PROSODICALLY MOTIVATED FOCUS IN HAUSA: AN OPTIMALITY THEORY ACCOUNT

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ABSTRACT
The purpose of this paper is to address the application by Zimmermann of OT syntactic and prosodic constraints to the Hausa language. It is found that subject movement is motivated by the desire to align the subject with the head of an intonational phrase. And this can be accomplished in Hausa by violating lower ranked syntactic constraints (i.e. Stay) or perhaps an economy constraint against structures that require multiple intonational phrases.

1. Introduction[1]

In a paper presented at the University of Massachusetts in Amherst, Malte Zimmermann presented a unified Optimality Theory (OT) account of focus strategies in three Chadic languages. Here I will address his application of OT syntactic and prosodic constraints to Hausa. I hope to improve upon his efforts by removing the need for some of his innovations—thereby simplifying the analysis of Hausa. My biases include an aversion to the proliferation of specialized constraints and an idealistic striving to be able to describe information structure, which appears to be marked in very language-specific ways, in universal terms of prosodic phrasing. The most ambitious goal of OT syntax is to create constraints that are general enough that they capture the most elementary constraints on human communication—those inherently and intrinsically related to the very act of speech itself—and that are only as specific as they need to be to accurately account for actual language data. In addition, I am inclined to agree with Knud Lambrecht's understanding of information structure that assumes *a priori* that every sentence has information structure and that "pragmatically neutral" sentences are not without information structure, but contain a more utilitarian structure that can be used in a wider variety of circumstances than can more peculiar, context-specific structures (Lambrecht 1994).

2. Optimality Theory

a. Overview

The key contribution of Optimality Theory to this description of information structure is its formalism: the "tableau". A tableau is a table that consists of ranked violable constraints that reflect real-world pressures on a grammar. Each of these constraints is considered to be a universal restriction or preference in language. The theory proposes that the differences between languages do not consist of different constraints, but of different hierarchical rankings of universal constraints. In this paper I am specifically looking at the relationship between constraints on prosodic structure, syntactic structure, and information structure. For example, consider the following three oversimplified constraints that we could posit for English and Italian.[2]

1) SVO: Word order must be Subject, Verb, then Object.
2) STRESSFINAL: Prosodic stress must be placed on the final element of the clause.
3) FOCUS: Any pragmatically focused element must receive prosodic stress.

These constraints together mean that when an object is focused in English or Italian, it will satisfy all three constraints by aligning the syntactic constraint (SVO) with the prosodic (STRESSFINAL) when it puts the object in the clause final position. However, when a subject is in focus not all three constraints can be satisfied. Both languages satisfy FOCUS (presumably a high-ranked constraint) but they take different strategies in dealing with the other two constraints.

As illustrated in the tableau below, English chooses to maintain word order and violate the prosodic structure. Optimality Theory illustrates this by ordering the syntactic constraint (left-to-right) over the prosodic constraint.

[1] This paper was written under the teaching of Paul Kroeger who taught me everything I know about syntax. I wish to thank him for his time and effort in reading and suggesting revisions to this paper.

[2] These constraints are my own formalization of a brief description of English, Italian and French found in Lambrecht's introduction (1994). The example sentences used in the tableaux are also from Lambrecht (1994). The basic idea presented here—that syntactic movement is motivated by prosodic structure—was taken most directly from Lambrecht.

Each asterisk shows a violation of the constraint in that column. The exclamation mark shows a fatal violation that has put the candidate out of contention. The dashed line shows that no strict order has been demonstrated between constraints. The grey fill in the last column shows that those cells have not been used to determine the optimal candidate. The pointing hand next to candidate (a) illustrates that it is the optimal candidate—the actual surface form.

English: FOCUS, SVO >> STRESSFINAL

4)	Focus: car	FOCUS	SVO	STRESSFINAL
a. ☞	[My CAR]$_F$ [broke down].			*
b.	[My car]$_F$ [broke DOWN].	*!		
c.	[Broke down] [my CAR]$_F$.		*!	
d.	[Broke DOWN] [my car]$_F$.	*!	*!	*

Italian, on the other hand, chooses to violate the unmarked word order by moving the focused Subject to the end of the phrase. In so doing, it avoids violating the prosodic constraint.

Italian: FOCUS, STRESSFINAL >> SVO

5)	Focus: macchina	FOCUS	STRESSFINAL	SVO
a. ☞	[Mi si e rotta] [la MACCHINA]$_F$.			*
b.	[La MACCHINA]$_F$ [si e rotta].		* !	
c.	[La macchina]$_F$ [si e ROTTA].	* !		
d.	[Mi si e ROTTA] [la macchina]$_F$.	* !	* !	*

b. Building natural constraints

In applications of OT to phonology, where the subject of study is much more available to empirical examination (phonetics), the constraints are meant to refer to the underlying physical or psychological motivations that result in a conflict—not directly to the conflict itself. That is, the constraints must be grounded (Archangeli & Pulleyblank 1994, Kager 1999:5,11-12). It is vital to the credibility and academic relevance of OT syntax that constraints be stated in such a way that their motivation in the real world of human communication be transparent and convincing. Constraints that make language-specific stipulations without an explanation of why that constraint should exist in any grammar (let alone every grammar) do not advance our understanding of language. They only make a straightforward descriptive grammar more opaque. On this point I take issue with a constraint proposed by Zimmerman (2006) but not used in his analysis of Hausa.

(Zimmerman 2006)
6) FOCNP: No focus realization on non-nominal constituents.

While this constraint no doubt proves to be useful for one of the three languages in his analysis, it is difficult to imagine this as a universal constraint. In addition, the constraint itself says nothing about its underlying motivation. Why do non-nominal elements not receive focus? The goal of OT syntax should be to explain these types of linguistic patterns—not simply to place them into tableau form. Part of the logic behind constraint formulation in phonology is to group constraints into two major categories: Markedness and Faithfulness.3 The Markedness constraints are those that prohibit surface sounds that are shown to be universally marked (i.e. rare) sounds. This concept is grounded in the idea that these marked sounds can be shown to be phonetically more difficult to produce. The reason that these sounds are marked is because of the universal condition of human apathy—or economy, to put it more positively. The Faithfulness constraints are those that prohibit any deletion,

[3] See, for example, Kager 1999:4-8.

addition or modification that would obscure the input form (phonemic form) of the word. The Faithfulness constraints are about meaning preservation. In syntax and information structure we should be able to equally ground our constraints in the universal principles of economy (Markedness) or semantics and pragmatics (Faithfulness).

Another issue that arises when constraints are not explicitly grounded in the real world of human speech is the acceptance of mutually exclusive constraints. A tableau that has constraints that directly contradict each other by stating "Do X" and "Don't do X" fails to reveal anything about how language works. It simply creates a complex riddle for stating known typological differences. For example, consider the following pair of constraints:

(Grimshaw 1997)
7) Head Left: The head is leftmost in its projections.
8) Head Right: The head is rightmost in its projections.

Because these constraints directly contradict each other they can prove to be very useful—too useful. It is counter-intuitive to think of both of these constraints as active parts of a natural grammar. Once the higher ranked constraint takes effect, it is hard to imagine that the other constraint would ever be relevant. In effect, having polar-opposite constraints is equivalent to setting language specific parameters, which is not part of the design of Optimality Theory. These constraints may be effective for creating functioning tableaux, but they leave us clueless as to why some languages are left-headed and some are right-headed. Since both of these tendencies need to be accounted for, I propose that, for this example, we are better off combining these two constraints into one constraint that requires the head to align with the edge of its projection. Such a constraint could be satisfied by languages that are typologically mirror-images of each other. With a more general constraint, we gain the possibility of seeing how edge-alignment interacts with different constraint rankings to produce a wide variety of surface structures.

3. Description of Zimmermann's OT account of focus in Hausa

a. Constraints

Zimmermann (2006) uses the following constraints in his OT description of Hausa:

9) F(OCUS)P(ROMINENCE)$_X$: Constituent focus on X must be realised on or next to X in a clause S iff S also contains non-focused (given) material.[4]
10) PROMIP: Right-align the most prominent constituent X in an intonational phrase (iP) with the edge of iP.[5]
11) STAY: No traces.[6]
12) *)φ: No φ –boundaries.
13) FAITHM(ORPH): Do not insert morphemes not present in the input.
14) SUBJ(ECT): Highest A-specifier must be filled (= EPP).[7]
15) PRED: A predicate shares a phonP with adjacent arguments.[8]

[4] Zimmermann cites Schwarzschild (1999), Büring (2001), and Selkirk (2004) as sources for this constraint. As will be elaborated on below, he interprets "realised" as only being satisfied by syntactic movement. The "on or next to" part of the constraint seems to refer to Schwarzschild's (1999) term "F Projection" which speaks to the relationship between the head of an XP and its internal arguments. The idea may come into play for constructions in Hausa that seem to front only part of a focused XP but it will not be relevant to my analysis once I present my own focus constraint.

[5] Zimmermann cites Truckenbrodt (1999), Büring (2001), and Samek-Lodovici (2005) as sources for this constraint. Truckenbrodt (1999) and Büring (2001) give credit to Selkirk (1984, 1986, 1999) for their alignment constraints. According to Zimmermann's application of this constraint in a later part of his paper I infer that the "most prominent constituent X" refers to the phonological phrase (specifically its head) which functions as the head of the intonational phrase as shown in (14) below.

[6] Zimmerman cites Grimshaw (1997) and Samek-Lodovici (2005) for this constraint.

[7] Zimmerman cites Grimshaw (1997) and Samek-Lodovici (2005) for this constraint. From Zimmerman's tableaux it is inferred that this constraint can be satisfied by a trace.

[8] Zimmermann cites Büring (2001) and Gutiérrez-Bravo & Büring (2001) as sources for this constraint. Zimmerman does not apply this constraint to Hausa but in a later section of the paper he uses the constraint to require that the verb be in the same phonological phrase as all of its arguments. The constraint in Gutiérrez-Bravo & Büring (2001) clarifies that it is "at least one" but not necessarily all arguments that are required to phrased with the predicate to satisfy this constraint. Specifically, it is violated when the predicate is in a phonological phrase on its own. Here I will use Gutiérrez-Bravo & Büring's application of the constraint. The only difference to using Zimmerman's application would be that it would require the constraint ranking XP >> Pred.

16) XP: XP is mapped onto phonP. If XP and YP are within the same phonP, one contains the other.9

His first group of constraints deals with the pragmatic functions of focus and prosody, which he labels information-structural. The first (FP_X) requires that any element marked for focus10 in the input must be realized as focus in the output. Crucial to his analysis is the precise definition of what it means to realize focus on a constituent. From his interpretation of when this constraint is violated, he expects that, in Hausa, there will always be a syntactic realization of focus (i.e. clefting, fronting, movement) in order to satisfy the constraint. One of the main hypotheses of my proposal is that focus is not realized syntactically, but prosodically. That is, any element marked with focus must be the head of its intonational phrase and any syntactic movement is motivated by the need to align focused elements with the head of the intonational phrase. After showing how Zimmermann's focus constraint functions I will later present my own.

The PromIP constraint interacts indirectly with focus constraints to produce most of the variations in focus strategies seen cross-linguistically. It requires that the head of the intonational phrase (iP) be found in the rightmost prosodic phrase (pP) as seen in the following diagram where X is above the constituent that is the head of the prosodic phrase.

17) Satisfies PROMIP:

(X) iP
(X) (X) pP
S V O

Violates PROMIP:

(X) iP
(X) (X) pP
S VO

His next three constraints are Faithfulness restrictions that are meant to limit modifications to the input. The first is Stay, which prohibits movement, or, in more theory-specific terminology, prohibits traces. On a theoretical level, Stay is a constraint that is inherently dependent on a specific syntactic analysis of what the pre-movement form or position is supposed to be. For this reason, I will try to show how removing this constraint actually gives a better picture of the optionality involved in object focus marking in Hausa.11

The next Faithfulness constraint *)φ is meant to limit the adding of prosodic boundaries. I will eliminate this constraint in my analysis since it is superfluous to an analysis of Hausa and I suspect not needed at all. Prosodic phrasing is already controlled by the constraints Pred and XP. It is counterintuitive to construct a constraint that directly prohibits what another constraint directly requires.

The FaithMorph constraint could probably be reintegrated into a more general faithfulness constraint that prohibits adding anything to the output that is not in the input. However, this constraint does not play a significant role in Zimmermann's account of Hausa and will be ignored here.

b. Three Hausa sentences

Zimmermann applies his constraints to three sentences in Hausa:

[9] Zimmermann cites Büring (2001) for this constraint.

[10] Focus can be defined in this paper as the part of the sentence that is least predictable and not presupposed (Lambrecht 1994). The examples of focus in Zimmerman's paper are all question-answer pairs.

[11] Underlying my rejection of such a frequently used constraint is an affinity for the Lexical-Functional Grammar theory which avoids speaking about constructions in terms of movement and an appreciation for the theoretical background of OT which rejects derivations as an unrealistic recounting of how human speech actually happens. The concept of instantaneous evaluation together with an LFG background makes a constraint like Stay oxymoronic to the analytic tools.

Zimmerman (2006)

18) Kandé **táa** dáfa kíifíi.
Kande 3sg.f.perf cook fish
'Kande cooked fish.' ("Neutral")

19) *Kíifíi*$_1$ Kandé **tá** dáfa t_1.
fish Kande 3sg.f.perf.**rel** cook
'Kande cooked FISH.' (Object focus)

20) *Kandé*$_1$ t_1 **tá** dáfa kíifíi.
Kande 3sg.f.perf.**rel** cook fish
'KANDE cooked fish.' (Subject focus)

The key difference between the first example and the latter two is the change in the Tense-Aspect-Modality (TAM) marker (marked in bold type above). In the sentence that can be used in a pragmatically neutral context (though we will see below that this structure can also be used in the pragmatic context of object focus) the marker shows a perfective aspect. In the later two examples, there is narrow focus on the first NP and the TAM has changed to reflect the different syntactic structure.

In the subject focused construction, the winning candidate has, in Zimmermann's analysis, moved and left a trace. Therefore, there must be some constraint ranked higher than Stay to justify its violation. Obviously, that constraint is FP.

(adapted from Zimmerman 2006)

21)	Kande = focus	FP_{SUBJ}	SUBJ	STAY	FP_{OBJ}
a.	*Kandé* táa dáfa kíifíi	*!			
b.☞	*Kandé*$_1$ t_1 **tá** dáfa kíifíi			*	
c.	Táa dáfa kíifíi *Kandé*		*!		

Candidate (a), the "neutral" 12 sentence, is said not to satisfy the constraint that requires subjects which are F-marked (marked for focus) in the input to be realized in the output. Again, by inference, it is a syntactic movement that Zimmermann is looking for to satisfy his constraint—at least within Hausa. Candidate (c) does have movement but this type of movement is interpreted as not leaving a trace, thus violating Subj. Thus the winner violates Stay but successfully focuses the subject.

Zimmermann introduces his next tableau by stating that the ranking of structural constraints over FP_{OBJ} "ensures that focused objects are not grammatically realized." To be more accurate, he will clarify later that syntactic movement to show focus on objects is optional—not always grammatically realized. What he hopes to accomplish in this tableau is an explanation of why subjects are always focused but objects don't have to be.

(adapted from Zimmerman 2006)

[12] I put "neutral" in quotes because I am not claiming that any sentences are truly pragmatically neutral in and of themselves. To be more accurate we can say that this structure would appear in a pragmatically neutral context where no particular element of the sentence needs to be in focus. For Lambrecht (1994), this would mean that the sentence actually contains predicate focus. That interpretation correlates nicely with tableau (23) where the prosodic prominence for our "neutral", predicate-focus sentence aligns with the VP.

22)	Object focus = *kíifíi*	FP_{SUBJ}	SUBJ	STAY	FP_{OBJ}
a.☞	Kandé táa dáfa *kíifíi*				*
b.	*Kíifíi*$_1$ Kandé **tá** dáfaa t_1			*!	

Here we see that although candidate (b) satisfies the FP_{OBJ} constraint, that constraint is ranked lower than Stay which could explain why an object that is F-marked is not required to be fronted. In Hausa, it is acceptable to use the "neutral" sentence type as in example (18) and candidate (a) in a pragmatic context of object focus—though not for subject focus. Without context, there exists an ambiguity between the "neutral" sentence and object focus. However, an object that is in focus can also be fronted just like the subject as in example (19) above and candidate (b) in tableau (22) to remove the ambiguity. In order to account for this Zimmermann suggests using a constraint like MarkNoteworthy (Legendre 2001) which would require that the F-marked object be syntactically realized in the situation where a discourse context found it noteworthy enough to receive the honor.

The constraints work in the sense that they correctly predict the winning candidates for subject and object focus, but they are not the most economical. Optionality in OT is normally expressed by tied constraints that can be ranked in either order resulting in different winners, or by two candidates that equally satisfy all of the relevant constraints. I will posit below that the optional fronting of objects in focus is the latter. I will also attempt to show how it is more economical to consider the FP constraint satisfied by prosodic structures and eliminate the need for different FP constraints for each grammatical constituent.

4. In situ focus

In his 2006 paper Zimmermann goes as far as to say that focused objects "can remain in situ and co-occur with the neutral TAM-marker", but he does not use the phrase "in situ focus". In a later paper (Hartmann & Zimmermann 2007) he argues explicitly against any type of prosodic or "soft" focus marking on in situ objects. First, we will look at how the constraints on prosodic phrasing already proposed by Zimmermann (2006) would correlate with the "in situ focus" analysis, then we will return to the phonetic data on Hausa to see if our theory contradicts the facts.

Green & Jaggar (2003) have looked at the same situation and decided to label it "in situ focus". In these constructions the focus is not marked with a specific syntactic structure but "is indicated by main sentential stress" (2003:10). They also point out, in agreement with Zimmermann, that the subject can not be focused in situ. Clearly there is an asymmetry between focus marking for subjects and focus marking for objects. In Zimmermann's terms, the question has been: "Why is focus marking obligatory for subjects and optional for objects?" In that phrasing, it makes sense that he has divided the FP constraint into separate constraints for each grammatical relation. However, in terms of in situ focus the question of asymmetry should be phrased in a slightly different manner: "Why can't subjects be focused in situ though objects can?" In these terms, we will be able to more accurately capture the subject-object difference.

a. Prosodic phrasing

Zimmermann (2006) gives a very succinct description of prosodic structuring in Hausa: "Prosodically, verb and object NP are grouped into one phonP, whereas subjects and adjuncts form their own phonPs (Leben et al. 1989), showing that both Pred and XP are operative." He continues with: "We will ignore prosodic phrasing, though, as it has no bearing on focus realisation in Hausa." Before looking at how prosodic phrasing can affect our analysis of focus marking we will reexamine our "neutral" sentence to see how these constraints create the prosodic phrasing.

In tableau (23) our winning candidate (a) is able to satisfy all of the constraints. This is because both pPs (represented by the parentheses immediately above the text) are XPs and the rightmost pP is acting as the head of the iP. Candidate (b) attempts to move the stress to the first pP and crucially violates PromIP. Candidate (c) has found a more creative way to get the stress to the subject by creating one giant pP so that the iP must be right-headed and satisfy PromIP. However, in doing so it fatally violates XP by putting two XPs into the same pP where one is not syntactically contained in the other (as is the object NP in the VP). The final candidate (d) has violated Pred by leaving the verb in its own pP without any of its arguments.

23)	PROMIP	PRED	XP
a.☞ (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$			
b. (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$	*!		
c. (X) iP (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$			*!
d. (X) iP (X) (X)(X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$		*!	

There is still one candidate for prosodic phrasing that the three constraints mentioned by Zimmermann do not account for: candidate (a) could have the verb instead of the object as the head of its pP. To eliminate this candidate we would need to introduce another constraint. One possibility would be to impose the same right-headedness restriction on pP as is imposed for iP. This extension of PromIP to all phonological phrases (including both the smaller prosodic phrase and the larger intonational phrase) would be ideal on theoretical grounds since it makes our constraints more general and avoids positing a new universal constraint. However, since that claim seems rather bold and novel and since I do not have cross-linguistic evidence to show that it works, we could instead refer to Büring (2001) for a more ad hoc constraint that he claims is operative in German.

(Büring 2001)
24) A/P (Argument-Over-Predicate):
Within [a phonological phrase], an argument is more prominent than a predicate.

25)	PROMIP	PRED	XP	A/P
a.☞ (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$				
b. (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$				*!

While the empirical evidence to back up the A/P constraint seems to be missing-in-action, its effect can be more felicitously acquired by adopting the prosodic phrasing constraints proposed by Truckenbrodt (1995) and propogated by Samek-Lodovici in favor of "more descriptive constraints capturing the same generalization, like the 'Argument-Over-Predicate' constraint" (2002 online draft of 2005). Truckenbrodt's constraints are known as Wrap and StressXP.

(as stated in Samek-Lodovici 2005:699)
26) Wrap: Each lexically headed XP is contained inside a phonological phrase P.
27) StressXP: Each lexically headed XP must contain a phrasal stress (where "phrasal stress" refers to the head of a phonological phrase P).

28)	PROMIP	WRAP	STRESSXP
a.☞ (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$			
b. (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$			*!
c. (X) iP (X) (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$	*!		
d. (X) iP (X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$			*!
e. (X) iP (X) (X)(X) pP [Kandé]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$		*!	

Crucial to the application of StressXP in tableau (28) is the definition of "contain" which is said to include the situation in which an XP syntactically dominates another XP that is the head of a pP. That is, the constraint states that every lexical node XP must dominate, at any level below it, some constituent that is the head of a pP. This means that a VP which dominates a stressed NP_{OBJ} satisfies the constraint StressXP as in (c). Note, however, that StressXP only applies to lexically headed XPs, not to categories like IP or CP. This is pertinent to candidate (d) in which it could be said that the subject NP dominates the VP as [Spec, IP] or [Spec, CP]. However, since both of those constituents are non-lexical XPs the "phrasal stress" does not extend all the way up the tree from the object to the subject. In candidate (d) it is the subject NP that is lacking phrasal stress.

On the grounds that the same effects can be achieved with just two constraints instead of three I will opt to use Truckenbrodt's constraints instead of XP, A/P, and Pred. In addition, we will see below that using these two constraints allows us to represent the variation between in situ and ex situ object focus as a tie between two candidates.

b. Prosodic phrasing for ex situ focus

In Leben, Inkelas & Cobler (1989) the prosodic phrasing is also discussed for an example of ex situ subject focus. Their sentence shows that there are three breaks in the prosodic structure, which they show by slashed lines.

(Leben et al 1989:46)

29)	Maalam Nuhu	nee /	ya	hana	Lawan /	hiira da Hawwa
	'Malam Nuhu'	FM[13]	TAM	'prevent'	'Lawan'	'from chatting with Hawwa'

'It was Malam Nuhu / who prevented Lawan / from chatting with Hawwa.'

Hartmann & Zimmermann (2007:26) summarize the facts: "Quite generally, there appear to be intonational phrase boundaries between an ex situ focus constituent and the rest of the clause, between a subject and the rest of the clause, and between the direct object and subsequent embedded clauses and/or adverbials." In Leben et al. (1989), the term "intonational phrase" is used generically for any break in prosodic structure. The question remains, are the two breaks in the above example both breaks at the same level of prosodic structure?

[13] *Nee* is an optional focus marker that has not been discussed in this paper.

Consider two possibilities:

30)a (X) iP (X) (X) (X) pP SUBJ-FM VP PP	b (X) (X) iP (X) (X) (X) pP SUBJ-FM VP PP

In example (a) we hypothesize that the break after the focused element is a prosodic phrase boundary and should exhibit the same phonological characteristics as the break between the VP and the PP. In example (b), we posit that the focused element creates its own intonational phrase so that the break between the subject and the VP is phonologically distinct from the pP division between the VP and PP. If (b) is the case then we should expect to find that there may be some evidence of a phonological process that can take place at the edge of two iPs but cannot take place at the border of pPs. Leben et al. (1989) point out that there is a phenomenon of raising a single high tone that happens with ex situ focus. Hartmann & Zimmermann (2007) have pointed out that this type of raising does not happen with in situ focus and argue that this proves that focus is not realized when a phrase is left in situ.

> The existence of local H raising for highlighting purposes in ex situ contexts is reminiscent of comparable processes in non-tonal languages such as German (see section 4.4 and 6.1.2), and shows that Hausa has the prosodic means to highlight, or focus a constituent if this constituent is realised ex situ. Nonetheless, we will see shortly that local H raising is not attested with instances of in situ focus.

For their argument, this phonological emphasis on ex situ focus is evidence that Hausa can show focus phonetically and chooses not to when the constituent that should be focused is left in situ. A more explanatory argument is that when an object is fronted it is also given its own iP which creates a phonological environment that triggers (or allows) the local H raising effect. Therefore, assuming a prosodic structure as in example (b), we should not expect to find the same phonological process that occurs under ex situ focus to be present for non-subjects left in situ. Under this analysis, we see that ex situ focus of subjects is motivated by the need to satisfy the focus constraint in giving the sentence-initial constituent its own iP to be the head of.

This brief sketch of intonation phrases should not be construed to be saying that speakers directly choose how to break up the intonation phrases of any given sentence. My assumption is that the creation of intonational phrases relates directly to the syntactic structure of the sentence. In Hausa, this can be seen in the change of the TAM marker reflecting the syntactic structure of ex situ focus constructions that require the utterance to be broken into two iPs.

5. Reworking Zimmermann's tableaux

With the prosodic structure at the front of our minds we will now begin to reconstruct Zimmermann's tableaux in terms of in situ focus. Let's first return to what he considered a case of focus not being marked at all. Instead of saying that the object is not marked for focus, we will instead interpret an in situ focus marking where the constituent marked for focus will align with prosodic prominence (i.e. will be the head of the iP). For this we will need to restate the FP constraints:

> 31) Focus: Every prosodic word marked for focus in the input must be the head of its intonational phrase or a part of the prosodic phrase in which another word marked for focus is the head.

Under this interpretation of focus marking the in situ placement of the object is seen to satisfy the Focus constraint.

32) Object focus = *kíifí*	PROMIP	STRESSXP	WRAP	FOCUS	SUBJ	STAY
a.☞ (X) (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$						
b. (X) (X) (X) (X) (X) [*Kíifíi*$_i$]$_{NP}$ [Kandé]$_{NP}$ [**tá** dáfaa t_i]$_{VP}$						*!
c. (X) (X) (X) (X) [*Kíifíi*$_i$]$_{NP}$ [Kandé]$_{NP}$ [**tá** dáfaa t_i]$_{VP}$		*!				*

Here we see that the "neutral" sentence (a) has already placed the head of the iP where the focus needs to be. For this reason the object focus sentence does not need to differ from a sentence in a more pragmatically neutral context and we see the underlying explanation for our ambiguous surface structure. Candidate (b), which is the object focus example (19), seems to be less optimal because it violates the Stay constraint. I will address this issue below. Candidate (c) has been included in this tableau to point out a piece of hazardous residue in regards to phonological phrasing. Without any empirical data we could posit the phonological phrasing of either (b), where the subject and verb group separately, or (c), where the subject and verb share a phonological phrase. Since the all of the prosodic phrasing rules for Hausa that I could find only addressed SVO sentences it is a blind assumption to keep the subject and verb in separate pPs in order to make the tableau work. Either way, we see how candidate (a) can be considered an optimal candidate for object focus contexts. Now we can turn to see why the same thing is not true of the subject.

33) Subject focus = *Kandé*	PROMIP	STRESSXP	WRAP	FOCUS	SUBJ	STAY
a. (X) (X) (X) [*Kandé*]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$				*!		
b. (X) (X) (X) (X) [*Kandé*]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$	*!					
c. (X) (X) [*Kandé*]$_{NP}$ [táa dáfa [kíifíi]$_{NP}$]$_{VP}$		*!*				
d. (X) (X) (X) [Táa dáfa [kíifíi]$_{NP}$]$_{VP}$ [*Kandé*]$_{NP}$					*!	*
e.☞ (X) (X) (X) (X) [*Kandé*$_i$]$_{NP}$ t_i [**tá** dáfa [kíifíi]$_{NP}$]$_{VP}$						*

In the tableau above we see that none of the candidates that attempt to shift the prosodic phrasing or word order to align the subject with the head of the intonational phrase are successful. Since Hausa is so strict about its prosodic constraints there is no way to align the subject with the prosodic focus without making some serious syntactic adjustments. While a language like English would be able to choose option (c), StressXP is ranked too high in Hausa for that option. Spanish or Italian would use option (d) but the ranking of Subj in Hausa makes that an unfavorable option. Therefore, the optimal candidate is (e) which satisfies the Focus constraint by creating a

separate iP for the subject to be the head of.14

Notice that the constraint Stay has actually become irrelevant in the evaluation process for determining the best candidate for subject focus. Therefore, if we now decide to not use the constraint it will make no difference to our analyses of subject focus. On the other hand, to be rid of the Stay constraint would make a great difference for our analysis of object focus. By removing that constraint we are left with two candidates that equally satisfy all relevant constraints and are therefore equally optimal candidates.

34) Object focus = *kíifí*	PROMIP	STRESSXP	WRAP	FOCUS	SUBJ
a.☞ (X) (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$					
b.☞ (X) (X) (X) (X) (X) [*Kíifíi*$_i$]$_{NP}$ [Kandé]$_{NP}$ [**tá** dáfaa t_i]$_{VP}$					

If it is not the case that candidate (b) is the actual prosodic phrasing of ex situ object focus constructions in Hausa, then the analysis would have to be significantly reworked since candidate (b) is the prosodic phrasing predicted by Wrap and StressXP. Phonetic testing on this point of residue could give a strong clue about the accuracy of my analysis in its ability to predict the phrasing of an OSV clause with ex situ object focus. 15

6. Marking in situ focus

Haltmann & Zimmermann (2007) have done further phonetic research on in situ focus and have made the claim that "in-situ focus is... prosodically unmarked." Their data does prove that, in a sense, in situ focus is "unmarked". It is unmarked in the sense that a sentence with object focus will be prosodically identical to sentence focus, VP-focus, or narrow focus on the verb. However, this sense of being unmarked is not to be unexpected. In fact, our prosodic phrasing constraints predict that this should be the case.

First, consider narrow focus on the object (the constituent meant to be in focus in marked in italics):

Object-focus = *kíifí*	PROMIP	PRED	XP
(X) (X) (X) (X) [*Kíifíi*$_i$]$_{NP}$ [Kandé]$_{NP}$ [tá dáfaa t_i]$_{VP}$			*!
(X) (X) (X) (X) (X) [*Kíifíi*$_i$]$_{NP}$ [Kandé]$_{NP}$ [tá dáfaa t_i]$_{VP}$		*!	

[14] It is worth noting that one candidate that has not yet been eliminated is t_i [**Tá** dáfa [kíifíi]$_{NP}$]$_{VP}$ [*Kandé*$_i$]$_{NP}$ where the subject NP has been extracted not to the beginning of the sentence, but to the end. Presumably there is some other constraint that could account for this possibility.

[15] Tableau (34) illustrates the advantage of using Truckenbrodt's constraints. With the other constraints there would be no case in which an ex situ object focus construction satisfied all the prosodic constraints since the XP and Pred constraints combine to the effect that the VP must have an embedded XP in order to satisfy both constraints.

35) Object focus = *kíifí*	PROMIP	STRESSXP	WRAP	FOCUS
a.☞ (X) (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$				
b. (X) (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$	*!			*
c. (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$		*!		
d. (X) (X) (X) (X) [Kandé]$_{NP}$ [táa dáfa [*kíifíi*]$_{NP}$]$_{VP}$			*!	

Three candidates above—(a), (c) and (d)—satisfy the Focus constraint by aligning the head of iP with the object. The optimal candidate is (a), which, in addition to satisfying the lower ranked Focus, also satisfies the undominated prosodic constraints. We see a similar situation under predicate-focus:

36) Pred-focus (VP-focus)	PROMIP	STRESSXP	WRAP	FOCUS
a.☞ (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$				
b. (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$	*!			*
c. (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$		*!		
d. (X) (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$			*!	*
e. (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$		*!		

Candidate (a) is the only candidate that satisfies all of the prosodic constraints and it also satisfies the Focus constraint by making a member of the VP the head of the iP. Note that there is no maximum size requirement for the pP that contains the focused constituent. Candidate (c) satisfies Focus even though it includes the subject in its pP.[16] Now, we can turn to tableau (37) to look at sentence focus where all constituents are considered to be in focus.

[16] Another method of evaluating Focus would be to follow the gradient scale used by Büring & Gutiérrez (2001). They consider every constituent that is in focus to be required to be the head of the iP and one violation is marked for each F-marked item that is not the head of an iP. Under that interpretation all of the candidates in tableau (36) that received no violation would receive one and those that receive one would receive two instead. Here the two methods reach the same conclusion and the next two tableaux show that under the interpretation I am using here we will still end up with winning candidates that are required to violate Focus.

The situation here is somewhat more complex since our winning candidate violates the Focus constraint. Under the evaluation that I've used, candidate (c) is the only option that satisfies Focus, but since the prosodic constraints are ranked higher it is not optimal. Here we are left with an optimal candidate that undeniably violates the focus constraint. At the same time, this is the only option for sentence focus since the entire clause cannot be fronted.

The fact that the focus constraint can be violated in this way does not come as a surprise. In the evaluation of German, English, and Spanish by Büring & Gutiérrez (2001), they claim that all three languages violate the focus constraint for sentence focus. None of those languages create a prosodic structure for sentence focus that is unique to any other type of focus. This type of ambiguity in focus marking has been recognized as early as 1972 by Ray Jackendoff and is a natural part of language.

37) Sentence focus	PROMIP	STRESSXP	WRAP	FOCUS
a.☞ (X) (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$				*
b. (X) (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$	*!			*
c. (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$		*!*		
d. (X) (X) (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$			*!	**
e. (X) (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$		*!		*
f. (X) (X) (X) (X) [*Kandé*]$_{NP}$ [*táa dáfa* [*kíifíi*]$_{NP}$]$_{VP}$	*!		*!	**

Finally, we can see that the tableau for narrow-focus on the verb will be very similar to the sentence focus tableau.

38) Verb-focus = *táa dáfa*	PROMIP	STRESSXP	WRAP	FOCUS
a.☞ (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [kíifíi]$_{NP}$]$_{VP}$				*
b. (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [kíifíi]$_{NP}$]$_{VP}$	*!			*
c. (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [kíifíi]$_{NP}$]$_{VP}$		*!*		
d. (X) (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [kíifíi]$_{NP}$]$_{VP}$	*!		*!	
e. (X) (X) (X) [Kandé]$_{NP}$ [*táa dáfa* [kíifíi]$_{NP}$]$_{VP}$		*!		

There is more residue with the question of narrow-focus on the verb in situ. For one, there are very few examples of it cited. Hartmann & Zimmermann (2007) cite only one example of narrow focus on the verb followed by an object NP. I found no other examples of it in any other papers by Zimmermann, Hartmann, Green, or Jaggar. Reviewing the results of their phonetic study, Hartmann & Zimmermann also mention that "the average pitch on narrowly focused verbs is minimally higher than on verbs that are not in focus," and continue to say that "the same cannot be said for… mean or maximum pitch on narrowly focused objects." Without any further phonetic study I can only conjecture that the slight difference between verb focus and object focus relates to the fact that the verb in narrow focus is not the head of its iP, while the object is.

7. Conclusion

Hartmann & Zimmermann (2007) give some of their thoughts on why an asymmetry exists between subjects and non-subjects in regards to focus:

> This raises the question of why overt focus marking is obligatory with and only with subjects in these and many other languages? Intuitively, the reason for this subject bias in the focus systems of these languages seems clear. The (default) preverbal subject position triggers a topic interpretation (see Givón 1976). Therefore, if a subject is to be interpreted as focus (and not as topic) something special has to be done. The subject has to be dislocated, which is reflected by a change in the morphological form of the auxiliary.

Their pragmatically motivated explanation for subject movement is plausible but doesn't help explain why languages like English are allowed to focus subjects in situ. The explanation offered in this paper is that subject movement is motivated by the desire to align the subject with the head of an intonational phrase. And this can be accomplished in Hausa by violating lower ranked syntactic constraints (i.e. Stay) or perhaps an economy constraint against structures that require multiple intonational phrases.

Another question that remains is in regard to why both ex situ and in situ focus should be used for non-subjects. In regards to objects, the constraints that have been discussed here show no criteria for choosing between ex situ focus and in situ focus. Unless it is truly the case that these two constructions are in free variation there may need to be semantic constraints that address issues of exhaustively and disambiguation in discourse context. These constraints would likely be ranked relatively high since Hartmann & Zimmermann's (2007) study show that ex situ focus is the strategy used two-thirds of the time.

A different scenario holds for V-focus where we would expect that the ex situ form that satisfies the prosodic and focus constraints would always be the optimal candidate. Presumably ex situ can satisfy all of the prosodic, pragmatic, and semantic constraints. In order to explain why in situ is ever motivated for narrow focus on the verb we could appeal to a constraint of economy that prefers candidates with the smallest number of intonational phrases. Hartmann & Zimmermann's data also shows that the in situ strategy is most often used in answering a direct question. In this type of context it is unlikely that the need to disambiguate focus would come into play and the semantic constraints would not affect our candidate choice allowing the economy constraint to instead decide on a prosodically and syntactically unmarked in situ structure.

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