Weak Heads at the Interface
A Crosslinguistic Investigation of Temporal Adverbial Clauses[*]

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Introduction: Labeling for the Interfaces?

Structure building has been one of the central issues in the syntactic theory. In the earlier theories of generative linguistics, Phrase Structure Rules and the X′-Theory encoded the information of word order, constituency, and labels. The Bare Phrase Structure theory (Chomsky 1995) deduces the X′-Theory from the operation Merge, which combines two elements and creates a set, separating computation of word order from the structure building operation (with word order determined at the S-M interface). Collins (2002), Seely (2006), and Chomsky (2013, 2015) further propose to dissociate labeling of a syntactic object from Merge, minimizing the structure building operation, or the computational system of UG. The question that remains is, then, whether and how the intuition of labels of the discrete units in syntax can be maintained and formulated. Chomsky (2013, 2015) proposes that labels of syntactic objects are determined based on Minimal Search, which is a third-factor operation/principle outside UG according to him. For instance, when a head X merges with a phrase YP, the head generally projects and provides the label of the configuration {X, YP}, because it is the first head found by Minimal Search, which searches the structure from the highest node. Interestingly, however, Chomsky (2015) suggests that there is a "weak" head, which cannot provide a label on its own. For instance, English T is a weak head; in order for the configuration {T, vP} to be labeled, T needs to undergo feature sharing of ϕ-features with a DP in its Spec, whereby it is "strengthened" and projects TP. Chomsky thus deduces the EPP effect in English from this feature-sharing requirement of weak T.

Chomsky also suggests that labels are required for interpretations at the interfaces. If we take this seriously, it is not unreasonable to expect that the syntactic weakness in the labeling sense would be reflected at the interfaces, such as PF. In this study, we propose the following syntax-PF mapping (see also Oda 2024a for related discussion; see also Takita 2020 for a proposal regarding relevance of labeling for PF):

(1) Weak heads, which are essentially syntactically dependent on another element, are also morpho-phonologically dependent on another element.

Ambiguity in Temporal Adverbial Clauses

The empirical domain we examine under the proposal in (1) is temporal adverbial clauses (TACs) in Japanese and other languages. Geis (1970) observes that TACs are ambiguous when there is more than one clause under the subordinator. (2) has two possible interpretations.

(2) I saw Mary in Tokyo before [CP1 she claimed [CP2 that she would arrive]].
   a. The speaker saw Mary before the time of her making a claim about her arrival time. (High reading)
   b. The speaker saw Mary before her arrival time according to her. (Low reading)

Larson (1990) argues that the Geis-ambiguity can be explained by null operator movement; when a null temporal operator moves from the higher clause (i.e., CP1), we obtain the high reading, while we obtain the low reading when a null temporal operator moves from the lower clause (i.e., CP2). This analysis is supported by the observation that Geis-ambiguity disappears when the lower clause is embedded in an island as seen in (3).

(3) I saw Mary in Tokyo before she made [island a claim that she would arrive]. (okHigh / *Low)

Interestingly, the situation is more complicated when we consider Japanese. Arregui and Kusumoto (1998) observe that Japanese temporal adverbial clauses do not show the Geis-ambiguity, as shown in (4).

(4) [[Mary-ga [John-ga Tokyo-ni kur-u   to]shutyoo-sur-u] mae]-ni   Taro-wa Tokyo-ni tsui-ta.
     Mary-NOM John-NOM Tokyo-LOC come-PRES C claim-do-PRES before-LOC Taro-TOP Tokyo-LOC arrive-PAST
    'Taro arrived in Tokyo before Mary claimed that John would come to Tokyo.' (okHigh / *Low)

(Adapted from Oda and Tatsumi 2017)

Crucially, Miyamoto (1993, 1996) observes that temporal adverbial clauses in Japanese allow the Geis-ambiguity in the presence of *yori* 'than', which is prototypically used in the comparative construction. Miyamoto also shows

that the low reading becomes unavailable when there is an island between the lower and higher clauses.

(5) [[Mary-ga [John-ga Tokyo-ni kur-u to] shutyoo-sur-u] **yori** mae]-ni

    Mary-NOM John-NOM Tokyo-LOC come-PRES C claim-do-PRES than before-LOC

    Taro-wa Tokyo-ni tsui-ta.

    Taro-TOP Tokyo-LOC arrive-PAST

    'Taro arrived in Tokyo before Mary claimed that John would come to Tokyo.' ([ok]High / [ok]Low)

Weak Head *n* in Temporal Adverbial Clauses

A question that arises here is why the relevant operator movement is available only in the presence of *yori* 'than' in Japanese. We propose that *yori* selects a covert time-denoting nominal head *n* (cf. Demirdache and Uribe-Etxebarria 2013), and that this covert nominal is a weak head in Chomsky's (2015) sense; the weak head *n* cannot provide a label on its own and requires an element in its specifier position for strengthening via feature sharing. Based on Sudo's (2015) argument that *yori* generally takes a nominal complement, we suggest that Op and *n* share the categorial feature [+N] (cf. Citko 2011), and hence the label of {Op, *n*} is <[+N], [+N]>, which essentially states that the relevant structure is nominal (even though it is apparently clausal). Thus, the fact that Japanese TACs exhibit Geis-ambiguity only in the presence of *yori* can be attributed to the nature of the covert time-denoting weak head.

Under the proposal in (1), weak heads are not only syntactically but also morpho-phonologically weak. This means that weak heads can survive only in the presence of an element on which they can morpho-phonologically depend. In Japanese TACs, the *n* can only be present in the presence of *yori*, which obviously is phonologically non-null. Since the relevant operator movement takes place only when the covert nominal appears in the structure, Geis-ambiguity does not arise without *yori*. A question that remains here is why *mae* 'before' cannot host the weak head *n*, even though it is phonologically non-null. An answer to this is that the weak *n* can only be hosted by an element in the same extended projections of a lexical domain (cf. Grimshaw 1990, Bošković 2014). Note that *mae* 'before' in Japanese is nominal unlike English before; a case particle, which is generally attached to a noun, can be attached to *mae* (e.g., *mae-ga* 'before-NOM'). Given this, we suggest that *mae* and the weak *n* are in separate nominal domains. Recall that the weak *n* together with the null operator projects <N, N>, which is essentially a nominal phrase. *Mae* then constitutes another nominal domain. Thus, *mae* cannot be a host of the weak *n*. In contrast, *yori* is P, which can be a functional element in the extended projections of a nominal domain (see Grimshaw 1990, Baker 2003, Zanon 2020, Oda 2024b). Thus, *yori* can be in the same extended projections of, hence can host, the weak *n*.

Crosslinguistic Considerations

An important aspect of the above proposal is that TACs in Japanese essentially involve a comparative construction (cf. Miyamoto 1996), in which the weak head hosts and requires a null operator that is responsible for the Geis-ambiguity. A question to be asked now is whether this analysis can be extended to other languages. In this study, examining Basque, Polish, Serbian, Mandarin Chinese, Spanish, and Italian, we show that TACs that show the Geis-ambiguity exhibit some comparative flavor; they either (i) involve a comparative construction marked by the counterpart of *than* or (ii) employ a temporal connective which is etymologically related to comparative or ablative, the latter of which is occasionally used in comparatives (in lieu of 'than', e.g., Latin). The first type is well-represented by Basque, in which *aurretik/aitzin* 'before' does not allow the Geis-ambiguity, while *baino lehenago* 'earlier than' allows it. The most striking of the second type is Italian, where *prima* 'before', which originates from Latin *primus* 'first', disallows the Geis-ambiguity, whereas *dopo* 'after', which traces back to Latin *dē* 'from' + *post* 'after, back', allows it (it is also worth mentioning that *prima* is an adverb which requires *di* 'of' to take a nominal argument, while *dopo* is a postposition which can directly select a nominal complement). We thus conclude that the proposed analysis of TACs as comparatives combined with (1) is crosslinguistically applicable, which we take as supporting the proposal of "weakness" in syntax-PF mapping under the labeling theory in (1).

Selected References: Chomsky, N. 2015. Problems of projection: Extensions. In *Structures, strategies and beyond*, ed. by Elisa Di Domenico, Cornelia Hamann, and Simona Matteini, 3–16. **Larson, R. K. 1990.** Extraction and multiple selection in PP. *The Linguistic Review* 7:169–182. **Miyamoto, Y. 1996.** More on temporal adverbial clauses. In *UConn working papers in linguistics 7*, 185–197.