

Height vs. Timing: Information Structure is derivationally late

Evidence from Bantu languages

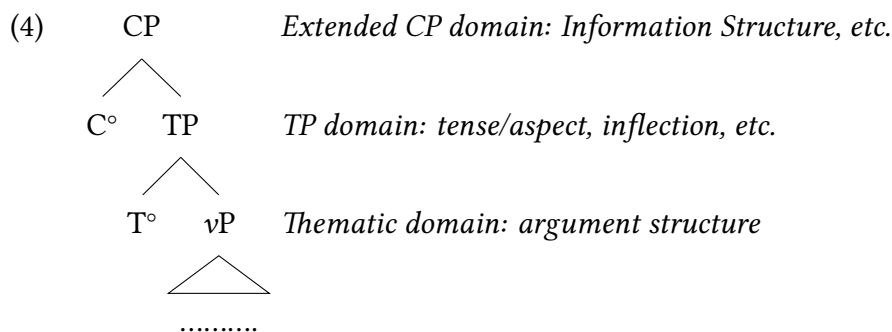
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1 Introduction

1.1 Hierarchy of Projections

- [1] As is well known, there is a relatively consistent Hierarchy of Projections (HoP) cross-linguistically (Grohmann, 2003; Ramchand and Svenonius, 2014; Wiltschko, 2014; Ritter and Wiltschko, 2014; Cinque, 1999; Ernst, 2014).
- [2] As Wiltschko (2014) points out (among many others), structural hierarchy across languages can vary in fine-grained details, but is quite consistent in broad strokes.
- [3] There is a limited set of structural domains that are extraordinarily consistent across languages.¹



1.2 Information Structure is Derivationally Late

- [4] My main proposal is that there is a **surface-orientation** of grammatical properties that are related to Information Structure.
- [5] i.e., **derivationally late** in a Minimalist syntactic analysis.
- Sometimes derivational lateness correlates with structural height. It is well-established that the left periphery canonically, crosslinguistically, contains positions relevant to Information Structure, discourse, etc. (Rizzi 1997 and much subsequent work).
 - Sometimes, derivational lateness correlates with the component of the grammar that Information Structure is realized in, namely, intonation. Prosodic phenomena are largely post-syntactic and it is common for Information Structure to be encoded via intonation.

¹For Wiltschko (2014) there are four such domains; Ramchand and Svenonius (2014) and Ritter and Wiltschko (2014) assume three (roughly corresponding to vP, TP-to-CP, and the expanded CP).

- **This talk:** §2 shows that there are instances of Information Structure that are:
 - 1) syntactic, and
 - 2) (relatively) structurally low, but
 - 3) nonetheless, derivationally late.

[6] This latter option results in a countercyclic syntactic derivation (e.g. Late Merger, in violation of the Extension Condition).

§4: Main claim of this talk

(7) Information Structure is derivationally late.

[8] §5 A potential rationale: Developmental Minimalist Syntax

[9] §9 Appendix: Kinande linker case study

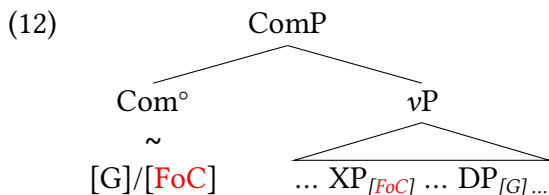
2 Low Focus/Givenness in Bantu Languages

2.1 Comment Phrase: A Proposal

[10] In an exploration of Lubukusu object marking, Sikuku and Diercks (2022) propose a middlefield projection that bears both topic and focus features that they call a **Comment Phrase (ComP)**, borrowing from the traditional terminology of topic-comment.

[11] Diercks (2022) argues that this ComP proposal can be extended to account for a broad range of relevant empirical patterns, including:

- object marking patterns across various languages (§2.3 & §2.4),
- conjoint/disjoint distinctions (§2.4),
- and the properties of unaugmented DPs in Southern Bantu languages (not covered here).



[13] Com° is the host for:

- The squiggle (~) operator, which introduces a focus antecedent from the discourse (and presupposes the existence of a focused constituent in its scope). (see Rooth, 1992, 2016; Büring, 2016; Wagner, 2021)
- Following Kratzer and Selkirk (2020), focus and givenness are syntactically implemented via focus (FoC) and givenness (G) features in the syntax.
- Com° hosts probes that search for [G] features and [FoC] features.^{2,3}

²While the specific formalization is novel in Sikuku and Diercks (2022), this analysis is a direct descendant of Halpert's (2016) LP, Zeller's (2015) XP, and Carstens and Mletshe's (2015; 2016) focus phrases.

³The actual implementation of the analysis in the relevant work uses the interaction/satisfaction model of Agree with fine-

[14] Diercks (2022) proposes that the [G] and [FoC] probes on Com^o are variably associated with interaction and satisfaction conditions of Agree in different languages (Deal, 2015, 2021).

[15] This results in different morphosyntactic realizations of focus and givenness in the vP domain across different languages.

2.2 Relevant Morphological Background Info

[16] Bantu languages are agglutinative, with rich noun class and agreement morphology.

(17) Lubukusu verbal form (simplified schematic) (Sikuku and Diercks, 2022)

SM- TNS- OM- **verb** -EXT -FV
 subject.marker- tense- object.marker- **verb.root** -derivational.extensions -final.vowel

(18) Partial listing of Lubukusu noun classes (adapted from Mutonyi, 2000, 6)

Class	Augment	Prefix	Example	Gloss
1	o-	mu-	omwana	‘child’
2	ba-	ba-	babaana	‘children’
3	ku-	mu-	kúmukhono	‘arm/hand’
4	ki-	mi-	kímikhono	‘arms/hands’
5	li-	li-	lilyaanda	‘ember’
6	ka-	ma-	kamaanda	‘embers’
7	si-	si-	sisyaangu	‘sponge’
8	bi-	bi-	bibyaangu	‘sponges’
9	e-	N-	eendubi	‘basket’
10	chi-	N-	chiindubi	‘baskets’

2.3 Lubukusu Comp

[19] Most Bantu languages have object marking (OMing) morphology that appears on the verb, generally occurring pre-stem between tense marking and the stem (as in (17) above).

[20] As is often the case with object clitics cross-linguistically, object markers (OMs) generally serve an anaphoric role akin to a pronoun when they appear in the absence of a lexical DP object.

(21) a. n-á-bon-a paapá [Lubukusu]

1SG.SM-REM.PST-see-FV 1father

‘I saw father.’ (Sikuku et al., 2018, 366)

b. n-á-(mu-) bon-a

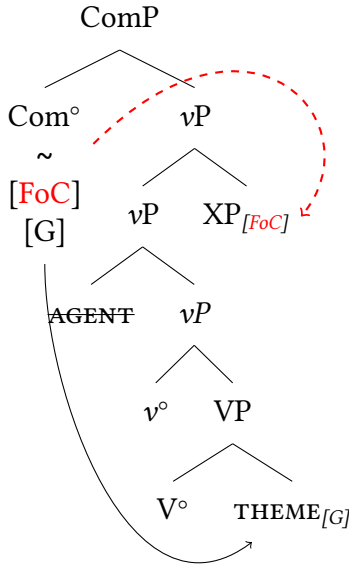
1SG.SM-REM.PST-1OM-see-FV

‘I saw him.’ (Sikuku et al., 2018, 366)

[21] **DOUBLING**: there are complex conditions that vary between languages as to what licenses the co-occurrence of an OM with an *in situ* lexical DP object.

grained feature specifications of the probes (Deal, 2015, 2021): see Sikuku and Diercks (2022), Langa da Câmara et al. (to appear), and Diercks (2022) for details. These details are central to this account accurately capturing the empirical effects, but I abstract away from the details here for expository reasons, as those details are not central to the point being addressed here.

(33) A simplified schematic of a typical instance of OM-doubling (cf. Sikuku and Diercks, 2022)



2.4 Zulu ComP

2.4.1 Zulu Object Marking

[34] It is well established that vP is a focus domain in Zulu:

- focused elements are required to occur inside vP , and
- discourse-given elements must vacate vP .

[35] For example, *wh*-subjects cannot occur in canonical preverbal subject position:

- (36) a. Ku-sebenz-e [bani]_{vP} ?
 17.EXPL-work-PST 1a.who
 ‘Who worked?’
- b. *U-bani u-sebenz-ile []_{vP} ?
 AUG-1a.who 1.SM-work-PST
 (Zeller, 2015, 20)

[37] OM-doubled objects tend to be necessarily specific/identifiable (Zeller, 2012):

- (38) Inherently indefinite objects cannot appear with an object marker
 A-ngi-(**m*)-thand-i mu-ntu?
 NEG-1SM-1OM-like-NEG 1-person
 ‘I don’t like anyone.’ (Zeller 2012: 27; Adams 2010: 42-43)

[39] Given that vP must be a focus domain, we would then expect that OM-doubled objects must vacate the vP : this is precisely what occurs.

[40] In the examples in (41) and (42) a manner adverb is used to diagnose the right edge of vP .⁵

⁵There is a host of research on object marking in Zulu; this summary is criminally brief (Adams, 2010; Buell, 2005, 2006; Cheng and Downing, 2009; Halpert, 2012; Van der Spuy, 1993; Zeller, 2012, 2014, 2015, among others).

(41) OM-doubled arguments cannot remain *in situ* inside *vP*

- a. Si-bon-a [i-n-kosi kahle]_{vP} .
1SG.SM-see-FV AUG-9-chief well
'We are seeing the chief well.'
- b. *Si-(yi-) bon-a [(i-n-kosi) kahle]_{vP} .
1SG.SM-9OM-see-FV AUG-9-chief well

(42) Objects move outside *vP* iff they are OM-doubled

- a. Si-(yi-) bon-a [kahle]_{vP} (i-n-kosi) .
1SG.SM-9OM-see-FV well AUG-9-chief
'We are seeing him well, the chief.' (Zeller, 2015, 20)
- b. *Si-bon-a [kahle]_{vP} i-n-kosi.
1SG.SM-see-FV well AUG-9-chief

2.4.2 Zulu Conjoint/Disjoint Marking

[42] Many Bantu languages have a form of verbal inflection that is associated with both focus content and the overt content of *vP*, which is known as **conjoint/disjoint**.⁶

[43] The widely-accepted analysis of conjoint/disjoint in Zulu is that it tracks the constituency of *vP*.

- Disjoint forms (*ya-*, circled below) occur when *vP* is empty.
- Conjoint forms (unmarked below) occur when *vP* contains an argument or adjunct XP.

(44) **Overt *in situ* objects take conjoint forms**

- a. U-mama u-phek-a [i-n-yama]_{vP} (conjoint)
AUG-1a.mother 1SM-cook-FV AUG-9-meat
'Mother is cooking the meat.'
- b. *U-mama u-phek-a []_{vP} (conjoint)
AUG-1a.mother 1.SM-cook-FV
Intended: 'Mother is cooking.'
- c. U-mama u-(ya-) phek-a []_{vP} (disjoint)
AUG-1a.mother 1.SM-DJ-cook-FV
'Mother is cooking.' (Zeller, 2015, 19)

(45) **Conjoint forms appear with low adverbials**

- a. uSipho u-gijima [kahle]_{vP}
AUG.1Sipho 1SM-run(CJ) well
'Sipho runs well.'
- b. *uSipho u-(ya-) gijima [kahle]_{vP}
AUG.1Sipho 1SM-DJ-run well
(Halpert, 2016, 126)

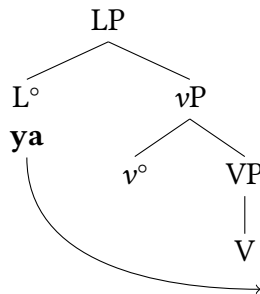
⁶van der Wal and Hyman (2017) offers a good overview of the relevant facts in a range of languages.

(46) Halpert's (2016) analysis of Zulu conjoint/disjoint

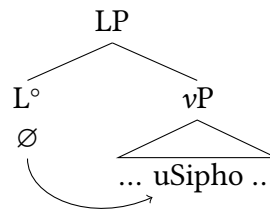
a. ku-ya-banda
 17SM-DJ-be.cold
 'It's cold.'

b. ku-pheka uSipho
 17SM-cook AUG.1Sipho
 'Sipho's cooking.'

Disjoint: the probe on L finds no goal.



Conjoint: the probe on L finds a goal.

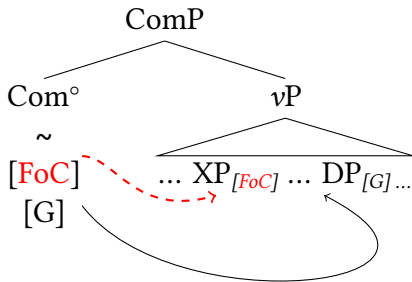


2.4.3 Zulu ComP

[47] Diercks (2022) argues that the ComP proposal can also account for Zulu object marking and conjoint/disjoint.⁷

- Object marking is the morphological spellout of the [G] probe on Com°.
 – valuation of the [G] probe is linked with an EPP property, raising [G]-agreed objects to Spec,ComP.⁸
- Conjoint/disjoint is the morphological spellout of the [FoC] probe on Com°.
- Focused phrases must remain inside vP in their surface position in order to be a goal for the focus probe.

(48) ComP analysis for Zulu (simplified representation) (Diercks, 2022)



3 Surface-orientation of ComP

[49] Across the board, the properties of ComP are surface-oriented.

- Agree relations show locality effects, but subjects don't intervene in their base positions.
- Conjoint/disjoint patterns track the surface content of vP.

[50] One analysis of these patterns is that ComP undergoes **Late Merger**, which is adopted by Sikuku and Diercks (2022) and Diercks (2022).

⁷As well as other properties we're not addressing here.

⁸This is almost exactly Zeller's (2015) analysis of Zulu OMinG.

- (51) a. $[_{TP} \text{SUBJ } T^{\circ} [_{vP} \text{SUBJ } v^{\circ} [_{VP} \text{V OBJ}]]] \rightarrow$
 b. $[_{TP} \text{SUBJ } T^{\circ} [_{\text{Comp}} \text{Com}^{\circ}] [_{vP} \text{SUBJ } v^{\circ} [_{VP} \text{V OBJ}]]]$

3.1 *In Situ* Subjects Inside Scope of ComP

- [52] Focused postverbal subjects can license object marking in Lubukusu;
- Sikuku and Diercks (2022) show that postverbal subjects are *in situ* in *vP*;
 - *in situ* subjects are therefore inside the scope of Com° : hence, they can license OM-doubling.

- (53) a-(bu-) ly-a (bu-suma) **Wekesa y-eng'ene.** [Lubukusu]
 1SM-14OM-eat-FV 14-ugali 1Wekesa 1-only
 'ONLY WEKESA ate ugali.'

- [54] Postverbal subjects in Zulu are likewise inside the scope of Com° .
- Postverbal *in situ* subjects lead to conjoint verb forms:

(55) Zulu Postverbal subject: conjoint required

- | | |
|---|--|
| a. uMlungisi u-(<u>ya-</u>) pheka [] _{vP}
AUG.1Mlungisi 1SM-DJ-cook
'Mlungisi is cooking.' (Halpert, 2016, 120) | preverbal subject: disjoint |
| b. ku-pheka [uSipho] _{vP}
17SM-cook AUG.1Sipho
'Sipho is cooking.' (Halpert, 2016, 124) | <i>in situ</i> subject: conjoint |
| c. *ku-(<u>ya-</u>) pheka [uSipho] _{vP}
17SM-DJ-cook AUG.1Sipho
(Halpert, 2016, 124) | <i>in situ</i> subject: *disjoint |

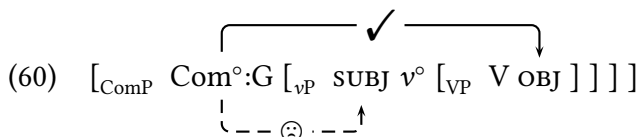
3.2 Surface-orientation of ComP

- [56] If *in situ* subjects are inside the scope of Com° , it creates timing puzzles for many typical SV(O) constructions.⁹

- [57] Consider a basic example of object marking in Zulu:

- (58) Si-(yi-) bon-a kahle (i-n-kosi). [Zulu]
 1SG.SM-9OM-see-FV well AUG-9-chief
 'We are seeing him well, the chief.' (Zeller, 2015, 20)

- [59] On standard assumptions of solely Merge-based structure building, when Com° is merged atop *vP* the closest potential goal is the *in situ* subject, not the object (i.e. the actual Goal of the probe).



⁹This issue has been tackled by Zeller (2015), Halpert (2016), and Pietraszko (2020) for A-movement of subjects.

[61] Given that OM probes tend to be [G] probes, and subjects are often/usually discourse-given and therefore [G]-marked, we expect subjects to intervene in the probe from Com°.

- But, of course, they don't actually intervene.

[62] Zeller (2015) accounts for this by claiming that T° must necessarily probe first, meaning that the subject would be agreed-with and raised to Spec,TP, out of the scope of Com° (his X°).

(63) **The “T Always Probes First” principle (TAPF)**¹⁰

The first vP-external PROBE-GOAL relation in a derivation must involve the uninterpretable features of T.

[64] The TAPF is obviously relatively *ad hoc*, though it captures the OM facts.

- An alternative explored by Halpert (2016) and Pietraszko (2020) is that the features motivating movement of subjects and object marking are located on the same head, and are **crucially ordered**.
- If EPP must be satisfied before φ -Agree occurs, the timing of A-movement of subjects and object agreement can be derived.

[65] However, we see this surface-orientation of Com° in a variety of ways beyond just the potential intervention of subjects.¹¹

- For example, OM-doubling in Lubukusu requires a focused element inside vP **on the surface**.
- Clefted focused phrases cannot license OM-doubling the way that *in situ* ones do.

- (66) a. **Liina** ni-lwo ba-ba-ana ba-a-(#ka-) kes-a (ka-ma-indi) ?
 when COMP-11 2-2-children 2SM-PST-6OM-harvest-FV 6-6-maize
 ‘When did the children OM-harvest the maize?’
 b. Ba-ba-ana ba-a-(ka-) kes-a (ka-ma-indi) **liina**?
 2-2-children 2SM-PST-6OM-harvest-FV 6-6-maize when
 ‘WHEN did the children harvest the maize?’

[67] Likewise, focused subjects must be postverbal to license OM-doubling. Preverbal focused subjects do not.

- (68) a. *-ong'ene* ‘only’ on preverbal subject does not facilitate OM-doubling:
Wekesa y-eng'ene a-(#bu-) ly-a (bu-suma).
 1Wekesa 1-only 1SM-14OM-eat-FV 14-ugali
 ‘Only Wekesa ate ugali.’
 b. *in situ* focused subject facilitates doubling
 a-(bu-) ly-a (bu-suma) **Wekesa y-eng'ene**.
 1SM-14OM-eat-FV 14-ugali 1Wekesa 1-only
 ‘Only Wekesa ate ugali.’

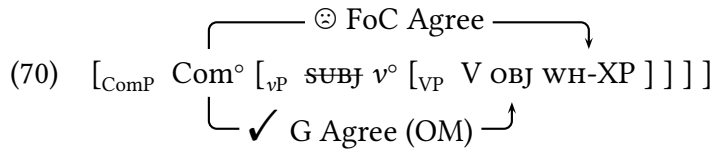
[69] The cyclicity puzzle:

- If structure is built solely bottom-up, the focused element *is* inside vP when Com° is merged.

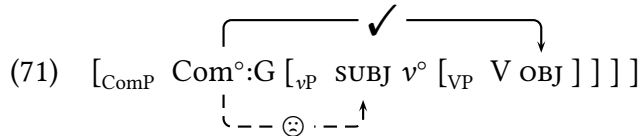
¹⁰Halpert (2016) deals with the same issue with her LP proposal by requiring that an EPP feature on L raise the subject outside of its scope before the licensing-probing work of L is completed.

¹¹Additional surface-properties of Com° include the requirement for overt material in vP for conjoint-marking and the requirement for two overt constituents postverbally for linker constructions: see §9.

- Therefore the focused element should be a licit Goal for the FoC probe on Com° , and OM-doubling ought to be acceptable ...
 - ... but it's not.



- As pointed out above, *in situ* subjects in most instances ought to intervene between the G probe on Com° and the object-marked object ...
 - ... but they don't.



^[72] Sikuku and Diercks (2022) and Diercks (2022) suggest that Com° is **Late Merged**.

- This derives the same effect as:
 - the previous proposals (TAPF; stipulating the sequence of A-movement and OM-probing).
 - It is *mildly* less arbitrary/ad hoc, in that Late Merger operations have previously been proposed for a broad range of analyses.¹²
 - But crucially, a Late Merger account of ComP also derives the surface-orientation of focus effects in Lubukusu and Zulu (and other languages), which an account targeted at the intervention of subjects cannot.
- At the same time, there are understandably intense critiques of Late Merger operations as contrary to the Strong Minimalist Thesis and unconstrained, overgenerative, and computationally intractable (Sportiche, 2019; Chomsky, 2019; Epstein et al., 2015, among others).

4 Information Structure is Derivationally Late

^[73] The main contribution of this talk is to suggest that the countercyclicity of ComP is **not arbitrary**.

Main claim of this talk

(74) Information Structure is derivationally late.

¹²Relevant Late Merger literature includes: Takahashi and Hulsey (2009); Lebeaux (1988, 2000); Fox (1999); Stepanov (2001); Nissenbaum (1998); Sauerland (1998); Abe (2018); Haddad (2019); Zyman (2021); Bhatt and Pancheva (2004).

- (75) Examples of derivational lateness of Information Structure:¹³
- a. Structural Height and Derivational Lateness are congruous in the left periphery: Canonically, topic and focus projections occur in the extended CP (Rizzi, 1997).
 - b. Structurally low, derivationally late: Late Merger (the examples discussed above).
 - c. Information Structure can be entirely postsyntactic: As is well-documented for Germanic languages, focus and givenness are realized intonationally. (for recent overviews, see Schwarzschild, 1999; Büring, 2016; Rooth, 2016; Wagner, 2021)

5 A Potential Explanation: Developmental Minimalist Syntax

- [76] For the sake of argument, let's assume that the main claim of the talk in (74) is empirically accurate, and Information Structure is derivationally late.
- Why should this be the case?
- [77] Diercks et al. (2022) propose that there is a direct correlation between Minimalist derivations and sequences of acquisition.

(78) **Developmental Minimalist Syntax (DMS)**

The Minimalist derivation of adult language structures recapitulates the ontogenetic (i.e. organism-internal) development of those same syntactic structures.

- [79] DMS proposes that the derivational nature of adult grammatical knowledge and the systematic cross-linguistic hierarchy of projections (among other properties of syntax) both find their root in the nature of acquisition of syntax.
- [80] Syntactic acquisition is generally additive, typically adding newly learned structures on top of existing structures. This canonical pattern was captured in the **Extension Condition** (Chomsky, 2000, 2001, 2008).
- [81] The claim is that children become grammatically productive in adult-like ways in predictable sequences of grammatical structures, (canonically) structurally lower elements before structurally higher ones.

¹³A'-opacity could potentially be an example of derivational lateness: it is well documented that A'-moved elements are generally inaccessible/opaque to subsequent syntactic operations (Rezac, 2003; Safir, 2019; Obata and Epstein, 2011; Carstens and Diercks, 2013). One potential explanation for A'-opacity is that A'-movements are in fact derivationally late, i.e. they occur after most other operations have already occurred. A'-movements tend to be related to information-structural/discourse purposes. Perhaps A'-movements can't feed additional syntactic processes because they in fact occur after those other syntactic processes have already occurred.

(82) Acquisition stages (adapted from Rakhlin and Progovac 2021, 7)

Syntax	Age (mo.)	Surface elements	Examples
Pre-syntax	12-22	holophrases	<i>are-you-ok; there-you-go; all done</i>
VP/small clause	18-24	Verb variety increases; verb–noun combinations increase relative to single words, intransitive grammar	<i>wash hands; more milk; baby fall</i>
vP	28-36	Frequency of transitive (with overt subjects and objects) structures increases; acquisition of more complex verb types, such as perception, desire, etc.	<i>I chewing; I text mama; Daddy go me around; I come it closer</i>
TP	37-42	Consistent tense and agreement marking; consistent use of auxiliary verbs and case distinctions	<i>I goed to school; We maked chapatis</i>
CP	43-48	Clausal subordination; overt complementizers	<i>relatively adult-like</i>

- [83] DMS proposes a systematic correlation between the derivation of adult syntactic structures and the pathways by which they are acquired.
- [84] Roughly speaking, the sequence of operations in a Minimalist analysis of an adult sentence is a fairly direct record of the acquisition timeline that a child traversed while acquiring their language.
- [85] On this view, many aspects of adult grammatical knowledge (movement, phases, etc.) are *ontogenetic fossils*, i.e. fossilized remnants of earlier stages of the person’s grammatical knowledge.
- e.g. the vP-internal subject hypothesis is explained by a stage in acquisition where children are producing predicates and arguments in an adult-like way, but not tense/aspect.
 - This is generally known as the root infinitive stage of acquisition (also the optional infinitive stage, or root default stage: see Grinstead 2016).

5.1 The Centrality of Derivational Timing

- [86] DMS embraces non-canonical derivational timing (including countercyclic operations).¹⁴
- The DMS correlation is not between structural height and acquisition: it is between the Minimalist derivation and acquisition. This allows for mismatches between structure height and derivational steps.
 - The DMS prediction is that countercyclic operations can and do exist in adult grammatical knowledge, but the prediction is that the same sequences occur in child language acquisition.
- [87] Diercks et al. (2022) discuss a number of countercyclic¹⁵ properties of syntax and their correlations with acquisition, including look-ahead in wh-movement, the construction of DPs over the course of constructing a clause (layering derivations), and the interleaving of prosody and syntax, among others.

¹⁴As is the case for standard Minimalist theorizing, it is still necessary to constrain the availability of countercyclic operations, and that work is underdeveloped at this point.

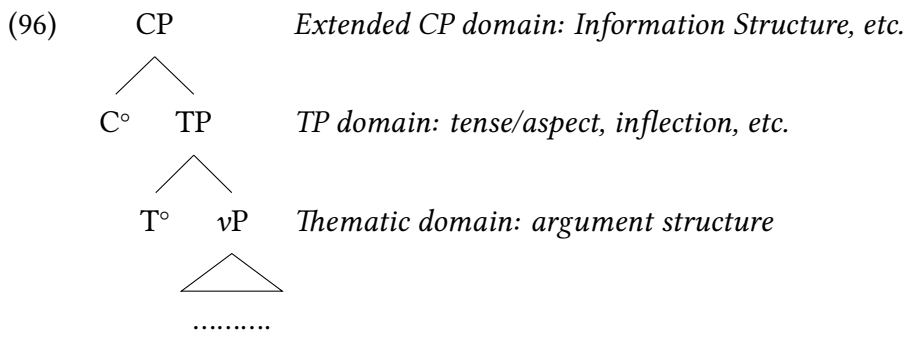
¹⁵Using this term as a cover term here for nuanced derivational timing, some of which aren’t strictly violations of the Extension Condition.

5.2 Per DMS, Adult Grammar Makes Acquisition Predictions

- [88] **Prediction:** In general, Late-Merged elements in adult grammar are late-acquired by children.
- Canonically, Information Structure is structurally high, as it is merged into the structure later than most other structure.
 - We would expect this to have a developmental basis:
 - children ought to become grammatically productive in adult-like ways with the grammar of left peripheral Information Structure later than they do with structurally-lower grammatical elements.
 - The Bantu evidence suggests that it is possible for Information Structure to be structurally low.
 - Assuming parallel acquisition timelines for similar ‘domains,’ however, we would expect these structures to be *derivationally* late (per DMS).
- [89] **Prediction:** Specifically for these Bantu structures, adult-like use of ComP-related constructions should be acquired in an adult-like fashion relatively ‘late.’
- Specifically, later than productive, adult-like use of TP structures (tense, subject agreement) and CP structures (wh-movement).
- [90] It is far from trivial to test this empirically given the relative dearth of work on acquisition of Bantu languages as well as the hard question of measuring children’s grammatical productivity, but it is certainly (in principle) possible.
- One study on Zulu acquisition (Suzman, 2002) supports the predictions here, but much more detailed work is necessary.

6 Conclusions

- [91] A number of structurally lower properties of Bantu languages have a surface-orientation: they appear to be dependent on the structure of the verbal domain *after* certain operations have already occurred (movement of subjects, subject agreement, verb movement, wh-movement, etc.).
- [92] These countercyclic properties are all plausibly linked with Information Structure.
- [93] A potential unification of information structural properties is that they are **derivationally late**.
- Left peripheral encoding of Information Structure fits within canonical theory: derivationally late = structurally high on a strict, cyclic Merge-based structure building.
 - Structurally low properties of Information Structure ought to be countercyclic, derivationally after the construction of the TP/CP domain.
 - Information Structure can also be entirely post-syntactic: e.g. prosodic focus/givenness in English and other similar languages (Büring, 2016; Wagner, 2021; Rochemont, 2016).
- [94] I have suggested that this may be rooted in sequences of acquisition: late-acquired properties correlate with derivationally-late sequences in adult grammar (but this requires empirical confirmation).
- [95] The DMS idea has expansive implications for the HoP more generally, also. Specifically, DMS suggests that the universal aspects of the HoP may emerge from developmental properties.
- The canonical domains noted in (96) may well be linked with acquisition stages.



7 Acknowledgments

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8 References

- Abe, Jun. 2018. Late merge and phases for anti-c-command requirements. *Syntax* 21:91–111.
- Adams, Nikki. 2010. The Zulu ditransitive verb phrase. Doctoral Dissertation, University of Chicago.
- Baker, Mark C. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.
- Baker, Mark C., and Chris Collins. 2006. Linkers and the internal structure of vp. *Natural Language and Linguistic Theory* 24:307–354.
- Bhatt, Rajesh, and Roumyana Pancheva. 2004. Late merger of degree clauses. *Linguistic Inquiry* 35:1–46.
- Buell, Leston. 2005. Issues in Zulu morphosyntax. Doctoral Dissertation, UCLA, Los Angeles, CA.
- Buell, Leston. 2006. The Zulu conjoint/disjoint verb alternation: focus or constituency? *ZAS Papers in Linguistics* 43:9–30.
- Büring, Daniel. 2016. *Intonation and meaning*. Surveys in Semantics and Pragmatics. Oxford: Oxford University Press. DOI:10.1093/acprof:oso/9780199226269.001.0001.
- Carstens, Vicki, and Michael Diercks. 2013. Agreeing how?: Implications for theories of agreement and locality. *Linguistic Inquiry* 44:179–237.
- Carstens, Vicki, and Loyiso Mletshe. 2015. Radical defectivity: implications of Xhosa expletive constructions. *Linguistic Inquiry* 46. DOI: 10.1162/LING_{a0}0180.
- Carstens, Vicki, and Loyiso Mletshe. 2016. Negative concord and nominal licensing in Zulu and Xhosa. *Natural Language & Linguistic Theory* 34:761–804. DOI: <https://doi.org/10.1007/s11049-015-9320-x>.
- Cheng, Lisa Lai-Shen, and Laura J. Downing. 2009. Where’s the topic in Zulu? *The Linguistic Review* 26:207–238. DOI: <https://doi.org/10.1515/tlir.2009.008>.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on Minimalist syntax in honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89–156. Cambridge: MIT Press.

- Chomsky, Noam. 2001. Derivation by phase. In Ken Hale: A life in linguistics, ed. Michael Kenstowicz, 1–52. Cambridge: MIT Press.
- Chomsky, Noam. 2008. On phases. In Foundational issues in linguistic theory, ed. Robert Freidin, Carlos Otero, and Maria Luisa Zubizarreta, 133–166. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2019. Some puzzling foundational issues: The Reading program. Catalan Journal of Linguistics Special Issue:263–285.
- Cinque, Guglielmo. 1999. Adverbs and functional heads: a cross-linguistic perspective. New York: Oxford University Press.
- Deal, Amy Rose. 2015. Interaction and satisfaction in ϕ -agreement. In The Proceedings of NELS 45, ed. T. Bui and D. Ozyildiz, 1–14.
- Deal, Amy Rose. 2021. Interaction, satisfaction, and the PCC. Linguistic Inquiry Advance Publication:1–80. https://doi.org/10.1162/ling_a00455.
- Diercks, Michael. 2022. Information structure is syntactic: Evidence from Bantu languages. Ms Under Review, Pomona College.
- Diercks, Michael, Galia Bar-Sever, Katherine Johnson, and Madeline Bossi. 2022. Developmental Minimalist Syntax. Ms, Pomona College. Earlier version available at <https://lingbuzz.net/lingbuzz/005671>.
- Epstein, Samuel D., Hisatsugu Kitahara, and T. Daniel Seely. 2015. Structure building that can't be! In Explorations in maximizing syntactic minimization, volume 22 of Routledge Leading Linguists, 155–174. New York & London: Routledge.
- Ernst, Thomas. 2014. The syntax of adverbs. In The Routledge Handbook of Syntax, ed. Andrew Carnie, Yosuke Sato, and Daniel Siddiqi, 108–130. Routledge.
- Fox, Danny. 1999. Reconstruction, binding theory, and the interpretation of chains. Linguistic Inquiry 30:157–196.
- Grinstead, John. 2016. Root infinitives in child language and the structure of the clause. In The Oxford handbook of developmental linguistics, ed. Jeffrey Lidz, William Snyder, and Joe Pater, 341–366. New York, NY: Oxford University Press, 1 edition.
- Grohmann, Kleanthes K. 2003. Prolific domains. on the anti-locality of movement dependencies. Amsterdam: John Benjamins.
- Haddad, Youssef A. 2019. Counter-cyclic Merge as a last resort for adjuncts: Evidence from Levantine Arabic attitude datives. Brill's Journal of Afroasiatic Languages and Linguistics 11:316–339.
- Halpert, Claire. 2012. Argument licensing and agreement in Zulu. Doctoral Dissertation, MIT. [Http://dspace.mit.edu/handle/1721.1/7582](http://dspace.mit.edu/handle/1721.1/7582).
- Halpert, Claire. 2016. Argument licensing and agreement. New York: Oxford University Press. DOI:10.1093/acprof:oso/9780190256470.001.0001.
- Kratzer, Angelika, and Elisabeth Selkirk. 2020. Deconstructing information structure. Glossa: a journal of general linguistics 5:113. 1–53. DOI: <https://doi.org/10.5334/gjgl.968>.
- Langa da Câmara, Crisófia, Michael Diercks, Madelyn Colantes, Brendan Ly, Jackson Kuzmik, and Hannah Lippard. to appear. An initial look at object marking in Cinyungwe. To appear in the Proceedings of ACAL 51/52.
- Lebeaux, David. 1988. Language acquisition and the form of the grammar. Doctoral Dissertation, University of Massachusetts, Amherst.
- Lebeaux, David. 2000. Language acquisition and the form of the grammar. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Mutonyi, Nasiombe. 2000. Aspects of Bukusu morphology and phonology. Doctoral Dissertation, The Ohio State University.
- Nissenbaum, Jon. 1998. Movement and derived predicates: Evidence from parasitic gaps. In The

- interpretive tract(25), ed. Orin Percus and Uli Sauerland, 247–295. Cambridge, Massachusetts: MIT, Department of Linguistics.
- Obata, Miki, and Samuel David Epstein. 2011. Feature-splitting Internal Merge: Improper movement, intervention and the A/A' distinction. *Syntax* 14:122–147.
- Pietraszko, Asia. 2020. The timing of agreement and A-movement in Ndebele. To appear in *Working Papers in the Language Sciences at the University of Rochester*. <https://ling.auf.net/lingbuzz/005254>.
- Rakhlin, Natalia, and Ljiljana Progovac. 2021. Hierarchical clause structure as a tool for cognitive advances in early childhood. *Language Sciences* 83:1–19.
- Ramchand, Gillian, and Peter Svenonius. 2014. Deriving the functional hierarchy. *Language Sciences* 46:152–174.
- Rezac, Milan. 2003. The fine structure of Cyclic Agree. *Syntax* 6:156–182.
- Richards, Norvin. 2010. *Uttering trees*. Linguistic Inquiry Monograph. Cambridge, MA: MIT Press.
- Ritter, Elizabeth, and Martina Wiltschko. 2014. The composition of INFL: An exploration of tense, tenseless languages, and tenseless constructions. *Natural Language & Linguistic Theory* 32:1331–1386.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of grammar*, ed. Liliane Haegeman, 281–337. Dordrecht: Kluwer Academic Publishers. DOI: <https://doi.org/10.1007/978-94-011-5420-8>.
- Rochemont, Michael. 2016. Givenness. In *The Oxford Handbook of Information Structure*, ed. Caroline Féry and Shinichiro Ishihara, 41–63. Oxford: Oxford University Press. DOI: 10.1093/oxfordhb/9780199642670.001.0001.
- Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1:117–121. DOI: <https://doi.org/10.1007/BF02342617>.
- Rooth, Mats. 2016. Alternative semantics. In *The Oxford handbook of information structure*, ed. Caroline Féry and Shinichiro Ishihara, 19–40. Oxford: Oxford University Press. DOI: <https://doi.org/10.1093/oxfordhb/9780199642670.013.19>.
- Safir, Ken. 2019. The a/ā distinction as an epiphenomenon. *Linguistic Inquiry* 50:285–336.
- Sauerland, Uli. 1998. The meaning of chains. Doctoral Dissertation, MIT.
- Schneider-Zioga, Patricia. 2015a. The linker in Kinande re-examined. In *Selected proceedings of the 44th Annual Conference on African Linguistics*, ed. Ruth Kramer, Elizabeth C. Zsiga, and One Tlale Boyer, 264–276. Somerville, MA: Cascadilla Proceedings Project.
- Schneider-Zioga, Patricia. 2015b. Linking, predication, and symmetry: On the syntax of the linker in Kinande. In *Proceedings of the 32nd West Coast Conference on Formal Linguistics*, ed. Ulrike Steindl, Thomas Borer, Huilin Fang, Alfredo García Pardo, Peter Guekguezian, Brian Hsu, Charlie O'Hara, and Iris Chuoying Ouyang, 323–331. Somerville, MA: Cascadilla Proceedings Project.
- Schneider-Zioga, Patricia. 2022. The linker, a'-agreement & licensing in kinande. Handout from talk given at UCSD field research lab; May 18, 2022.
- Schneider-Zioga, Patricia, and Philip N. M. Mutaka. 2015. The linker in Kinande: A predication relation. *The Journal of West African Languages* 42.
- Schwarzschild, Roger. 1999. Givenness, Avoid F and other constraints on the placement of accent. *Natural Language Semantics* 7:141–177. DOI: <https://doi.org/10.1023/A:1008370902407>.
- Sikuku, Justine, and Michael Diercks. 2021. Object marking in Lubukusu: Information structure in the verb phrase. In *Celebrating 50 years of ACAL: Selected papers from the 50th Annual Conference on African Linguistics*, ed. Akinbiyi Akinlabi, Lee Bickmore, Michael Cahill, Michael Diercks, Laura J. Downing, James Essegbey, Katie Franich, Laura McPherson, and Sharon Rose, 305–330. Berlin: Language Science Press. DOI: 10.5281/zenodo.5578822.
- Sikuku, Justine, and Michael Diercks. 2022. Object marking in Bukusu: At the interface of pragmatics and syntax. Ms, Moi University and Pomona College. Available online at

- <https://research.pomona.edu/mjkd/papers/>.
- Sikuku, Justine, Michael Diercks, and Michael Marlo. 2018. Pragmatic effects of clitic doubling: Two kinds of object markers in Lubukusu. *Linguistic Variation* 18:359–429.
- Sportiche, Dominique. 2019. Somber prospects for Late Merger. *Linguistic Inquiry* 50:416–424.
- Van der Spuy, Andrew. 1993. Dislocated noun phrases in Nguni. *Lingua* 90:335–355. DOI: [https://doi.org/10.1016/0024-3841\(93\)90031-Q](https://doi.org/10.1016/0024-3841(93)90031-Q).
- Stepanov, Arthur. 2001. Late adjunction and minimalist phrase structure. *Syntax* 4:94–125. DOI: <https://doi.org/10.1111/1467-9612.00038>.
- Suzman, Susan M. 2002. Morphological accessibility in Zulu. In *Clinical linguistics: Theory and applications in speech pathology and therapy*, ed. Elisabetta Fava, volume 227 of *Current issues in linguistic theory*, 155–174. Amsterdam: John Benjamins Publishing Company.
- Takahashi, Shoichi, and Sarah Hulse. 2009. Wholesale Late Merger: Beyond the A/A' Distinction. *Linguistic Inquiry* 40:387–426. DOI: 10.1162/ling.2009.40.3.387.
- Travis, Lisa. 1984. Parameters and effects of word order variation. Doctoral Dissertation, Massachusetts Institute of Technology.
- van der Wal, Jenneke, and Larry M. Hyman, ed. 2017. *The conjoint/disjoint alternation in Bantu*. Berlin: Mouton de Gruyter. DOI: <https://doi.org/10.1515/9783110490831>.
- Wagner, Michael. 2021. Prosodic focus. In *The Wiley Blackwell companion to semantics, first edition*, ed. Daniel Gutzmann, Lisa Matthewson, Cécile Meier, Hotze Rullmann, and Thomas Ede Zimmermann. John Wiley & Sons. <https://doi.org/10.1002/9781118788516.sem133>.
- Wiltschko, Martina. 2014. *The universal structure of categories: Towards a formal typology*. Cambridge University Press.
- Zeller, Jochen. 2012. Object marking in Zulu. *Southern African Linguistics and Applied Language Studies* 30:219–325. <https://doi.org/10.2989/16073614.2012.737600>.
- Zeller, Jochen. 2014. Three types of object marking in Bantu. *Linguistische Berichte* 239:347–367.
- Zeller, Jochen. 2015. Argument prominence and agreement: Explaining an unexpected object asymmetry in Zulu. *Lingua* 156:17–39. DOI: <https://doi.org/10.1016/j.lingua.2014.11.009>.
- Zyman, Erik. 2021. Phase-constrained obligatory late adjunction. *Syntax* 25:84–121. <https://doi.org/10.1111/synt.12226>.

9 Appendix: Case Study on Kinande Linkers

[96] In Kinande (Bantu, DRC) there are functional morphemes called **linkers** that appear between postverbal constituents (Baker and Collins, 2006; Schneider-Zioga, 2015a; Schneider-Zioga and Mutaka, 2015; Schneider-Zioga, 2015b; Richards, 2010).

- (97) a. Kám bale ágúlira ekitábú (kyo) Nadíne
 Kambale bought 7book 7LK 1Nadine
 ‘Kambale bought a book for Nadine.’
- b. Kám bale ágúlira Nadíne (y’) ekitábu
 Kambale bought 1Nadine 1LK book
 ‘Kambale bought Nadine a book.’ (Schneider-Zioga, 2015b, 323)

[98] Notable characteristics of linkers include:

- variable word order of the two surrounding XPs (as in (97))
- the linker agrees in noun class with whichever phrase precedes it
- non-arguments can participate in linker constructions, as in (99):

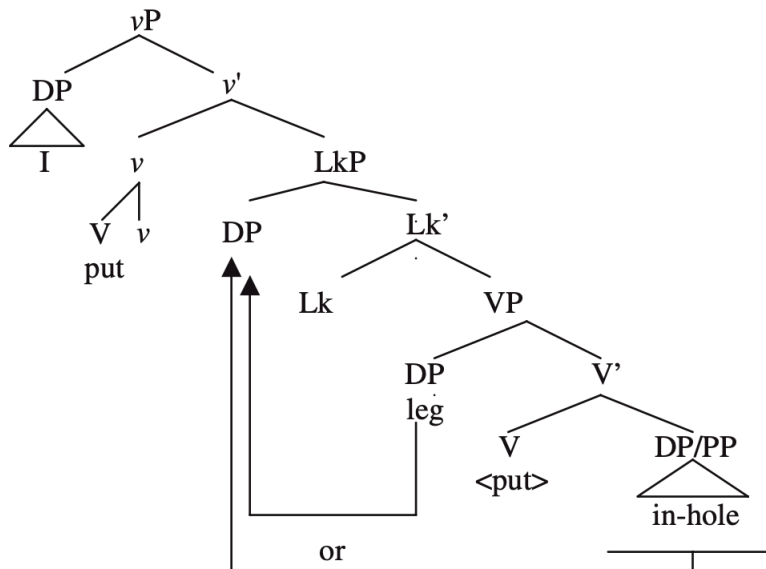
- (99) a. Kámbalé átuma ebarúhá (yó) lubálúba
 Kambale sent 9letter 9LK quickly
 ‘Kambale sent the letter quickly. (Schneider-Zioga, 2015b, 324)
- b. ábaná móbakáya okokalási (kó) ba-tyâ
 2children 2went 17school 17LK 2-thus
 ‘The children went to school thus (e.g. without eating)’ (Schneider-Zioga, 2022, 7)

[100] Linkers have been analyzed in various ways, including:

- Case-licensors (Baker and Collins, 2006)
- A result of conditions on linearization (*Distinctness*) (Richards, 2010)
- Solutions to labeling problems (Schneider-Zioga, 2015b)
- Predicational elements (Schneider-Zioga and Mutaka, 2015)

[101] Linkers are most plausibly being analyzed as functional heads in the main clause structure, as most work on them assumes.

- (102) a. i. Mo-n-a-hir-ire okugulu (k'-) omo-kihuna.
 AFF-1SG.SM-TNS-put-EXT leg.15 LK.15 LOC.18-hole.7
 ‘I put the leg in the hole.’
- ii. Mo-n-a-hir-ire omo-kihuna (m'-) okugulu.
 AFF-1SG.SM-TNS-put-EXT LOC.18-hole.7 LK.18 leg.15
 ‘I put the leg in the hole.’
 (Baker and Collins, 2006, 311)



(103)

(Baker and Collins, 2006, 313)

[104] But verbs in Kinande raise past linkers.

- Given the widely assumed Head Movement Constraint (Travis, 1984; Baker, 1988), we would not expect the verb to be able to head move past the linker head.
- Baker and Collins (2006, 313) address this by what is essentially stipulation: “We assume the verb starts as the head of VP and raises over Lk to the higher verb position ν ... This movement does not violate the Minimal Link Condition, presumably because Lk has no lexical category features that would be attracted by ν (cf. Chomsky 1995).”

[105] But perhaps we consider linkers interveners for verb movement;

- put another way, we can say that linkers pose a cyclicity problem: if they are present in the structure they should intervene in verb movement, but they do not in fact intervene.

[106] Notably, linker constructions are in fact closely integrated with Information Structure, which is only recently receiving attention. Schneider-Zioga (2022) notes:

- A TOPIC reading of the element preceding the linker.
- An obligatory FOCUS reading of the element following the linker.

(107) Schematic of Linker Information Structure: (Schneider-Zioga, 2022)

V TOPIC (linker) FOCUS

(108) Exhaustively focused XPs may only be in post-linker position

a. omúkali á-lyá-let-er' eriyáyá (ry') omúpe mu:sâ
 1woman 3sg-TAM-bring-APPL 5egg 5LK 1priest 1only
 ‘The woman has brought the egg to the priest only/alone.’

b. *omúkali á-lyá-let-er' omúpe mu:sâ (y') eriyáyá
 1woman 3sg-TAM-bring-APPL 1priest 1only 1LK 5egg

int: ‘The woman has brought the egg to the priest only/alone.’ (Schneider-Zioga, 2022, 14)

[109] One approach to this puzzle is a countercyclic analysis of the Lk head: **LkP is Late Merged**, such that the verb has raised past its position before Lk is merged.¹⁶

[110] If the foundational functional properties of linkers are about Information Structure, this is consistent with the main claims of this talk.

[111] Linkers do indeed appear to be surface-oriented in other ways, too.

(112) a. **Ekihi**_k ky-o Kámbale á-gúl-ir-a t_k Nadíne **No Linker in Extraction**
 7what 7LK 1Kambale 1SM-bought-APPL-FV 1Nadine
 ‘What did Kambale buy for Nadine?’

b. ***Ekihi**_k kyo Kámbale ágúlira t_k (kyo) Nadíne * **Linker**
 7what 7LK 1Kambale 1SM-bought-APPL-FV 7LK 1Nadine
 Intended: ‘What did Kambale buy for Nadine?’

c. ***Ekihi**_k kyo Kámbale ágúlira Nadíne (yo) t_k * **Linker**
 7what 7LK 1Kambale 1SM-bought-APPL-FV 1Nadine 1LK
 Intended: ‘What did Kambale buy for Nadine?’ (Philip Mutaka, pc)

¹⁶The properties of ComP proposed by Sikuku and Diercks (2022) and Diercks (2022) in fact show many similarities to linkers: it’s possible that linkers might be amenable to a ComP analysis, but I leave that to future consideration.

[113] Therefore, linkers appear between two **overt** ν P-internal constituents, despite the overtiness of the relevant XPs not being established until a structurally higher point in the derivation.

[114] This is the same surface-orientation that we saw with object marking and conjoint-disjoint forms.

(115) A Late Merger account of Kinande linkers:

- Explains the surface-orientation of linkers
 - linkers do not intervene for verb movement
 - linkers are only present between two constituents internal to the ν P on the surface, i.e. overtly.
- Accords with the information-structural properties of linkers (if the main claim of this talk is correct).