

Contiguity Theory and Crystallization: *wh*-phrases and concord adverbs in Japanese

Puzzles. This paper discusses the two puzzles of insitu *wh*-phrases in Japanese adjunct clauses. The acceptability of insitu *wh*-phrases is contingent upon the presence of *concord adverbs*. Although insitu *wh*-elements in the conditional clause are acceptable in this language (= (1)a), the sentence becomes illicit if there is an adverb, e.g., *mosi* and *karini*, which conconds with the head of the conditional clause *-tara* ‘if,’ as shown in (1)b, despite the fact that its existence is optional in the corresponding declarative sentence in (2) (the ADVERB PUZZLE). Since *mosi* strengthens the hypotheticality of the conditional clause, one may wonder if this strengthening effect triggers a conflict with the *wh*-element in meaning. But, this view is challenged by the fact that the mere scrambling of *nani* ameliorates the acceptability (= (1)c) though the degree of hypotheticality of the conditional clause in (1)b must be the same as that of (1)c (SCRAMBLING PUZZLE). In addition, these puzzles cannot be explained, for example, by the distinction of strong/weak [+*wh*] or the EPP of C.

- (1) a. [CP [CP Nani-o ire-tara] amak-u nat-ta [C ka]-na]?
 what-ACC put-if sweet-ADV become-PST Q-SFP
 b. *[CP [CP *Mosi* nani-o ire-tara] amak-u nat-ta [C ka]-na]?
 if.ADV **what-ACC** put-if sweet-ADV become-PST Q-SFP
 c. [CP [CP Nani-o *mosi* ire-tara] amak-u nat-ta [C ka]-na]?
 what-ACC *if.ADV* put-if sweet-ADV become-PST Q-SFP
 ‘What would it have become sweeter [CP if I had put in it]? (lit.)’

- (2) [CP [CP (*Mosi*) meron-o ire-tara] amak-u nat-ta ka-na]? ‘Would it have become sweeter if I had put the melon in it?’

Contiguity Theory. I propose that these two puzzles are explained from the *syntax-phonology interface*, hinted by Contiguity Theory (Richards 2010, 2016, 2017; hereafter, CT), which claims that “apparent syntactic differences between languages are always the consequence of more fundamental phonological and morphological parameters, together with a cross-linguistically invariant syntactic system (Richards 2016: 2).” With a set of syntax-prosody mapping principles in Match Theory (Selkirk 2009, 2011, Bennet, Elfner and McCloskey 2016), CT argues that the difference between *wh*-movement and *wh*-insitu languages results from the principles in (3) (*ibid*: 195). *Contiguity-prominent elements* (e.g., *wh*-phrases) must be prosodically related to the C which Agrees with them. Japanese requires the *wh*-phrase to appear at the left-edge of this domain and, to fulfill this requirement, a string vacuou structural change takes place, i.e., from (4)a to (4)b, called *Grouping* (*ibid*: 78).

- (3) (a) If α either Agrees with or selects β , α and β must be dominated by a single prosodic node ϕ , within which β is contiguity prominent. (b) β is *contiguity-prominent* within ϕ if β is adjacent to a prosodically active edge of ϕ .
 (4) a. [ϕ_1 Kare-wa [DP nani-o] nomimas-ita [C ka]] ? > [ϕ_2 Karewa [ϕ_1 [DP nani-o] nomimas-ita [C ka]]]?
 he-TOP what-ACC drink-PST Q
 ‘What did he drink?’

Analysis. I argue that (i) concord adverbs are also contiguity-prominent *w.r.t.* its corresponding head and (ii) propose the following PF linearity requirement:

- (5) **Crystallization:** In the linear configuration, ...W...X...Y...Z..., X and Z cannot form a prosodic domain, if W and Y have already created a prosodic domain.

First, for (1)a, the prosodic phrase ϕ_1 in phonological tree (corresponding to CP in the syntactic tree) has *nani* at its left edge, as in (6); it is contiguous to C. Second, in (1)b, *mosi*’s contiguity is checked when the embedded adjunct clause is formed, as in (7). But, *nani-o* cannot satisfy the contiguity requirement with or without Grouping. Without Grouping, as in (8), *nani-o* is not at the left-edge; it is illicit. With Grouping, as in (9), *nani-o* and *kana* fail to form a prosodic domain due to crystallization; i.e., *mosi* and *tara* form a crystallized pitch reduction region (note that, in the case of (1)a, *tara* is not an *ender* of a prosodic region, because there is no *initiator* (= no concord adverb); thus, there is no crystallization effect in this sentence). Finally, if *nani-o* is scrambled out of the crystallized region, as in (11), *nani-o* is contiguous to C (*kana*). As in (10), *mosi* is also contiguous to C (*tara*). The scrambling is required due to the PF-requirement in (5).

- (6) [CP = ϕ_1 [DP Nani-o] ire-tara ama-ku nat-ta [C kana]] (ϕ for *nani*; Fig 1)
 (7) [ϕ_3 [AdvP *Mosi*] [DP nani-o] ire-[C tara]] (ϕ for *mosi*; Fig 2)
 (8) *[CP = ϕ_1 [ϕ_3 [AdvP *Mosi*] [DP nani-o] ire-tara] ama-ku nat-ta [C kana]] (* ϕ for *nani*; Fig 2)
 (9) *[ϕ_2 [ϕ_1 [AdvP *Mosi*] [ϕ_3 [DP nani-o] ire-[C tara]]] ama-ku nat-ta [C kana]] (*for *nani*; Fig 2)
 (10) [ϕ_1 [ϕ_2 [DP Nani-o] [ϕ_3 [AdvP *mosi*] ire-[C tara]]] ama-ku nat-ta [C kana]] (for *mosi*; Fig 3)
 (11) [ϕ_1 [ϕ_2 [DP Nani-o] [ϕ_3 [AdvP *mosi*] ire-tara]] ama-ku nat-ta [C kana]] (for *nani*; Fig 3)

Interpretation. The proposal in (5) can be rephrased as follows: *prosodic domains must be nested*. Fig 1 to 3 show the pitch patterns of the three sentences. Of all the three, Fig 2 is not well-formed, because the pitch-reduction of the *wh*-phrase (the blue region) and that of *mosi* (the red region) are not nested. Scrambling in Fig 3, on the other hand, makes the red region inside the blue region (hence, it is nested). Importantly, the movement of *nani-o* (a syntactic operation) is triggered AFTER the pitch-region marking (a phonological operation). This works out only under the architecture of CT, which, unlike Chomsky (2000, 2001), assumes that “the building of certain aspects of phonological structure in fact begins in the narrow syntax (Richards 2016: 2)” and syntactic and phonological operations alternate during the derivation.

References. Bennet, R. Elfner, E. and McCloskey, J. (2016) Lightest to the right: an apparently anomalous displacement in Irish. *Linguistic Inquiry*. Richards, N. (2010) *Uttering trees*. MIT. Richards, N. (2016) *Contiguity Theory*. MIT. Richards, N. (2017) Detecting prosodic activity in Contiguity Theory. In Workshop *Phonological externalization of morphosyntactic structure*. LSA Institute. Selkirk, E. (2009) On clause and intonational phrase in Japanese: the syntactic grounding of prosodic constituent structure. *Gengo Kenkyu*. Selkirk, E. (2011) The syntax-phonology interface. *The handbook of phonological theory*.

Fig. 1 The pitch contour for (1)a.

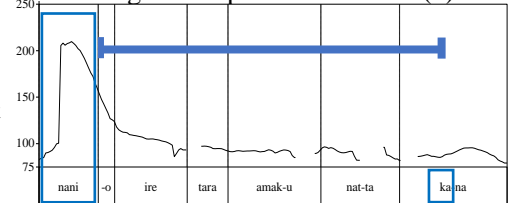


Fig. 2 The pitch contour for (1)b.

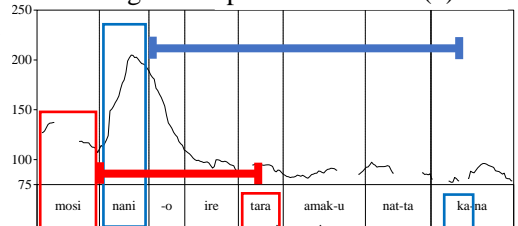


Fig. 3 The pitch contour for (1)c.

