Agreeing How?
Implications for theories of agreement and locality[*]
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1. Introduction

1.1 The empirical issue

Alone among the inventory of Luyia (Bantu, J.30) wh-expressions and adjuncts, 'how' must agree in person, number, and noun class with the subject of its clause. We illustrate with data from Lusaamia (Uganda/Western Kenya) and Lubukusu (Western Kenya):[1,2]

(1) a. **Ny**-emba **en**-die? [Lusaamia]
1sgSA-sing 1sg-how
'How do I sing?'

b. **W**-emba **o**-tie?
2sgSA-sing 2sg-how
'How do you sing?'

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[*] The basic Lubukusu 'how' facts were first described in Wasike's (2007) dissertation. Thanks to Dennis Odalloh for Lusaamia data and to Justine Sikuku, Lillian Jivetti, and Aggrey Wanyonyi for Lubukusu data. For helpful discussion and comments on this material our thanks to Daniel Seely, Juvenal Ndayiragije, Meredith Landman, and members of our audience at the 2011 Bantu 4 conference where it was presented.

[1]We use 'X agrees with Y' to mean that intrinsic features of Y are reflected on X -- not the converse. In glosses, SA=subject agreement; cardinal numbers (1-3) denote person features when they are accompanied by a number specification (sg= singular and pl= plural); thus 2sgSA=second person singular subject agreement. Arabic numbers 1-17 are noun classes, hence 2SA=subject agreement for noun class 2. We gloss agreement with a singular human as 3sgSA but agreement with plural humans as 2SA = class 2 subject agreement due to evidence for person features in the former but not the latter (see among others Bokamba 1976, Diercks 2010, Henderson 2009, in press, Kinyalolo 1991). This will become relevant in §4.2 and §5.2. Other glossing conventions are PST= past; FUT= future; AAE=alternative-agreement effect. We follow Carstens (1991) in analyzing noun class as number and gender. (1a) *ny-* vs *en-* and (1c) *y-* vs *a-* are phonologically conditioned variants. Tone marking is omitted for lack of a guiding analysis or confidence in our transcriptions.

[2] Lubukusu's classification by Guthrie as E31 was revised to JE31c in Maho (2008) and J30 in Lewis (2009).

c. **Y**-emba **a**-tie?
3sgSA-sing 3sg-how
'How does s/he sing?'

d. **Khw**-emba **khu**-tie?
1plSA-sing 1pl-how
'How do we sing?'

e. Ki-mi-saala **ki**-a-kw-ile **ki**-rie(na) [Lubukusu]
4-4-tree 4SA-PST-fall-PST 4-how
'How did the trees fall?'

f. Sitanda **si**-funikhe **s**i-rie(na)
7bed 7SA-broke 7-how
'How did the bed break?'

In this paper we provide a description and analysis of the distribution and properties of Luyia agreeing 'how', based mainly on data from Lubukusu. We show that agreement on 'how' is usually but not always identical to subject agreement, diverging crucially in the features it exhibits in certain locative inversion and subject extraction environments. The contrasts argue that 'how' has an agreement relationship with the subject independent of the relation that yields agreement on the verb. We analyze agreeing 'how' as a vP-adjunct and demonstrate that only a downward probing Agree analysis (Chomsky 2000, 2001) captures all of the 'how' agreement facts. This runs counter to proposals in Baker (2008) and Diercks (2011) that agreement in Bantu involves systematic upwards probing as a matter of cross-linguistic parametric choice. The facts of agreeing 'how' also argue against the view that agreement always spells out a Spec-head relation (Koopman 2000, 2006). And they are incompatible with the claim in Chomsky (2007, 2008) that all probe features are introduced on phase heads and surface on phase head complements.

1.2 Structure of the paper

In the next subsection of this introduction we provide a summary of our theoretical assumptions. The paper then consists of 8 major sections: §2 describes the properties and distribution of agreeing 'how' and gives a preliminary sketch of the analysis. §3 addresses

two potential alternative accounts and shows how they fail. §4 presents some crucial facts relating to non-canonical subjects: inverted locatives, and subject operators. §5 develops the analysis of agreeing 'how' as a downward-probing vP-adjunct, showing that 'how' must have independent uPhi that Agree with the subject in its base position. §6 lays out the reasons why upwards-probing, Spec, head agreement, and the Feature Inheritance theory of Chomsky (2007, 2008) and Richards (2007) fail to explain the properties of 'how', and sketches out a theory of agreement compatible with the facts. §7 explores some apparent locality paradoxes (including so-called A' opacity) connected with the analysis of 'how', based on the ability of the locative to move across the thematic subject and vice versa. What makes this especially interesting is compelling evidence that there are hierarchical relations among the two expressions in the form of restrictions on which of them 'how' can agree with. §8 summaries and concludes.

1.3 Theoretical assumptions.

This paper is written within the Minimalist theoretical framework of Chomsky (2000; 2001). In particular, we assume that syntactic objects are constructed from bottom to top by the Merge operation, and that there is cyclic Transfer to the Conceptual-Intentional (C-I) and Sensory Motor interfaces (henceforth PF). We follow Chomsky (op cit) in taking Transfer to follow Merge of the phase heads *v** and C*. We also follow Chomsky (op cit) in assuming that agreement and Case are uninterpretable, unvalued features (uFs; uPhi and uCase respectively). When uPhi is Merged on some category α, it immediately *probes* its c-command domain to find a *goal* β -- an expression that can provide values for α's unvalued features. We assume the "activity requirement" – that a goal must have a uF itself. In Indo-European A-relations, the feature satisfying this requirement is usually a DPs uCase.

As noted in §1.1, we depart from more recent Minimalist ideas in several significant respects. Chomsky (2007, 2008) proposes that agreement is universally restricted to one occurrence per phase for reasons rooted in the Conceptual-Intentional interface. The data in (1) provide a preliminary indicator of the difficulties that Bantu languages raise in connection with this view, particularly given evidence to be presented that agreement on 'how' is independent of subject agreement on the verb. A principled and predictive account of the differences between Bantu and English agreement is argued for in §6.5. On specific problems that 'how' raises for Chomsky (2007, 2008) see §6.4.

2. Overview of agreeing 'how'

Despite its novelty from a cross-linguistic standpoint, agreeing 'how' is unremarkable in many language-internal respects, sharing several key properties with other Luyia *wh*-phrases. This section overviews the morphosyntactic properties of agreeing 'how' with a focus on Lubukusu. Apart from a brief preview in section §2.7, analysis is for the most part put off to later sections.

2.1 Long and short forms

All *wh* apart from 'why' have short and long forms in Lubukusu, the latter bearing the suffix –*na*. 'How' patterns with the rest in this respect (see 2).

(2)
	a.	sii(na)	'what'
	b.	lii(na)	'when'
	c.	waa(ena)	'where'
	d.	-rie(na)	'how'
	e.	-rie(na)	'what kind/size/quantity' (see §2.4 and §3)

2.2. Two locations

Although agreeing 'how' is usually clause final, like other non-subject *wh*- in many Bantu languages including Luyia, it has an alternate position immediately after the verb (IAV):

(3) Ng'wa e-kahawa en-die /Ng'wa en-die ekahawa [Lusaamia]
1sgSA-drink 9-coffee 1sg-how/1sgSA-drink 1sg-how 9-coffee
'How do I drink coffee? (Subject)>verb>WH>OB *or* (Subject)>verb>OB>WH

Similarly, if a verb has a clausal complement, 'how' can either precede or follow it.

(4) a. W-a-ul-ile **o-rie** [oli ba-ba-an ab-oola]? [Lubukusu]
2sgSA-PST-hear-PST 2sg-how that 2-2-children 2SA-arrived
'How did you hear that the children arrived?'

b. W-a-ul-ile [oli ba-ba-ana b-oola] **o-rie**?
2sgSA-PST-hear-PST that 2-2-children 2SA-arrived 2sg-how
'How did you hear that the children arrived?'

The fact that agreeing 'how' has access to IAV aligns it with other *wh*-phrases. (5) and (6) illustrate the same alternation between final and IAV positions for 'where' and 'when.'

(5) a. Ba-ba-ana ba-a-nyola chi-lomo waae(na)? (Wasike 2007: 356)
2-2-children 2SA-PST-receive 10-report where
'Where did the children receive information?'

b. Ba-ba-ana ba-a-nyola waae(na) chi-lomo?
2-2-children 2SA-PST-receive where 10-report
'Where did the children receive information?'

(6) a. Ba-ba-ana ba-a-nyola chi-lomo liina?
2-2-children 2SA-PST-receive 10-report when
'When did the children receive information?'

b. Ba-ba-ana ba-a-nyola liina chi-lomo?
2-2-children 2SA-PST-receive when 10-report
'When did the children receive information?'

IAV poses intriguing syntactic questions, but it is a property of all non-subject *wh*- rather than of 'how' in particular. Since the focus of this paper is the special properties of agreeing 'how' we will not explore IAV here, and henceforth restrict examples to final 'how'.[3]

[3] See Buell (2009) and Cheng & Downing (to appear), for arguments that IAV *wh* are in situ and post IAV items are right-dislocated. On the other hand see Van der Vaal (2009) for a movement analysis of IAV.

2.3 'How' agreement correlates with scope

'How's agreement features can serve to disambiguate its scope. (7a,b) are otherwise identical, but agreement suffices to distinguish two possible interpretations.

(7) a. Ba-ba-ana ba-anyola chi-lomo mbo Wafula e-eba si-tabu **ba-**rie(ena)
2-2-children 2SA-received 10-news that 1Waf. 3sgSA-stole 7-book 2-how
'[How did children receive information] that Wafula stole a book? [Lubukusu]

b. Ba-ba-ana ba-anyola chi-lomo mbo Wafula e-eba si-tabu **a-**rie(ena)
2-2-children 2SA–received 10-news that 1Waf. 3sgSA-stole 7-book 3sg-how
'The children received information that [Wafula stole a book by what means]?

'How's scope is ambiguous if it follows clauses whose subjects have the same phi-features:[4]

(8) Nafula a-a-nyola chi-lomo mbo Wafula e-eba si-tabu a-rie(ena)
1Naf. 3sgSA-PST-receive 10-news that 1Waf. 3sgSA-stole 7-book 3sg-how
a. [How did Nafula receive information] that Wafula stole a book? *Main clause construal*
b. Nafula learned that [Wafula stole a book by what means]? *Lower clause construal*

2.4 A wh-adnominal homophone

Agreeing 'how' has a *wh*-adnominal homophone usually translated as "what kind?" (see 9 and 10). The homophone also lacks intrinsic phi-features and must acquire phi-values through agreement (for further discussion of the homophone see §3).

(9) Ka-ma-ki ka-rie ka-katikh-e?
6-6-egg 6-how 6SA-break-PST
'What kind of eggs broke?'

(10) Ku-mu-nyu ku-rie ku-kho-kuya?
3-3-soup 3-how 3SA-PRES-cook
'What kind of soup is cooking?'

[4] This sentence is taken from Wasike (2007), who claims that 'how's right-edge position makes its scope unambiguous. In contrast, the 3 speakers whom we have consulted consistently find this and comparable examples to be compatible with both matrix and embedded construals.

It seems unlikely that the identity between agreeing 'how' and agreeing 'what kind' is accidental. In fact, based on comparable similarities between certain manner adverbs and adnominals in Polish, German, and Russian, Landman and Morzycki (2003) argue that the 2 types of expressions are completely parallel: not only are they homophonous modifiers, but on an analysis of manner as an event-kind, semantically the 2 types are uniformly kind-anaphoric. Thus both denote sets whose members instantiate some contextually-salient kind: for adverbial modification these are kinds of events, whereas for adnominal modification these are kinds of individuals. Landman and Morzycki (2003)'s proposal explains why an identical *wh*-modifier can be used both adnominally and adverbially; we assume that their analysis can be extended to explain the dual uses of agreeing *–rie* in adnominal and adverbial *wh*-questions.[5]

2.5 Phi-features of wh-operators: why does 'how' agree?

A natural question about 'how' is why it must agree. Most expressions in Bantu languages either have intrinsic phi-features or acquire them in the form of agreement (for discussion and references on the latter issue see §6.5). But most Luyia *wh*-words differ from 'how' and 'what kind' in being lexically specified for noun class.

(11) a. who *naanu* (class 1/2) b. what *sii(na)* (class 7)
c. when *lii(na)* (class 11) d. where *waa(ena)* (class 16)
e. why *sikila sii(na)* (7reason 7what)

[5]We learned recently from David Odden and Michael Marlo (personal communication) that some varieties of Luyia have an agreeing manner adverb meaning "thus", strengthening the resemblance between Luyia and the languages discussed in Landman and Morzycki (2003) where the non-*wh* homophone is *'like so' or 'such.'*

An explanation for this difference between 'how/what kind' on the one hand and 'who,' 'what,' and 'where,' on the other is readily available in the fact that answers to the latter name an individual or location -- items that, Chomsky's (1981) categorical typology, are typically [+N]. All nominal expressions have intrinsic phi-features in Bantu languages; and it is in keeping with this generalization that *wh*-words have noun class features like those of their canonical answer types ('who' is answered with nouns referring to humans so is Class 1/2, etc). Answers to 'when' questions are also often nominal expressions like "today" or "last week"; hence the corresponding question word is also [+N] and has class features. Reason questions are expressed with the complex *wh*-phrase *sikila siina* 'reason what' (12e), which is inherently class 7 by nature of *sikilia* and *siina*'s membership in class 7. The contrast between reason and manner questions is perhaps attributable in part to the fact that reasons are more readily countable than manners; and see §2.4 on the relationship of manners to kinds rather than entities or individuals.

Summing up, most *wh*- are entity-oriented [+N] expressions so they have class features; on the other hand manner adjuncts are event-oriented and hence non-nominal. Their lack of intrinsic phi-features is therefore not surprising. This opens up the possibility for manner phrases and the corresponding 'how' questions to agree. The logic extends to the use of *–rie* as 'what kind', which typically elicits an adjective in response. Like manner adverbials and 'how', adjectives lack intrinsic phi-values and acquire them via agreement.

2.6 Clefting wh-phrases: 'how' alone cannot cleft

One other point of contrast between 'how' and other Lubukusu *wh*-phrases is that 'how' alone cannot cleft. We propose below that this is a direct consequence of the fact that its phi-features as not intrinsic but agreement.

Wasike (2007: 361-362) shows that most *wh*-phrases in Lubukusu can appear left-peripherally in cleft constructions as an alternate to surfacing in situ. Clefts involve an agreeing complementizer, as shown in (12a,b) for *siina* 'what' and *waaena* 'when'.

(12) a. Siina ni-**syo** Nangila a-a-tekh-el-a Wafula?
7what COMP-7 3sgNangila 3sgSA-PST-cook-APPL-FV 1Wafula
'What did Nangila cook for Wekesa?'

b. Waae(na) ni-**o** Nafula a-kha-ch-a?
16where COMP-16 1Nafula 3sgSA-pres-go-fv
'Where is it that Nafula is going?'

'How' cannot be clefted, however, whether agreement on the cleft is class 1 to match the features of the subject that 'how' agrees with or default class 16 (13b). Wasike also notes that manner adverbs cannot be clefted either (13c); nor can prepositional phases (13d). He concludes that clefting is restricted to items with phi-features.

(13) a. Nafula a-kha-kenda a-rie(na)?
1Nafula 3sgSA-PRES-walk 3sg-how
'How is Nafula walking?' *in situ 'how'*

b. *a-rie(na) ni-ye/-o Nafula a-kha-kenda?
3sg-how COMP-3sg/16 1Nafula 3sgSA-PRES-walk
'How is it that Nafula is walking?' **clefted 'how'*

c. *Bu-li bwaangu ni-bwo Wafula a-a-nywa ka-ma-lwa.
14-be quickly COMP-14 1Wafula 1SA-PST-drink 6-6-beer
'It is quickly that Wafula drank beer.' **clefted adverbial*

d. *A-li ne Nekesa ni-ye Wekesa a-a-lomaloma
1-be with 1Nekesa COMP-1 1Wekesa 1SA-PST-speak
'It is with Nekesa that Wekesa spoke.' **clefted PP*

Wasike's proposal seems to be on the right track but it ignores the fact that agreeing 'how' does have phi-features; they differ from those of other *wh* (and other cleftable expressions) in that 'how's phi-features are agreement as we have seen. We accordingly adopt Wasike's

proposal supplemented by (14) from Carstens (2010a).[6] Carstens's proposal is specifically designed to prohibit potential relations that she calls Agree-with-agreement.[7]

(14) **Phonological Theory of Valuation**: the conversion of uF from [-value] → [+value] is phonological in nature, providing information on how uF will be pronounced [in a particular location: VC]. Hence probe features do not become potential goal features upon valuation in Agree.

As our exploration of 'how' proceeds, it will become clear that T probes the subject in its base position, ignoring valued uPhi on 'how'. In addition to accounting for the inability of 'how' to cleft, (14) explains why 'how' does not intervene in the relation Agree (T, SU).

2.7 Summary and analytical preview

We have shown that agreeing 'how' is a *wh*-expression with unvalued phi features (uPhi). Possible analyses consistent with the facts presented so far include at least the following:

(15) Potential Hypotheses for Agreeing 'How'

i. Agreeing 'how' is a sort of floating *wh*-modifier of the subject like English *all* in *The boys have all left.*
ii. Agreeing 'how' is an interrogative version of a subject-oriented depictive secondary predicate.
iii. Agreeing 'how' gets its phi-features by downwards spreading (inheritance) from T.
iv. Agreeing 'how' is a head in the functional structure of the clause and gets its phi-values through Spec-head agreement.
v. Agreeing 'how' is a *wh*-adjunct comparable to English 'how' but with unvalued phi-features which probe the subject from a position adjoined to either (a) vP or (b) TP.

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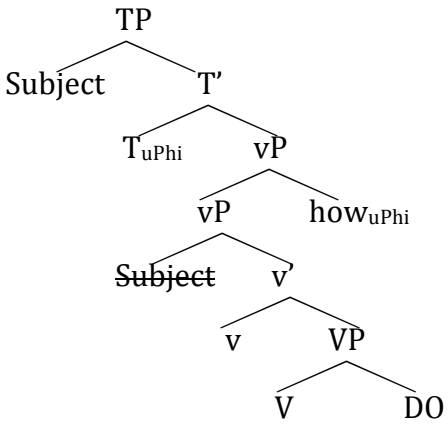
[6] This proposal was inspired by ideas in Epstein, Kitahara, & Seely (2010); see §6.5 for some discussion. We add 'in a particular location' to relate (14) to the context sensitivity of uF values. (14)'s original purpose was to explain why gender agreement on Romance D doesn't lead to inclusion of gender in Romance SA (on issues connected with gender agreement see Carstens op cit and §6.5).

[7] We pin the Luyia problem on agreement because PPs and adverbials can cleft in languages where clefts do not involve agreement: *It was [in the morning] that John realized his error*.

In §3 we will provide evidence for rejecting (i) and (ii). §4 presents some highly significant patterns connected with non-canonical subjects, specifically agreement on 'how' with subject operators and inverted locatives. These facts will lead us in §5 to reject the direct dependency between T and 'how' suggested in (iii) and to adopt instead option (v) in which 'how' is a downwards probing vP-level wh-adjunct (see 16).[8] §6 will argue against (iv).

(16)



3. Two Failed Analyses

3.1 Introduction

In this section we address the first two hypotheses in (15), demonstrating that agreeing 'how' is not a floating modifier or a secondary predicate of any sort. The arguments against these two hypotheses strengthen the case for (16).

3.2 Agreeing 'how' is not a floating modifier

3.2.1 The hypothesis

One conceivable approach to agreeing 'how' might be to analyze it along the lines of Sportiche's (1988) theory of floating quantifiers. That is, 'how' and the subject could be

[8] We adopt the assumption that verbs in Bantu raise into the middle field of the clause (see among others Julien 2002, Carstens 2005, and Ngonyani 2006 for proposals as to its precise location in various languages).

hypothesized to originate as a single constituent XP in which 'how' is the subject's modifier. The subject raises out of XP and moves leftwards, stranding 'how' as shown in (17).

(17) a. ….[$_{XP}$ SU *u*Phi-how]… *A hypothetical floating modifier approach to 'how'*
b. SU...[$_{XP}$ ~~SU~~ *u*Phi-how]…

While this analysis would make the agreement relationship between 'how' and the subject easy to explain, the restriction to a 'what kind' interpretation for DP-internal 'how' seems inconsistent with it (see 9 and 10). We will also show in §4 that 'how' agrees with an in situ subject of a locative inversion construction – a context where 'floating' could not have taken place, casting further doubt on this as a possible analysis. Expletive and infinitive constructions provide additional evidence that we turn to next.

3.2.2 Expletives and infinitives

Subject agreement on the verb is class 6 in Lubukusu [expletive…CP] constructions (see 18a). 'How' also agrees with the expletive in (18b).

(18) a. Ka-nyalikhana khu-khu-pila lu-simu
6SA-be.possible 15-2sgOA-hit 11-phone
'It is possible to call you.'

b. Ka-nyalikhana khu-khu-pila lu-simu ka-rie
6SA-be.possible 15-2sgOA-hit 11-phone 6-how
'How is it possible to call you?'

Alternatively, 'how' can agree with the infinitival clause. Infinitives in Bantu languages often have nominal properties; they comprise a separate noun class, class 15, and can control agreement on modifiers. (19a, b) illustrates agreement of 'how' in class 15.[9]

[9] Though in general we expect a scope difference to correlate with differences in agreement like (18b) versus 19a), it's not clear that this extends to cases where the matrix subject is an expletive. One speaker suggested that Class 15 agreement (19a,b) would be most appropriate if a lot of people might want to call. Ndayiragije

(19) a. Ka-nyalikhana khu-khu-pila lu-simu khu-rie?
6SA-be.possible 15-2sgOA-hit 11-phone 15-how
'How is it possible to call you?'

b. Khu-khu-pila lu-simu khu-nyalikhana khu-rie
15-2sgOA-hit 11-phone 15SA-be.possible 15-how
'How is it possible to call you?'

(19a,b) raise questions about the nature of Bantu infinitives that are outside the scope of this paper (but see note 9). For present purposes it suffices to say that these examples seem quite anomalous for a discontinuous modifier approach to agreeing 'how.'

3.2 Agreeing 'how' is not a subject depictive

The analysis represented in (16) is not far removed from recent treatments of subject-oriented depictive secondary predicates like *drunk* in *Mary likes to attend church drunk;* or *naked* in *John danced naked:* Pylkkanen (2002, 2008) proposes that subject depictives Merge at the vP level, and Irimia (2005) uses Agree to account for agreement on depictive secondary predicates in Armenian, Slovenian, and Albanian. One might therefore consider analyzing *–rie* 'how' as a *wh*-depictive secondary predicate.[10]

Its ability to agree with an expletive or an infinitive (see §3.1) is a first reason for skepticism regarding such an analysis. In this section we will illustrate several additional ways in which the approach does not match up with the facts.

(p.c.) makes the plausible suggestion that this would be consistent with an arbitrary PRO reading for the subject of the infinitive. We leave analysis of Class 15 'how' agreement for future research. See Carstens 1991 for arguments that Class 15 includes true infinitives as well as counterparts to the so-called *acc-ing* and *poss-ing* gerunds of English, a set of possibilities that would take us quite far afield to explore in relation to 'how'.

[10] Thanks to Juvenal Ndayiragije (personal communication) for suggesting this possibility to us.

First, the most natural answers to agreeing 'how' questions are not subject-oriented depictives. This is apparent in (20), where responses that came to mind for speakers we interviewed describe manners, instruments, and even properties of the direct object. While not precluded, a subject-depictive answer is judged unexpected and somewhat anomalous.

(20) a. A-li-le e-nyama a-riena?
3sgSA-eat-PST 9-meat 3sg-how
'How did he eat the meat?'

b. Kalaa *Manner answer*
slowly
'Slowly'

c. Nende si-chiko *Instrument answer*
with 7-spoon
'with a spoon'

d. Embisi *Object-oriented answer*
9raw
'raw'

e. #A-li-le ne-a-melile / n-a-nwile *Subject-oriented answer*
3sgSA-eat-PST NE-3sgSA-be.drunk / NE-3sgSA-be.tired
'He ate it (while he was) drunk/tired' (unexpected in context)

One might perhaps consider treating manners and instruments as extended properties of agents in an event and hence not incompatible with the subject depictive analysis (though 20d,e would constitute anomalies to be explained). This brings us to our second reason for rejecting an analysis of agreeing 'how' as a secondary predicate: its uses and interpretation are indifferent to whether a sentence is active or passive. 'How' is natural in either sentence type, and elicits the same kinds of answers in both cases (see 21).

(21) a. E-nyama e-li-l-we e-rie?
9-9letter 9SA-eat-PST-PASS 9-how
'How was the meat eaten?'

b. Nende si-chiko *Instrument answer*
with 7-7spoon
'With a spoon'

c. Bwangu *Manner answer*
hastily
'Hastily'

d. E-mbisi *Object-oriented answer*
9-raw
'Raw'

Thus the interpretation of 'how' does not co-vary with changes in the item it agrees with – there seems to be no link between the properties of the surface subject and the meaning or function of 'how'. This contrasts sharply with the behavior of secondary predicates.

Pylkkanen (2002, 2008) notes that depictives cannot be predicated of the implicit argument in a passive, a generalization that holds up in Lubukusu.[11] (22a) and (22b) show that Lubukusu post-verbal depictives can be predicated of subjects, as they can in English. (23) demonstrates the inability of a depictive to modify an implicit agent of a passive.

(22) a. S-ok-ile mu-nyanja sichula[12]
1sgSA-swim-PST 18LOC-9lake naked
'I swam in the lake naked.'

[11]Lubukusu is a 'high' applicative (APPL) language in Pylkkanen's terms, allowing APPL on intransitive verbs and lacking the rigid transfer of possession semantics that she argues holds in 'low' applicative languages like English. Contrary to the predictions of her analysis, Lubukusu does not allow depictive secondary predication of indirect objects (IOs) apart from clausal-looking ones like '(while he was) drunk/tired' which can refer to English IOs too (*I gave John a book while he was drunk; vs *I gave John a book naked* -- out on construal of *naked* with *John*). For this reason IO evidence is not useful in relation to our investigation of 'how'. In contrast a question with *–rie* inside the IO is fine, such as 'What kind of children did you buy food for?'

[12] *Sichula* 'naked' is uninflecting and can only be used as a predicate adjective (**omwana sichula* – 'a naked child'). *Embisi* –'raw' is an agreeing adjective. Some depictives involve more internal structure, for example *ne-ba-mele* – (while they were) drunk' from (20d). These differences do not affect the analysis of 'how.'

b. E-nyama e-li-l-we e-mbisi
9-meat 9SA-eat-PST-PASS 9-raw
'The meat was eaten raw.'

(23) *E-barua ey-andik-we sichula
9-letter 9SA-write-PASS naked
*'The letter was written naked.'

In contrast, we saw in (21) that 'how' is fine in a passive sentence, ranging over the same interpretations as in an active sentence despite the fact that it agrees with the thematic object. The comparisons among (20), (21) and (23) demonstrate conclusively that 'how' is not a subject-oriented depictive secondary predicate. In addition to allowing object-oriented answers in transitive clauses, the ability of agreeing 'how' to interrogate such matters as the manner or instrument in an event does not co-vary with whether the logical subject is explicit or implicit, or with whether the structural subject is agent or theme.

One final reason for rejecting an analysis of 'how' as a *wh*-depictive secondary predicate is its inability to agree with (and to question) objects in transitive clauses, in contrast to the general behavior of secondary predicates cross-linguistically. When *–rie(na)* agrees with an object, it is DP-internal as in (9) and (10), not a depictive secondary predicate at all. First, the 'what kind' meaning is its only interpretation in this context (see 24). As Pylkkanen (2002:26) notes, depictive secondary predicates describe a state which holds of one of the arguments of the verb during the event described by the verb. For this reason, individual-level adjectives sound strange as depictives (an observation for which Pylkkanen cites Geuder, 2000); thus *He entered the room annoyed* is fine, unlike *#He entered the room tall*. Given this, the restriction to 'what kind' readings for object-agreeing *-rie(na)* is inconsistent with a *wh*-secondary predicate analysis.

(24) Ba-khal-ile lu-karatasi lu-riena?
2SA-cut-PST 11-paper 11-how
'What kind of paper did they cut? (i.e. letter or legal size?)
#'How did they cut the paper?' (i.e. into circles or triangles)

In contrast to cases like (24), an object-oriented answer to a *-rie(na)* question is readily available when it agrees with the subject, as shown in (25). [13]

(25) a. Ba-khal-ile lu-karatasi ba-riena?
2SA-cut-PST 11-paper 2-how
'How did they cut the paper?'

b. mu-bi-kara/ mu-bi-tonyi *Object-oriented answer*
18-8-circle / 18-8-piece
'into circles/pieces'

And when *-rie(na)* is construed with an object, it must generally be adjacent to it as demonstrated in (26).[14] This is consistent with an analysis of it as a DP-internal *wh*-. It is not compatible with an object depictive secondary predicate analysis.

[13] Justine Sikuku (personal communication) finds object oriented answers more natural than instrument type answers, because adding an applicative morpheme to the verb and using 'what' allows one to formulate the question "What did they cut the paper with?' specifically questioning the instrument.

[14] We have found a class of exceptions to this generalization, in which the verb is 'want' or a perception verb like 'see' and a time expression intervenes licitly between the apparent direct object and 'how' agreeing in the object's features. We suggest that this is because 'want' and the like can take a small clause complement headed by a zero copula. This is consistent with the general availability of a zero copula in Bukusu, and with the standard properties of 'want' type verbs cross-linguistically.

(i) W-enya ka-ma-ki asubuhi ka-rie
2sgSA-want 6-6-egg morning 6-how
'How do you want your eggs in the morning, i.e. fried or scrambled?'
Our analysis: You want [your eggs in the morning (to be) how]

(26) *Ba-khal-ile lu-karatasi [nende ka-ma-kasi] lu-riena?
2SA-cut-PST 11-11paper with 6-6-scissors 11-how
?*'What kind of paper did they cut with the scissors? (i.e. letter or legal size?)
*'How did they cut the paper with the scissors?' (i.e. into circles or triangles)

Summing up, *–rie(na)* cannot function as a *wh*-object depictive, and in its use forming sentential 'how' questions *–rie(na)* does not pattern like a *wh*-subject depictive secondary predicate either – the most natural kinds of answers to *-rie(na)* questions are not subject depictives, and are consistent in their content even when the subject is changed from an agent to a theme by passivization. For all of these reasons we will not pursue a *wh*-secondary predicate analysis of *–rie(na)* and will henceforth refer to *-rie(na)* solely as agreeing 'how,' avoiding for the most part further discussion of its DP-internal usage.

3.3 Summary

In this section we argued against two logical possibilities for analyzing agreeing 'how': (15i) as a floating modifier; and (15ii) as a *wh*-subject depictive secondary predicate. We will show in the next section that in operator and inversion constructions, agreement on 'how' differs from SA on T. The facts lead us to reject (15iii), the hypothesis that agreement on 'how' is a copied or spread from T. Arguments against (15iv) are presented in §6.

4. Agreement mismatches between 'how' and T with non-canonical subjects

4.1 Introduction

In this section we introduce three constructions with non-canonical subjects: subject extractions and two varieties of locative inversion. After briefly describing each construction, we illustrate the pattern of agreement that occurs when the 'how' question word is added. We demonstrate that in locative inversion and subject extraction contexts, the features of agreement on 'how' do not always match those of subject agreement on the verb. These patterns will be crucial to the analysis of 'how,' leading us to conclude in §5

that 'how' has independent uPhi probing downwards for valuation by the subject in its base position (Spec, vP) hypothesis (v) in (15), as illustrated in (16).

4.2 Operator subjects

When a 3rd person singular animate subject is questioned or relativized, a special agreement form [o-] appears on the verb in place of the usual [a-] (the special form is glossed AAE = alternative agreement effect). These facts are illustrated in (27):

(27) a. Naliaka a-li mu-nju (Wasike 2007)
1Naliaka 3sgSA-be 18LOC-house [Lubukusu]
'Naliaka is in the house.'

b. Naanu oo-li mu-nju?
1who AAE-be 18LOC-house
'Who is in the house?'

c. *Naanu a-li mu-nju?
1who 3sgSA-be 18LOC-house
'Who is in the house?'

Kinyalolo (1991) demonstrates that the crucial property of Bantu AAE is an absence of person features (agreement in noun class is not affected). Henderson (op cit) and Diercks (op cit) argue that syntactic strategies to avoid or repair extraction from Spec, TP give rise to this effect, relating it to 'that-trace' and *que-qui* phenomena of English and French respectively (see Rizzi & Shlonsky 2007). What is important for our purposes is not the details of those analyses but the fact that 'how' can only bear [a-] agreement. Thus there is a mismatch between subject agreement and 'how' agreement in these cases, unexpected if the latter was contingent on that of T or based on locality with Spec, TP.

(28) Naanu **oo**-tekh-ile e-ngokho **a-**riena / ***o**-riena?
1who **AAE**-cook-PST 9-chicken 3sg-how / ***AAE**-how
'Who cooked the chicken how?' *Subject Question + HOW*

(29) Ba-a-bona o-mu-ndu **ow**-a-tekha e-ngokho a-riena / ***o**-riena?
2SA-PST-see 1-1-person **AAE**-PST-cook 9-chicken 3sg-how / ***AAE**-how
'They saw [the person who cooked the chicken how]?' *Subject Relative + HOW*

4.3 'How' agreement in locative inversion constructions

4.3.1 Introduction to Luyia locatives

Like many Bantu languages Lubukusu has three locative noun classes. In Lubukusu they are expressed in the prefixes *a-, khu-, mu-* added to nouns, replacing the so-called pre-prefixes but leaving the inner prefixes of the noun's intrinsic class (see 30, from Mutonyi 2000). As (31) demonstrates, locativized nouns can appear in argument positions and control agreement in the locative classes. For this reason they are analyzed as DPs.[15]

(30) a. **ku**-mu-lyaango
3-3-door
'(a/the) door'

b. **a**-mu-lyaango
16-3-door
'near the door'

c. **khu**-mu-lyaango.
17-3-door
'on the door'

d. **mu**-mu-lyaango
18-3-door
'in the door'

(31) [$_{DP}$ mu-n-ju] mu-unya
18-9-house 18SA-stink
'The inside of the house stinks.'

We turn now to the facts of locative inversion (LI). We will show that, like subject extraction, locative inversions exhibit mismatches between agreement on 'how' and on T.

---

[15] Myers (1987) and Bresnan & Mchombo (1995) propose that locative *(p)a-, ku- and mu-* are nouns. Because they do not trigger 'of' insertion like other nouns and fail to meet a 2 mora minimum size requirement to which only functional categories are exempt, Carstens (1997) argues that locatives are headed by null nouns (meaning 'vicinity', 'inside' and 'surface'); the locative prefixes are gender-particular prepositions (see i).

(i) [$_{DP}$ …[$_{NP}$…[$_{N}$ e]$_{18}$ mu-ny-anja]] [Chichewa]
(inside) 18of-9-lake
'in the lake' (Carstens 1997)

4.3.2 Two kinds of locative inversion

Two types of LI are found in Lubukusu. Both involve a post-verbal clitic agreeing with the fronted locative phrase (on which see §7), but their properties differ in other crucial respects. In one variety, which Diercks (2011) calls Repeated Agreement LI (RALI), subject agreement (SA) reflects the features of the fronted locative phrase (henceforth $DP_{loc;}$ and see 33). Only unaccusative verbs can participate in this construction. In the other, which Diercks calls Disjoint Agreement LI (DALI), SA is with the post-verbal thematic subject (SU) (see 34). Both unaccusative and unergative verbs can participate in DALI. (Henceforth for clarity we underline the class prefix of the thematic subject and agreement with it; and boldface the locative prefix on DP_{loc} and locative agreement with it).

(32) Ku-mu-saala kw-a-kwa **mu**-mu-siiru. [Lubukusu]
3-3-tree 3SA-pst-fall 18-3-forest **Declarative**
'A tree fell in the forest.'

(33) **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala. **Repeated Agreement LI**
18-3-forest 18SA-PST-fall-18L 3-3-tree *Unaccusative only*
'In the forest fell a tree'

(34) a. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala. **Disjoint Agreement LI**
18-3-forest 3SA-PST-fall-18L 3-3-tree *Unaccusative*
'In the forest fell a tree.'

b. **Mw**-iloo e-sun-ile-**mo** enduyu
18-5hole 9SA-jump-PST-18L 9-9rabbit *Unergative*
'Into the hole jumped the rabbit.'

Diercks demonstrates that only locatives with a fairly tight semantic connection to the verb can participate in either construction, hence the unacceptability of (35).

(35) *__mw__-i-duka **mw-**/ka-a-chekha-**m**o o-mw-ana *LI with unselected locative*
18-9-store 18SA/3sgSA-PST-laugh-18L 1-1-child
'In the store laughed a child.'

Based on facts like (35) Diercks argues that inverting locatives are selected arguments, Merged as sister to V. Apart from this, he demonstrates that the constructions have

different structures. He proposes the representations in (36) and (37) based on a variety of diagnostics for occupancy of Spec, TP including a subject-to-subject raising test, adverb locations, presentational constructions, and a clefting test (Diercks 2011:710-714).

(36) **Repeated agreement LI (RALI):** *DP_{loc} raises to Spec, TP; thematic SU in situ*
[$_{TP}$ LOC T-v-V… [$_{vP}$ ~~v~~ [$_{VP}$ SUBJ ~~V~~ ~~LOC~~]]] *unaccusative only*

(37) **Disjoint agreement LI (DALI):** *Thematic SU raises to Spec TP; DPloc to Spec, CP*
a. [$_{CP}$ LOC C-T-v-V [$_{TP}$ SUBJ ~~T~~ [$_{vP}$ ~~v~~ [$_{VP}$ ~~SUBJ~~ ~~V~~ ~~LOC~~]]]] *unaccusative*
b. [$_{CP}$ LOC C-T-v-V [$_{TP}$ SUBJ ~~T~~ [$_{vP}$ ~~SUBJ~~ ~~v~~ [$_{VP}$ ~~V~~ ~~LOC~~]]]] *unergative*

The crucial contrast is thus that in RALI DP_{loc} undergoes A-movement to Spec, TP. In contrast DALI involves raising of SU to Spec, TP and raising of DP_{loc} to Spec, CP. The features of SA on the verb are a helpful indicator of this difference.

As in the subject operator constructions discussed in §4.3.1, there are two logical possibilities for agreement when 'how' is added to an LI construction: the features on 'how' might match the features of SA and hence the contents of Spec, TP, or they might mismatch, agreeing with the expression that remains in the vP. In §4.3.3 we describe the pattern of facts. §5 provides an analysis in terms of downwards probing by vP-adjoined 'how'.

4.3.3. Agreeing 'how' in locative constructions.

In non-inverted sentences involving locatives, 'how' can only agree with the preverbal subject, as is consistent with the data reported so far.

(38) Ku-mu-saala kw-a-kwa **mu**-mu-siiru ku-rie? [S V LOC]
3-3-tree 3SA-PST-fall 18-3-forest 3-how
'How did a tree fall in the forest?'

In inversion constructions, however, judgments diverge slightly among speakers. Of our three main consultants, speakers #1 and #2 accept agreement on 'how' only with the

postverbal thematic subject. Agreement with the class 18 preverbal DP_{loc} is strongly rejected even in (39a), where SA on the verb is class 18.[16]

(39) Locative inversion + agreeing 'how', Speakers #1 & 2: **Variety A**
'How' can agree only with the thematic subject.

a. **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? RALI
18-3-forest 18SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

b. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? DALI
18-3-forest 3SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

For speaker #3 there is divergence between the two constructions. In his judgments, 'how' must agree with the thematic subject SU in DALI (40b), but in RALI 'how' can agree with either SU or DP_{loc} in Spec TP (40a).

(40) Locative inversion + agreeing 'how,' Speaker #3: **Variety B**
*'How' can agree with the preposed locative **or** the thematic subject in the RALI construction, but only with the thematic subject in the DALI construction.*

a. **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala ku-rie / **mu**-rie? RALI
18-3-forest 18SA-PST-fall-18L 3-3-tree 3-how / 18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

b. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? DALI
18-3-forest 3SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

The properties of 'how' agreement in Lubukusu LI constructions are summarized in (41):

(41) Possible 'How' Agreements in Lubukusu Locative Inversions

	Variety A		Variety B	
	Thematic Subject	Fronted Locative	Thematic Subject	Fronted Locative
RALI	✓	*	✓	✓
DALI	✓	*	✓	*

[16] Since 'tree' and 'how' are string-adjacent and 'how' agrees with tree, (39) and (40) can also mean 'What kind of tree fell in the forest?' We will ignore such systematically available but irrelevant readings.

The pattern, then, is that 'how' agreement with the post-verbal thematic SU is possible in all LI constructions for all speakers, and 'how' agreement with the fronted DP_{loc} is ruled out in all DALI constructions for all speakers. The sole point of variation is found in RALI, where the fronted DP_{loc} triggers SA. Variety B allows 'how' agreement with DP_{loc} as an option, whereas Variety A does not.

5. Analysis of agreeing 'how'

5.1 Our proposal

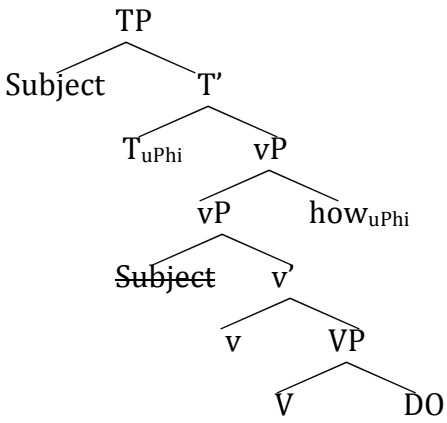
We have established that in two distinct circumstances, 'how' agreement diverges from SA:

(i) When a subject is extracted, 'how' agrees with it in person, number, and gender while the verb agrees with it only in number and gender.

(ii) When a locative phrase occupies Spec, TP, all speakers accept agreement with the thematic, *in situ* subject. For two out of three speakers this is the only licit option.

To account for the mismatches between agreement on 'how' and SA on T, we propose that 'how' has its own uPhi and probes the subject independently. In line with the location of modifiers that are typical answers to 'how' questions, we analyze agreeing 'how' as a right adjunct to vP. The closest c-command locality constraint on Agree ensures that 'how's uPhi features will typically be valued by the thematic subject (see 16, repeated below).

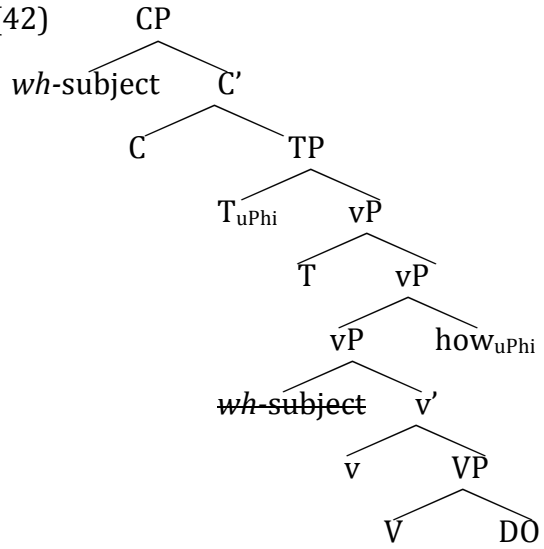
(16)



5.2 Analysis of agreement with operator subjects.

As shown in §4.2, 'how' bears canonical [a-] subject agreement in operator constructions while T bears the special [-person] [o-] agreement; we represent schematically in (42).

(42)



←*Person agreement on T illicit*

←*Person agreement on 'how' obligatory*

§4.2 noted that Henderson (2009) and Diercks (2009) analyze T 's special agreement in operator constructions as related to 'that-trace' and *que-qui* effects, and serves to avoid or repair subject extraction from Spec, TP (cf. Rizzi & Shlonsky 2007).[17] The mismatch in features between 'how' and T is important evidence that the two probe independently.

We conclude that agreement on 'how' is not parasitic on T's features (*contra* hypothesis 15iii). The facts also strongly suggest that 'how' does not probe Spec, TP, as it is questionable whether the subject ever occupies this position (see Diercks 2010). Rather, the facts argue that 'how' probes and Agrees with the subject in its base position.

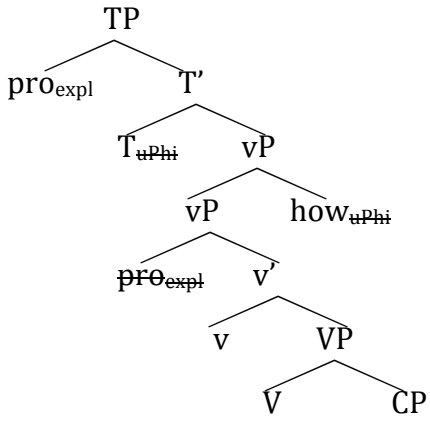
[17] Not depicted here is agreement of C with an OP, which results in doubling of the SA morpheme. The features of this agreement are also restricted to gender and number; person is precluded.

5.3 Analysis of 'how' in expletive constructions

We propose that expletive agreement on 'how' comes about because an expletive *pro* is Merged in Spec, vP and probed by uPhi of 'how' (see 18b repeated below, and 43).

(18) b. Ka-nyalikhana khu-khu-pila lu-simu ka-rie
6SA-be.possible 15-2sgOA-hit 11-phone 6-how
'How is it possible to call you?'

(43)



Merging of expletives to Spec, vP is proposed in Bowers (2002) (and see Radford 2009). Thus the facts of 'how' agreement lend support for an independently motivated analysis.

5.4 Accounting for the locative inversion facts.

5.4.1 The basics

We saw in §4.3 that there are two Lubukusu LI constructions RALI and DALI, and speakers' judgments diverge as to which expression 'how' agrees with in RALI. In this section we will present an account, building on the analysis of LI in Diercks (2011).

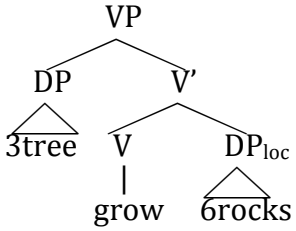
Recall from §4.3.2:(35) that only a locative selected by an intransitive verb can participate in Lubukusu LI, leading Diercks (2011) to argue that the locatives are Merged as sisters to V. On this assumption the LI constructions of (44) are built as shown in (45).[18]

[18] This analysis sets aside questions of how to constrain (i) LI to selected LOCS, (ii) RALI to unaccusatives and (iii) DALI to intransitives. We present a movement-theoretic account of (ii) in §7.3.4. See also Belletti 1988,

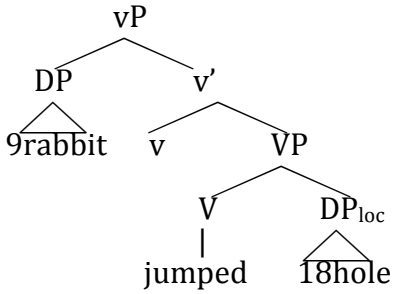
(44) a. **Mu**-ma-vale **mu**-mela-**mo** ku-mo-rogoro *unaccusative RALI*
18-6-rocks 18-grow-18L 3-3tree
'In the rocks grew a tree.'

b. **Mw**-iloo e-sun-ile-**mo** e-nduyu *unergative DALI*
18-5hole 9SA-jump-PST-18L 9-9rabbit
'Into the hole jumped the rabbit'

(45) a. *unaccusative base for locative inversion Diercks (2011)*

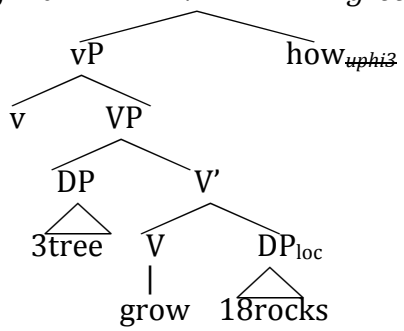


b. *unergative base for locative inversion Diercks (2011)*



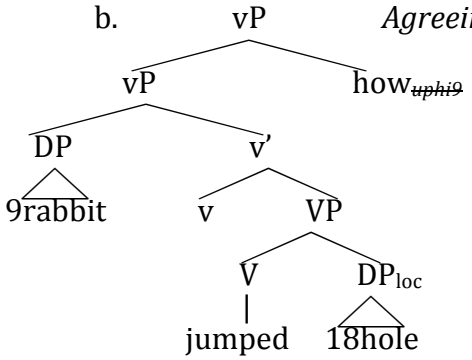
In combination with our analysis of 'how' as a vP adjunct, Diercks' proposals predict that the closest DP to 'how' is the thematic subject in both LI constructions. This accounts for the fact that agreement on 'how' is always with the thematic subject in Lubukusu Variety A.

(46) a. *Agreeing 'how': unaccusative construction with selected locative*



Alexiadou & Anagnostopoulu 2001 for Case-theoretic ideas relevant to (ii-iii); Diercks (2011) for an alternative approach without Case. Details are beyond the scope of this paper.

b. *Agreeing 'how': unergative construction with selected locative*



5.4.2 RALI in Variety B

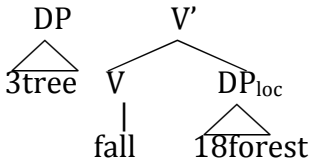
Recall however that in RALI, Speaker #3 accepts agreement on 'how' with either the postverbal subject or fronted DP_{loc} in Spec TP (see 40, repeated below). We propose that in Variety B there is a structural ambiguity in unaccusative constructions with selected locatives: either DP_{loc} or the theme argument can Merge as sister to the verb (47a,b).

(40) Locative inversion + agreeing 'how,' Speaker #3: **Variety B**
*'How' can agree with the preposed locative **or** the thematic subject in the RALI construction, but only with the thematic subject in the DALI construction.*

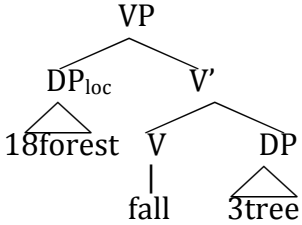
a. **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala ku-rie **/ mu**-rie? RALI
18-3-forest 18SA-PST-fall-18L 3-3-tree 3-how / 18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

b. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? DALI
18-3-forest 3SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

(47) a. *Base for RALI (Diercks 2011)*

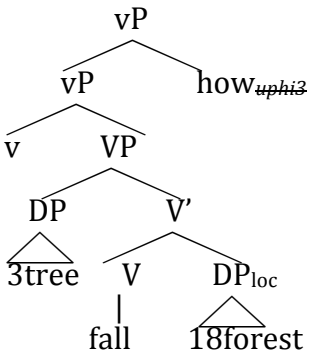


b. *Alternative base for RALI motivated by 'how' agreement options of Speaker #3*

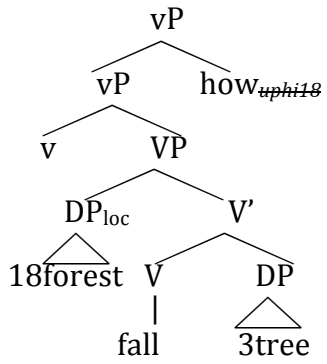


As a result, either of the two expressions may be more local to 'how' (48a,b).

(48) a.



b.

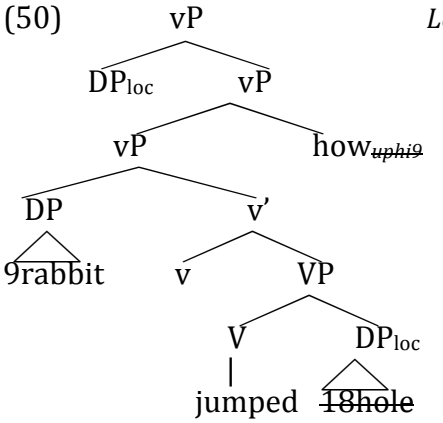


5.4.3 DALI and an issue in Variety B

For all speakers, 'how' can only agree with the thematic subject in an unergative LI, not with the locative (see 49). (46b) sketched out why this is so, and (50) demonstrates in greater detail: a locative selected by V will necessarily Merge lower than the agentive subject in Spec, vP; and the pattern of facts is predicted even under the assumption that the inverting DP_{loc} must adjoin to the unergative vP to escape the vP phase (Chomsky 2001). It is well established that Merge takes precedence over Move operations (Chomsky 1995, 2001), so 'how' will Merge before DP_{loc} adjoins, ensuring that the unergative subject is the most local goal for Agree in its c-command domain.

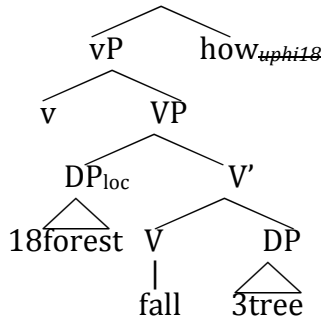
(49) **Mw**-iloo e-sun-ile-**mo** e-nduyu subuhi e-rie / *mu-rie? *unergative DALI*
18-5hole 9SA-jump-PST-18L 9-9rabbit morning 9-how / *18-how
'How did the rabbit jump into the hole this morning?'
[Lit: Into the hole jumped the rabbit this morning how?]

(50) *Locative escaping phasal vP adjoins to it after 'how' Merges, leaving agreement of 'how' with the thematic subject as the only option.*



What we have not explained so far is why the alternative base for unaccusative LI in Variety B (see 48b, repeated below) can result in agreement on 'how' in RALI but not in the DALI construction, where the thematic subject raises to Spec, TP and the locative to Spec, CP. The latter pattern of agreement is unacceptable (see 40b, repeated below).

(48) b. *Why can this feed RALI but not DALI?*



(40) b. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? DALI
18-3-forest 3SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

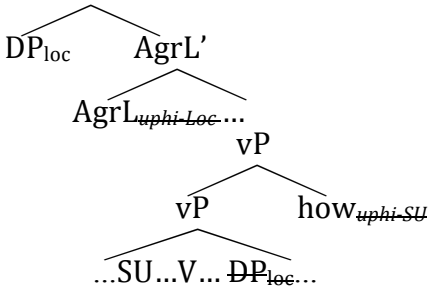
Given our proposal that 'how' agrees with the highest expression in vP, this state of affairs is in fact just what standard locality constraints on A-movement would lead one to expect: DP_{loc} intervenes to block raising of the thematic subject to Spec, TP in (48b). We will see in §7 that locatives have a special means of transiting out of VP across subjects in LI constructions, but not vice-versa (a preview of this account is provided in §5.4.4). Hence the only option for continuing (48b) is raising DP_{loc} to Spec, TP – a RALI construction. Our

findings argue strongly that expressions in VP are not equidistant from probes outside it, though this has been a common approach to inversion phenomena over the years (see note 30 and references therein). We return to this issue in §7 and §8.

5.4.4 Summary and remarks

We have demonstrated in this section that agreeing 'how' is a *wh*-manner adjunct bearing uPhi which probe its c-command domain independently of T. 'How' agreement patterns in RALI and DALI constructions of both Lubukusu varieties are accounted for by this proposal. We will argue in §7 that the next derivational step is to Merge the locative clitic that always surfaces on the verb in LIs. In our analysis, the clitic heads a projection that Diercks (2011) dubs AgrLP. It probes for and raises DP_{loc} and is thus instrumental in inversion:

(51)



There is more to be said about the properties of AgrL and its role in the two LI constructions. In §7and §8 we address this and several complex locality questions raised by LI with 'how'. But we first turn to implications of agreeing 'how' for agreement theory.

6. Luyia 'how' and agreement theory

6.1 Introduction

In this section we consider some theoretical issues connected with agreeing 'how.' We will argue that the 'how' facts contradict the claims of Baker (2008) and Diercks (2011) that Bantu agreement probes upwards as a matter of parametric choice. We will show that it is also inconsistent with the Spec, head agreement hypothesis. We will discuss the Feature

Inheritance system proposed in Chomsky (2007, 2008) and Richards (2007), arguing against the view that probe features are only introduced on phase heads. Lastly we will argue that proposals in Carstens (2010a, 2011) account for all the agreement facts.

6.2 Against an upwards Agree account

Baker (2008) and Diercks (2011) argue that the directionality of Agree is parameterized, looking upwards for a goal in Bantu, rather than probing its c-command domain. Major difficulties arise for an upward Agree account in RALI 'how' questions, however, where 'how' agrees with the *in situ* unaccusative subject (see 40a repeated below).

(40) a. **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala ku-rie **/ mu**-rie? RALI
18-3-forest 18SA-PST-fall-18L 3-3-tree 3-how / 18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

For upwards Agree to work in a case like (40a), 'how' would have to be lower than the unaccusative SU. But independent evidence regarding the position of the thematic SU in LI reported in Diercks (2011: 710-714) argues that it remains in situ within the VP. And if 'how' can be positioned lower in the clause than the in situ unaccusative subject, it becomes difficult to explain why 'how' cannot Agree upwards with the direct object of a transitive clause. If we were to assume, contrary to the evidence, that the unaccusative SU raises to some intermediate position, it is not obvious where this would be, why it would move, why a direct object could not also move there, and how upwards agreement with the raised DP_{loc} is to be avoided. A downwards Agree account avoids all of these problems.[19]

[19] An account of the apparent upward orientation of Bantu agreement in some constructions is possible under Carstens's (2005) proposal that uPhi in Bantu is often paired with an edge feature (see also Collins 2004).

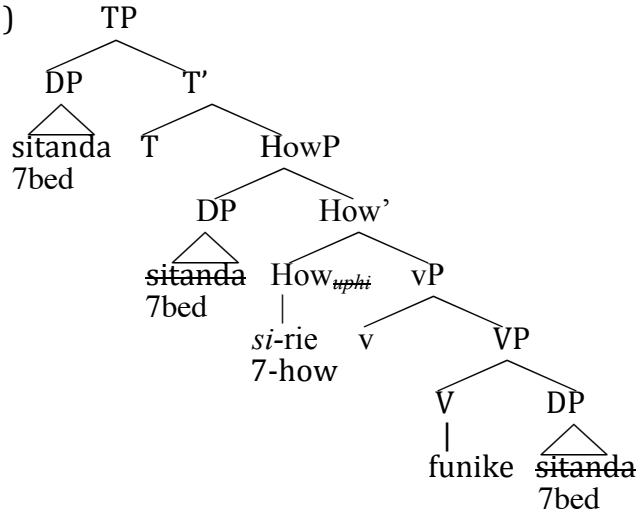
6.3 Against a Spec, head agreement account

An alternate account of agreeing 'how' might be attempted under the assumption that 'how' heads a functional projection in the clause and the subject passes through its Spec (see Wasike 2007 for a proposal along these lines). As we will show here, however, word order in 'how' constructions is incompatible with analysis of 'how' as a head.

Consider (52), an illustration of the hypothesis that 'how' agrees with an expression that transits through a Spec, HowP based on (1f) repeated below.

(1) f. Si-tanda **si**-funikhe **s**i-rie(na)
7-bed 7SA-broke 7-how
'How did the bed break?'

(52)



Hypothesis to be rejected: 'how' as a functional head

There are three word order arguments against the approach sketched out in (52).

First, Luyia is a strictly head-initial language and the position of 'how' is always post-verbal. Raising of the subject DP in (52) goes a little way towards deriving the surface

word order, but there is no obvious means of moving the verb to the left of 'how'. If 'how' is a head, it should block verb raising, leaving the verb to 'how's right.[20]

Second, recall that in transitive clauses the direct object often precedes 'how' (see 53). This is inconsistent with the analysis of 'how' as a head, given Luyia's strict left-headedness. As (54) illustrates, the HowP analysis of agreeing 'how' predicts that both the verb and the direct object will appear to the right of 'how', contrary to fact.

(53) Baba-ana ba-kha-kule bi-tabu ba-rie(ena)
2-children 2SA-FUT-buy 8-book 2-how
'How will the children buy books?'

(54) *[$_{TP}$ the children [$_{T'}$ FUT [$_{HowP}$ ~~the children~~ [$_{How'}$ how [$_{vP}$ ~~the children~~ buy the books]]]]]

There is one possible means of deriving surface word order under an analysis of 'how' as head of HowP: pied piping the entire vP containing the verb and its object to Spec of 'how':

(55) [$_{TP}$ the children [$_{T'}$ FUT [$_{HowP}$ [$_{vP}$ ~~the children~~ buy the books] [$_{How'}$ how t_{vP}]]]]

This brings us to our third word order argument against analysis of 'how' as a head. Recall that, like all other *wh*-phrases, 'how' has an alternative location immediately after the verb (= IAV, see §2.2). This is difficult to reconcile with a pied-piping/'how'-as-head account of the consistently post-verbal position of 'how'. If we adopt the assumption that 'how' is a head, raising the goal that values its uPhi to Spec, HowP, the only way of deriving IAV word order would seem to be positing an optional movement of the direct object out of the vP before the vP raises (see 56). A different derivation would be needed to account for an IAV

[20]An additional linear order problem for treating 'how' as a head in the middle field of the clause arises in relation to syntactic structure associated with the clitic in locative inversion constructions, because like the verb it must precede 'how' in linear order (see our preview of this analysis in §5.4.4, and details in §7).

wh-phrase like 'which book' in (57b), which is not plausibly a head. To attribute IAV to such disparate sources without independent motivation seems ill-warranted.[21]

(56) [$_{TP}$ the children [$_{T'}$ FUT [$_{HowP}$ [$_{vP}$ ~~the children~~ buy t_{DP}] [$_{How'}$ how t_{vP}]]]] [$_{DP}$the books]

(57) a. Ba-khasi ba-we-le ba-ba-ana bi-tabu *Neutral word order*
2-woman 2SA-give-PST 2-2-child 8-book
'The women gave the children books.'

b. Ba-khasi ba-we-le [bi-tabu si] ba-ba-ana *IAV position for 'which book'*
2-woman 2SA-give-PST 8-book what 2-2-child
'What books did the women give the children?'

We conclude that analyzing 'how' as a head leads to highly unsatisfactory results, arguing against the last remaining alternative analysis (15iv). We conclude that downwards probing is the best tool for analyzing agreeing 'how.' This being the case, it cannot be correct that all agreement in natural language is Spec, head (*contra* Koopman 2000; 2006); or (as argued above) that Lubukusu (or all of Bantu) is parametrically committed to upwards Agree *contra* Baker (2008) and Diercks (2011).

6.4 Against phase heads as the only sources of uPhi

6.4.1 General problems

Properties of Bantu agreement raise difficulties for the Feature Inheritance (FI) approach to agreement proposed in Chomsky (2007, 2008) and Richards (2007). Richards writes, "[i]t thus follows from the SMT [Strong Minimalist Thesis] that uninterpretable (unvalued) features can only be a property of phase heads, that is, those heads that trigger Spell-

[21] Based on careful comparison, Buell (2007) argues that Zulu 'why' in IAV position merits a special account different from that of other IAV *wh*- and focused phrases. In contrast the fragmented approach to IAV in Luyia required by the assumption that 'how' is a head is not motivated by properties of the *wh*- or the construction, but strictly to accommodate an approach to 'how' which has many other weaknesses and problems.

Out/Transfer" (Richards 2007: 567). Phase heads hand down probe features to the heads of their complements because "value and transfer of uFs must happen together," or else there would be no way to distinguish valued uninterpretable features from interpretable features at the Conceptual-Intentional (C-I) interface (Richards 2007:566).

It is well-known that a Bantu clause can include multiple SA, and that in the same clause C can agree with a *wh*-phrase (see 58). The FI approach requires that phasal and non-phasal heads interleave, and as a consequence we should see alternations of agreeing and non-agreeing heads. Bantu languages do not display the predicted interleaving.

(58) Siina ni-syo a-kha-be ne-a-khola?
7what COMP-7 3SGSA-FUT-be NE-3SGSA-do
'What will s/he be be doing?' (Lubukusu; Wasike 2007: 342)

Building on the analysis of Carstens (2001, 2005) (58) can be represented schematically as follows (lines indicate agreement relationships between an aspectual affix and the subject; between T and the subject; and between C and the operator).

(59) OP $C_{\sout{uphi}}$ SU $T_{\sout{uphi}}$ V+v+$Asp_{\sout{uphi}}$ ~~OP~~ ~~SU~~ ...

Asp agrees with the subject
T agrees with the subject
C agrees with the operator

There is no independent evidence that Luyia has phase heads which are absent in English, intervening between C and T, and between T and Asp. Carstens (2010a) argues based upon problems of this kind that the conclusions of Chomsky and Richards must be abandoned. Epstein, Kitahara and Seely (2010 henceforth EKS) provide compelling arguments from English against the Chomsky/Richards approach (among them the presence of valued uCase at the phase edge on *whom* in *Whom do they like?* and valued uPhi on *v** in *They like him*). EKS propose that uFs are recognizable as such throughout the derivation and simply

ignored at C-I. As long as valuation precedes Transfer to PF so uFs can be pronounced, they are licit on any head. This proposal has much to recommend it and we adopt it here.

6.4.2 Agreeing 'how', and the origins of probe features

The facts of agreeing 'how' reinforce these general conclusions. Since 'how' is adjoined to vP, it cannot be Transferred with the VP complement of *v;* it is part of the higher CP phase. Thus under the Chomsky/Richards view that only phase heads introduce probe features, it would follow that uPhi of T, Asp, and 'how' all originate on C. The mismatches between SA on T and Asp and agreement on 'how' can only be accommodated under Feature Inheritance theory if C's features can be duplicated, distributed to the various agreement bearers including 'how', and allowed to agree with different expressions (see 60).

(60) a. C_{uphi} [$_{TP}$ T [$_{vP}$ [$_{vP}$ *v* [$_{VP}$ SU V **LOC**]] How]] *C introduces the sole uphi*

b. C [$_{TP}$ T_{uphi}…[$_{vP}$ [$_{vp}$ *v* [$_{VP}$ SU V **LOC**]] How_{uphi}]] *T and 'how' inherit C's uphi*

c. C [$_{TP}$ $T_{\sout{uphi}}$…[$_{vP}$ [$_{vp}$ *v* [$_{VP}$ SU V **LOC**]] $How_{\sout{uphi}}$]]] *'How' agrees with the subject; T agrees with the locative*

For the FI approach to work in Luyia it seems there can be no constraints placed on the domain over which copies of C's uPhi can be distributed (since additional agreeing aspectuals could increase the number of items sharing copies of C's uPhi bundle to 3 or 4).[22] There would also need to be no constraint prohibiting the features of the copies from diverging: once C's uPhi are distributed, each copy would have to be entirely independent in terms of ultimate feature values. There can accordingly be no way to determine whether or not a given instance of agreement has any relation to C, since it can appear on any expression in the phase that lacks iPhi, and agree with whatever DP is local to it. Thus we

[22] Once the agreeing locative clitic is taken into account this problem is exacerbated; see §7.

seem to arrive at a system that cannot be falsified by any empirical facts of agreement. We consider this a fatal flaw and put the approach aside.

6.5 An agreement theory that works for agreeing 'how'

The tools needed to explain why Bantu but not English should allow an expression like 'how' to agree are available in Chomsky (2001), particularly in the "activity" requirement.

(61) The Activity Requirement: each participant in an Agree relation must have an unchecked uninterpretable feature (uF).

While the sole uF activating goals in English A-relations is uCase, Carstens (2010a, 2011) proposes that the grammatical gender of nouns (a component of noun class; see note 1) is a meaningless formal feature, hence uninterpretable (see also Zamparelli 2008 and Bošković to appear); as such, it makes its bearer "active" as a goal for Agree. This property is clearly demonstrated in the familiar phenomenon of concord within noun phrases. It is a well established cross-linguistic pattern that if nouns have grammatical gender (uGen), many modifiers agree with them (see 62, from Carstens 2011).[23]

(62) a. la maison vert-e [French]
the.FS house(F) green-FS
'the green house'

b. kiatu ch-angu ki-dogo [Swahili]
7shoe 7-my 7-small
'my small shoe'

What concord also makes clear is that when a noun's uGen is goal in an Agree relation no "deactivation" effect occurs. In other words, the same noun can value concord on a number of items inside the DP as shown in these examples. In this respect concord contrasts

[23] We assume that concord is simply agreement under closest c-command with the features available in the noun phrase (see Carstens 2010a, 2011, and 2000 on the relationship of concord to Minimalist theory).

sharply with English SA. Based on facts like (63), Chomsky (2001:6) writes, ‘‘Once the Case value is determined, N no longer enters into agreement relations and is ‘frozen in place.’”

(63) *He seems ___ has left.

To account for this contrast between uCase and uGen as active goal features, Carstens (op cit) proposes that deactivation accompanies valuation of a DP’s uCase because further Agree relations have the potential to tamper illicitly with the value determined in the initial Agree, leading to a PF crash based on unclarity regarding how uCase is to be pronounced (see the proposal in 14 that values acquired by uFs are phonological). This problem does not arise for iterating Agree where N’s uGen is the active goal feature, because N’s uGen enters the syntax with a value rather than acquiring it via Agree (see Pesetsky & Torrego 2007 on the logical independence of interpretability and value, and Bošković to appear for similar ideas on gender in Serbo-Croatian, though somewhat different in implementation).

Returning to the issue of Bantu’s abundant clause-level agreement, Carstens points out that in all cases it shares with concord the inclusion of grammatical gender features. This in turn follows, in Carstens’s proposals, from the fact that Bantu nouns raise and adjoin to D, making N’s uGen uniformly accessible to clause-level probes like T and C. Because of N-to-D, Bantu contrasts with Romance languages which also have uGen; its effects as an activity feature in Romance are seen only inside the noun phrase because Romance lacks N-to-D (compare 64 with 65-66, from Carstens 2011).[24] The sole exception to this pattern of Romance agreement is gender agreement on participles which, significantly, are lexically

[24] Cinque (2005) rejects N-raising and head-movement generally. But see Carstens (2010b) for an N-raising analysis of DP-internal word order variation; Matushansky (2006) for a Minimalist head-movement theory.

insensitive to D's person feature. Carstens argues that [person] intervenes blocking access to N's gender for any probe outside the DP with sensitivity to [person], absent N-to-D. [25]

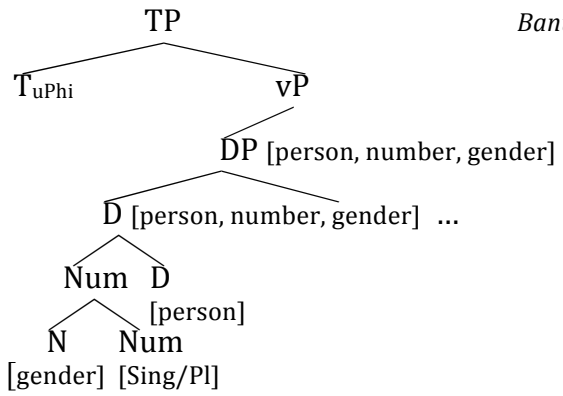
(64) a. la mia casa [Italian; see Cinque 1994]
the my house
'my house'

b. [$_{DP}$ la [$_{FP}$ mia casa [$_{NP}$ t_N]]]

(65) a. nyumba yangu nzuri [Swahili; Carstens 1991]
house my nice
'my nice house'

b. [$_{DP}$ nyumba+D [$_{FP}$ yangu t_F [$_{NP}$ nzuri [$_{NP}$ t_N]]]]

(66) *Bantu N-adjunction to D leads to inclusion of gender in SA when uPhi of T probes DP*



The proposal that gender is never deactivated explains a broad range of constructions in Bantu languages where on standard assumptions a DP should cease to agree and move, but in fact does not. [26] Carstens refers to these phenomena as 'hyperagreement' and

[25] Carstens points out that number agreement outside DP is also unexpected on the common assumption that number heads a functional projection in the DP's middle field (see Carstens 1991; Ritter 1992 among others). She argues that in a featural version of QR, number always raises to D to take scope over DP; hence interpretable number features are generally accessible to value uPhi of clause-level probes.

[26] A few additional technicalities connected with constraining iterating agreement lie outside the scope of this brief sketch; see Carstens (2010a, 2011) for details.

'hyperactivity.' Diercks (to appear) adds the proposal that some or perhaps all Bantu languages lack uCase altogether, relying on uGen as the sole activity feature.

With uGen providing inexhaustible "activity", any DP in Bantu can serve as goal in an infinite series of Agree relations. Thus a subject can value agreement on 'how', on an aspectual, and on T. Similarly, fronted DP_{loc} can value the features of the locative clitic and move on to a second Agree relation with T and/or C as we will see in §7.

Summing up, a principled explanation for differing cross-linguistic patterns of agreement is not available in the framework of Chomsky (2007, 2008), but the approach of Chomsky (2001) yields a nicely predictive system once the roles of grammatical gender and N-to-D adjunction are taken into account. Under this approach to agreement, the co-occurrence of 'how' agreement and SA with a single expression is not a problem at all.

7. Inversion, locality, and agreeing 'how'

7.1 Introduction

In the preceding sections we have analyzed agreeing 'how' as a vP adjunct with uPhi. We have shown that this proposal nicely accounts for agreement phenomena associated with several kinds of non-canonical subjects including expletives, fronted locatives, and operators. Two potential locality problems associated with LI constructions are readily explained by assuming two Merge options for selected locatives in unaccusative constructions (see discussion of 47 and 48 in §5.4.2), and by adopting Merge-over-Move (see Chomsky 1995, 2001 and discussion of 50). Some additional locality puzzles arise, however, in connection with agreeing 'how' and LI.

First, it is interesting to note that the thematic subject doesn't systematically block raising of DP_{loc}. We will argue that DP_{loc} is probed and raised to Spec of the locative clitic

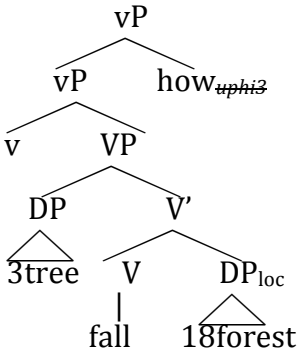
that appears on the verb whenever a locative is fronted. Because the clitic is sensitive only to locatives, the subject is irrelevant to its search.

This explains why the subject does not block raising of DP_{lo}, but it leads to a second locality question: if DP_{loc} transits through an intermediate position, we need to explain why it does not block raising of the subject to Spec, TP in the DALI construction. We relate this to A'-opacity effects in a range of other languages.

7.2 Why the subject doesn't block raising of the locative

Recall our proposal that the expression valuing 'how's uPhi does so because it is the highest DP in vP and hence most local to 'how'. When 'how' and T agree with different expressions, a locality puzzle therefore arises: surely the expression closest to 'how' is closest to T as well (see 48a, repeated below). Why then, when 'how' agrees with the logical subject SU in a RALI construction like (39a repeated below), is it possible for T to probe and raise DP_{loc}?

(48) a.



(39) a. **Mu**-mu-siiru **mw**-a-kwa-**mo** ku-mu-saala ku-rie / ***mu**-rie? RALI
18-3-forest 18SA-PST-fall-18L 3-3-tree 3-how / *18-how
'How did a tree fall in the forest?' (Lit: In the forest fell a tree how?)

A likely explanation for this phenomenon lies in the existence of the special locative clitic that always and only agrees with locatives when left-dislocated (67b), raised to Spec, CP (67d) or occupying Spec, TP (67c); but never with in situ LOCs (67a) (cf. Diercks 2011).

(67) a. *Ku-mu-saala kw-a-kwa-**mo** **mu**-mu-siiru *in situ LOC*
3-3-tree 3SA-PST-fall-PST-18L 18-3-forest
'A tree fell in the forest.'

b. **Mu**-mu-siiru, ku-mu-sala kw-a-kwa-*(**mo**) *Left-dislocated LOC*
18-3-forest 3-3-tree 3S-PST-fall-PST-18L
'In the forest, a tree fell.'

c. **Mu**-mu-siiru **mw**-a-kwa-*(**mo**) ku-mu-saala *RALI*
18-3-forest 18SA-PST-fall-PST-18L 3-3-tree
'In the forest fell a tree'

d. **Mu**-mu-siiru kw-a-kwa-*(**mo**) ku-mu-saala. *DALI*
18-3-forest 3SA-PST-fall-18L 3-3-tree
'In the forest fell a tree.'

We adopt Diercks's (2011) proposal that this clitic heads a syntactic projection in the middle field of the clause,[27] which he dubs AgrLP. The clitic probes for and agrees with DP_{loc}. Because its uPhi is sensitive only to locatives, intervening non-locative DPs are irrelevant to its search (see Rizzi 1990 on effects of this kind, and discussion in §7.3.4). We depart from Diercks' account in proposing that the clitic has an edge feature[28] which raises DP_{loc} to Spec, AgrLP where it is closest to uPhi of T.[29] Note that DP_{loc} is not deactivated or "frozen in place" after this Agree relation with the locative clitic; it remains active to Agree with T for the reasons sketched out in §6.5.

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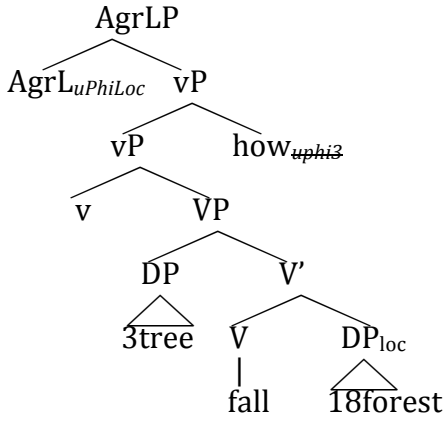
[27] In a compound tense construction (not illustrated here for reasons of length) the locative clitic attaches to the highest auxiliary. We therefore locate the projection that the clitic heads as sister to T in (68c).

[28] Alternatively we might suppose that even unaccusative v has an edge feature (see Legate 2003) raising DP_{loc} to an outer Spec, vP from whence DP_{loc} can either A-move to Spec, TP or A'-move to Spec, CP. The obligatory presence of the locative clitic would have to be viewed as coincidental.

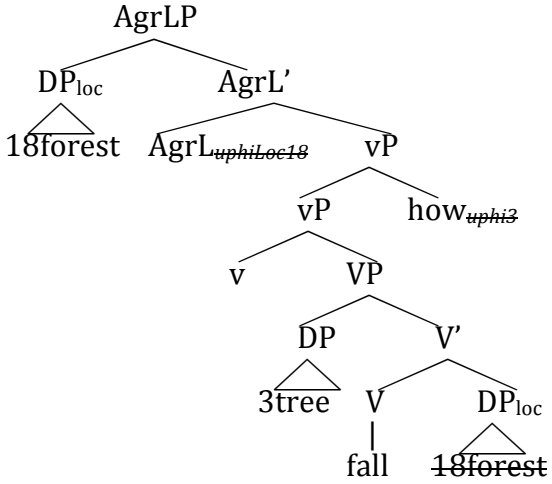
[29]Agreement with DP_{loc} on AgrL and hence probing by AgrL feeds both A- and A'-movement of DP_{loc},. Chomsky (2008) proposes that an A' position is one created by the edge feature of a phase head; based on this we might consider that AgrL has both phasal and non-phasal versions (see §7.3.3).

(68) *RALI constructions, Variety A: 'how' agrees with SU; T and the locative clitic with DP_{loc}*

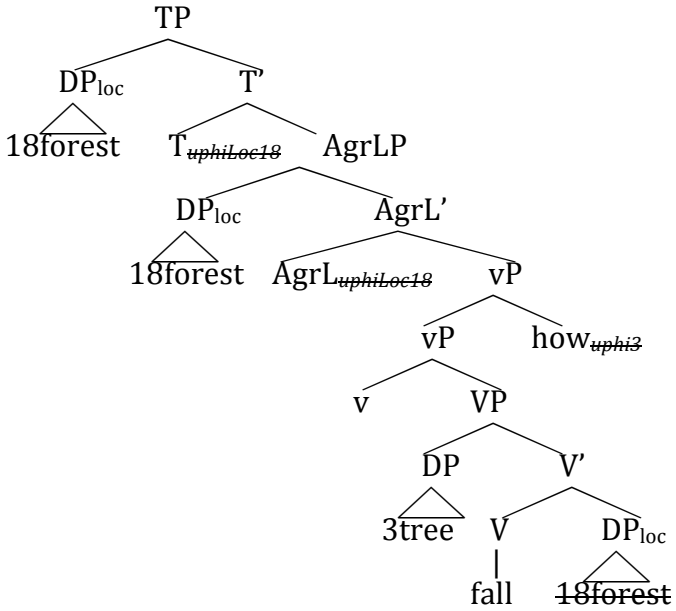
a. *AgrL Merges with vP*



b. *AgrL agrees with and raises DPloc*



c. *T Merges with AgrLP, then T agrees with and raises DP_{loc}*



But now a different locality question arises: if fronted locatives move to Spec, AgrLP, how can T ever agree with the thematic subject in a locative inversion construction? [30]

7.3 Why the locative in Spec AgrLP doesn't block raising of the subject

7.3.1 The problem

The preceding section explained the absence of an intervention effect for T probing a locative phrase that begins lower in the structure than the subject of the unaccusative RALI construction: we argued that the special locative clitic heads a projection mid-way between T and vP, and that it probes and raises all and only extracted or inverted locatives to an intermediate position between T and the thematic subject. Once DP_{loc} is in that position, T can probe and raise it to Spec, TP, yielding the construction we call RALI:

(69) a. T [$_{AgrP}$ DP_{loc} AgrL [$_{vP}$ v [$_{VP}$ SU… ~~DP_{loc}~~]]] →

b. [$_{TP}$ DP_{loc} T [$_{AgrLocP}$ ~~DP_{loc}~~ AgrL [$_{vP}$ v [$_{VP}$ SU…]]]]

Under these assumptions, both unaccusative and unergative DALI constructions raise a new locality puzzle. Recall that in DALI constructions, T and 'how' agree with the thematic subject, but the locative clitic agrees with the inverted locative phrase. The pattern is exemplified for an unaccusative and an unergative in (34a,b), repeated below:

(34) a. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala. **Disjoint Agreement LI**
18-3-forest 3SA-PST-fall-18L 3-3-tree *Unaccusative*
'In the forest fell a tree.'

---

[30] A number of previous analyses of LI assume that it exists in part because a locative and unaccusative SU in VP are "equidistant" from T (cf. Collins 1997, Culicover and Levine 2001, Diercks 2011, Rezac 2006; see Chomsky 1995, Ura 1994, 1996 on equidistance). Since for many speakers 'how' agrees only with SU this will not work, motivating our analysis based on properties of AgrL. Our approach may assist in the analysis of inversion phenomena generally (see Zeller 2011 for similar ideas on other inversion constructions).

b. **Mw**-iloo e-sun-ile-**mo** enduyu
18-5hole 9SA-jump-PST-18L 9-9rabbit *Unergative*
'Into the hole jumped the rabbit.'

Recall also that DALI constructions have the (partial) structures shown in (37a,b repeated below), where the landing site of DP_{loc} is Spec, CP and that of the logical subject is Spec, TP.

(37) **Disjoint agreement LI (DALI):** *Thematic SU raises to Spec TP; DPloc to Spec, CP*
a. [CP LOC C-T-V-V [TP SUBJ ~~T~~ [vP ~~v~~ [VP ~~SUBJ~~ ~~V~~ ~~LOC~~]]]] *unaccusative*
b. [CP LOC C-T-V-V [TP SUBJ ~~T~~ [vP ~~SUBJ~~ ~~v~~ [VP ~~V~~ ~~LOC~~]]]] *unergative*

Updating these representations to reflect the hypothesized intermediate positions of the operator DP_{loc} including Spec, AgrLP yields (70) and (71).[31] Notice that the surface position of SU is separated from its base position by the intermediate occurrences of DP_{loc}:

(70) *OK* [CP DP_{loc} V-V-T-C [TP SUBJ ~~T~~ [AGRLP ~~DP_{loc}~~ ~~AgrL~~ [vP ~~DP_{loc}~~ ~~[SUBJ~~ ~~v~~ [VP ~~V~~ ~~DP_{loc}~~]]]]] *unergative*

(71) *OK* [CP DP_{loc} V-V-T-C [TP SUBJ ~~T~~ [AGRLP ~~DP_{loc}~~ ~~AgrL~~ [vP ~~v~~ [VP ~~SUBJ~~ ~~V~~ ~~DP_{loc}~~]]]]] *unaccusative*

In a DALI 'how' question, then, an intriguing locality puzzle arises in connection with SA and subject raising to Spec, TP: why doesn't DP_{loc} block Agree (T, SU)?

This issue may seem at first glance to arise as a consequence of our proposal that the locative clitic probes and raises DP_{loc} to the intermediate Spec, AgrLP. But in fact the problem exists independently of that. Let us consider in closer detail the intermediate stage in the derivation of an unergative DALI construction before AgrL is even Merged, as depicted in (72). The Minimalist hypothesis of cyclic phasal Transfer and Spell-Out dictates

[31]It is conceivable that AgrL's edge feature is used only in A-movement, so A' movement does not pass through its Spec. This seems stipulative (and inverts Minimalist approaches to movement in a curious way). We will not pursue the idea here partly for reasons of length; and partly, anticipating discussion of (73), because avoiding A' movement through Spec, AgrL seems not to alter substantially the outcome.

that unless DP_{loc} moves to outer Spec, vP en route to Spec CP it will be removed from narrow syntax when the complement to v (= the shaded area in 72) is Transferred away.

(72) *probe…*[$_{vP}$ DP_{loc} [$_{vP}$ SUBJ *v* [$_{VP}$ ~~V~~ ~~DP_{loc}~~]]] *unergative DALI, intermediate stage*

Even at this point in the derivation, then, before AgrL is involved, strict locality would lead us to expect DP_{loc} to intervene and prevent T raising or agreeing with the logical subject.

The problem described here is not by any means a novel one restricted to the analysis of Bukusu locative constructions. (72) is no different in principle from the configuration that arises in *wh*-questioning of an English non-subject. We illustrate with a case of object extraction in (73) (Transferred material is again shaded); see in particular the intermediate stage (73b). The thematic subject can (and in fact must) be raised to Spec, TP across an intervening operator bound for Spec, CP in a *wh*-question of this kind. Explaining such phenomena in a way consistent with other evidence of strict locality in movement and agreement is a recurring issue in Minimialist syntactic theory.

(73) a. Who did John see? *an object question*
b. T [$_{vP}$ DP_{OB} [$_{vP}$ SUBJ *v* [$_{VP}$ ~~V~~ ~~DP_{OB}~~]]] *intermediate stage*
c. [$_{CP}$ DP_{OB} C [$_{TP}$ Subj T [$_{vP}$ ~~DP_{OB}~~ ~~Subj~~ v]]] *end of CP phase*

7.3.2 Towards a solution

A number of related theoretical proposals can be at least partially represented in the preliminary generalization we provide in (74) (for helpful recent discussion and review of the literature on this question see Obata & Epstein 2011; see also Rezac 2003, Svenonius 2000, Chomsky 2008 among many others).[32]

[32]The authors we cite have different approaches to the problems described here, not necessarily consistent with (74) and (75) in their particulars. We discuss Rezac (2003) and Obata & Eptein (2011) briefly in §7.4.

(74) T cannot probe a category that is *en route* to Spec, CP.

It has often been argued in relation to this issue that a chain including both A- and A'-positions is "improper" (see Obata & Epstein op cit). A condition like (75) takes us a little further towards explaining the invisibility of the object operator in (73) and the locative operators in (70-72) when T is probing – a state of affairs that Rezac (2003) aptly refers to as A'-opacity.[33] We discuss some approaches to deriving (75) in §7.4.[34]

(75) **Prohibition on Mixed Chains**: A'-chains are inaccessible to A-relations.

7.3.3 Defining A'-opaque material

A rather subtle question arises as to how A'-chains and their members are to be identified in narrow syntax for purposes of the prohibition in (75).[35] Recall from §5.4.3 that T cannot probe the thematic subject SU when DP_{loc} is Merged higher than SU. The relevant configuration is the unaccusative VP in (48b), repeated below; proposed because for our third speaker, 'how' could agree with either SU or with DP_{loc} in RALI constructions. To

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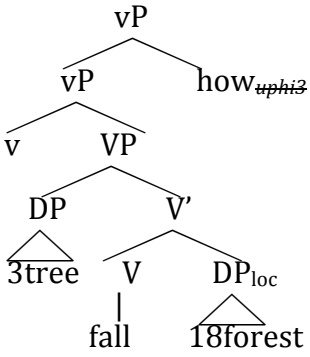
[33]As Rezac (2003) and Obata & Epstein (2011) note, not all languages exhibit A' opacity. Under the analysis of Carstens (2005), Kilega is a Bantu language which does not. We note a potential conceptual connection between (74/75) and the alternative agreement phenomena (AAE) described for subject operators in §4.2 and §5.2. But AAE does not correlate with A' opacity: it is found in Kilega and Luyia both. Further consideration lies outside this paper's scope.

[34] A question arises as to the status of (Agree ('how', DP)) in relation to this generalization. We argue below that before they leave their Merge positions, operators are visible in A-relations.

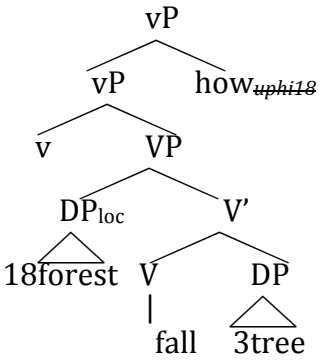
[35] Under the FI model of Chomsky (2008), the entire chain is visible at the crucial point in (73) because probing waits until C is Merged and gives uF to T. We have already detailed reasons in §6.4 for rejecting Chomsky's proposal to introduce all probe features on phase heads for Luyia. We conclude that, for Luyia at least, the requirement of uniform chains in (75) cannot be derived in the way proposed in Chomsky (2008).

account for this pattern of judgments we proposed that in the dialect of speaker #3, unaccusative VPs have the structural ambiguity shown in (48a,b).

(48) a.



b.



Now notice that in the hypothetical derivation of an unacceptable DALI continuation from (48b), DP_{loc} would surface in Spec, CP; hence it is an operator as shown in (48b').

(48b') *[$_{CP}$ DP_{loc} V-v-T-C [$_{TP}$ SUBJ ~~T~~ [$_{AGRLP}$ ~~DP_{loc}~~ ~~AgrL~~ [$_{vP}$ ~~v~~ [$_{VP}$ ~~DP_{loc}~~ ~~V~~ ~~SUBJ~~]]]]]

Unacceptable unaccusative DALI construction based on (48b)

The contrast between the impossible derivation in (48b') and the licit ones in (70) and (71) (repeated below) argue that there is no A-opacity effect for the DP_{loc} operator in its base position. Only its intermediate occurrences are successfully ignored by T when T probes.

(70) *OK* [$_{CP}$ DP_{loc} V-v-T-C [$_{TP}$ SUBJ ~~T~~ [$_{AGRLP}$ ~~DP_{loc}~~ ~~AgrL~~ [$_{vP}$ ~~DP_{loc}~~ ~~[SUBJ~~ ~~v~~ [$_{VP}$ ~~V~~ ~~DP_{loc}~~]]]]] *unergative*

(71) *OK* [$_{CP}$ DP_{loc} V-v-T-C [$_{TP}$ SUBJ ~~T~~ [$_{AGRLP}$ ~~DP_{loc}~~ ~~AgrL~~ [$_{vP}$ ~~v~~ [$_{VP}$ ~~SUBJ~~ ~~V~~ ~~DP_{loc}~~]]]]] *unaccusative*

It has been noted elsewhere that operators in their landing sites can be invisible to A-probing, like their intermediate occurrences are here. Consider (76), from Svenonius

(2000). Svenonius (op cit) provides a number of arguments that the clause-medial negative expression in the Icelandic (76) is an A' operator. It is therefore significant that the subject can move to Spec, TP across it, indicating that the relationship (T, SU) succeeds though the null hypothesis is for the negative expression's phi-features to be relevant to T's search. See Jayaseelan (2001) for discussion of several similar A'-opacity problems.

(76) Strákarnir$_2$ höfðu [engu grjóti]$_1$ [vP t$_2$ [VP hent t_2 í bílana]].
the-boys had no rock thrown in the-cars
'The boys had thrown no rocks at the cars.' (Svenonius 2000)

Together the facts of (48b', 70, 71, and 76) argue that while an operator in its base position is visible in A-relations, once it has moved this visibility ceases. Let us follow Chomsky (2008) in defining an A' position as one created by the edge feature of a phase head.[36] Then we can formulate (75) in a way precise enough to predict all the facts (see 75').

(75') **Prohibition on Mixed Chains**: A'-positions are inaccessible to A-relations.

When T probes in (48b') it finds DP_{loc} in its Merge position higher than SU. This occurrence is not in an A' position. The desired result is obtained: (48b) cannot feed a DALI construction because T cannot probe SU across DP_{loc} in the VP of (48b). In all cases, however, T will ignore intermediate occurrences of DP_{loc}. The formulation in (75') allows us to explain why AgrL and 'how' are not sensitive to A/A' differences in their goal. AgrL and 'how' probe expressions in their base positions, where A'-opacity is not a factor.

[36] See note 29 and discussion of (68) in relation to AgrL and phasehood. The fact that it probes in both A and A' constructions suggests that it has dual status or two varieties; one phasal and one non-phasal.

7.3.4 Summary and remarks

We have argued that apparent locality paradoxes in LI constructions have two primary sources. First, A-movement of DP_{loc} across the thematic subject is mediated by the locative clitic. The subject is irrelevant to its search because the clitic is sensitive only to locative material. We argued that the clitic has both uPhi and an edge feature (we argued in §6 that uF probe features are not properties of phase heads alone, contra Chomsky 2008).

The second apparent locality paradox we considered was the ability of T to probe the subject across the intervening DP_{loc} in DALI constructions. We argued that this is because in DALI DP_{loc} moves through an A' position, and A-probing typically ignores the contents of A' positions. The structure in (72) showed that the initial locality issue in unergative DALI constructions is essentially the same as those of object operator constructions more generally (and see the Icelandic example in 76) in that both of the potential goals for Agree relations are at the edge of the *v*P phase. But if we are correct about the role of AgrL in locative inversions, then DALI constructions in Lubukusu provide some novel evidence that A-probing can reach over intervening operators even across a significant structural divide. (77) represents DALI with an unaccusative verb (such as in 34a, repeated below), where the subject is internal to VP, and T nonetheless successfully probes and raises it across the locative in Spec, AgrL.

(34) a. **Mu**-mu-siiru kw-a-kwa-**mo** ku-mu-saala. **Disjoint Agreement LI**
18-3-forest 3SA-PST-fall-18L 3-3-tree *Unaccusative*
'In the forest fell a tree.'

(77) T*probe…* [$_{AGRLP}$ DP_{loc} AGRL [$_{vP}$ *v* [$_{VP}$ SUBJ V DP_{loc}]]

DALI constructions in Lubukusu thus suggest that A'-opacity is not attributable to parochial considerations of the properties of particular phase edges, such as the hypothesis of equidistance among multiple specifiers of a single head (Ura 1994, 1996).

The Prohibition on Mixed Chains in (75') provides insight into why unergative verbs cannot participate in RALI constructions. Since ergative vP is phasal, DP_{loc} cannot escape it without first moving to an outer Spec, vP. Given that this is an A' position, T will never be able to probe DP_{loc} there. Hence unergatives are restricted to DALI constructions.

7.4 Approaching A'-opacity

Locality paradoxes like (70-73), and hence A'-opacity effects more generally, are independent of the analysis of agreeing 'how', and so in principle a variety of approaches to them might well be compatible with the analysis of 'how' presented in this paper. It is worth noting, however, that the Luyia phenomena present some special challenges.

Two prominent analyses of A'-opacity propose that it arises because the phi-features of an operator (henceforth OP and iPhi; i = intrinsic) cease to be visible before the point where T probes. Rezac (2003) argues that an Agree relation encapsulates the goal in a KP shell of functional structure. Once features have been encapsulated, nothing further can probe them. Obata & Epstein (2011) argue that A'-opacity arises for an English object OP because of 'feature splitting': in Agree (v, OB) uCase and iPhi features move to v leaving OP with just the Q-feature relevant in A'-relations (see 74a repeated below, and 78).

(74) a. Who did John see? *an object question*

(78) *Obata and Epstein's Feature Splitting*

a. v [$_{VP}$ V who$_{[uCase][iphi]\ [Q]}$] *little v probes the object 'who'*

b. [$_{vP}$ who$_{[Q]}$ [$_{vP}$ SUBJ v [$_{VP}$ ~~V who~~]]] *at the phase edge, English 'who' no longer has* iPhi *or* uCase

Luyia raises novel problems for both of these approaches because it exhibits A'-opacity, but its operators control agreement. Hence iPhi of OPs must be syntactically visible. We can see this in (79), where a locative OP first values uPhi of the locative clitic and subsequently uPhi of the complementizer in a cleft.[37] (80) demonstrates the same sort of phenomenon for an object operator: it values agreement on C of the cleft. For these valuation relations to be possible, OP's iPhi must be visible and active. Yet A'-opacity obtains nonetheless; T Agrees with the thematic subject, raising it to Spec and adopting its Phi-values in SA (80): The relevant (T, SU) relations are illustrated in (81) and (82).

(79) **mw**-a-ba **mu**-nju ni-**mwo** ba-ba-ana ba-a-funa-**(mo)** lu-u-saala
18SA-PST-be 18-house COMP-18 2-2-child 2SA-PST-break-18L 11-11-stick
'It was in the house that the children broke the stick.' **Locative Cleft**

(80) **lw**-a-ba **lu**-u-saala ni-**lwo** ba-ba-ana ba-a-funa
11SA-PST-be 11-11-stick COMP-11 2-2-child 2SA-PST-11OA-break
'It was the stick that the children broke.' **Object Cleft**

(81) $[_{CP}\ OP_{loc18}\ C_{\sout{uPhi18}}\ [_{TP}\ SU_{Class2}\ T_{\sout{uPhi2}}\ [_{AgrLP}\ \sout{OP_{loc18}}\ AgrL_{\sout{uPhi}}\ [_{vP}\ \sout{OP_{loc18}}\ \sout{SU}_{Class2}\ v[_{VP}\ V\ OB\ldots]]]]]$

In (79), OPs phi-features are active to value agreement on AgrL and C, but T successfully probes and raises the subject nonetheless

(82) $[_{CP}\ OP_{Class11}\ C_{\sout{uPhi11}}\ [_{TP}\ SU_{Class2}\ T_{\sout{uPhi2}}\ [_{vP}\ \sout{OP}_{Class11}\ \sout{SU}\ _{Class2}\ v\ [_{VP}\ V\ \sout{OP}\ _{Class11}\ ]]]]$

In (80), the object OP retains its phi-features to value agreement on C, but T successfully probes and raises the subject nonetheless.

We conclude that A'-opacity cannot be attributed to inaccessibility of OP's iPhi, at least in Luyia; assuming a unitary approach is desirable, the solution must be sought elsewhere.

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[37] Carstens (2005) argued that Bantu *wh*-constructions which appear to be monoclausal [Op agr-C [SU SA-T…]] must in reality be biclausal clefts formed with featureless null Ops raised to Spec, CP, in an attempt to explain why such languages have agreement with OPs but A'-opacity effects nonetheless. Lubukusu's ability to have clause-medial agreement of 'how' and the locative clitic with a locative OP rules this approach out.

It seems to us that a promising factor in approaching opacity effects is the selectivity of probe features that this investigation has uncovered. Compare 'how' and AgrLoc, both of which probe with uPhi. As we have seen, uPhi of AgrLoc ignores iPhi of a non-locative DP, whereas 'how' must Agree with the closest DP to it. The fact that T can ignore operators in A' positions seems to us to align it with AgrLoc: the conclusion suggested is that T's uPhi probe is not a "pure" one like that of 'how', but one of greater specificity like AgrLoc's.

In some "inverse Case filter" analyses, T has a probe feature that we can think of as uNom linked to its uPhi (see 83). This seems to us one possible angle on A'-opacity. [38]

(83) $T_{uNom;uPhi}$ [$_{vP}$ OP $_{iPhi;\ \sout{uCase}}$ [$_{vP}$ SUBJ$_{iPhi\ uCase}$ *v* [$_{VP}$ V ~~OP~~]]]
T ignores OP, looking for unvalued uCase

Something along these lines seems to have potential to explain the selectivity with which T probes, ignoring the intervening operator's occurrences in A' positions.[39] Much about the role of Case in Bantu languages is unclear, however, and we are unable to do the topic justice here for reasons of length (see note 18 on the restriction of Luyia LI to intransitives, and on the other hand Diercks 2011 for persuasive arguments that Case plays no role in Bantu syntax). Adapting an idea from Rizzi & Shlonsky (2007), an alternative might be to suppose that T's probing involves a feature connected, at least historically, with discourse or information packaging (topic/comment; theme/rheme structure); and incompatible with the focus-properties of operators encoded in their Q feature. Bundled with T's uphi,

[38] On the inverse Case filter see Martin 1999; Bošković 1997, 2002; Duguine 2010 for arguments in favor. See Bošković (2007) among others for arguments against it.

[39] See Broekhuis (2007) for persuasive arguments that defective intervention, a problem that might be thought to arise in (83), does not in fact exist.

the relevant feature (labeled uD in 84 for its possible discourse origins) causes T to ignore the operator-in-transit when seeking a goal.

(84) $T_{uPhi;uD}$ [$_{vP}$ $OP_{iPhi;Q}$ [$_{vP}$ $SUBJ_{iPhi}$ *v* [$_{VP}$ V ~~OP~~]]]
T ignores OP because of incompatible search specification

Both (83) and (84) lead to questions outside this paper's scope about the impossibility of T probing/raising SU across a locative Merged higher than SU in the VP (see discussion of 48b in §5.4.3 and §7.3.3.).

We leave it to future research to find the best explanation for A' opacity. We conclude only that it is unexpected for OPs with active iPhi on the analyses discussed, and that sensitivities of T's probe features seem a promising direction to look for insight.[40]

8. Summary and conclusions

In this paper we have described the properties of agreeing 'how' in the Luyia language Lubukusu. We have shown that it is neither a floating modifier nor a *wh*-subject depictive. It questions kinds of events and hence is non-referential and [-N]. In Bantu, expressions lacking intrinsic phi-features generally acquire them via Agree and this is true of Luyia 'how.' Relying on evidence from expletive subjects, subject questions, locative inversion

[40]We noted in footnote 33 that Kilega lacks A' opacity; its operators value uPhi of T and raise through Spec, TP (same for any aspectuals present; see Carstens 2005; Obata & Epstein 2011). Kilega T thus seems a good candidate for a pure uPhi probe, like 'how.' Obata & Epstein propose that feature-splitting works differently in Kilega than in English, leaving Ops iPhi active. But the problematic prediction remains that agreement with OP and absence of A' opacity should go hand in hand. We consider that the contrast between Kilega and Luyia is perhaps the strongest argument against concluding that operators simply do not ever need to stop in an outer Spec, vP universally, so the expectation of A' opacity effects at this stage does not arise.

constructions, we proposed that agreeing 'how' is merged as a *v*P adjunct with uPhi which probe the subject in its base position independently of T's uPhi.

This conclusion we based on evidence that 'how' and T can agree with different expressions in inversion constructions, or in different features with the same expression (subject operators). It has important consequences for various aspects of syntactic architecture. First, it argues that downward probing is a better tool for analyzing Bantu agreement than upward agreement and Spec-head agreement, neither of which can adequately account for the facts of agreeing 'how'. Second, it poses a strong challenge to the Feature Inheritance model, which claims that all probes originate on phase heads. Like many other facts of Bantu, the evidence of 'how' suggests that probe features are licit on any expression, providing they obtain values before Transfer to PF for Spell Out.

This paper also makes an original contribution to the study of inversion phenomena. Looking at 'how' questions formed on locative inversion sentences, we showed that the two expressions in an LI construction are not actually equidistant from probes outside of VP (see footnote 30). A pure uPhi probe like 'how' identifies the highest DP in the VP. For the lower DP to invert, undergoing A-movement to Spec, TP, a special strategy is required to get it across the higher one; in Lubukusu, this strategy comes in the form of AgrL.

The interaction of 'how' and inversion provide some novel evidence on the topic of A' opacity since they show that locative (and other) operators in Lubukusu have and retain phi-features throughout the derivation but are nonetheless opaque to probing by T. We have made a tentative suggestion relating this to the contrasting behavior of 'how' and AgrL as uPhi probes, arguing that even probes sensitive to the same basic sorts of features can differ in selecting different subsets of them (and perhaps selecting them in combination

with other features), with consequences in terms of what constitutes an intervening expression in a relation otherwise constrained by closest-command.

Agreeing 'how' is one among many systematic cases in Bantu where a single DP participates in multiple Agree relations: alongside of multiple agreement in compound tense constructions and operator constructions, syntactic theory must also recognize that a DP can value agreement on 'how' and the locative clitic. The phenomenon is well-established (see Carstens 2001, Henderson 2007 among many others), and is related to very broad-reaching claims about the nature of DP-licensing in human language (see Diercks to appear, Carstens 2010a, 2011, and the summary in §6.5).

Our analysis also provides yet another addition to the many existing arguments for a low base position for clausal subjects (see Kratzer 1996 and many others).

Finally, the position and agreement properties of 'how' provide an interesting and compelling argument that height and 'leftness' do not correlate, contra Cinque (2005) and Kayne (1994). In particular, the facts of agreement on 'how' strongly argue that it is Merged higher than vP material to its left. This being the case, it cannot be true that syntactic hierarchy maps consistently and universally into left-to-right linear order.

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