

Deriving the Directionality Parameter in OT-LFG

Recent work in Optimality Theoretic Syntax (e.g. Grimshaw 1997, Sells 2001) successfully models positioning of syntactic elements that target a privileged position in a clause, such as topics, sentential adverbs, operators, and a core syntactic dependent like subject, by extending the mechanism of Generalized Alignment (McCarthy and Prince 1993) to the domain of clausal syntax. By allowing only left-alignment, Sells' (2001) work takes a pioneering step towards recasting Kayne's (1994) insightful observation that phrase structure is fundamentally antisymmetric: there is a universal preference for the left-edge of the clause, so that the structure is overwhelmingly right-branching.

Restricting alignment to the left-edge of a clause as in earlier proposals imposes serious limitations on the kinds of syntactic positioning and constructions we can explain within the constraint-based, output-oriented model of grammar. For example there is a major class of constituents that exhibit affinity with the head, and structural position of such constituents is dependent on the directionality of heads: head-initial languages typically place the head of the relative clause before the modifying clause, negation before the verb, and objects and focus after the verb; head-final languages, on the other hand, place the head of the relative clause after the modifying clause, negation after the verb, and objects and focus before the verb. The opposite patterns are rare or non-existent. These predictable patterns of syntactic positioning therefore deserve a principled explanation. Focusing on a typology of relative clauses, my goal in this paper is to propose an additional generalized formal mechanism within OT-LFG which provides a unified treatment of syntactic elements that exhibit strong affinity with the head, effectively deriving the directionality parameter in a non-derivational theory of syntax.

A subset of Bantu languages such as Dzamba (1) exhibits verb raising in object relativization, where the canonically preverbal subject must appear postverbally ((1a); cf. (1b)). Other Bantu languages such as Sesotho do not show verb raising ((2a); cf. (2b)). Earlier work (Demuth and Harford 1999, Harford and Demuth 1999) accounts for this variation by positing two different positions for subject: in the former type (Dzamba), the verb raises to C, and subject stays in VP-internal position (3a). In the latter (Sesotho), the verb raises to I, and subject raises to SpecIP (3b). Such an analysis immediately raises two problems. First, there is no evidence for I in these Bantu languages (Bresnan and Mchombo 1986, 1987, Morimoto 2000); under the analysis in (3a) for Dzamba, I is only needed for the verb to move through to C, and is never filled. Second, two different subject positions across the Bantu languages are not motivated outside object relativization. The presence/absence of verb raising in these languages, in fact, provides a crucial piece to a wider typology of relativization and follows straightforwardly from the present approach.

The formal mechanism proposed in the present work, *abutment*, is defined in (4). Abutment is alignment of *opposite*, rather than identical, edges. According to (4), there exist category C_1 (e.g. focus, adverb, relativizer) and C_2 (V-head, N-head); abutment is satisfied if, for example, the left-edge of C_1 is adjacent to the right-edge of C_2 . Crucially, the constraint does not specify particular edges of the elements; the only requirement is that two edges be opposite.

The typology of object relativization in (5) is derived by the universal constraints given in (6), which are independently motivated both across and within these languages (cf. Sells 2001, Morimoto 2001). (6a,b) are constraints on clausal skeleton: Head-L \gg Spine-R (the only right-alignment in the current approach) prefers the head-initial structure; Spine-R \gg Head-L prefers the head-final structure. C_1 and C_2 in (4) can be instantiated by REL and N-head respectively, as in (6c). Importantly, the interaction of Abut-REL(N-HD) (6c) and the constraints on head positioning (6a,b) correctly derives the positioning of REL (realized in various ways) in head-initial (I–IV) and head-final (V) languages. Note also that DON'TPROJ (e) \gg Spine-R (b) as in II gives us a relativizer in C—C head on the left violates Spine-R; Spine-R (b) \gg DON'TPROJ (e) as in IV gives us a relative pronoun DP—an extra projection, hence a more severe violation of DON'TPROJ, but fewer violation of Spine-R. Stipulation of two subject positions in Bantu languages can also be eliminated.

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- (1) a. oPetelo a-nyamozi imo-dondo i-mu-bundaki Zaki Dzamba
 Peter 1-sold the-alligator REL-it-caught Jack
 ‘Peter sold the alligator that Jack caught.’
- b. *oPetelo a-nyamozi imo-dondo Zaki i-mu-bundakiz (Givón 1972:190)
 Peter 1-sold the-alligator Jack REL-it-caught
- (2) a. di-kobo tseo ba-sadi ba-di-rekileng kajeno. Sesotho
 10-blankets 10REL 2-women 2-10-bought today
 ‘the blankets which the women bought’
- b. *di-kobo tseo ba-di-rekileng basadi kajeno (Demuth and Harford 1999)
 10-blankets 10REL 2-10-bought 2women today
- (3) a. [[N' N_j [[C' REL-verb_i [t_j [I' t_i [NP_{SUBJ} [V' t_i t_j]]]]]]]] (= 1a)
- b. [[N' N_j [[C' REL.PRON [NP_{SUBJk} [I' verb_i [t_k [V' t_i t_j]]]]]]]] (= 2a)
- (4) $\text{Abut}(C_1, \text{Edge}_1, C_2, \text{Edge}_2) =_{def}$
 C_1 abuts with C_2 if and only if Edge_1 of C_1 shares Edge_2 of C_2 ; where $\text{Edge}_1 \neq \text{Edge}_2$
 (abbreviated as “Abut- $C_1(C_2)$ ” below).
- (5)

(5)	Languages	Positions	REL Category
I.	Dzamba, Chishona	N-head REL-verb NP _{su}	V _{aff} bound to V in C
II.	Sesotho/Setswana	N-head REL NP _{su} verb	C, free-standing
III.	Kirundi/Kinyarwanda	N-head NP _{su} REL.verb	high tone on V
IV.	English	N-head REL.PRON NP _{su} verb	DP (or <i>that</i> in C)
V.	Korean	NP _{su} verb-REL N-head	V _{aff} , bound to V
- (6) a. Head-L: X⁰ aligns left in its immediate constituent.
 b. Spine-R: Co-heads align right in their immediate constituents.
 c. Abut-REL(N-HD): “The relativizer and N-head must be adjacent to each other.”
 d. *Lex-in-F: Avoid lexical head in F.
 e. DON'TPROJ: Do not project (every XP is penalized).
- (7) I. a ≫ c ≫ e ≫ d ≫ b
 II. a ≫ c ≫ d ≫ e ≫ b
 III. a ≫ e ≫ d ≫ c ≫ b
 IV. a ≫ c ≫ d ≫ b, e
 V. b ≫ a; e ≫ d ≫ c
- (8) a. [[N' N [[C' REL-verb [S NP_{SUBJ}]]]]]] (= 1a)
- b. [[N' N [[C' REL.PRON [S NP_{SUBJ} [VP verb]]]]]] (= 2a)