Word order in nominalizations: Another domain for the FOFC[*]

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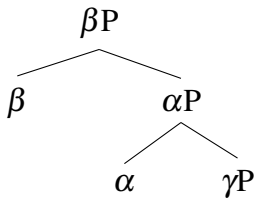
1. Introduction

The Final-over-Final Condition (1). is been shown to a wide-reaching and powerful generalization about possible word orders cross-linguistically (e.g. Holmberg 2000, Biberauer et al. 2014, Sheehan et al. 2017, Erlewine 2017, 2018, Branan 2019).

(1) *The Final-over-Final Condition (FOFC)* (Biberauer et al. 2014, 171):
A head-final phrase αP cannot immediately dominate a head-initial phrase βP, if α and β are members of the same extended projection.

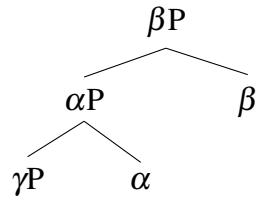
Of the four possible orderings of head-complement sequences in a recursive binary-branching structure, the FOFC predicts only three (2a,b,c). Final-over-initial orders (2d) are ruled out.

(2) a.



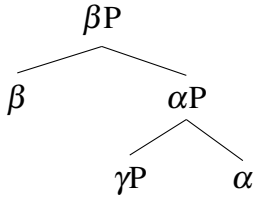
Consistent head-initial (harmonic)

b.



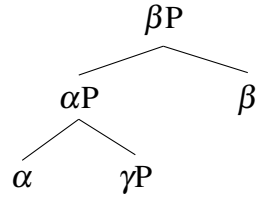
Consistent head-final (harmonic)

c.



Initial-over-final (disharmonic)

d. *



Final-over-initial (disharmonic)

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This empirical prediction has been shown to hold in a number of domains. For example, in structures where an auxiliary (corresponding to β in (2)) embeds a verb phrase (corresponding to αP), then we expect the order corresponding to (2d), namely V-O-AUX, to be unattested. Indeed, this seems to be the case. As Holmberg (2000) showed for Finnish, while the three orders permitted by the FOFC are grammatical, the final-over-initial configuration is not (3d).

(3) *3/4 orders possible in Finnish* (Holmberg 2000, 128):

a. Milloin Jussi [$_{\text{AuxP}}$ olisi [$_{\text{VP}}$ krijoittanut romaanin]] ?
when Jussi AUX written novel
'When would Jussi have written a novel?' (AUX V O)

b. Milloin Jussi [$_{\text{AuxP}}$ olisi [$_{\text{VP}}$ romaanin krijoittanut]] ?
when Jussi AUX novel written
'When would Jussi have written a novel?' (AUX O V)

c. Milloin Jussi [$_{\text{AuxP}}$ [$_{\text{VP}}$ romaanin krijoittanut] olisi] ?
when Jussi novel written AUX
'When would Jussi have written a novel?' (O V AUX)

d. *Milloin Jussi [$_{\text{AuxP}}$ [$_{\text{VP}}$ krijoittanut romaanin] olisi] ?
when Jussi written novel AUX
'When would Jussi have written a novel?' (*V O AUX)

Biberauer et al. (2014) also show that this pattern is not found in Germanic and other languages where one might expect to find it.

2. VP nominalization

We show that a similar restriction can be found with nominalization. A number of West African languages require that VPs are nominalized if they are focus-fronted or embedded under certain aspectual heads. The hierarchical structure of a nominalized verb phrase that we will assume is given in (4), with the nominalizer *n* taking the VP as its complement.

(4) *Structure of nominalized VPs*:
[$_{n\text{P}}$ *n* [$_{\text{VP}}$ V O]]

This configuration is analogous to the examples in (3) with an auxiliary selecting a VP. Therefore, if the FOFC were to hold in such a structure, we would expect the possible linearizations of (4) to adhere to the pattern in (2). The following sections will show that we also only find 3 out of the 4 logically possible orders in VP nominalizations.

2.1 VO languages with a prefixal nominalizer

The first set of languages we will consider are head-initial VO languages that have a prefixal nominalizer (i.e. head-initial *n*P). Data below is given from Limbum (Grassfields Bantu) (5), Mani (Mel, Niger-Congo) (6), and Yoruba (Niger-Congo) (7).

(5) *Limbum* (Becker and Nformi 2016, 58, 74f.):

a. ŋwè fɔ̄ àm [$_{VP}$ tí ŋgū]
man DET PST3 cut wood
'The man cut the wood.' (V O)

b. Á r-[$_{VP}$ yū msāŋ] (cí) njíŋ wɛ̀ fɔ̄ bí gī
FOC NMLZ- buy rice COMP woman DET FUT1 do
'The woman will BUY RICE.' (NMLZ V O)

(6) *Mani* (Childs 2011, 148, 219):

a. Ù ká [$_{VP}$ tɔ̀k dòmɔ̀ mì]
1SG PST wash shirt 1SG
'I washed my shirt.' (V O)

b. Ù- [$_{VP}$ bán wɔ́m] kɔ́ ḿbòm wɔ̀ báŋ-yɛ̀
NMLZ- build boat PRO.FOC Mbom 3SG build-STAT
'It is building a boat Mbom built a boat.' (NMLZ V O)

(7) *Yoruba* (Manfredi 1993, 19f.):

a. Ajé [$_{VP}$ ra ìwé]
Aje buy paper
'Aje {is buying/bought} {a book/books}.' (V O)

b. Rí- [$_{VP}$ rà ìwé] ni Ajé ra ìwé
NMLZ- buy paper FOC Aje buy paper
'It is book-buying that Aje {is doing/did}.' (NMLZ V O)

In each of the (b)-examples, we see that the internal word order of the VP does not change, remaining VO.

2.2 VO languages with a suffixal nominalizer

There are other VO languages that have a suffixal nominalizer. Data below are given from Buli (Gur, Niger-Congo), Dagaare (Gur, Niger-Congo), Dangme (Kwa, Niger-Congo), Gengbe (Gbe, Niger-Congo) and Akan (Kwa, Niger-Congo). What is striking here is that none of the nominalized VPs in these languages show the order V-O-NMLZ. Instead, all show an obligatory shift to OV order when nominalized.

(8) *Buli* (Hiraiwa 2005a, 262; Hiraiwa 2005b, 546):

a. (Ká) [$_{VP}$ mángò-kú dɛ̄]-kā àlī/àtì Àtìm dɛ̀ dīēm
FOC mango-DEF eat -NMLZ C Àtìm ate yesterday
'It is eating the mango that Àtìm ate yesterday (not e.g. buying a banana).'

b. Àtìm [$_{VP}$ dɛ̀ mángò-kú-lá] dīēm
Àtìm ate mango-DEF-DEM yesterday
'Àtìm ate that mango yesterday.'

(9) *Dagaare* (Hiraiwa and Bodomo 2008, 802,805):

a. Ǹ dà [$_{VP}$ dá lá bóɔ́]
1SG PST buy FOC goat
'I bought a goat.' (V O)

b. [$_{VP}$ Bóɔ́ dáá]-ó lá ká ń dà dà
goat buy -NMLZ FOC C 1SG PST buy
'It is buying a goat that I did.' (O V NMLZ)

(10) *Dangme* (Ameka and Kropp Dakubu 2008, 273,274):

a. Ì [$_{VP}$ kàné womi ɔ]
1SG read book DEF
'I read the book' (V O)

b. [$_{VP}$ womi ɔ kàné]-mĩ
book DEF read -NMLZ
'reading the book' (O V NMLZ)

(11) *Gengbe* (Manfredi 1997, 90; Aboh 2005, 165f.):

a. Mù [$_{VP}$ ɖù nú]
1SG eat thing
'I ate (something).' (V O)

b. Kwésí lè [$_{VP}$ mɔ́lú ɖù]-ɔ̀
Kwesi AUX rice eat -NMLZ
'Kwesi is eating rice' (O V NMLZ)

c. [$_{VP}$ Mɔ́lú ɖù]-ɔ̀ yè Kwésí lè
rice eat -NMLZ FOC Kwesi AUX
'Kwesi is EATING RICE.' (O V NMLZ)

(12) *Akan* (Hein 2017, 7; S. Korsah, p.c.):

a. Kofí [$_{VP}$ á-si dán]
Kofi PRF-build house
'Kofi has built a house.' (V O)

b. [$_{VP}$ Dán sí](-é) na Kofí á-yɔ́
house build -NMLZ FOC Kofi PRF-do
'Kofi has BUILT A HOUSE.' (O V NMLZ)

c. Me-kyiri [$_{VP}$ dan si](-e)
1SG-hate house build -NMLZ
'I hate building houses.' (O V NMLZ)

3. Optional OV with a prefixal nominalizer

Finally, there are some VO languages in West Africa that also allow for an optional change from VO to OV inside a nominalized VP. Krachi is a particularly striking example of such

a language. As (13a) shows, the basic word order within the VP is VO, however under nominalization is can surface with both VO (13b) and OV (13c) orders.

(13) *Krachi* (Kandybowicz and Torrence 2016, 227f.) :

a. ɔkyɪ wʊ [$_{VP}$ ɛ-dɪkɛ i-gyo]
woman the PST-cook PL-yam
'The woman cooked yams.' (V O)

b. Kɛ-[$_{VP}$ dɪkɛ i-gyo] yɪ ɔkyɪ wʊ ɛ-dɪkɛ
NMLZ- cook PL-yam FOC woman the PST-cook
'The woman only cooked yams.' (NMLZ V O)

c. Ke-[$_{VP}$ i-gyo dɪkɛ] yɪ ɔkyɪ wʊ ɛ-dɪkɛ
NMLZ- PL-yam cook FOC woman the PST-cook
'It was COOKING YAMS that the woman did.' (NMLZ O V)

The Krachi case is particular clear because the nominalizer appears to be enclitic, i.e. it 'leans' onto whatever follows it. This can also be the object, as in (13c). In many languages, however, the nominalizer is a verbal affix. Nevertheless, we find languages such as Yoruba (14) and Igbo (15) that exhibit the same kind of (optional) VO→OV change when the nominalizer attaches to the verb. In (14b), the word order has changed to VO, despite the fact that the nominalizer is still prefixed to the verb. The same pattern appears to be obligatory under nominalization in Igbo (14b).

(14) *Yoruba* (Manfredi 1997, 96):

a. Mo fẹ́ [$_{VP}$ ẹ́-hun aso]
1SG want NMLZ-weave cloth
'I want to weave (some) cloth.' (NMLZ-V O)

b. Mo fẹ́ [$_{VP}$ aso ọ́-hun]
1SG want cloth NMLZ-weave
'I want to weave (some) cloth' (O NMLZ-V)

(15) *Igbo* (Manfredi 1997, 97f.):

a. Ó kụ́zhi-ri m [$_{VP}$ i-gbá igwè]
3SG teach-ASP 1SG INF-move iron
'S/he taught me to ride a bike.' (NMLZ-V O)

b. Ó mára-na [$_{VP}$ igwè a-gbá]
3SG know-PERF iron NMLZ-move
'S/he knows how to ride a bike.' (O NMLZ-V)

The optional change in word order is still found here, with the additional complication that the nominalizer must be attached to the verb, which we assume takes place via post-syntactic lowering (Embick and Noyer 2001). Nevertheless, Igbo and Yoruba seem to show the same pattern of optionality under a prefixal nominalizer that we saw in Krachi.

3.1 Interim summary

What we have seen so far is summarized in the table in (16).

(16) *Mini-typology of VP nominalization in West African languages*:

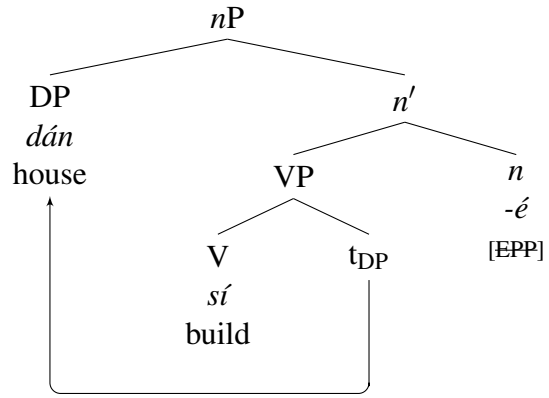
	Base order	Nominalized	
Krachi	VO	NMLZ-VO	(Kandybowicz and Torrence 2016)
Limbum	VO	NMLZ-VO	(Becker and Nformi 2016)
Mani	VO	NMLZ-VO	(Childs 2011)
Yoruba	VO	NMLZ-VO	(Manfredi 1993)
Krachi	VO	NMLZ-OV	(Kandybowicz and Torrence 2016)
Igbo	VO	NMLZ-OV	(Manfredi 1997)
Yoruba	VO	NMLZ-OV	(Manfredi 1997)
Akan	VO	OV-NMLZ	(Hein 2017)
Buli	VO	OV-NMLZ	(Hiraiwa 2005a,b)
Dagaare	VO	OV-NMLZ	(Hiraiwa and Bodomo 2008)
Dangme	VO	OV-NMLZ	(Ameka and Kropp Dakubu 2008)
Gengbe	VO	OV-NMLZ	(Aboh 2005)

In VO languages with prefixal nominalizers, we find that there is either no change, or an optional change to OV under nominalization. In comparable VO languages with suffixal nominalizers, however, we find that no language retains this VO order when the VP is nominalized. All of the languages in question change to OV order. This gives rise to the empirical generalization in (17).

(17) *Generalization:*
No language retains VO word order inside a nominalized VP if the nominalizer is a suffix.

The question at this point is how the shift from VO to OV order can be tied to the prefix/suffix status of the nominalizer. Previous literature has assumed that change in word order inside nominalized VPs results from a kind of 'object shift' that places the object outside the VP (e.g. Manfredi 1997, Aboh 2004, 2005, Hiraiwa and Bodomo 2008). For example, the object could move to Spec-*n*P, triggered by an [EPP]-feature on *n*.

(18)

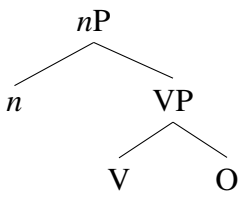


However, notice that this approach cannot derive the generalization in (18), since there is no intuitive link between the headedness of the *n*P projection and whether or not it bears an [EPP]-feature that triggers object shift.

4. A FOFC-based explanation

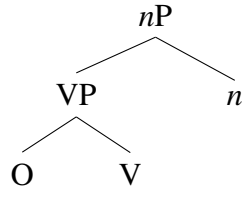
The ¾ pattern we observe with VP nominalization follows naturally as an instantiation of the basic FOFC pattern in (2). As (19) illustrates, the unattested configuration involving a head-initial VP selected by a nominalizing suffix is not a FOFC-compliant structure (19d).

(19) a.



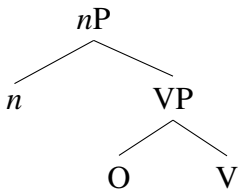
Consistent head-initial
(e.g. Yoruba)

b.



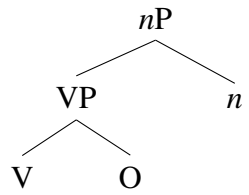
Consistent head-final
(e.g. Akan)

c.



Initial-over-final
(e.g. Krachi)

d. *



Final-over-initial
(unattested?)

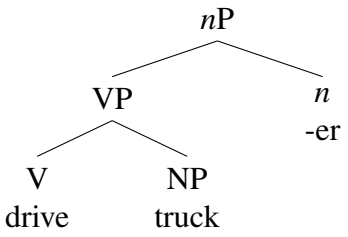
On the other hand, the other three orders in (20a,b,c) are attested in the table in (16).

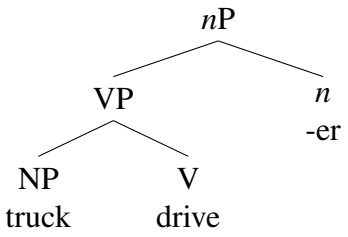
Consequently, we propose that word order inside nominalized VPs is constrained by the FOFC. In languages in which a head-initial VP merges with a nominalizing suffix, the illicit order V-O-NMLZ must be avoided by means of some relevant repair. This could be re-linearization (Richards 2016, Hein and Murphy 2018) or some exceptional FOFC-

related movement process (Branan 2019). Assuming that the FOFC holds as a universal (Biberauer et al. 2014), then the typological gap in (16) is accounted for.

This view also extends to synthetic compounds such as *truck drive-r* seem to suggest that VPs in English also seem to exhibit a shift in word order from VO to OV when nominalized (20) (Ackema and Neeleman 2004, Roberts 2017).

(20) *





5. Consequences for the FOFC

An important consequence of this proposal is that the domain of application for the FOFC must be broadened. Recall from the definition of the FOFC in (1) that it is typically assumed to hold within an *extended projection* (Grimshaw 1991). However, *n* is not standardly assumed to belong to the same extended projection as V. For this reason, we propose that the scope of the FOFC should be widened to include so-called 'mixed extended projections' such as nominalizations (Borsley and Kornfilt 2000, Pietraszko 2019).

Biberauer et al. (2014) propose an LCA-based account of the FOFC (Kayne 1994), where head-final structures are be derived by 'roll-up' movement of the complement of a head to its specifier. Concretely, Biberauer et al. (2014) propose that this is triggered by a caret (ˆ) diacritic on the categorial feature of that head, which can be inherited by the next head in the extended projection. A higher head can only bear ˆ if the lower head does (21).

(21) *The Final-over-Final Condition (formal statement)* (Biberauer et al. 2014, 210):
If a head α_i in the extended projection EP of a lexical head L, EP(L), has ˆ associated with its [categorial] feature, then so does α_{i+1}, where α_{i+1} is c-selected by α_i in EP(L)

A head-final VP, for example, is derived by a [+Vˆ] feature on the V head (22a), which triggers movement of its complement to the specifier of V (22b).

(22) a. $[_{VP}\ V_{[+V\hat{}]}\ DP\ ]$
b. $[_{VP}\ DP\ [_{V'}\ V_{[+V\hat{}]}\ \_\_{}_{DP}\ ]]$

The FOFC can be accounted for by assuming that this caret feature can reach a higher head by percolation from a lower head within the same extended projection (Biberauer et al. 2014, 210). This percolation requirement means that an Aux head, for example, can only bear the ˆ-feature triggering roll-up movement if the head of the phrase it selects (V) also has it (23a). This crucially rules out the unwanted final-over-initial configuration (23b).

(23) a. $[_{\text{AuxP}}\ \underline{[_{\text{VP}}\ \text{DP}\ [_{\text{V}'}\ \text{V}_{[+\text{V}\hat{}]}\ \text{—DP}\ ]]}\ [_{\text{Aux}'}\ \text{Aux}_{[+\text{V}\hat{}]}\ \text{—VP}\ ]\ ]$

b. $*[_{\text{AuxP}}\ \underline{[_{\text{VP}}\ \text{V}_{[+\text{V}]}\ \text{DP}\ ]}\ [_{\text{Aux}'}\ \text{Aux}_{[+\text{V}\hat{}]}\ \text{—VP}\ ]\ ]$

If the FOFC is enforced by inheritance of ˆ associated with categorial heads within an extended projection, then we need to ensure that (21) holds in mixed projections as well. This can be achieved if we follow Panagiotidis (2015, 143) in assuming that heads that form mixed extended projections actually carry two types of categorial features (what he calls *switches*). For example, a nominalizer would have bear [N, *u*V]; its own categorial feature (N) and an uninterpretable selectional features for the other EP it is part of (*u*V). If [*u*V] on *n* counts as a feature in the EP of V, then (21) will rule out structures such as (24).

(24) $*[_{n\text{P}}\ [_{\text{VP}}\ \text{V}_{[\text{V}]}\ \text{DP}\ ]\ [_{n'}\ n_{[\text{N},\ \#\text{V}\hat{}]}\ \text{—VP}\ ]\ ]$

This correctly rules out the kind of unwanted final-over-initial configurations that we have seen do not arise under VP nominalization.

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