

Constraining Scrambling: Cyclic Linearization and Subject Movement

Proposal. This paper proposes that word order variation in scrambling languages is not random, but strictly constrained by *Cyclic Linearization* (1), which was defended by Fox and Pesetsky (2003) for order preservation phenomena such as Object Shift in Scandinavian languages. In particular, (1) implies that linearization information is sent to the phonology at the end of a given phase *permanently*, thus subsequent scrambling must preserve the orderings established at the previous phases. I show that this proposal accounts for the long-standing puzzles concerning *the peculiarities of subject scrambling*, and further explains *the systematic asymmetry between vP-external and vP-internal adverbs* in licensing floating quantifiers. In doing so, this paper contributes to the thesis that *the architecture of the grammar requires linearization in phonology to be cyclically determined at syntax*, in the spirit of Chomsky (1999).

Puzzle. In Korean and Japanese (K/J), an Object (O) may scramble and license a Numeral Quantifier (NQ) across a Subject (S), as in (2a). In contrast, S cannot license a NQ across O, as in (2b) (Haig 1980; Kuroda 1983; Lee 1993). This asymmetry has often been attributed to the claim that S may not scramble, unlike other arguments (Saito 1985). Other literature, however, provides contradictory evidence, arguing that there is no general ban on subject scrambling. In particular, *clause-external scrambling* of an embedded S is possible, as illustrated in (3a) (Kurata 1991; Sohn 1995). Further, S may scramble even *clause-internally* and license a NQ across a high adverb like *amato* ‘probably’, as in (3b). Given that both S and O may scramble and license a floating NQ, it has been puzzling why the asymmetry in (2) holds.

Analysis. I argue that this asymmetry between S and O follows from two factors: (i) K/J scrambling is constrained by (1), and (ii) S may scramble, in principle (cf. Saito 1985), but does not move within the vP that S is externally-merged in, since there is no attracting head higher than S in the vP (Chomsky 1999).

Consider first (4a), the derivation of (2a). At the vP phase, O scrambles from its base-position (following Sportiche 1988 and Ueda 1990, I assume that NP and NQ are base-generated as sisters; cf. Dowty & Brodie 1984; Miyagawa 1989). After Spell-out of vP, the initial ordering ($O < S < NQ_o < V$) is established. At the next phase CP, O scrambles further and the new ordering ($O < (adv) < S < NQ_o < V$) obtains. Crucially, this new ordering conforms to (1), because it does not contradict the previous ordering established at vP. Compare this with (4b), the derivation of (2b). Given that there is no attracting head higher than S within the vP, S does not scramble within the vP. Thus, when the vP is spelled-out after scrambling of O, the ordering ($O < S < NQ_s < V$) is established. At the next phase CP, S may scramble, just like other items, but the result of movement must satisfy (1). That is, O should precede both S and NQ_s at the CP phase, as in the vP phase. If O intervenes between S and NQ_s at CP ($S < (adv) < O < NQ_s < V$), as in (4b), it contradicts the ordering established at vP ($O < S < NQ_s < V$), thus, is ruled out as a violation of (1).

Further, the orderings in (3a,b) are correctly allowed under the proposal. As shown in (5), the matrix subject *na-nun* or the high adverb *amato* does not establish an ordering with respect to S at the initial vP. Hence, *na-nun* or *amato*, unlike O in (4b), may follow the S after the scrambling of S at the higher phase.

Further Evidence. It has been noted that while an *unaccusative* S may license a NQ across low adverb phrases (e.g. manner/instrumental), *unergative* S cannot: (6) (Miyagawa 1989). However, this asymmetry disappears when a high adverb (e.g. epistemic/temporal/locational) is substituted for the low adverbs: (7). This difference between high and low adverb phrases is explained by (1). Consider first (8), the derivations of (6a,b), where a low adverb (L-Adv) is merged within the vP. As shown in (8a), S of an unaccusative verb is originated in a VP, so it may move from VP to vP before *the first spell-out of vP*. Thus, L-adv may intervene between S and NQ_s within the vP. By contrast, in (8b), S in the unergative vP is externally-merged in [Spec,vP], and thus cannot move within the vP. As a result, (1) requires that L-adv precede or follow both S and NQ_s throughout the derivation, as in the vP phase. If the L-adv intervenes between S and NQ_s at the CP phase ($S < L-adv < NQ_s < V$), as in (8b), it contradicts the previous ordering at vP ($L-adv < S < NQ_s < V$), thus, is ruled out. That is, (8b) is ruled out for the same reasoning as (4b).

Compare this with (9), the derivation of (7a,b), where a high adverb (H-adv) is merged outside vP. In both (9a) and (9b), H-adv does not enter into the *Linearization* process at the vP phase. At the CP phase, S may scramble over H-adv and establish a new ordering with respect to the H-Adv. Hence, unlike L-adv or O, H-adv may intervene between S and NQ_s , regardless of argument structure that S is embedded in.

- (1) **Cyclic Linearization:** The linear ordering of syntactic units is affected by Merge and Move *within* a Spell-out Domain (*phase*), but is fixed *once and for all* at the end of each phase (vP/CP)- where the phase containing Spec, head, and Complement is shipped to PF (cf. Chomsky 1999).
- (2) a. **Maykcwu-lul_i** (pwunmeyng_{hi}) John-i t_i **sey-pyeng** masi-ess-ta
 Beer-Acc evidently John-Nom three-CL_{bottle} drink-Past-Dec
 ‘(Evidently) John drank three bottles of beer’
 b. **Haksayng-tul-i_i** (pwunmeyng_{hi}) maykcwu-lul_j t_j **sey-myeng** t_j masi-ess-ta
 Student-Pl-Nom evidently beer-Acc three-CL_{person} drink-Past-Dec
 ‘(Evidently) three students drank beer.’ (adapted from Saito 1985: examples are given in Korean)
- (3) a. **John-i_i** [na-nun [t_i Mary-lul salanghan-ta-ko]] sayngkakha-n-ta
 J-Nom I-Top M-Acc love-Dec-C think-Pres-Dec
 ‘John, I think that _ loves Mary.’
 b. **Hakpwumo-tul-i_i** *amato* t_i **sey-myeng** hakkyo-lul pangmwunha-yess-ulkusi-ta
 Parent-Pl-Nom probably three-CL_{person} school-Acc visit-Past-is.likely-Dec
 ‘Probably, three parents visited the school.’
- (4) a. [CP O (adv) ... [vP Θ [vP S Θ NQ_o V]]]¹: see (2a)
 Linearize vP: O<S<NQ_o<V; Linearize CP: O<(adv)<S<NQ_o<V
 b. ^{*?}[CP S (adv) ... [vP O [vP \mathfrak{S} NQ_s Θ V]]]: see (2b)
 Linearize vP: O<S<NQ_s<V; Linearize CP: S<(adv)<O<NQ_s<V
- (5) a. [vP₂ S [vP₂ matrix S [CP ... [vP₁ \mathfrak{S} O V₁]]V₂]]: see (3a)
 Linearize vP₁: S<O<V₁; ... Linearize vP₂: embedded-S<matrix-S<O<V₁<V₂
 b. [CP S *amato* ... [vP \mathfrak{S} NQ_s O V]]]: see (3b)
 Linearize vP: S<NQ_s<O<V; Linearize CP: S<amato<NQ_s<O<V
- (6) a. **Koyangi-ka** i-pyeng-ulo **sey-mari** cwuk-ess-ta
 Cat-Nom this disease-by three-CL_{animal} die-Past-Dec
 ‘Three cats died from this disease’
 b. **Haksayng-tul-i** mwulyeyhakey **sey-myeng** cenhwaha-yess-ta
 Student-Pl-Nom rudely three-CL_{person} telephone-Past-Dec
 ‘Three students telephoned in a rude manner’ (adapted from Miyagawa 1989)
- (7) a. **Koyangi-ka** pwunmeyng_{hi} **sey-mari** cwuk-ess-ta
 Cat-Nom evidently three-CL_{animal} die-Past-Dec
 ‘Evidently, three cats died.’
 b. **Haksayng-tul-i** pwunmeyng_{hi} **sey-myeng** cenhwaha-yess-ta
 Student-Pl-Nom evidently three-CL_{person} telephone-Past-Dec
 ‘Evidently, three students telephoned.’
- (8) a. [CP (S) ... [vP S L-adv [vP \mathfrak{S} NQ_s V]]]: see (6a), **Linearize vP: S<L-adv<NQ_s<V**
 b. ^{*?}[CP S ... [vP L-adv [vP \mathfrak{S} NQ_s V]]]: see (6b)
Linearize vP: L-adv<S<NQ_s<V; **Linearize CP: S<L-adv<NQ_s<V**
- (9) a. [CP S H-adv ... [vP \mathfrak{S} [vP \mathfrak{S} NQ_s V]]]: see (7a)
 Linearize vP: S<NQ_s<V; Linearize CP: S<H-adv<NQ_s<V
 b. [CP S H-adv ... [vP \mathfrak{S} NQ_s V]]]: see (7b)
 Linearize vP: S<NQ_s<V; Linearize CP: S<H-adv<NQ_s<V

Selected References. Chomsky, N. 1999. Derivation by phase. MITWPL; Fox, D. & D. Pesetsky. 2003. Cyclic linearization and the typology of movement. ms, MIT; Miyagawa, S. 1989. Structure and case marking in Japanese. Academic Press; Saito, M. 1985. Some asymmetries in Japanese and their theoretical implications, PhD diss, MIT; Sohn, K.-W. 1995. Negative Polarity Items, Scope and Economy, PhD diss, UConn; Ueda, M. 1990. Japanese Phrase Structure and Parameter Setting, PhD diss, UMass, Amherst.

¹ Θ and \mathfrak{S} stand for a trace of O and S; Unimportant intermediate steps of movement are omitted. NQ_s and NQ_o represent the subject-oriented NQ and the object-oriented NQ, respectively.