

Focus size in non-prosodically focus-marking languages*

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1. Introduction

In intonational focus languages like English, focus is marked by stress, pitch accenting and post-focal deaccenting. In many other languages, however, focus is encoded by a specific syntactic position or a morphological marker, and the focus patterns we see in these languages are often very different from what we are used to in the English cases. In this paper we take a closer look at the different focus configurations in three West African languages: Hausa, Buli and Gùrùntùm. Though the focus marking patterns in these languages are well described, they have thus far not been linked to formal focus semantics theories. We thus propose a model that allows us to formally compute the focus semantics of those languages.

We start from the general observation that the same marking can encode different focus patterns, i.e. the same sentence form is ambiguous regarding the different focus sizes it signals. In English, for example, a nuclear pitch accent on the object can indicate narrow object focus, but also any focus “bigger” than the object, i.e. VP or sentence focus. That the same form can express either a narrow focus or a broader focus is referred to as ‘focus projection’ in the literature (Selkirk 1984, 1995, Rochemont 1986). We will continue to use the terms ‘projection’ and ‘ambiguity’ descriptively throughout this paper, although our theoretical modelling does not use syntactic F-markers and thus knows no ambiguities or projections. The sentence in (1) can be an answer to ‘What did Mary buy a book about?’, ‘What did Mary buy?’, ‘What did Mary do?’, and ‘What happened?’ (small caps indicate prosodic prominence):

- (1) Mary bought a book about BATS. (Selkirk 1995, p. 554)

In this paper we show that Hausa, Buli and Gùrùntùm differ significantly from English in the way that focus projection works. One immediate consequence is that none of them

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lend themselves to the way focus projection has been treated theoretically by systems using F-marking in English. For example, Selkirk (1995) assumes that focus projects from the internal argument to the head, i.e. that focus on just the internal argument and focus on internal argument + verb are expressed the same way, and that focus projects from the head to the whole phrase, i.e. that focus on a head and focus on its phrase are expressed the same way.

To illustrate, the realization in (1) can express (among others) the following structures:

- (2) a. Mary bought a book about [bats]_F
 b. Mary bought [[a book]_F about [bats]_F]_F
 c. [Mary bought [[a book]_F about [bats]_F]_F]_F

Both Selkirk (1995) and Schwarzschild (1999) assume that any F-marked non-head terminal needs to be marked by prosody. However, focus marking in the languages we discuss in this paper frequently only care about whether a constituent *contains* a focused element, not about whether it actually is focused. On the other hand, these languages will frequently *not* mark an element as focused, even though it is focused, if a higher constituent is focused as well.

One well-known case of a language that lets focus project much more freely than from the head is Hausa (Hartmann and Zimmermann (2007b)), where focus is unspecified in many contexts. The observation is that a sentence with neutral word order can convey any broad or narrow focus, except for narrow subject focus, which will be discussed in more detail in Section 3.

An example of a language that clearly allows projection from non-heads is Buli, which employs the marker $(\grave{a})l\bar{e}$ in narrow subject focus contexts (focus is marked by underlining in the translations throughout):¹

- (3) Q: ‘Who called George?’
 A: (ká) nípōk àlē wì-wá.
 (FOC) woman FOC call-3SG
 ‘A woman called him.’ (Schwarz 2009, p. 966)

Notably, the same marker $(\grave{a})l\bar{e}$ is also used in any configuration which contains the subject. (4) is an example of sentence focus in Buli:

- (4) Q: ‘What happened?’
 A: nípōk àlē wì George.
 woman FOC call G.
 ‘A woman called George’. (Schwarz 2009, p. 966)

¹ $(\grave{a})l\bar{e}$ is originally glossed as PARTICLE, CONNECTIVE or simply LĒ in the original papers we take the examples from. In this paper, we decide to gloss $(\grave{a})l\bar{e}$ as FOC, since we analyse it as a focus marker.

This pattern is quite unusual from a Germanic point of view, since in these languages, the focus on the subject never ‘projects’ to the sentence. Subjects can usually be *part of* a broader focus, but in this case they cannot bear any focus marking (i.e. the sentence’s nuclear pitch accent). Whenever the subject is focus marked, it can only be interpreted as the sole (narrow) focus of the sentence. This is not the case in Buli, since the marker (*à*)*lē* is present also in a broad focus context, where the subject is part of a focus, but not the focus itself.

One could draw a weaker generalization about wide foci always being marked the same as *some* narrow focus, which is the case in English object focus, Hausa non-subject focus, and Buli subject focus. But this would not capture a focus pattern observed in Gùrùntùm, where sentence focus is unambiguously marked (Hartmann and Zimmermann 2009). Sentence (5) illustrates sentence focus in Gùrùntùm, with the focus marker *a* located sentence finally. In this case, where a broad focus is formally distinct from *any* single-phrase focus, we cannot even speak of a smaller focus ‘projecting’ to a bigger focus.

- (5) Kóo vùr mǎ kǎa Màì Dǎwà sǎi tí shí gǎnyáhu-à.
every when Mai Dawa then 3SG eat rice-FOC
‘Always, Mai Dawa used to eat rice’. (Hartmann and Zimmermann 2009, p. 1356)

In order to properly model these and similar problematic case, we will, in the next section, introduce our theoretical framework, Unalternative Semantics (UAS), using English examples. In Sections 3, 4 and 5 respectively, we will show how the different focus patterns of Hausa, Buli and Gùrùntùm can be accounted for using only the two constraints of UAS. In Section 6 we draw generalizations from all three languages and point out the problems they pose for F-marking. Section 7 concludes.

2. Unalternative Semantics – the basics

In this section, we show that Unalternative Semantics, as proposed in Buring (2015), is easily adapted to correctly express the focus ambiguities found in the languages discussed here. The core idea of UAS is that focussing is relational, and the system doesn’t use F-markers or any other syntactic representation of focus. Instead, the focus alternatives are calculated using only two relational constraints, the weak and strong restriction. For a more intuitive understanding of how these work, it pays off to use the following definition of FOCAL:

- (6) a. A terminal node is focal iff its literal meaning is not used for the computation of the focal target.
b. A non-terminal node is focal iff any of its daughters are.

To illustrate, the focal target of the answer in (7) is the question. To arrive at the meaning of the question, you use the literal meaning of *John*, which makes *John* non-focal. You have to replace both the meaning of *banana* and *eating*, which makes both *banana* and *eating*

focal. Since these are focal, all constituents containing them are focal as well, including the sentence. Thus, ‘focal’ corresponds to ‘containing (a part of) the focus’.

- (7) Q: What is John doing?
A: John is eating a banana.

In the case of English, the alternatives are calculated directly from metrical trees. Following the stress assignment rules for English, the default prosody of a branching node is (w)eak-(s)trong. When the default is reversed, i.e. s-w, as in (8a), the STRONG RESTRICTION (SR) applies. Informally speaking, the SR states that the strong daughter is focal and the weak daughter is not. This means that in (8a), the verb has to be (part of) the focus, and the object cannot be.

- (8) a. Strong Restriction, reversed b. Weak Restriction, default
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The WEAK RESTRICTION (WR) applies when sisters show default prosody, as in (8b). Informally, the WR says that the sister at the tail of the arrow (the verb in (8b)) can only be focal if the sister at the tip of the arrow (the object in (8b)) also is. This means that in (8b) the object can be focal on its own ((part-of-)object focus), it can be focal together with the verb (VP focus), or it can be the case that none of them are focal (no focus in the VP). In other words, the focus alternatives of the WR are all the complementary alternatives of the SR.

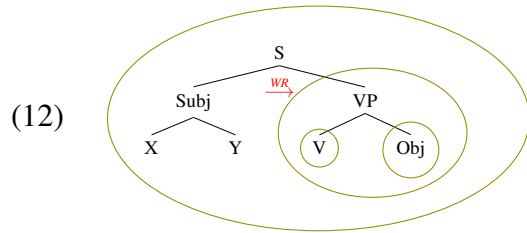
As discussed above, there are no structural ambiguities in UAS, i.e. there are no different syntactic representations for the same sentence. Rather, the same syntactic representation gets different semantic interpretations depending on context. Note also that since UAS does not put F-markers on constituents, terms like VP-focus or sentence focus simply mean that every terminal in the VP, or the sentence, is focal. This allows for foci that are not constituents, such as Subj + verb, where (every part of) subject and verb are focal, but the object is not.

The technical implementation of UAS gets more complex once we consider larger structures and different cases of focusing and givenness (see Buring 2015, 2019 for more on the semantic details of the system). For the purposes of this paper, however, this much background of the framework should be enough.

3. Hausa

Hausa is a West Chadic language, spoken by more than thirty-five million native speakers in Nigeria, Republic of Niger, Cameroon and Ghana (Eberhard et al. (2019)). It is an SVO language, encoding temporal, aspectual and mood agreement on a morpheme that usually precedes the verb. (9) is an example of a sentence in Hausa with canonical SVO word order and absolute form of the verb, *taa*. Following Hartmann and Zimmermann (2007b), we

We model the focus patterns of Hausa using the WR and SR of Unalternative Semantics. In (12), a Weak Restriction applies between Subject and VP; thus, the subject can only be focal if VP is. This amounts to sentence focus if every terminal is focal, but also includes Subj + V focus.



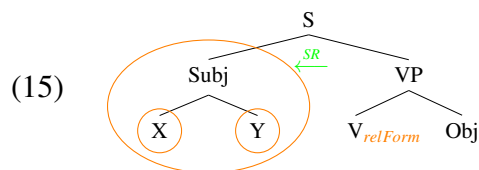
So a focal subject within a larger focus is not marked; conversely, though, subjects containing a narrow focus always require marking. In (13), the focus on *farii* ‘white’ is marked by the relative form of the verb and the focus marker *nee* following the whole subject:

- (13) A: ‘A black horse kicked the boy.’
 B: A’a, *farii*-n dookii na **nee ya** halbi yaarò
 no white-LINK horse DEF.PROX FOC 3SG.M.REL.PFV kick child
 na.
 DEF.PROX
 ‘No, the white horse kicked the child.’

If a subject within a subject clause is narrowly focused, we get marking in both the matrix and the embedded clause. (14) is an example of a focused subject *tsooho* ‘the old man’ within a subject clause (subject clause in square brackets for easier reading):

- (14) A: ‘That he is beating the dog makes her angry.’ (*he* refers to a boy)
 B: A’a, [cewa(ḥ) tsooho nà] **nee ya-kèè** bugàa
 No COMP old.man DEF.PROX FOC 3SG.M-REL.IPFV beat
 kàree-n-nàn] **kèè** sâ tà fushii.
 dog-LINK-DEF.PROX REL.IPFV put 3SG.F anger
 ‘No, that this old man is beating this dog makes her angry.’

(15) captures the specific configuration where the focus is contained in the subject in Hausa: a SR points towards the subject, which means that the subject has to be focal, that anything inside it can be focal, but crucially that its sister cannot.



Summarizing, in Hausa by default there is a Weak Restriction from Subj to VP allowing anything other or bigger than the subject to be focal. The use of the relative form on the verb changes the WR to a strong restriction from VP to Subj, which requires that only the subject is focal. Since the sets of alternatives that a WR and a SR in opposite directions allow are the complements of each other, this exactly partitions the full set of sentence alternatives: For everything that ought to be focused, there is exactly one way of expressing that focus without changing the word order. This is something we will also see for Buli and Gùrùntùm.

4. Buli

Buli is a Gur/Mabia (Niger-Congo) language with 168.000 speakers (Eberhard et al. 2019) and SVO word order. It distinguishes three constellations of focus marking: *ká* before the object for object or VP focus, sentence-final *kámā* for V focus, and a construction with *(à)lē* after the subject for any focus containing the subject. The main findings of interest are that in Buli: i) narrow subject focus and any focus containing the subject are marked the same way, object and VP focus are marked in the same way (but different from subject foci), and ii) verb focus is not marked the same way as any other focus. Neither i) nor ii) are captured by F-marking theories, which assume that focus on the phrase always has to project from the head of the phrase.

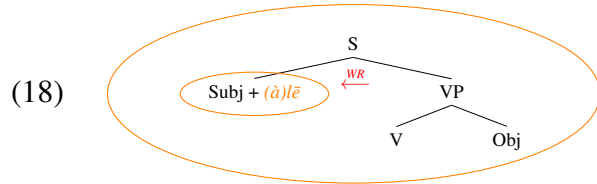
Any focus containing the **subject** is marked by suffixing *(à)lē* to the subject, be it narrow subject focus or any other larger focus containing the subject. Unlike in other constructions, the verb doesn't show tonal agreement in the presence of *(à)lē* (Schwarz 2016). Below are two Buli sentences with the morpheme *(à)lē* following the subject, repeated from the introduction. (16) is an example of subject focus, while (17) illustrates an instance of sentence focus:⁴

- (16) Q: 'Who called George?'
A: (ká) nípōk àlē wì-wá.
(FOC) woman FOC call-3SG
'A woman called him.' (Schwarz 2009, p. 966)

- (17) Q: 'What happened?'
A: Nípōk àlē wì George.
woman FOC call G.
'A woman called George'. (Schwarz 2009, p. 966)

We capture this by assuming that the *(à)lē*-construction marks a Weak Restriction from the VP to the subject: This can mean that the subject alone is focal, which gives us subject focus, or that both the subject and the VP are focal, which gives us sentence focus.

⁴Although not present in example (17), the marker *ká* (which always precedes the object in object focus) may also appear before the subject in cases of broad foci containing the subject. See also (Schwarz 2009, 966) and Schwarz (2011).



This also predicts that the same construction may express any part-of-subject focus, and any focus made up from constituents of both subject and VP, such as subject+verb. This prediction is borne out, as shown in (19):

- (19) Q: ‘Can I borrow your car?’
 A: Aáya, biik **alé** zú logni.
 no child FOC steal car
 ‘No, a child stole the car.’

Fiedler et al. (2010) and Schwarz (2016) treat the *(à)lē*-construction as expressing *theticity* rather than focus. However, an analysis that claims that *(à)lē* invariably marks theticity would make it necessary to assume that a sentence be formally marked as thetic, i.e. as having no internal information structure, while at the same time being interpreted as containing subject focus, as typical for categorical sentences. Consider (20):

- (20) Q: ‘Who ate the beans?’
 A: (Ká) Mary àlē ᵑᵔᵔᵔ
 (FOC) Mary FOC eat.ASS
 ‘Mary ate them.’ (Fiedler et al. 2010, p. 246)

According to Schwarz (2016), this sentence would have the following information structure:

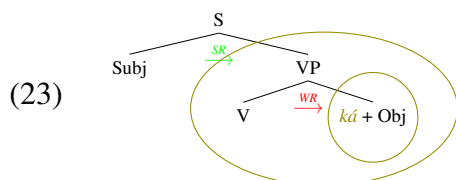
- (21) [Categorical [TOPIC \emptyset -expression] [COMMENT ká [Thetic Mary àlē ᵑᵔᵔᵔ]]]

But that representation would mean that *ᵑᵔᵔᵔ* ‘eat (them)’ is interpreted as part of the comment, rather than as the topic, even though it refers back to the question of the first speaker. We can account for the data in a far simpler way by assuming that one of the interpretations of the *(à)lē*-construction is subject focus.

Object focus and **VP focus** are marked the same way in Buli. Both are marked by the particle *ká* before the object (or other DPs contained in the VP). (22) can be an answer to both ‘What did the woman eat’ and ‘What did the woman do?’:

- (22) ᵔ-ᵑᵔᵔᵔ **kà** túé.
 3SG-eat FOC bean.PL
 ‘She ate beans.’ (Schwarz 2011, pp. 19–20)

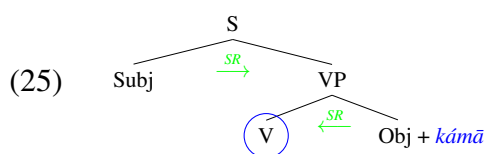
We model this by a Strong Restriction from the subject to the VP, and a Weak Restriction from the verb to the object: This gives us a focal object (object focus), or a focal verb and a focal object (VP focus), but correctly rules out focal verb without focal object (V focus), as well as focal VP with focal subject (sentence focus). The tree for (22) with restrictions and circles around the possible foci is given in (23).



Narrow verb focus in Buli is expressed by the sentence final particle *kámā* (Schwarz 2010).⁵ (24) is an answer to ‘Did you wash the clothes?’:

- (24) Àáyà, mí lán-ŋá **kámā**.
 no 1SG patch-3NC.PL FOC
 ‘No, I patched them.’ (Schwarz 2010, p. 302)

This is captured by two Strong Restrictions: One from the object to the verb that prevents the object from being focal, and one from the subject to the VP that prevents the subject from being focal. This only leaves narrow verb focus as a possibility. (The VP is marked as focal, being at the arrow tip of a Strong Restriction, but remember that by our definition (6), VP is focal iff at least one of its daughters is focal, so the strong restriction towards the VP does not mean that there is (broad) VP focus.)



Again, the three focus constructions in Buli partition the possible sentence alternatives: Every focus that includes (part of) the subject will be marked by the (*à*)*lē*-construction, every focus that doesn’t but includes (part of) the object will be marked by *ká* preceding the object, and every focus that only includes the verb will be marked by sentence-final *kámā*.⁶

5. Gùrùntùm

Gùrùntùm (also known as Gùrdùŋ) is a South Bauchi (West Chadic, Afro-Asiatic) language spoken in Bauchi State in Nigeria by 15.000 people (1993 consensus, Eberhard

⁵Under certain circumstances, the marker *-ya* can be used instead of *kámā*. See Schwarz (2010) for details.

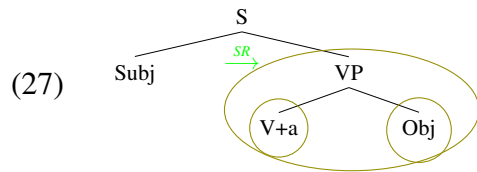
⁶Any nominals within the VP behave like the object here. Further research is needed for VPs with more than one nominal.

et al. 2019). It has SVO word order and focus is, depending on the aspect of the verb, obligatorily marked by an invariable focus marker *a* underspecified for tone (Hartmann and Zimmermann 2009). The main findings of interest for Gürüntùm are that narrow verb, narrow object and VP focus are marked in the same way and that sentence focus is marked in a different way from any smaller focus, unlike either Hausa or Buli.

Verb, object and VP focus are marked by the focus marker *a* preceding the object and cliticising to the verb, as in (26).

- (26) Tí bà ròm̄b-á g^wéì
 3SG PROG gather-FOC seeds.
 ‘He is gathering the seeds.’ (Hartmann and Zimmermann 2009, p. 1347)

(26) can either answer ‘What is he gathering?’ (object focus), ‘What is he doing?’ (VP focus) or ‘What is he doing with the seeds?’ (verb focus). Thus, when the marker *a* appears preceding the object, the minimum requirement is that something within the VP is focal.⁷ This is captured by a SR on the VP, as illustrated in (27). The possible foci in (27) are indicated with circles.



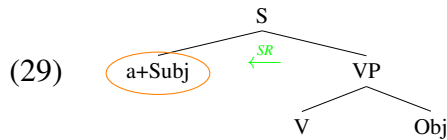
Since there are no restrictions between the verb and the object, anything within the VP can be focal, be it just the verb, just the object or both. Ambiguity between verb and object focus is not common crosslinguistically, but it can also be found in the related language Tangale (see Hartmann and Zimmermann 2007a). Recall that we have already seen this ambiguity for the unmarked case in Hausa in Section 3.

Subject focus is marked with the marker *a* preceding the subject. An example is given in (28), used as an answer to ‘Who is chewing colanut?’:

- (28) Á fúrmáyò bà wúm kwálingá
 FOC Fulani PROG chew colanut
 ‘The Fulani is chewing colanut.’ (Hartmann and Zimmermann 2009, p. 1342)

This configuration can easily be modeled by positing a SR pointing towards the subject, as shown in (29), meaning that (part of the) subject has to be focal and the rest of the sentence cannot be.

⁷In the case of narrow focus on obliques, which presumably are adjoined to VP, the marker *a* precedes the oblique (see Hartmann and Zimmermann 2009, p.1343). Further research is needed to examine the exact interaction between additional nominals and possible focus sizes.

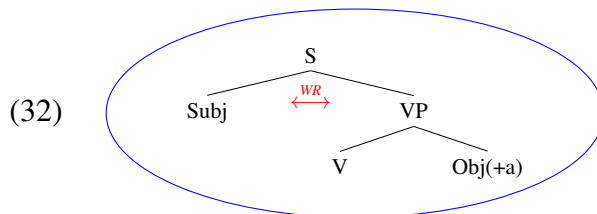


Sentence focus in Gùrùntùm is marked differently from any smaller focus size:⁸ By the marker *a* at the end of a sentence in perfective aspect, and by the lack of a focus marker in future, progressive and habitual aspect. An example of a discourse-initial perfective sentence is given in (30), whereas in (31) we see an example of a progressive sentence.

(30) Tí vún lúurìn nvùrì-à.
 3SG wash clothes yesterday-FOC
 ‘She washed clothes yesterday.’ (Hartmann and Zimmermann 2009, p. 1359)

(31) Tí bà nyóolì góobílishí.
 3SG PROG write letter
 ‘He is writing a letter.’ (Hartmann and Zimmermann 2009, p. 1359)

From a focus projection perspective, this lack of ambiguity is completely unexpected: If sentence focus, any broad focus in fact, is projected from something, it should be formally identical to *some* narrower focus. In UAS, we employ a double-sided WR between the nodes, as shown in (32).⁹ This says that for both sister nodes it holds that either node can only be focal if its sister is too. This comes down to both nodes being either focal together or non-focal together, i.e., the whole sentence can be either all-new or all-given.¹⁰



To summarize, in Gùrùntùm: (i) verb, VP and object focus are marked in the exact same way, by *a* preceding the object; (ii) subject focus is marked differently from any bigger focus, by *a* preceding the subject; (iii) sentence focus is marked differently from any smaller focus, by *a* at the end of the sentence or no marker, depending on the aspect.

⁸Our account predicts that technically, (part-of-)Subj + V and (part-of-)Subj + (part-of-)O focus should be marked the same way. There are, however, no data available on such discontinuous foci in Gùrùntùm.

⁹ \overleftrightarrow{WR} is shorthand for \overrightarrow{WR} \overleftarrow{WR} , i.e. Weak Restrictions in both directions.

¹⁰(32) predicts that sentence focus and all-given sentences are marked the same; the data in Hartmann and Zimmermann (2009) are all all-new; if this is systematic, it can be modelled by an additional SR towards the root node.

6. Challenges for F-marking

Having presented the different focus projection patterns for the three languages and our UAS based analysis for them, in this section we elaborate on why it would have been extremely challenging to do so with traditional F-marks. We present four issues for which it is unclear how an analysis employing syntactic F-marks could deal with them, namely: i) foci projecting from a non-head, as seen in Buli (Section 4), ii) sentence focus not projecting from anything, as seen in Gùrùntùm (Section 5), iii) no direct correspondence between focus marking and F-marks and iv) disjunctive ambiguities.

Focus projection from a non-head: Buli focus marking is unusual from an F-marking perspective: Focus projects from non-heads, at least in the case of sentence focus, which is expressed the same way as subject focus. It might appear that an F-marking theory need only introduce a language-specific rule for Buli where focus always projects from arguments and never from heads. But that also doesn't get the facts right: Such a rule would predict that focus cannot project to phrases that only contain a focused head. However, sentence (33) clearly shows that VP-focus be expressed the same way as verb focus when the verb is intransitive.

- (33) Q: 'What are you doing?'
 A: Má-à sūgūrī kāmā
 1S-IPFV wash FOC
 'I am washing.' (Schwarz 2010, p. 300)

Sentence focus not projecting from anything: The fact that in Gùrùntùm sentence focus projects neither from subject focus nor from verb focus is also problematic. It is unclear what sort of focus projection rule could enable projection in general, but not to the sentence node under any circumstances.

No direct correspondence between focus marking and F-marks: Hausa subject focus is challenging for F-marking theories because there can be no direct correspondence between F-marks and focus marking: Subject focus marking is required for subject focus, where the subject would have to bear an F-mark. However, when the subject is *part of* a larger focus, it is unmarked syntactically (see (9) and (11)). Therefore, it wouldn't do, for example, to assume that subjects in sentences without any focus marking are generally marked as G(iven).

Furthermore, subject focus marking is also required for part-of-subject, (13), where the subject itself is not the focus, and should therefore not bear an F-mark. Thus we both have a constellation where the subject cannot be F-marked, but has to be marked by focus movement, and a constellation where the subject would have to be F-marked and yet not marked by focus movement.

Disjunctive ambiguities: This is a pattern that we have seen in all three languages. In Gùrùntùm it is the VP/V/O ambiguity, where the same marking can be interpreted as focus on either verb or object: two non-overlapping nodes (see (27)). In Hausa, this ambiguity appears in the unmarked focus case (see (12)), where also either the verb or the object can be focal. In Hausa and Buli we furthermore see this ambiguity in subject focus: When part

of the subject is focal, the whole subject is marked, regardless of whether it is the modifier or the noun itself that is focal. Thinking in terms of focus projection, it is unexpected that there are disjunctive ambiguity patterns. Focus projection always requires the same form expressing either a narrow or a broader focus *containing* it. With current F-marking theories, it is not clear how to model an ambiguity of two non-overlapping foci of equal size.

We do not want to suggest that it is impossible for a theory of F-marking to deal with these challenges, especially when looking at the languages in isolation, but it is clear that adapting already existing theories of F-marking to the data presented here is by no means trivial, and that doing so will require significant attention to syntactic details. Whether such an adapted theory offers insights or generalizations that are superior to our own adaptation of UAS remains to be seen. We believe, however, that our adaptation of UAS enables us to turn the many findings which we take from the literature into cohesive and predictive models without running into trouble at the challenges outlined in this section.

7. Conclusion

We have presented a model for the formal calculation of focus alternatives in Hausa, Buli and Gùrùntùm. We have shown that focus projection in those languages poses a challenge for accounts that assume syntactic F-marking, but that the data can be accurately modelled by using the Weak and Strong Restrictions from Unalternative Semantics.

Abbreviations

1, 2, 3	first, second, third person	NC	noun class
ASS	assertive	NMLZ	nominalizer
COMP	complementizer	O	object pronoun
DEF	definite	PFV	perfective
F	feminine	PL	plural
FOC	focus marker	PROG	progressive
IPFV	imperfective	PROX	proximal
LINK	linker	REL	relative
M	masculine	SG	singular

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