (Clitic Licensing)
Step 4: Spell out *-ra*



Step 5: Move *-nya* (Clitic Licensing)
(*-la* pied-pipes due to Person First)



(19) Vocabulary items for 1PL.LOC *-la-nya-ra*
☐ *-la* ⇔ [AUG [+AUTH [+PART

□ *-nya* ⇔ [ACC [NOM [NONATOM
□ *-ra* ⇔ [LOC [DAT

At this point, all the features on the head have spelled out, and so the derivation is evaluated to see if it satisfies Person First. The tree in Step 5 has person at the left, so no further movement is necessary. You'll note at this point that there is still an unchecked □ feature on *-ra*. We will return to this issue later on in Section 4.2, but this unchecked □ will be the trigger for the clitic movement to second position in the clausal periphery. I leave this detail for now, and refer the reader to Section 4.2.

3.4.2 Discussion of Clitic Licensing

By locating the □ feature on the lexical items themselves, I offer a way of formalizing clitichood without requiring phonological form to always be visible to the narrow syntax. Certain phonological forms in the lexicon can bear the clitic □ feature, which induces a bundled set of prosodic and syntactic behaviors. Both the prosodic and syntactic properties of clitics are properties of lexical items, and this is made explicit by the present framework.

Clitic Licensing builds on earlier analyses of clitic movement, which claimed that clitics must move to receive case (Borer, 1994; Jaeggli, 1982, 1986; Kayne, 1975). The core difference is that the □ feature here is not a purely abstract syntactic feature. In practice, this means that □ features are introduced late in the derivation, after Spellout has matched phi features to a □-bearing lexical item.

In intuitive terms, the □ feature is what indexes a clitic as a syntactically bound form.[7] I assume that this □ feature persists into the phonology, which will then act as a morphophonological diacritic that captures the unique prosodic properties of clitics.

There are two broad advantages of this approach: (i) it predicts that clitichood is a property tied to particular phonological forms, rather than morphosyntactic features, and (ii) it predicts that languages may have a mixture of pronominal clitics and weak pronouns depending on the particular lexical entries. I now go through each of these in detail.

3.4.3 Background on Clitic Prosody

Clitic pronouns have been long argued to be prosodically weak (Cardinaletti and Starke, 1999; Halpern, 1992, a.o.). This prosodic weakness has been argued to account for the syntactic distribution of clitics and also for their inability to bear lexical stress (Cardinaletti and Starke, 1999). In Australian languages, clitics have been described as lacking primary stress (e.g. Hale 1973: 313), although reports differ (see Baker (2008): 139, Jones 2011: 44 for clitics bearing primary stress; Douglas et al. 1964: 8 for secondary stress).[8] For Late Insertion models of syntax, which assume that phonological entries are introduced after much syntax has occurred, this collection of phonological and syntactic properties for clitics is unexpected. Why is phonological and syntactic behavior so tightly connected in clitics? How is this connection made, when otherwise such interactions are banned by the assumed architecture of grammar? Late Insertion models do not address these questions.

Under my account, the weak prosodic characteristics observed in Cardinaletti and Starke (1999) are directly connected to their syntactic behavior through the □ feature. I therefore predict that Yulparija clitics should be unable to bear lexical stress. Prosodic data on Yulparija is not available at this time, but we do have descriptions of clitic prosody in Wangkajunga, a closely related Western Desert language. Jones (2011) reports that Wangkajunga clitics obey the general stress pattern of affixes. Monosyllabic clitics and affixes are stressless, but those that are disyllabic or larger bear initial secondary stress. Neither clitics nor affixes can bear primary stress. This is consistent with Cardinaletti and Starke (1999)'s claim that clitics do not bear lexical word accent, unlike weak pronouns.

Another advantage of locating clitichood in the lexicon is that it allows us to predict some languages to have non-homogeneous inventories of pronominal clitics and weak pronouns. For instance, Ordóñez (2002) discusses Indo-European languages that show exceptional ACC-DAT pronominal orders, even though most Indo-European languages have DAT-ACC. In these exceptional ACC-DAT languages, Ordóñez finds that the dative pronoun also

[7] Suffixes could be modelled with a similar diacritic feature, except that they attract a phonological word to them instead of moving themselves.

[8] Tabain et al. (2014) argue against secondary stress in the Western Desert language Pitjantjatjara, and instead only find phonetic evidence of word-initial stress. However, this study is not conclusive on whether clitics bear stress. This comes down to an issue in data handling: Tabain et al. label polysyllabic clitics and some affixes as separate words (essentially lumping them together with lexical roots), and so it is unclear from this study whether they bear stress or not.

receives primary stress. Ordóñez claims that these languages have accusative pronominal clitics *and* dative weak pronouns. The ordering facts follow from the fact that weak pronouns may remain in-situ, but clitics must move. In my analysis, weak pronouns and clitics are both formed via Agree and therefore rootless, but only prosodically weak entities can be labeled as clitics and gain a □ feature.

3.5 Interim conclusion

In my framework, clitic movement is driven by Clitic Licensing. Additionally, spans of phi features must be matched with vocabulary items, and Last Resort movement re-groups features to enable matching. In the next section, we will formally introduce Person First. Person First requires that Clitic Licensing movements pied-pipe local person features ([+AUTHOR] and [+PARTICIPANT]) to place them linearly first.

We will see that the full system with Person First derives all observed clitic discontinuities in Yulparija, including the challenging splitting pattern with second person duals. This sets the analysis apart from previous work (e.g. Harbour 2008) which overgenerates splitting (see Section 5).

4 Deriving Discontinuities

In this section, I show how discontinuities emerge from the interaction of Person First with Spellout. Person First imposes a requirement on syntactic heads for person to be leftmost, and is satisfied in two ways: First, person obligatory pied-pipes during Clitic Licensing movement; Second, after Clitic Licensing, person will move further if it is not leftmost at phase boundaries. Person First is shown in (20) below:[9]

(20) *Person First Requirement*: The highest-ranked person features must be contained in the leftmost lexical item of a spelled-out phase. To accomplish this, all syntactic movements during Spellout will:
   a. Obligatorily pied-pipe lexical items that spell out [±AUTHOR] and [+PARTICIPANT] (but not [-PART])
   b. When the Spellout algorithm reaches the top of a syntactic head, any phi-subtree contained therein is evaluated for Person First. If a high person ([+AUTHOR] or [+PARTICIPANT]) is preceded by a morpheme exponing a lower person, then move the constituent containing the high person to the left periphery of that domain.

Other analogues to Person First have been proposed before, but all have slightly different paths in their implementation. Trommer (2003, 2008), for example, proposes a violable "Person Left" constraint that uses an Optimality Theoretic grammar to place person-exponing morphemes at the left edge of a spellout domain. A similar intuition is captured syntactically in Zubizarreta and Pancheva (2017), who propose a P-constraint on syntactic derivations that enforces the highest-ranked persons to appear at the edge of a syntactic domain. Hammerly (2020: 270) proposes another syntactic analysis, where movement is triggered by an EPP relativized to local persons instead of a filter. Section 5.1 discusses the predictions of Person First, and how they differ from these alternatives.

This section is structured as follows. In Section 4.1, I first focus on discontinuities within clitics cross-referencing a single DP. Then in Section 4.2 I turn to the clitic cluster, and show how these exact same mechanisms produce splitting. The reason why splitting is limited to second-person duals follows from how Person First interacts with other movements during Spellout. Section 4.3 discusses why clitics do not split in a closely related language, and Section 4.4 discusses an exception.

4.1 Clitics cross-referencing a single DP

I focus on plural clitics, and show how discontinuities in exclusives follow from the interaction of Person First with Clitic Licensing. (Duals have the exact same composition, but with *-la* '1PL' replaced with *-li* '1DU'.)

In (21) we see that *-ju* and *-la* are discontinuous in accusatives and datives. Even more puzzlingly, *-ju* can also be wedged between accusative and locative case (e.g. *-la-nya-**ju**-ra* '1PL-ACC-**EXCL**-LOC). Based on an assumption that phi features all have the underlying hierarchy CASE ≫ NUMBER ≫ PERSON (see Section 3.2), we would expect for the morpheme *-ju* to originate near *-la*, because they are both person-like features.

[9] Languages are expected to vary on which features Person First targets, just as they may differ in their person hierarchies. If a privative feature system were used, then the features listed in (20a.&b.) would change, but not the principles themselves.

(21)

		NOM/ERG	ACC	DAT/GEN	LOC
plural	1 inclusive	-la	-la-nya	-la-mpa	-la-nya-ra
		1PL(.NOM)	1PL-ACC	1PL-DAT	1PL-ACC-LOC
	1 exclusive	-la-**ju**	-la-nya-**ju**	-la-mpa-**ju**	-la-nya-**ju**-ra
		1PL(.NOM)-**EXCL**	1PL-ACC-**EXCL**	1PL-DAT-**EXCL**	1PL-ACC-**EXCL**-LOC

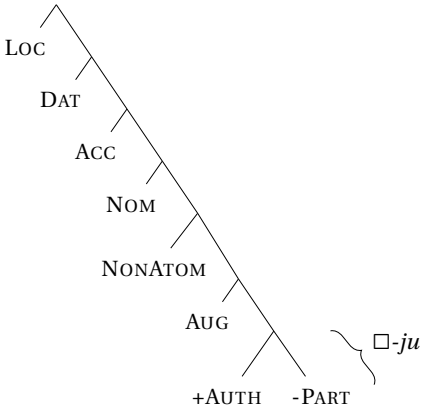
The mechanisms introduced in Section 3 already predict this exact interleaving of case and person. Intuitively, Person First induces a kind of lazy optimism in pied-piping, where the core 1, 2, 3 person features will always be pied-piped with other constituents. This means that when roll-up movement occurs, *-la* will get siphoned up with other movements, whereas *-ju* will be stranded.

To illustrate, take the derivation of *-la-nya-ju-ra* '1PL-ACC-EXCL-LOC' in (22) below. The vocabulary items used are given in (23).

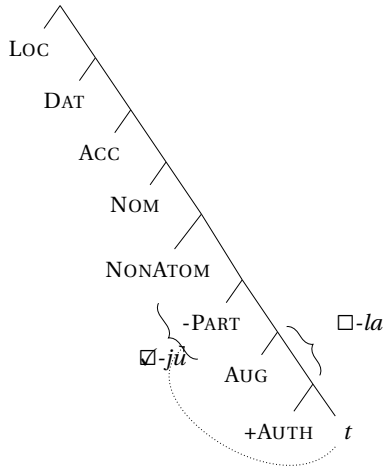
In Step 1, the exclusive *-ju* ↔ [-PART] spells out. In Step 2, *-la* spells out, and *-ju* moves above it to satisfy its □ feature. In Step 3, *-la* moves to check its □ feature, stranding *-ju* at the bottom of the subtree. In Step 4, *-nya* moves and pied-pipes along *-la* (because person features must be pied-piped according to Person First). The derivation yields the desired *-la-nya-ju-ra*.

(22)

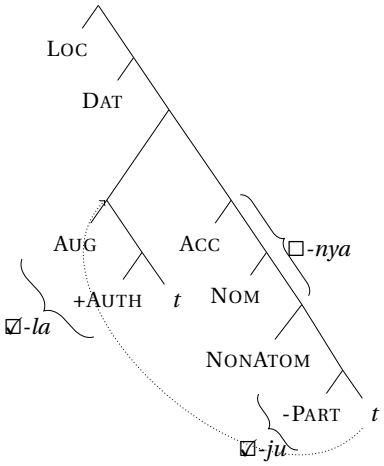
Step 1: Spell out *-ju*



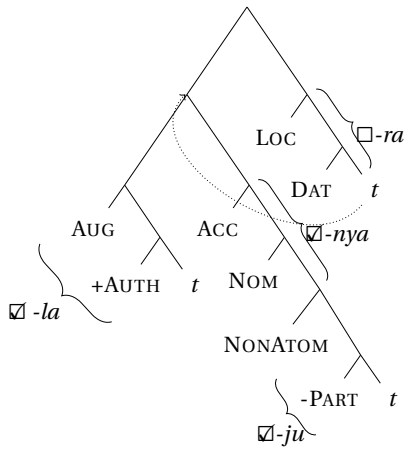
Step 2: Spell out *-la*,
Move *-ju* (Clitic Licensing)



Step 3: Spell out *-nya*, move *-la*,
Move *-la* (Clitic Licensing)



Step 4: Spell out *-ra*,
Move *la-nya-ju* (Clitic Licensing, pied-piping by Person First)



(23) Vocabulary items for 1PL.EXCL.LOC *-la-nya-ju-ra*
- □ *-la* ⇔ [AUG [+AUTH [+PART
- □ *-nya* ⇔ [ACC [NOM [NONATOM
- □ *-ju* ⇔ [-PART]
- □ *-ra* ⇔ [LOC [DAT

The role of Person First is critical here. Person First forces obligatory pied-piping of *-la* in Step 3, since *-la* lexifies local person features. If Person First were entirely inactive, the derivation would incorrectly produce *-*nya-ju-la-ra* '*-ACC-EXCL-1PL-LOC', because *-nya* would not pied-pipe *-la*. Only positive-valued person features are targeted by Person First, and never [-PART].[10] If [-PART] were similarly targeted by Person First, we would expect for *-ju* to be pied-piped along with -LA in Step 3, which would incorrectly yield the order **-ju-la-nya-ra* '*-EXCL-1PL-ACC-LOC'.[11]

For all other plural clitics, this analysis also yields the correct orders. I summarize the vocabulary items needed for the exclusive paradigm in (24).[12] Note that these vocabulary items are largely identical to what would be used in a Distributed Morphology analysis. The primary difference is that I represent phi features as containment hierarchies instead of feature bundles.

(24) Vocabulary item summary – Exclusives

Person	1 dual	□ *-li*	⇔	[MIN [+AUTH [+PART
	1 plural	□ *-la*	⇔	[AUG [+AUTH [+PART
	exclusive	□ *-ju*	⇔	[-PART
Case	Nom	□ *-∅*	⇔	[NOM [NONATOM
	Acc	□ *-nya*	⇔	[ACC [NOM [NONATOM
	Dat	□ *-mpa*	⇔	[DAT [ACC [NOM [NONATOM
	Loc	□ *-ra*	⇔	[LOC [DAT

To sum up, the exclusives pose a challenge for most theories of morphology — the exclusive morpheme *-ju* is discontinuous with the rest of the clitic's person features, and can surface between morphemes dedicated to case. In this account, these facts follow directly from how Person First interacts with various movements during Spellout. Clitics must move during the course of a derivation due to features introduced by the lexicon (Clitic Licensing). Discontinuities arise when certain features must move twice, once due to Last Resort to find a lexicalizable span, and once due to the requirement on clitics to undergo movement.

From an empirical perspective, Yulparija exclusives are important because they are a kind of non-flanking discontinuity. The exclusive *-ju* interleaves between case (X-Y-X-Y, ***la**-nya-**ju**-ra* '1PL-ACC-EXCL-LOC'), instead of flanking (X-Y-Y-X, ***la**-nya-ra-**ju***). This is a counterexample to Harbour (2008)'s claim that flanking is universal.

In the next section, I show how my analysis also predicts that splitting is restricted to second-person duals. In comparison, linearization, Distributed Morphology, or Cartographic accounts would need to stipulate that this restriction. I return to these alternatives in Section 5.

4.2 Splitting in the clitic cluster

In the clitic cluster, discontinuities emerge when second person dual clitics co-occur with a third person clitic. In this section, I argue that these discontinuities are no different from those that generate discontinuities in individual clitics that we saw in Section 4.1. They arise from the interaction of Person First and Clitic Licensing.

Recall, the data in question here are the splitting cases, reproduced in (25). Descriptively, what is happening here is that the clitic cluster must obey a (1 > 2 > 3) person hierarchy, which allows the *-nta* '2ACC' morph to occur farther to the left than the dual number *-pula* 'DUAL'.

(25) Clitic *-nta-pula* '2.ACC-DUAL' splits across third person clitic, reproduced from (3)

[10] The precise features Person First targets are expected to vary from language to language, just as person hierarchies vary from language to language.

[11] Note here that it is crucial that we assume both Clitic Licensing and Last Resort Movement. For example, if we did not assume Clitic Licensing (but did assume Person First and Last Resort), the derivation would yield **-la-ju-ra-nya* '*-1PL-EXCL-LOC-ACC'. Similarly, if we removed Last Resort movement and instead allowed [1 [2 [3 to spell out in situ (either via the Superset Principle, as in ordinary Nanosyntax, or as a kind of Last Resort lowering), the derivation would produce **-la-ju-nya-ra* '*-1PL-EXCL-ACC-LOC'. Thus, both Clitic Licensing and Last Resort are necessary to derive the desired order of morphemes.

[12] The lexical entries for all of the Yulparija clitics are summarized in Section 8.3

a. *pu-nganya* **=nta** **=ya** **=pula**
hit-FUT -2ACC(DU) -3PL.NOM -(2ACC)DU

'They will hit you.'

b. *ka-ngu* **=nta** **=ya** **=pula**
carry-PST -2ACC(DU) -3PL.NOM -(2ACC)DU

'They took you.'

The critical question here is why splitting occurs in these second-person duals, but not in other clitic combinations. I reproduce cases that *lack* splitting in (26) below:

(26) Other clitic combinations do not split (reproduced from (4))

a. *pu-nganya* **=li-ju** **=nta-pula** *(* =li =nta =ju =pula)*
hit-FUT 1DU.NOM-EXCL 2.ACC-DU

'We (excl) will hit you…'

b. *pu-ngku-la* **=la-nya** **=ya** *pawu-lku-rta* *(* =la =ya =nya)*
hit-IRR-IMP =1PL-ACC =3PL.NOM cook-IRR-EMPH

'They might kill us and cook us.'

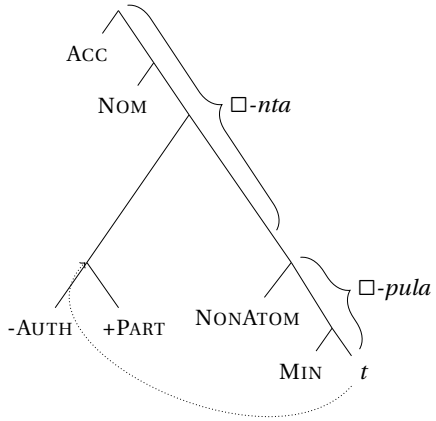
I now proceed to the derivations for splitting and non-splitting clitics.

4.2.1 Splitting Clitics

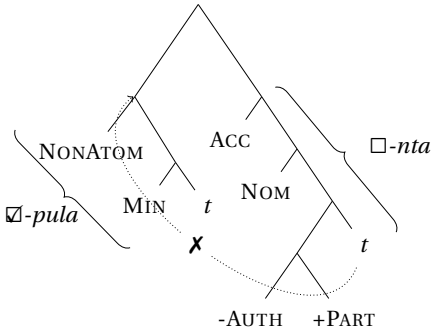
Splitting is limited to second person duals because they have a different structure from other clitics. Only second-person duals do not spell out person and number as a portmanteau, instead spelling out person and *case* in a single morph.

To illustrate, examine the structure of the clitic *=nta=pula* '2ACC-DUAL' in (27) below. In order to spell out with case, the second person features undergo Last Resort movement above number. Ordinarily, at this point in the derivation we would then proceed with Clitic Licensing, moving *-pula* above *-nta*. However, in this case this movement is blocked because it would create a head with number-person order, violating Person First, as in (28). As a result, the clitic remains in the configuration in (27), where there are two clitic □ features left unchecked.

(27) Second-Person Duals have two unchecked □ features (Last Resort creates person-number order)



(28) Person First blocks Clitic Licensing of *-pula*

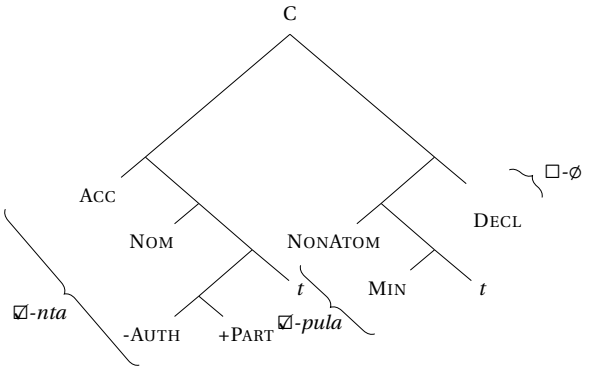


The presence of two unchecked □ features in (28) is what enables second person duals able to split. After clitics cross-referencing a single DP are formed, they will greedily search up the tree in a head-to-head fashion looking for another clitic to move towards. In Yulparija, complementizer heads are clitics (see discussion in Section 4.3), and so pronominal clitics will check their remaining □ features by moving to C.

Since we are adopting a first-in, first-out approach to clitic licensing, we expect *-pula* will move first to C to check its □ feature, and then *-nta* follows. This creates the structure shown in (29):

The second-person dual morphemes (*-nta* and *-pula*) move separately to C for Clitic Licensing

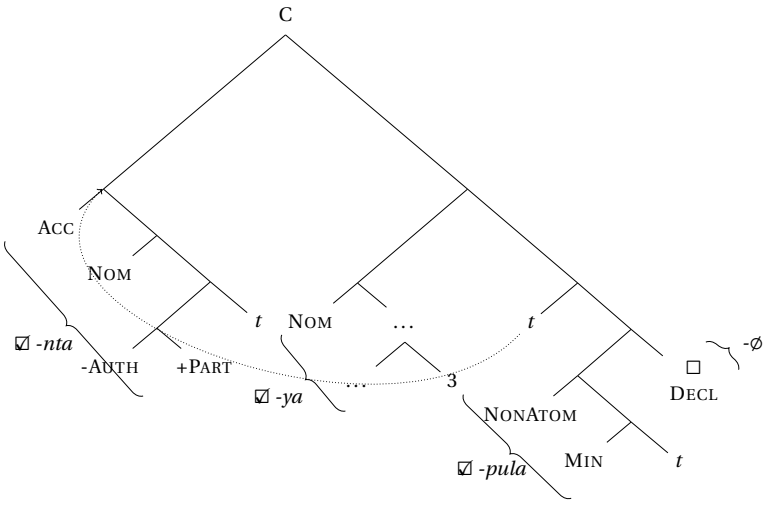
(29)



In this structure, *-nta* and *-pula* are separate adjuncts above DECL. As the derivation continues, other clitics may move up above *-nta* and *-pula* before the C head is evaluated for Person First. If there are third-person clitics above *-nta*, *-nta* will move to satisfy the Person First Requirement, as in (30). In this case, *-pula* will be stranded because it does not form a constituent with *-nta*.

The second-person clitic *-nta* moves alone to satisfy Person First, stranding *-pula*

(30)

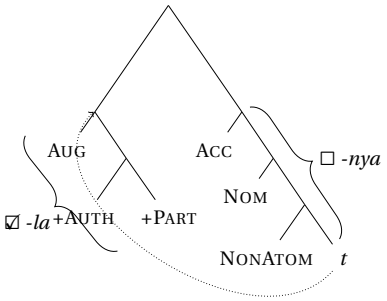


What the present analysis does is explain why person and case portmanteaux should have exceptional behavior. Person and case are not adjacent on the underlying hierarchy, and so in order to be spelled out together, person must undergo Last Resort movement. This Last Resort movement feeds a conflict between Person First and Clitic Licensing, which ultimately has the effect of person and number morphemes in second-person duals behaving as separate constituents at the clausal level.

4.2.2 Non-Splitting Clitics

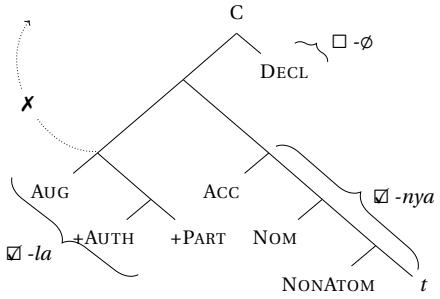
By contrast, all other Yulparija clitics just have one unchecked □ feature on each of these φ-feature subtrees, which corresponds to their inability to split. For example, a clitic such as *-la-nya* '1PL-ACC' has the structure shown in (31).

(31) *-la-nya* '1PL-ACC' has just one unchecked □ feature



Since *-la-nya* has just one unchecked □ feature, it moves to C as a single constituent. (Note that *-la* is pied-piped along because of Person First.) In (32) subextraction from within this clitic constituent is blocked by Criterial Freezing (Rizzi, 2006), and therefore *-la-nya* cannot split. Instead, *la-nya* will move as a single constituent to satisfy Person First.

(32) *-la-nya* moves to C as a single constituent,
No splitting because subextraction of *-la* blocked by Criterial Freezing



4.2.3 Summary of Splitting

To summarize, the spanning analysis presented here predicts that splitting is tightly connected to clitic composition. As clitics spell out, they undergo various movements that can put Person First at odds with Clitic Licensing. In these cases, clitics cross-referencing a single DP (such as second-person duals) may move separately to C, and therefore behave as separate constituents for the remainder of the derivation.

By contrast, when Person First and Clitic Licensing are not in conflict, clitics cross-referencing a single DP will move to together to C, and therefore will behave as a single constituent. In concrete terms, this predicts that splitting should be possible only when person is portmanteau with a non-adjacent feature on the hierarchy. (This includes when person and case are portmanteau to the exclusion of number.)

4.3 Wangkajunga: same paradigm, no splitting

Wangkajunga (Western Desert, Pama-Nyungan), a language closely related to Yulparija, appears to challenge my prediction that clitic composition should predict splitting behavior. Wangkajunga has a very similar clitic paradigm to Yulparija, but it does not allow splitting.[13] This is shown in (33):

(33) Wangkajunga does not split in second-person duals (Jones 2011: 145)

pu-ngku	***=nta=pula=ya***	*jii-n-pa*	*wirta*
hit-FUT	=2ACC=DU(2ACC)=3PL.NOM	DEM-PL-AUG	dog

'Those dogs will bite you two.' (* =*nta* =*ya* =*pula*)

[13] Thank you to an anonymous reviewer for bringing this to my attention.

Does the lack of splitting in Wangkajunga reflect a lack of Person First? No. This would incorrectly predict *-*pula-nta* for the second-person dual accusative clitic. Additionally, removing Person First would also predict that (a) there should be no person hierarchy in the cluster, and (b) that there are no discontinuities with exclusives. Both of these are false. Wangkajunga has the same person hierarchy as Yulparija where first person clitics must go first (Jones 2011: 145), and Wangkajunga has identical forms for exclusive clitics (Jones 2011: 144).

I argue that the difference between Wangkajunga and Yulparija is explainable by a difference in where clitics are base-generated. In clauses with multiple third-person arguments, Yulparija generally has subject clitics before object clitics.[14] In Wangkajunga, object clitics precede subject clitics. I connect this to a parametric difference in where the pronominal clitics are formed. In Yulparija, they originate inside a big DP, whereas in Wangkajunga they originate in the verbal spine.

In Yulparija, clitics are base-generated inside DPs. This means that pronominal clitics will move directly from their base-generated positions to C. Since we have adopted a first-in, first-out approach to Clitic Licensing, this predicts that lower-generated arguments should move first, generating NOM-ACC order in the cluster. This is illustrated in (34):

(34) Nominative clitics precede accusatives in Yulparija

a. *nya-ngu* ***=pula*** ***=jana-nya***
see-PST -3DU.NOM -3PL-ACC

'They two saw them.' G1-342

b. *kanyi-rnin -pa* ***=ya*** ***=jana-nya*** *rtulku-ngka*
has-PRS -COMP -3PL.NOM -3PL-ACC corroboree-LOC

'They've got them in a corroboree.' G1-189

By contrast, Wangkajunga base-generates clitics inside DP-licensing functional heads in the verbal spine. This means that clitics cluster on intermediate heads on the verbal spine before moving to C. This generates the rolled-up ACC-NOM order, as shown in (35):

(35) Accusative clitics precede nominatives in Wangkajunga

a. *jiji-rti* ***=jana-nya*** ***=pula*** *kanyin-in-pa nyupa-rarra-lu larrku-ngka*
child-PL =3PL-ACC =3DU.NOM have-PRS-AUG spouse-PAIR-ERG valley-LOC

'The parents are caring for their children in the valley between the sandhills.' (Jones 2011: 208)

b. *mara* ***=ya*** ***=pula-nya*** *tuju pinga-lu paja-rnu kujarra-ngulyu*
hand =3PL.NOM =3DU-ACC woman ant-ERG bite-PST two-CERT

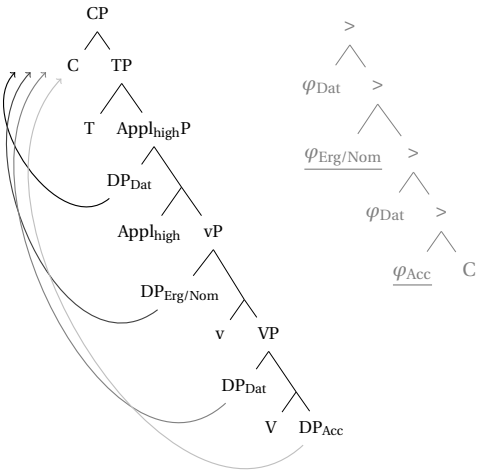
'The ants bit the hands of the women, of two of the women.' (Jones 2011: 241)

The different clitic generation sites are shown in (36). When clitics are base-generated inside DPs (36a.), as in Yulparija, we get NOM-ACC order. When clitics are base-generated on the verbal spine (36b.), as in Wangkajunga, we get ACC-NOM order.

[14] Both Yulparija and Wangkajunga show variation between NOM-ACC and ACC-NOM orders, but with different frequencies. For instance, Jones (2011: 145) describes ACC-NOM as the general case for Wangkajunga. For Yulparija, NOM-ACC is more common. Given porosity between dialects in Western Desert (and robust multilingualism), I treat speakers as having both grammars available (36a.) and (36b.). As a simplifying assumption, I treat the grammar in (36a.) as "Yulparija" and the one in (36b.) as "Wangkajunga". Although this abstracts away from meaningful variation within each speech community, it allows us to make clear predictions: speakers who favor NOM-ACC orders are predicted to allow splitting, whereas speakers who favor ACC-NOM should not.

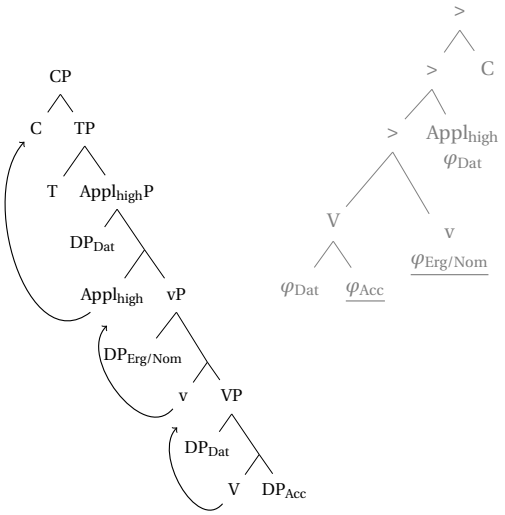
(36)

a. Clitic Agree probes hosted inside DPs
matches the underlying hierarchy of arguments



NOM - ACC order (Yulparija)

b. Clitic Agree probes hosted on functional heads
inverts the underlying hierarchy of arguments



ACC - NOM order (Wangkajunga)

In splitting, this difference in base order essentially obscures the fact that *-nta* '2ACC' and *-pula* 'DUAL' are separate constituents in the cluster. In Yulparija, nominatives precede accusatives at C, and so *-nta* '2ACC' must move above *-ya* '3PL.NOM' to satisfy Person First. The inversion of the cluster's case hierarchy is what allows us to observe splitting, because it strands *-pula* '(2ACC)DUAL' low.

However, in Wangkajunga, the base order is accusative before nominative, and so before any Person First movement at C, the order should be *=nta=pula=ya* '=2.ACC=DU=3PL.NOM'. Thus, when Person First is evaluated at C, the highest person is already leftmost, and so no further movement is necessary. This explains why splitting is not observed in (33) above — no movement is needed to satisfy Person First, and so *-pula* will not be stranded.

If we compare with other northwestern Wati languages, the base order of the clitics is ACC-NOM and accordingly, there is no splitting in the clitic cluster. This holds for Wangkajunga, Manyjilyjara, Pintupi-Luritja, and Warnman, as shown in (37).

(37)

Language	Person hierarchy	Case hierarchy	Splitting	Source
Yulparija	1 > 2 > 3	NOM-ACC	yes	O'Grady 1967
Wangkajunga	1 > 2 > 3	ACC-NOM	no	Jones 2011: 145-148
Manyjilyjara	1 > 2 > 3	ACC-NOM	no	Marsh 1976: 55-57
Pintupi-Luritja	1 > 2 > 3	ACC-NOM	no	Heffernan and Heffernan 1999: 66-68
Warnman	1 > 2 > 3	ACC-NOM	no	Wangka Maya 2003: 32-33

If we look to other Western Desert and Ngumpin languages spoken in Western Australia, the prediction again holds up: splitting only occurs in languages whose clitic pronouns have a person hierarchy and a NOM-ACC hierarchy in the cluster.

(38)

Language	Person hierarchy	Case hierarchy	Splitting	Source
Yankunytjatja	none	ACC-NOM	no	Goddard 1985: 124
Warlpiri	1 > 2 > 3	NOM-ACC	yes	Laughren et al. 1996: 165
Djaru	1 > 2 > 3	NOM-ACC	yes	Tsunoda 1981: 131-135
Walmatjari	1 > 2 > 3	NOM-ACC	yes	Hudson 1978: 60

In sum, the Wangkajunga data is compatible with the present analysis. My analysis predicts that splitting should only be possible when (a) there is a person hierarchy, and (b) there is a NOM-ACC case hierarchy. In the next section, I briefly discuss a complication found in many Western Desert languages, where the position of the pronominal clitic *=n* '2.NOM' has an exceptional position.

4.4 An exception: second-person nominative clitics

Across Western Desert languages, the second-person nominative clitic is generally realized as *=n* (Capell et al. 1979: 519). This clitic often has an exceptional surface position that violates the person hierarchy. In languages such as Warlpiri and Walmatjari, *=n(pa)* occurs immediately after the tense/complementizer clitic (39)-(40), even if that means preceding first person clitics.

(39) Warlpiri second-person nominatives occur immediately after T

a. *nyuntulu-rlu* ***ka*** ***=npa*** ***=ju*** *ngaju* *nya-nyi*
2-ERG PRS-2.NOM-1.ACC 1(Abs) see-NPST

'You see me.' (Hale 1973: 328)

b. *nyiya-ku* ***ka*** ***=npa*** ***=jana*** *kurdu-kurdu-ju* *paka-rni*
what-DAT PRS-2.NOM-3PL.ACC child-PL(REDUP)-TOP hit-NPST

'Why are you hitting the children?' (Simpson 1991: 373)

(40) Walmatjari second-person nominatives occur (a) after C or (b) after a monosyllabic first-person clitic

a. *nyanya* ***ma*** ***=ny*** ***=jarra=nya***
see C-2.NOM-1PL.EXCL-ACC

'You see us.' (Hudson 1978: 70)

b. *marni* ***pa=ji*** ***=n*** ***=lu***
said C=1SG.ACC=2.NOM=PL

'You all said to me.' (Hudson 1978: 70)

In Yulparija, second-person nominative clitics always occur at the *end* of the clitic cluster, as in (41), regardless of if third-person clitics precede it.[15] Unlike Walmatjari and Warlpiri, this behavior applies to both the clitic *=n* '2SG.NOM' and to *=nyurra* '2PL.NOM'.

(41) Yulparija 2NOM clitics occur rightmost, even after third-person clitics

a. *yakurrji-nu* ***=ra*** ***=n***
taste-PST =3SG.DAT =2SG.NOM

'You tasted it.'

b. *wiya* ***=lu*** ***=n*** *partaja-lku-rta*
NEG =3SG.LOC =2SG.NOM forget-IRR-EMPH

'Don't (you) forget it.'

c. *ngana-ku* ***=lu*** ***=ra*** ***=nyurra*** *kurnta-rri-nyin* *wangka-ku*
WH-DAT =3SG.LOC =3SG.DAT =2PL.NOM shame-INCH-PRS language-DAT

'Why are you lot ashamed of your language?'

Previous work treats the position of these clitics as phonological. For instance, Harbour (2008) argues that the position of *=n* in Walmatjari is driven by a need for phonological well-formedness. The second-person nominative *=n* is the only clitic with a coda, and so it metathesizes to avoid a marked consonant cluster.

However, this is not a possible explanation for Yulparija, where the final position of *=n* is more phonologically marked than its base position. Word-final consonants are marked in Yulparija, and will generally be avoided via epenthesis of the syllable *-pa*. Additionally, this cluster-final behavior in Yulparija is not limited to *=n* '2SG.NOM' — it also applies to *=nyurra* '2PL.NOM', a clitic comprised of two open syllables. The same type of coda or cluster avoidance is not a possible explanation in this case. We can thus conclude that the position of *=n* is not phonotactically optimizing, and must instead be driven by arbitrary lexical requirements.

In my view, the broad generalization that has been missed so far is that the position of these exceptional clitics is always *edge-oriented*. In Warlpiri, *=n* occurs at the left edge of the pronominal clitic cluster (not including C);

[15] The same behavior is seen for cognate Nyangumarta *-n*, but in that case it occurs verb finally, since Nyangumarta bound pronouns are verbal agreement instead of clitics (Simpson 1991: 161).

in Walmatjari, it occurs either leftmost or after the leftmost monosyllabic pronominal clitic. In Yulparija, Wangkajunga, and Nyangumarta, *=n* occurs at the right edge of the clitic cluster. Metathesis rules alone do not predict this restricted distribution. Instead, they predict that exceptional clitics should be able to surface virtually anywhere in the cluster.

To capture this generalization, I treat these exceptional clitics as infixes. Infixes have also been argued to both (a) have an edge-oriented bias and (b) have their placement driven by lexically specific requirements rather than phonotactic optimization (Yu, 2002, 2007). Both of these are compatible with the distribution of second-person nominative clitics. Without going into detail on the exact morphophonological mechanisms responsible for infixation, I argue that *=n* is infixed rightwards relatively late in the derivation, after Person First has already been evaluated. This is compatible with recent work on infixation, which has argued that it must occur after linearization (Kalin, 2020). I therefore expect the syntactic derivations for these clusters to proceed as expected (yielding Yulparija *=n=lu* and *=n=ra* in (41a.)-(41)b.), where the final placement of *=n* occurs post-Spellout.

4.5 Interim conclusion

Compared to previous work (e.g. Harbour 2008), the present analysis captures discontinuities involving both exclusives and duals. Recall that Harbour (2008) derives only flanking for double discontinuities. As we will see in Section 5, Djaru clitic clusters clearly display non-flanking discontinuities. Arguably, Yulparija exclusives also display non-flanking discontinuities (see Section 4.1, where exclusives interleave with case).

The presence of non-flanking discontinuities suggests that we need a predictive theory of both flanking and non-flanking discontinuities. One contribution of the present work is to reconcile non-flanking discontinuities with a strong person-first requirement.

5 Alternatives

In this section I first discuss typological predictions, and then I compare the proposal to four alternatives: purely syntactic approaches, Distributed Morphology, linearization (following Harbour 2008), and mainstream Nanosyntax. There are other alternatives as well, such as Distributed Optimality (Trommer, 2001) or other constraint-based approaches to linearization (e.g. Grimshaw, 2001; Woolford, 2001) but for space concerns I do not address them in detail here.

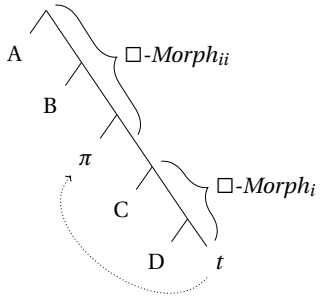
5.1 Typological predictions

In this paper, I've argued that splitting in the clitic cluster is generated by predictable movements during Spellout. The broad question at stake here is exactly what speakers need to know in order to generate person discontinuities. If person discontinuities emerge from memorized morphological metathesis rules as in many DM analyses, then we expect there to be no predictable relationship between morphological form and surface position. On the other hand, the span-based analysis contends that morphological form *is* important, because it provides speakers clues about the syntactic substructure of the clitics.

For clitic systems like Yulparija's, I predict that person discontinuities should arise whenever person is spelled out with non-adjacent features. Assuming a CASE ≫ NUMBER ≫ PERSON hierarchy, this will include any time that person is spelled out with case to the exclusion of number. This is illustrated in (42). Provided that [C [D are spelled out separately as *-Morph$_i$*, any derivation that spells out person π with [A [B features should be able to split.

Splitting expected for any clitic with person last-resort moving high

(42)



Note that this predicts that splitting should occur when a morpheme portmanteau with person excludes intermediate features in the hierarchy. This includes when person is portmanteau with high case or high number (to the exclusion of lower intervening features). To my knowledge, this prediction is unique: other proposals must stipulate that there is something special about person and number that makes these discontinuities so common (e.g. Trommer 2008). In comparison, this account predicts discontinuities by examining which features are absent from the portmanteau morpheme.

A second major prediction of this analysis concerns Person First. Although languages may differ in what features Person First targets, Person First acts on all phi-feature subtrees and cannot distinguish between clitics and ordinary agreement, since that is a distinction made on lexical items directly, not morphosyntactic features. The prediction this makes is that we should see similar types of Person First effects in ordinary agreement systems.

If we examine existing analyses of agreement in other language families, we see this prediction is borne out. There is a robust trend of analyses requiring pied piping or movement of high person phi-features — the exact imprint we expect of Person First. For example, Blix (2020) gives a span-based account of agreement in Laz and Georgian. Notably, Blix is able to explain that second-person morphemes are prefixal by assuming that Voice must pied-pipe along PART (Blix 2020: 40).

Algonquian languages with direct/inverse agreement systems bear a similar pattern – the prefix agrees with the highest-ranked person (2 > 1 > 3 > 3'), rather than consistently agreeing with the subject or object. Oxford (2018) analyzes this pattern in Algonquin (a dialect of Ojibwe) by adopting a relativized agreement probe (following Béjar and Rezac 2009). This agreement probe agrees with the DP that most closely matches its specification, which in this case is DP with the highest-ranked person features. While Oxford's analysis captures the fact that the prefix agrees with the highest person, it does not predict that there should be direct/inverse markers or suffixes cross-referencing the other DP.

Instead, Oxford's analysis predicts that there should be languages where there is *only* agreement with the highest-ranked DP, with no morphological agreement for other arguments. As a toy example of what this would look like, see (43):

(43) Toy example of a "agree with highest" language (argued to not exist)
(If S > O, subject agreement; if O > S, object agreement. No suffixes.)

	gloss	translation
a.	*mi-si*	'I see you' / 'You see me'
	1SG-see	
b.	*mi-si*	'I see him' / 'He sees me'
	1SG-see	
c.	*yu-si*	'You see him' / 'He sees you'
	2SG-see	
d.	*hi-si*	'He sees them/him/her'
	3SG-see	

S \ O	1	2	3
1	–	*mi-*	*mi-*
2	*mi-*	–	*yu-*
3	*mi-*	*yu-*	*hi-*

To my knowledge, this type of pattern does not exist, and yet it is what is predicted by theories using Cyclic Agree (Béjar, 2003; Béjar and Rezac, 2009). (This prediction also applies to theories that allow movement to target the highest person (e.g. Zubizarreta and Pancheva, 2017), because this movement could feed agreement.) Béjar and Rezac (2009) present a number of examples that they describe in these terms, but all of them include overt suffixes

that could be exponing phi-features of the remaining argument. I therefore treat the pattern in (43) as a faulty prediction of these previous analyses.

By contrast, an analysis with Person First will contend that agreement cannot implement person hierarchies directly (see Bruening 2005 for a similar position). The reason why prefixes bear the highest person follows from movement during Spellout, not because of narrow syntactic movement or agreement itself. There is thus no need to assume that narrow syntactic operations implement the person hierarchy themselves. In this view, the reason why high-person prefixes always co-occur with direct/inverse suffixes is no accident: the direct/inverse suffixes are expected to be the features left over from agreement with both arguments.

Naturally, this a testable prediction. If Person First is on the right track, then we would expect patterns like those in (43) to be impossible because person hierarchies are implemented via Person First, not the agreement probes themselves. On the other hand, if agreement probes can specify "look for the highest-ranked person" then patterns like those in (43) should be possible, and it may not be necessary to use mechanisms like Person First.

In broad terms, the main prediction of this analysis is that phi-feature orders are a syntactic phenomenon. All reordering arises through movement, and person hierarchies are implemented as requirements for movement during Spellout. Since the core mechanisms in play are ordinary syntax, we expect for familiar requirements on movement (such as locality) to determine how phi-exponing morphemes move. They may move as a constituent, move alone (creating discontinuities), or fail to move entirely (perhaps leaving copies). In this sense, the relationship between these morphological patterns and clausal syntax becomes clearer: they all arise from limitations on movement in syntactic structures.

5.2 Syntactic Approaches

In a purely syntactic approach, splitting is generally handled by denying that the two morphemes originate from the same syntactic head. A typical approach would be to say there are two separate Agreement probes, one high (looking for person) and one low (looking for number). What we are seeing in so-called splitting is just realization of both of these probes, each in their original positions. The advantage of this approach is that it is straightforward and is easily able to capture how splitting interacts with the person hierarchy in the clitic cluster. There are separate positions for first, second, and third person clitics in the clausal periphery, and so the reason why so many languages have person hierarchies is because they are part of the universal functional spine.

However, there are two main problems with this analysis when applied to Yulparija. The first is that it cannot capture the parallelism between the structure of the clitic cluster and the structure of clitics cross-referencing a single DP. As discussed in Section 4.1, similar discontinuities also occur with exclusives. A purely syntactic approach would need to either (a) deny these parallelisms as true person discontinuities, or (b) stipulate that high persons must move, stranding exclusives low. The first approach misses an important empirical generalization, and the second approach tends to overgenerate, since then we must explain why some clitics appear to pied-pipe number and others strand it.

This leads us to the second, and perhaps even greater problem, which is generality. If person and number undergo agreement with separate functional heads, we would expect for splitting patterns to be very regular. Any time that person and number are exponed separately, they should behave as separate constituents. However, this is not the case in Yulparija nor in many other Western Desert languages. Splitting appears to be highly restricted, and does not occur even in similar polymorphemic clitics (e.g. Yulparija *=la=nya* '1PL-ACC(PL)'). What appears to predict splitting is not that number is exponed to the exclusion of person, but rather than person is exponed to the exclusion of number. Only person morphemes that bear no number features will move high. This is difficult to predict in a syntactic account, because movement should generally be driven by what features a goal has, not which ones it lacks.

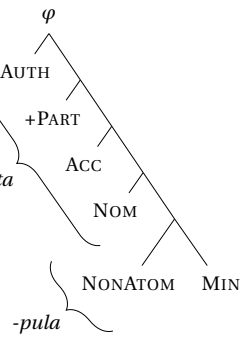
5.2.1 Base-Generating Person High

As a last syntactic alternative, in this paper I have assumed a CASE ≫ NUMBER ≫ PERSON underlying hierarchy, where person must move high to satisfy Person First. Another alternative is to base-generate person higher, such as in a PERSON ≫ CASE ≫ NUMBER configuration. Even if we keep everything else about Spellout the same, this alternative fails to capture why splitting is limited to second-person duals.

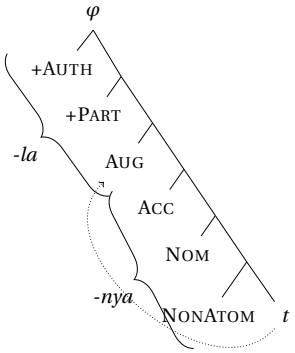
Take the trees in (44). For the splittable clitic *-nta-pula* '2ACC-DUAL' in (44a.), this gives us the configuration we need. However, for *-la-nya* '1PL-ACC' in (44b.), number Last Resort moves high to spell out with *-la*, but this produces the same structure as in (44a.).

(44)

a. Splitting clitic (*-nta-pula* '2ACC-DU')



b. Non-Splitting clitic (*la-nya* '1PL-ACC')



This alternative thus fails to capture the structural difference between these two types of clitics.

5.3 Distributed Morphology

In the earliest work in Distributed Morphology (henceforth, DM), the order of inflectional material was determined by the complexity of the features encoded (Halle and Marantz 1993: 389). Morphemes that encode more complex features (such as [DAT, +AUTH, +AUG]) will precede smaller, simpler ones (such as [+AUTH] on its own). This generally predicts that portmanteau morphemes will have a tendency to occur farther leftwards than their simpler counterparts.

For discontinuities, these DM derivations appeal to a fission rule that breaks feature bundles into separate positions of exponence (Bonet 1991: 111, Noyer 1992: 142, Halle and Marantz 1993: 387). Depending on how the fission rule is stated, this may include a direct stipulation about the surface order of morphemes. In Noyer (1992), for instance, fission splits a head into two positions of exponence. Exactly which features end up where is determined by the combination of an external markedness hierarchy and individual lexical requirements. Similarly, Halle and Marantz (1993: 387) treat their fission rule in Georgian as stipulating no linear order at all — the Person-Verb-Number order is a consequence of the number morpheme being a suffix, and so no restrictions are predicted on the existence of Number-Person-Verb orders.

In more recent years, the order of fissioned phi-features has generally drifted away from explanations that use these external hierarchies and shifted onto post-syntactic metathesis operations. For example, in Arregi and Nevins (2012: 266), discontinuities in the Basque auxiliary are generated with fission followed by metathesis. Fission first splits an absolutive plural into two positions of exponence (e.g. Cl_{Abs}-Cl_{Pl}-T), and then metathesis manipulates these to give Cl_{Abs}-T-Cl_{Pl} order. Metathesis rules of this type have become a common tool in DM analyses of discontinuous agreement (see Generalized Reduplication, Harris and Halle (2005); Hewett 2020 for Semitic; Hammerly 2020 for Ojibwe).

There are some intuitive similarities between DM accounts and the span-based account proposed here. For one, both my analysis and the older-style DM approaches rely on hierarchies that are external to the syntax to derive the correct order of morphemes. In DM, this is the idea that morphemes exponing more marked features go first, and in the present account this is Person First. As morphemes are spelled out and linearized, they aim to preserve this external hierarchy.

However, there are some important differences. For one, the DM account differs in how it implements this hierarchy preservation. Instead of using syntactic movement, DM often uses various post-syntactic rules to generate the final output. These rules are extraordinarily expressive, and common point against them is that they are capable of stating any arbitrary order. On an intuitive level, these metathesis rules are essentially templates, because they state linear order for morphemes based on the abstract morphosyntactic features they expone. By contrast, the span-based approach treats discontinuities as predictable, because they will only emerge when different principles of Spellout conflict.

A deep issue at stake here is the question of whether such post-syntactic metathesis rules exist at all. DM accounts generally defend the existence of morphological metathesis rules on the grounds that similar rules exist in phonology (e.g. Arregi and Nevins 2012: 133). However, recent work in phonological typology argues phonology

may lack true transposition entirely (Mooney, 2021; Takahashi, 2018, 2019), and therefore that such cross-modular parallelisms may not be warranted. If this is true, we must carefully examine any post-syntactic metathesis rules we propose, because they would be something unique to the morphological module of grammar.

5.4 Harbour (2008): Linearization of φ-feature bundles

Harbour (2008) proposes that discontinuities arise from conflicts during linearization. In this account, linearization proceeds cyclically from the root outwards, where dominance relations between syntactic features are replaced by adjacency relations between spelled-out lexical items. In constructions with discontinuities, there is a conflict between maintaining existing adjacency relations and linearizing lower material. Rather than disrupt existing adjacency relations, number will linearize to the right of the entire cluster.

Harbour applies this analysis to discontinuities in Yimas and Walmatjari, which display flanking (*Person*$_i$-Person$_k$-Number$_k$-*Number*$_i$) order. For an example of the analysis in Walmatjari, take the derivation in (45). The crucial step is Step 3, where φ_O is spelled out, but *-lu* cannot be spelled out directly after *-n* without disrupting the adjacency relation (notated as →) between *-n* and *-tarra*.

(45) Derivation of Walmatjari flanking -*n*-*tarra-nya*-*lu* '2.NOM-1PL.EXCL-DU-PL(NOM)'

Step 0: Structure pre-Spellout

[AUX [φ_O [φ_S]]]
2S 1PL.EXCL
PL DU

Step 1: φ_S spells out

[AUX [φ_O [φ_S]]]
2S **tarra**
PL **nya**

Step 2: morphemes linearize

[AUX [φ_O → **tarra** → **nya**]]
2S
PL

Step 3: φ_S spells out

[AUX [**n** → **tarra** → **nya**]]
lu

Step 4: *-lu* linearizes after cluster to preserve existing adjacency

[AUX [**n** → **tarra** → **nya** → **lu**]]

However, to derive the correct set of discontinuities in Walmatjari, Harbour must stipulate that clitic clusters with objects in a local person have different syntactic structures. Clitic clusters with a third-person object have the structure in (46a.), but those with first or second person objects have the structure in (46b) and (46c).

(46) Three different structures for the clitic cluster depending on person of φ_S and φ_O

a. When O is third person: [AUX [φ_S]] … [$\varphi_{O(3)}$]

b. When O is second, S is first: [AUX [$\varphi_{S(1)}$ [$\varphi_{O(2)}$]]]

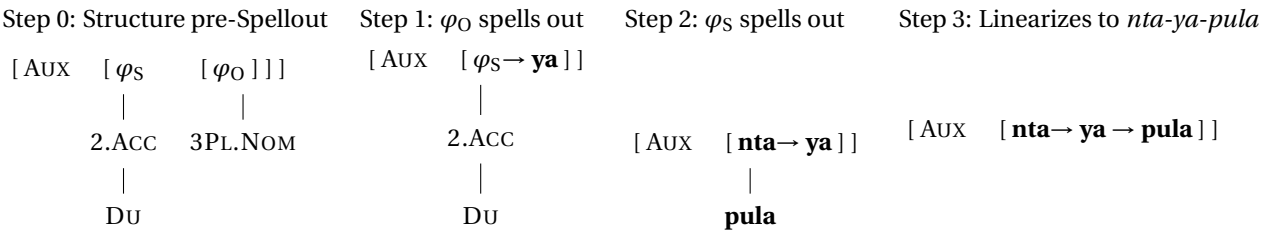
c. When O is first or second, S is third: [AUX [$\varphi_{O(1,2)}$ [$\varphi_{S(3)}$]]]

Descriptively, Harbour defines this stipulation as a requirement for local persons to be adjacent to the auxiliary (or modal root). In (46b.) and (46c.), the derivation moves φ_O up into the complex auxiliary head to satisfy this requirement, but in (46a.), φ_O remains low. This stipulation ensures that discontinuities never occur in clusters with third-person objects.

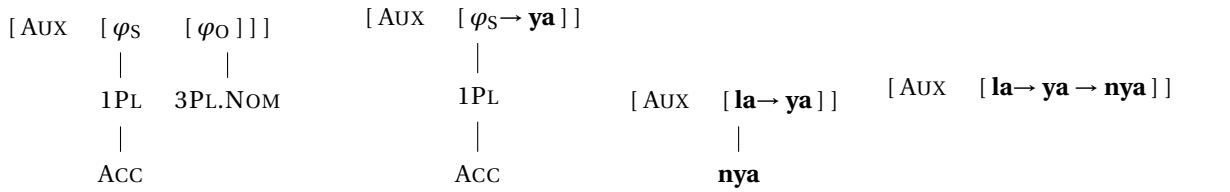
While this explanation is intuitive coming from the perspective of Person First, this is at odds with the broader spirit of Harbour's analysis, which is that discontinuities emerge from linearization, not syntactic movement. In essence, Harbour must stipulate a movement that looks very similar to a combination of Clitic Licensing and Person First. Thus, even a linearization-only approach cannot escape from needing some type of syntactic movement.

In concrete terms, when applied to Yulparija the linearization account will predict discontinuities in clitics other than the second-person dual. For example, in a clitic like *-la-nya* '1PL-ACC(PL)', the linearization account would incorrectly predict flanking.

(47) a. Linearization model predicts *-nta-pula* '2ACC-DU' should split



b. Linearization model incorrectly predicts *-la-nya* '1PL-ACC' should split



To avoid this prediction, we would need to stipulate a different structure for (47b), but it is unclear what the motivation for this would be. Both involve a local subject (first or second person) combining with a third person object, and yet only (47a) allows splitting.

Harbour's linearization model also predicts that flanking should be universal for constructions with double discontinuities. The primary problem with this is empirical: flanking orders are not universal. In Djaru (Ngumpin, Pama-Nyungan), for instance, we get interleaving of person with case and number (*Person*$_i$-Person$_k$-*Number*$_i$-Number$_k$), not flanking. This is shown in (48):

(48) No flanking in Djaru discontinuities (Tsunoda 1981: 135-136)

a. *nganampa* ***nga-*** ***rna*** ***-ngku-*** ***lu*** ***-la*** *nyinang-an ngununyin-rta*
1PL.EXCL C-1.NOM-2SG-PL(NOM)-LOC(2SG) sit-PRS 2SG-LOC
'We sit with you.' (**-rnalu-ngkula* '1PL.EXCL.NOM-2SG.LOC')

b. *nyunpula* ***nga*** ***-n*** ***-nganampa*** ***-wula*** ***-la*** *nyinang-an nganampanginy-rta*
2DU C-2.NOM-1PL.EXCL-DU(NOM)-LOC sit-PRS 1PL.EXCL-LOC
'You two will sit with us.' (**-npula-nganampala* '2DU.NOM-1PL.EXCL.LOC')

Similar interleaving patterns also exist in Ojibwe (McGinnis, 1995; Oxford, 2019) and Walmatjari (Harbour, 2008; Hudson, 1978). To capture these data, a linearization-style analysis needs to posit a morphophonological metathesis rule (cf. Harbour 2008: 213). While this may be necessary in cases like (48b.), which involve a single-consonant clitic like *-n* '2.NOM', it is unclear what is phonologically ill-formed about the Djaru (48a.) **rna-lu-ngku-la*. A linearization account would have to contend that metathesis occurs in this case as a response to arbitrary requirements of lexical items. From a typological standpoint, this is significant because it suggests that the output of linearization may be reordered by either phonotactic or lexical pressures. We therefore should expect any phi-order to be possible in the world's languages, but that certain orders are simply biased against because they require separate rules.

To sum up, a Harbour-style analysis attempts to reduce discontinuities to conflicts during linearization, but this appears too brittle. To successfully derive the Yulparija facts, three stipulations are necessary: (i) local persons must move high, (ii) person must dominate (and therefore precede) number, and (iii) the second-person dual clitic has an exceptional syntactic structure. These are incredibly similar to what Person First does in the present span-based analysis. While the span-based analysis is more outwardly complex, it is able to accurately predict how splitting and the unique syntactic structure of the clitic cluster arise from a unified set of Spellout mechanisms.

5.5 Nanosyntax

The present proposal draws from Nanosyntax for defining its Spellout algorithm, but there are several important differences. I compare to two main varieties of mainstream Nanosyntax here: (i) span-based Spellout with the Superset Principle (Starke, 2002, 2009), and (ii) constituent-based Spellout (Starke, 2018).

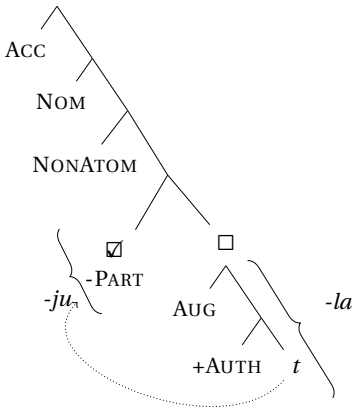
(i) *Span-based Spellout with the Superset Principle.* In this account, I dispense with the Superset Principle largely to motivate Last Resort movement in duals and exclusives. Taking the dual case as an example (see Section 3.3), the features [-AUTH [+PART have to Last Resort move above number so that they can spell out as *-ngku*, *-nta*, or another second-person singular clitic. If the Superset Principle were active, then a competing candidate for [-AUTH [+PART would be *-li* ⇔ [MIN [-AUTH [+PART, the first person dual. This would produce *-li-mpa* instead of *-ngku-pula* for the dative second-person dual, incorrectly producing syncretism with the first person. A way to avoid this prediction would be to say that the Superset Principle is active, but only applies at the top of a head when there is no other choice. This is an open possibility, but ultimately would not change the core analysis proposed here.

Yet another possibility would be to dispense with Last Resort movement altogether. This is not an adequate option, because any in-situ lexicalization of person would create [NUMBER [PERSON]] span orders in duals. This would predict that there should be no splitting clitics, because all clitics would be able to move their person span above number to check one of their □ features. Recall, in this account the reason why splitting clitics exist is because their initial generated order is [PERSON [NUMBER]], and so no head-internal movement can occur to check either □ feature due to the Person First Requirement.

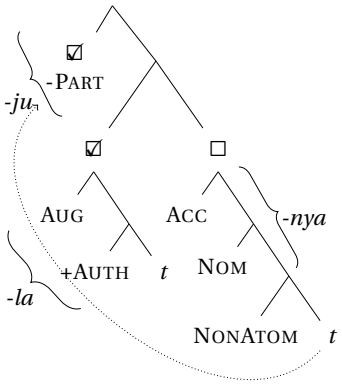
(ii) *Constituent-based Spellout.* Starke (2018) proposes that only constituents may spell out, which induces movements that superficially resemble those used in Clitic Licensing. However, adopting constituent-based Spellout will predict the wrong ordering facts in exclusive clitics. In *-la-nya-ju* '1PL-ACC-EXCL', the first two spans that spell out happen to be constituents, Steps 1-2 (49). But, if we move the exclusive clitic *-ju* to then spell out accusative constituent *-nya*, we get the wrong order **-ju-la-nya*, Step 3 (49).

(49) Constituent-based Spellout yields **-ju-la-nya*, instead of *-la-nya-ju* '1PL-ACC-EXCL'
cf. (22) from Section 4.1

Steps 1-2: Spell out *ju*, spell out *la*



Step 3: Move *-ju-la* so *-nya* is constituent,
derivation yields **ju-la-nya* instead of *la-nya-ju*



One option at this point could be to say that *-ju* must move early or tuck in to avoid a violation of the Person First Requirement – note that this still incorrectly predicts **-la-ju-nya* instead of the desired *-la-nya-ju*. The same thing happens if we allow *-la* to subextract at this stage; we incorrectly derive **-la-ju-nya*.

5.6 Interim summary

This spanning-based analysis is certainly not the only one that can derive the Yulparija facts. For instance, both DM and linearization-based accounts can also capture the data, but they require stipulating exceptional structure for clitics that split. By contrast, the span-based account (a) derives the necessary structure for split clitics from uniform Spellout principles, and (b) accomplishes all clitic ordering in the syntax (aside from *=n*/*=nyurra*). The facts on clitic order thus follow directly from what speakers already know about their ordinary clausal syntax and the lexical entries for the clitics.

The broad prediction this makes is that if a learner were presented with the full inventory of lexical items and sentences lacking clitics, then they should be able to correctly produce all clitic orders and discontinuities. The

question that remains is therefore largely empirical: in other languages, can person discontinuities be predicted in the same way, or is this approach too restrictive? Are person-number discontinuities memorized, or computed? In this paper, I've argued for the latter approach in Yulparija: clitic discontinuities are predictable from parameters that can be observed in the clitic paradigm alone.

6 Extensions: Clitic and DP Case Syncretism

In the analysis thus far, I have primarily focused on clitic order. However, the main purpose of Nanosyntax and similar theories using spans is to model morphological syncretism. Therefore, it would be a poor use of spans here if they could not also be used to capture morphological facts in the Yulparija clitics.

Here I present an extension to the analysis, showing how it can account for syncretisms in clitic and DP morphology, including the NOM-ACC case alignment of clitics and ERG-ABS alignment of DPs. I demonstrate that while clitics and DPs have identical feature values, they are realized with different lexical items because of how the features are structured. Readers less interested in these morphological facts may skip this section.

6.1 Compressing the case distinctions in clitics

Yulparija clitics express fewer case distinctions than those in the full DPs they cross-reference. In (50), there are at least nine cases for overt DPs, but only five cases for clitics. As an example, COM, GEN, and DAT DP cases all bear *-ku*, but surprisingly, they are not all cross-referenced by dative clitics.

(50)

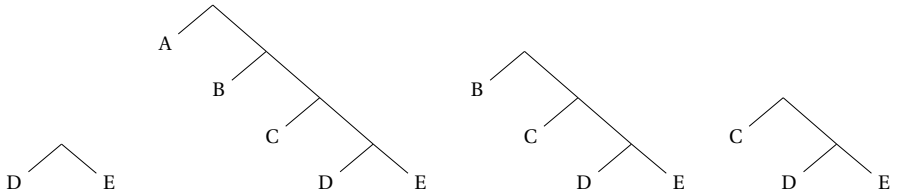
Clitics	DPs	
Ablative	ABL	*-nguru* / *-janu*
Locative	LOC	*-ngka* / *-la*
	ALL	*-karti*
	COM	*-kurlu*
Dative	GEN	*-kurangu* / *-kurnu*
	DAT	*-ku*
Accusative	ACC	*-∅*
Nominative	NOM	*-∅*
	ERG	*-lu* / *-ju*

To summarize, clitics compress the number of underlying case distinctions in comparison to full DPs. This presents a morphological challenge: How do we derive syncretisms for doubled clitics without deriving parallel syncretisms in full DPs?

I contend that the best way to account for these data is with disjunctive lexical items, where a portion of a span may be absent and still be spelled out by a given lexical item (cf. pointers, Blix, 2020; Caha and Pantcheva, 2012). I propose there are two types of spans that lexical items can reference, *core spans* and *peripheral spans*.

A core span is an obligatory part of the lexical entry, where any subtree that matches a core span perfectly may be spelled out by the associated lexical item. Every lexical entry will contain a core span of some size. Peripheral spans, on the other hand, are optional. A lexical item can spell out any tree that matches its core span plus any subset of its peripheral span. These peripheral spans may be located above, below, or inside the core span. Peripheral spans are written in gray text like this. As an example, [D [E is a core span in (51), with [A [B [C as its peripheral span. This means that the lexical item *morph* can be inserted for any of the trees in (51).

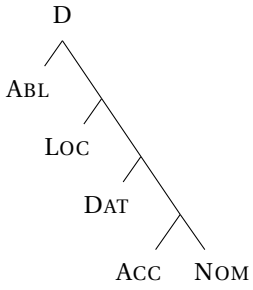
(51) Spans that match the vocabulary item *morph* ⇔ [A [B [C [D [E



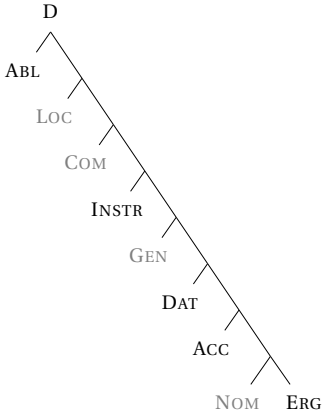
The core/peripheral span distinction fills a similar role to the Subset Principle in Distributed Morphology (Halle, 1997). When no perfect match exists, Spellout will insert a span that at least has a matching core span.[16]

With this mechanism, we can take the simplified case hierarchy from (52) and expand it to the case hierarchy in (53). Clitics may only have NOM, GEN, COM, and LOC cases as peripheral spans (grayed out in (53) above), never as core spans. This means that NOM, GEN, COM, and LOC cases will always be syncretic with the first core span beneath them. Note that I relabel ERG as NOM and INSTR as LOC when going from the full case hierarchy to the shorthand so that the descriptive labels match the shorthand labels.

(52) Case hierarchy (shorthand)



(53) Case hierarchy (full, modified from Caha 2009)



To illustrate, let us look at syncretism in clitics cross-referencing GEN and DAT DPs. In (54), DPs marked with dative *-ku* or genitive *-kurangu*/*-kurnu* are cross-referenced by the same clitic *-ju* '1SG.DAT'.

(54) No DAT/GEN distinction in the clitics

a. *ngayu-**ku** **=ju** yikarri-nyin-pa*
1-DAT -1SG.DAT laugh-PRS-AUG
'He's laughing at me.' G2-159

b. *punmu **=ju** ngayu-**kurangu** country*
Punmu -1SG.GEN 1-GEN country
'Punmu is my country.' B-25

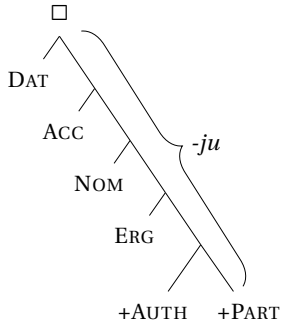
c. *wayi-nga-pa **=ju** ngayu-**kurnu** wirta*
INTER-TOP-FOC -1SG.GEN 1-GEN dog
'Where's my dog?' G2-141

In this analysis, this occurs because the dative clitic lexical item contains a peripheral span. Biggest Wins allows *-ju* to insert for both 1SG.DAT, as in (55a.), or for 1SG.GEN, as in (55b.).

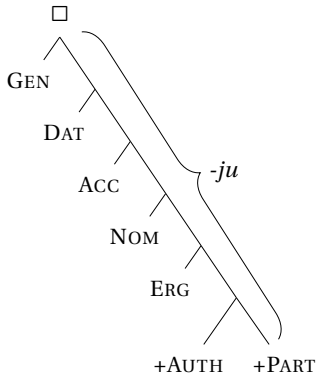
(55) □ *-ju* ⇔ [GEN [DAT [ACC [NOM [ERG [+AUTH [+PART

[16] The addition of peripheral spans requires one more restriction to our Spellout algorithm to ensure it always converges. In cases where more than one lexical item matches a span (e.g. a competing VI *borph* ↔ [Z [A [B [C [D [E for any of the trees in (51)), the derivation will prefer the vocabulary item that has the fewest unused nodes, in this case *morph* ⇔ [A [B [C [D [E. In Nanosyntax, this principle is known as Minimize Junk (Starke 2009: 4).

a.



b.



By contrast, the DP cases do not show this syncretism because their vocabulary items do not have GEN as a peripheral span. As an example, the dative case *-ku* spells out [DAT [ACC [NOM [ERG , which must be combined with *-rangu* to spell out [GEN].[17] Clitic lexical items like *-ju* cannot be inserted instead of case markers because the case markers do not have person features at their anchor.

6.2 Deriving the ergative split between DPs and clitics

Yulparija has an ergative split between clitics and full DPs, where clitics are nominative-accusative and DPs are ergative-absolutive. This immediately poses a morphological challenge: since clitics copy the phi-features of full pronouns, why aren't the case alignment systems identical? Here I will show that peripheral spans can help us capture this ergative split, using a single tripartite case system as the input.

I analyze Yulparija as having underlying tripartite case alignment, shown in (56). The subject of an intransitive is nominative, the external argument of a transitive is ergative, and the internal argument of a transitive is accusative. Nominative and ergative clitics are syncretic (*-pula*), whereas nominative and accusative DP case markers are syncretic (-∅). This gives the impression of an ergative split.

(56) Tripartite Case in Clitics and Nominals

a. *pala-kujarra-∅* ***=pula*** *ngurlu-rri-nyin*
3-two-NOM -3DU.NOM fearful-INCH-PRS
'They two are frightened.' G2-65

b. *nyupararra-lu* ***=pula*** *kanyi-rnin jiji-∅*
husband.&.wife-ERG -3DU.ERG have-PRS child-ACC
'The husband and wife have a child.' G1-67

c. *kujarra-kujupa-∅* ***=pulanya*** *janyi-pu-ngu* *ngartaly-pu-ngu*
two-other-ACC -3DU.ACC shape.wood-hit-PST break-hit-PST
He's chopped another two (trees) down already and broke them.' G1-88

This type of tripartite analysis has been proposed before for Western Desert languages based on both diachronic and comparative arguments (Blake et al., 1979; Goddard, 1982; Legate, 2008).

What we are seeing in (56) is thus a systematic syncretism between DPs and clitics (Legate, 2008). In clitics, the ergative and nominative cases are always syncretic. In full DPs, both nominative and accusative cases are ∅, giving the impression of ergative-absolutive alignment. This is schematized in (57):

(57) Underlying tripartite case as syncretism (Legate 2008)

	Clitics	DP Arguments	
Nominative	Acc	Nom	Absolutive
	Nom	Acc	
	Erg	Erg	

[17] Note that we will also need suffixes to undergo roll-up movement to derive the correct order. While similar to clitic licensing, this movement must remain inside the DP.

In my analysis, I capture this with peripheral spans. NOM case must always be a peripheral span for clitic lexical items, just as GEN was for datives in Section 6.1. This ensures that nominative and ergative clitics are consistently syncretic. From a learning perspective, this type of meta-constraint is a type of lexicon optimization, because it reduces the number of clitic lexical items that must be memorized.

6.3 Morphological zeroes reinforcing the tripartite analysis

Tripartite case alignment is expected to be difficult to learn in Western Desert languages, primarily because there is always at least one contrast neutralized at a time. Clitics will always neutralize the ERG/NOM distinction, whereas full DPs will neutralize NOM/ACC. An important typological question is thus why speakers analyze Yulparija with tripartite case alignment, rather than an ergative split based on nominal type (cf. nominal hierarchy in Silverstein 1986).

In this section, I argue that ergative splits cannot be made based on clitics versus full pronoun distinction. Instead, the reason why a tripartite analysis is favored in Yulparija (and other Western Desert languages) has to do with the distribution of morphological zeroes. I propose that all nominal morphological zeroes in Yulparija are associated with a single vocabulary entry. These zero morpheme provides learners with positive evidence in favor of using a single featural system to model both clitics and DPs.

First, examine the paradigms for full DP case morphemes in (58) and singular clitics in (59). The important thing to notice here is the distribution of $-\emptyset$. In both clitics and DPs, nominative and accusative cases are realized as a phonologically null morpheme.

(58) Case morphemes for full DPs

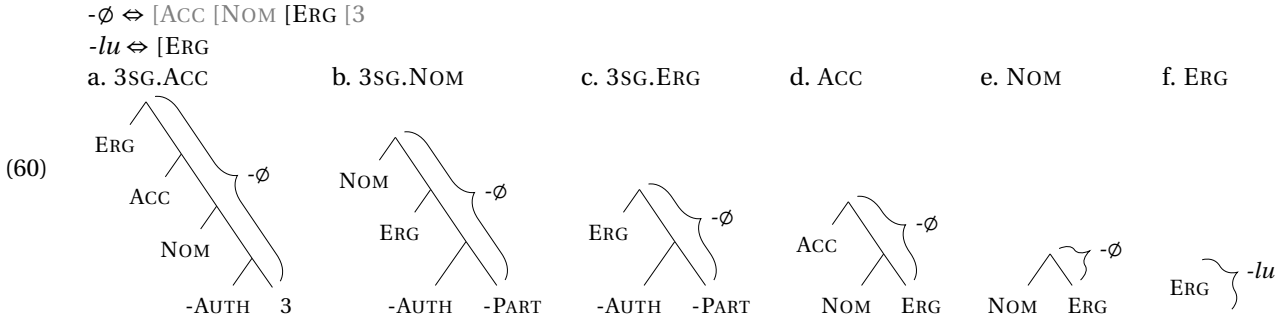
ERG	NOM	ACC	DAT	GEN	COM	LOC	ABL
-lu	-∅	-∅	-ku	-kuraku / -kurlu	-kurangu	-ngka	-ngurra

(59) Paradigm for singular clitics

		ERG/NOM	ACC	DAT/GEN	LOC
sg	1	-rna	-ja	-ju	-ja-ra
	2	-n	-nta	-ngku	-nta-ra
	3	-∅	-∅	-ra	-lu

In summary, here we see -∅ for NOM and ACC cases, as well as for 3SG.NOM, 3SG.ERG, and 3SG.ACC clitics. I propose that all five of these morphemes share a single lexical entry: ∅ ⇔ [ACC [NOM [ERG [3]]]], as shown in (60).

(60)



I argue that this syncretism across accusative and nominative cases is no coincidence, but rather an important cue for learners in discovering the tripartite case system. When confronted with the data in (58), a learner must posit at least two vocabulary entries. There is a clear ergative, *-lu* ↔ [ERG], and then another case morpheme with uncertain featural status that we'll label as ∅ ↔ X for the time being. The learner will then decide how to assign a feature value to X (either as [ABSOLUTIVE] or [ACC [NOM]) based on other morphological evidence.

The learner then sees the data in (59). This immediately provides evidence in favor of the [ACC [NOM] hypothesis above, because there is clear evidence of a nominative-accusative contrast in first and second persons. The learner must decide whether (i) to use a separate case system for clitics (e.g. ∅ ↔ [ACC [NOM) or (ii) to use the same set of case features as for DPs (e.g. ∅ ↔ [ACC [NOM [ERG [3). Because these entries are zeroes, there is a clear optimal choice here. The learner will choose the tripartite case option, because this allows maximal lexicon

optimization (i.e. ∅ ↔ [ACC [NOM [ERG [3). If these entries were non-zero, the learner would not have this bias in favor of a tripartite analysis, and therefore could analyze the case system of the language differently.

If my analysis is correct, then we would predict for the ergative split between DPs and clitics to be most stable in languages that share this distribution of zeroes. There is some preliminary evidence that this true. For example, Gurindji Kriol is a mixed language that formed as the result of contact between Gurindji (Ngumpin, Pama-Nyungan) and Australian Kriol. Like Yulparija, Gurindji had ergative-absolutive alignment in DPs, but nominative-accusative alignment in clitics with zeroes in the same regions of each paradigm (Meakins and McConvell 2021: 341). In Gurindji Kriol, the pronominal clitics were lost entirely, but full pronouns retained nominative-accusative alignment (Meakins 2011: 215). The interesting thing is that the ergative split quickly deteriorated in Gurindji Kriol: no ergative split was maintained between pronouns and common nouns, and instead the ergative marker has been reanalyzed as a discourse marker (Meakins 2011: 228). Under my analysis, this tight connection between the clitic paradigm and DP case alignment is expected.

6.4 Loose end: Competition between clitics and DPs

In this section, I briefly remark on why Yulparija clitics are distinct from full DP morphology. The reason why this is important is because my analysis does not make use of external mechanisms (such as postsyntactic operations, or syntactically-conditioned allomorphy) prevent DP case morphology from appearing in clitics, or vice versa. Rather, Yulparija clitics are different from their full DP counterparts because of how Agree structures subtrees. I argue that this allows different spans to be inserted even when their feature values are identical.

Recall from Section 3.1.1 that Agree copies features but not roots. Clitics will therefore always have a person feature as their lowest node, whereas full pronouns have a pronominal root. This is important because Spellout proceeds bottom-up, and so this lowest node has a disproportionate effect on what spans are available. The entries for DP vocabulary items are summarized in (61).

(61) Summary of vocabulary items for full DPs

Case	*-lu*	⇔	[ERG
	-∅	⇔	[ACC [NOM [ERG [-AUTH [-PART
	-ku	⇔	[DAT [ACC [NOM [ERG
	-rlu/*-raku*	⇔	[GEN
	-rangu	⇔	[COM [GEN
	-ngka	⇔	[LOC [COM [GEN [ACC [NOM [ERG
	-ngurra	⇔	[ABL [LOC [COM [GEN [ACC [NOM [ERG
Number	*-kujarra*	⇔	[NONATOM [MIN [$\sqrt{\text{TWO}}$
	-rti	⇔	[NONATOM [AUG
Person	*ngayu*	⇔	[+AUTH [±PART [$\sqrt{\text{PRONOUN}}$
	nyuntu	⇔	[-AUTH [+PART [$\sqrt{\text{PRONOUN}}$
	pala	⇔	[-AUTH [-PART [$\sqrt{\text{PRONOUN}}$

The crucial thing to observe in (61) is that full DPs always have ERG, AUG/MIN, or $\sqrt{\text{PRONOUN}}$ as the lowest nodes in their spans. This contrasts with clitics, which only have [±PART], [DAT] or [NONATOM] as their lowest nodes. Clitics and DPs will thus never be in direct competition with each other in Yulparija, because their span start and endpoints do not line up.

As an example, consider a genitive second-person plural pronoun *nyuntu-rti-ku-rlu* '2-PL-DAT-GEN'. We would assign this the following feature set (branching nodes removed for simplicity):

(62)

[GEN	[DAT [ACC [NOM [ERG	[NONATOM [AUG	[-AUTH [+PART [$\sqrt{\text{PRONOUN}}$
④ *-rlu*	③ *-ku*	② *-rti*	① *nyuntu*

Spelling out from bottom to top (right to left in (62)), the derivation spells out *nyuntu*, and then plural number as *-rti*. Then it would begin spelling out case, first spelling out *-ku* for the dative, then *-rlu* for the genitive. Assuming the suffixes induce roll-up movement, this yields *nyuntu-rti-ku-rlu* '2-PL-DAT-GEN', as desired.

Dative clitics cannot be inserted in (62) because their lowest node is [±PART], not a pronominal root. The lack of a pronominal root in clitics thus creates a cascading effect for Spellout, because then the next node to spell out is [AUG] (and not say, [NONATOM], which would be needed for the clitic lexical entries). The current analysis is

thus able to derive distinct inventories for clitics and full DP morphology without needing to appeal to allomorphy rules.

To summarize, clitics and DPs lexicalize identical sets of morphosyntactic features, but differ in whether they have roots. Clitics and DPs have different lexical entries because of how the Spellout algorithm parses from bottom up, amplifying the effect of the root node, not because of any post-syntactic operations.

7 Conclusion

This paper argues that the order of clitics – including person discontinuities – arise from predictable movements during Spellout. I adopt Person First, an output requirement on person-bearing morphemes in trees, and I demonstrate that this allows us to derive a variety of facts within the Pama-Nyungan language Yulparija. In Yulparija, pronominal clitics show robust parallelisms between their order at the clausal level (in the clitic cluster) and at the D level (in clitics cross-referencing a single DP).

Compared to previous work (e.g. Harbour 2008), the present analysis captures discontinuities involving both exclusives and duals. Crucially, this allows us to derive non-flanking discontinuities, which are observed in Djaru clitic clusters (uncontroversially) and possibly also in Yulparija exclusives. By deriving flanking and non-flanking discontinuities within the same system, I offer a more explanatory account of person-left discontinuities in general.

Person First offers a unified account of these ordering facts, where all orders are predictable from interactions between Person First and general principles of Spellout. Under this approach, person discontinuities are expected to be predictable, not memorized, and so they should be learnable from a relatively restricted input.

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8 Supplemental Materials

8.1 Yulparija Clitic Paradigm

(63) Excerpt of Yulparija clitic paradigm (Burgman 2008: 24)

		NOM/ERG	ACC	DAT/GEN	LOC/COM
sg	1	-rna	-ja	-ju	-ja-ra
		1SG.NOM	1SG.ACC	1SG.DAT	1SG.ACC-LOC
	2	-n	-nta	-ngku	-nta-ra
		2SG.NOM	2SG.ACC	2SG.DAT	2SG.ACC-LOC
	3	-∅	-∅	-ra	-lu
		3SG.NOM	3SG.ACC	3SG.DAT	3SG.LOC
du	1 incl	-li	-li-nya	-li-mpa	-li-nya-ra
		1DU(.NOM)	1DU-ACC	1DU-DAT	1DU-ACC-LOC
	1 excl	-li-**ju**	-li-nya-**ju**	-li-mpa-**ju**	-li-nya-**ju**-ra
		1DU(.NOM)-**EXCL**	1DU-ACC-**EXCL**	1DU-DAT-**EXCL**	1DU-ACC-**EXCL**-LOC
	2	-n-pula	-nta-pula	-ngku-pula	-nta-ra-pula
		2(.NOM)-DU	2ACC-DU	2DAT-DU	2ACC-LOC-DU
	3	-pula	-pula-nya	-pula-mpa	-pula-nya-ra
		(3)DU	(3)DU-ACC	(3)DU-DAT	(3)DU-ACC-LOC
pl	1 incl	-la	-la-nya	-la-mpa	-la-nya-ra
		1PL(.NOM)	1PL-ACC	1PL-DAT	1PL-ACC-LOC
	1 excl	-la-**ju**	-la-nya-**ju**	-la-mpa-**ju**	-la-nya-**ju**-ra
		1PL(.NOM)-**EXCL**	1PL-ACC-**EXCL**	1PL-DAT-**EXCL**	1PL-ACC-**EXCL**-LOC
	2	-nyurra	-nyurra-nya	-nyurra-mpa	-nyurra-nya-ra
		2PL(.NOM)	2PL-ACC	2PL-DAT	2PL-ACC-LOC
	3	-ya	-jana-nya	-jana-mpa	-jana-nya-ra
		3PL.NOM	3PL-ACC	3PL-DAT	3PL-ACC-LOC

8.2 The Span Match Algorithm

(64) *Span Match Algorithm without backtracking*
Before Step a, satisfy any movement features if possible.

a. Has the selected node been associated with a span yet? (If this is the first iteration, begin with [A].)
   i. If no, select the next node down and repeat Step a. If there is no unspelled out node beneath this one, keep the current selected node and proceed to Step b.
   ii. If yes, return to the previous node that has no associated span and proceed to Step b. (If there is no node in that position, end match, and spell out any spans left in the workspace.)

b. Is there an adjunct below the selected node?
   i. If yes, select the top node in that adjunct and go to Step a.
   ii. If no, label the selected node as the anchor.

c. Select the topmost node in span [A [. . . [Z]]]. Label this node as the pin. Proceed to Step d.

d. Is there a vocabulary item whose core or core + peripheral span *matches* the span from the pin to the anchor? (If the pin and the anchor are on the same node, is there a vocabulary item whose core span is only that node?)
   i. If yes, select that vocabulary item. If there are multiple vocabulary items that accomplish this, pick the one that matches the pin to anchor span most closely. Proceed to Step e.
   ii. If no, save the identity of the pin node to the workspace, and move the pin to the next node down. Return to Step d. If there is no node below the pin node, go to Step f.

e. Look into the workspace for a list of nodes that have been pinned. Does the lexicon have a core span that matches any contiguous sequence of these nodes?
   i. If yes, spell out the selected vocabulary item and remove it from the workspace. Clear the workspace of all pinned nodes. If there are leftover features go to Step g, otherwise, return to Step a.
   ii. If no, you will try to take a non-maximal span. Remove the selected vocabulary item from the workspace, and move the pin to the next node down. Return to Step d.

f. If an anchor node is not contained by any span in the lexicon, label it as leftover. Remove the anchor label and assign it to the node above it. Return to Step d.

g. Move all leftover features to an adjunct position immediately above the inserted span. Return to Step a.

8.3 Vocabulary Item Index

(65) Vocabulary item summary – full DPs (using the full set of case features)

Person	*ngayu*	⇔	[+AUTH [+PART [$\sqrt{\text{PRONOUN}}$
	nyuntu	⇔	[-AUTH [+PART [$\sqrt{\text{PRONOUN}}$
	pala	⇔	[-AUTH [-PART [$\sqrt{\text{PRONOUN}}$
Number	*-kujarra*	⇔	[NONATOM [MIN [$\sqrt{\text{TWO}}$
	-rti	⇔	[NONATOM [AUG
Case	*-lu*	⇔	[ERG
	-∅	⇔	[ACC [NOM [ERG [3
	-ku	⇔	[DAT [ACC [NOM [ERG
	-rlu/*-raku*	⇔	[GEN
	-rangu	⇔	[COM [GEN
	-ngka	⇔	[LOC [COM [GEN [ACC [NOM [ERG
	-ngurra	⇔	[ABL [LOC [COM [GEN [ACC [NOM [ERG

(66) Vocabulary item summary – Clitics

			Shorthand case feature system	Full case feature system
Case				
Nom	☐ *-∅*	⇔	[NOM [NONATOM	[NOM [ERG [NONATOM
Acc	☐ *-nya*	⇔	[ACC [NOM [NONATOM	[ACC [NOM [ERG [NONATOM
Dat	☐ *-mpa*	⇔	[DAT [ACC [NOM [NONATOM	[GEN [DAT [ACC [NOM [ERG [NONATOM
Loc	☐ *-ra*	⇔	[LOC [DAT	[LOC [ALL [COM [GEN [DAT
Person				
Excl	☐ *-ju*	⇔	[-PART	
Person & Number				
1pl	☐ *-la*	⇔	[AUG [+AUTH [+PART	
1du	☐ *-li*	⇔	[MIN [+AUTH [+PART	
3du	☐ *-pula*	⇔	[NONATOM [MIN [-AUTH [-PART	
2pl	☐ *-nyurra*	⇔	[AUG [-AUTH [+PART	
3pl	☐ *-jana*	⇔	[AUG [-AUTH [-PART	
Person & Case				
1	☐ *-rna*	⇔	[NOM [+AUTH [+PART	[NOM [ERG [+AUTH [+PART
	☐ *-ja*	⇔	[ACC [NOM [+AUTH [+PART	[ACC [NOM [ERG [+AUTH [+PART
	☐ *-ju*	⇔	[DAT [ACC [NOM [+AUTH [+PART	[GEN [DAT [ACC [NOM [ERG [+AUTH [+PART
2	☐ *-n*	⇔	[NOM [-AUTH [+PART	[NOM [ERG [-AUTH [+PART
	☐ *-nta*	⇔	[ACC [NOM [-AUTH [+PART	[ACC [NOM [ERG [-AUTH [+PART
	☐ *-ngku*	⇔	[DAT [ACC [NOM [-AUTH [+PART	[GEN [DAT [ACC [NOM [ERG [-AUTH [+PART
3	*-∅*	⇔	[ACC [NOM [-AUTH [-PART	[ACC [NOM [ERG [-AUTH [-PART
	☐ *-ya*	⇔	[NOM [NONATOM [AUG [-AUTH [-PART	[NOM [ERG [NONATOM [AUG [-AUTH [-PART
	☐ *-ra*	⇔	[DAT [ACC [NOM [-AUTH [-PART	[GEN [DAT [ACC [NOM [ERG [-AUTH [-PART
	☐ *-lu*	⇔	[LOC [DAT [ACC [NOM [-AUTH [-PART	[LOC [ALL [COM [GEN [DAT [ACC [NOM [ERG [-AUTH [-PART