Feature-relativized Criterial Freezing

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This paper investigates motivations for criterial freezing: the ban on movement from a criterial position. Rizzi (2006) argues that criterial freezing is motivated by the duality of semantics and the economy condition on chain formation: a chain may only have one theta-role and one discourse property. On the other hand, Rizzi (2015) attributes criterial freezing to the labeling algorithm and the maximality principle. This paper's objective is twofold. First, I demonstrate that the labeling algorithm-based criterial freezing is only applicable to overt movement given the standard assumption that the labeling algorithm is only applicable to an element with phonological features. Second, I extend the semantic-based criterial freezing of Rizzi (2006) and argue that criterial freezing is sensitive to exhaustive satisfaction of criterial features; this feature-based criterial freezing accounts for the fact that an element with multiple criterial features may covertly move from one criterial position to another.

Keywords: criterial freezing, the labeling algorithm, covert movement, wh-*sae*

1. Introduction

Rizzi (2006, 2010, 2015) observes that an XP that has entered into a criterial relation with a discourse/scope-related functional head in the left periphery (e.g. TopP, FocP) cannot undergo further movement. This phenomenon is called criterial freezing.

(1) Criterial Freezing (Rizzi 2006: 112)

A phrase meeting a criterion is frozen in place.

Criterial freezing accounts for the illicit movement out of a criterial position, as illustrated in (2) and (3). Example (2) shows that a wh-phrase that has satisfied a Q(uestion)-criterion cannot move further to satisfy another Q-criterion. The contrast in (3a, b) demonstrates that in Italian a wh-phrase that has satisfied a Q-criterion may be focalized in the Q-criterial position, while a focalized wh-phrase that has satisfied a Q-criterion in the embedded CP cannot undergo focus movement to the matrix clause to satisfy a Foc(us)-criterion.

(2) *Which book does John wonder Bill read? (Rizzi 2006: 112)

(3) a. Mi domandavo quale RAGAZZA avessero scelto, non quale ragazzo.

I wondered which girl had chosen, not which boy

'I wondered which GIRL they had chosen, not which boy'

b. *Quale RAGAZZA mi domandavo ___ avessero scelto, non quale ragazzo.

which girl I wondered had chosen, not which boy

'Which GIRL I wondered they had chosen, not which boy' (Rizzi 2006: 113)

Criterial freezing is an elegant generalization that accounts for the ban on movement out of a criterial position, but a question arises as to what motivates criterial freezing. Rizzi (2006) argues that criterial freezing is an economy condition imposed on a chain that satisfies the duality of semantics: unique theta-role and unique scope-discourse marking. On the other hand, Rizzi (2015) argues that criterial freezing is deduced from the interaction of Chomsky's (2013) Labeling Algorithm (LA) with the maximality principle. In this paper, I argue that the LA-based criterial freezing and the semantic-based criterial freezing are both on the right track, and that they operate on different movement types; specifically, based on the widely but tacitly held assumption that copies with phonological features are only visible for the purposes of the application of the LA (Chomsky 2013, 2015), I argue that the LA-based criterial freezing (Rizzi 2015) operates only on overt movement, whereas the semantic-based criterial freezing (Rizzi 2006) operates on covert movement as well as overt movement. In other words, overt movement is restricted both by the LA-based criterial freezing and by the semantic-based criterial freezing, as shown in (4a), while covert movement is only restricted by the semantic-based criterial freezing, as shown in (4b).

(4) A hybrid theory of Criterial Freezing (CF)

a. *[XP_{α} [$_{\alpha}$ XP_{α} Y_{α} … <XP_{α}>]] (the LA-based CF & the semantic-based CF)

b. *[<$XP>_{\alpha}$ [$_{\alpha}$ <XP_{α}> Y_{α} ... XP_{α}]] (the semantic-based CF)

(where α = criterial feature; <XP> represents an unpronounced copy)

The difference in the coverage of the two proposals becomes clear when the moved element bears more than one criterial feature. I will show that the LA-based criterial freezing blocks movement of an element out of a criterial position that it has reached by overt movement. The pattern is schematized in (5a) and (5b); (5a) shows overt movement of an XP out of a criterial position that it has reached by overt movement, and (5b) shows covert movement of an XP out of a criterial position that it has reached by overt movement.[1] On the other hand, I will show that covert movement from a criterial position an element moves to by covert movement is possible when the moved element is endowed with more than one criterial feature, as schematized in (5c).[2]

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[1] Note that criterial freezing is a freezing phenomenon on a first criterial position. Hence, by saying that the LA-based criterial freezing only operates on overt movements, I assume that the LA-based criterial freezing bans any movement out of a criterial position that the element has reached by overt movement.

[2] Three reviewers raise a question whether the presence of multiple criterial features makes it possible to covertly subextract a phrase YP out of an element XP that has reached a criterial position by overt movement. (Note that the example (10) is covert movement, not subextraction, of XP out of a criterial position that it has reached by overt movement.) In this respect, it is important to note that criterial freezing as defined by Rizzi (2006, 2015) is operative on the element that undergoes movement to a criterial position, and it does not restrict subextraction out of the moved element. For instance, in contrast with (3b), (i) is marginally acceptable, where the subpart of the wh-phrase which has satisfied the Q-criterion is extracted and moves to the matrix CP domain.

(5) a. *[$_{\beta}$ $XP_{\alpha, \beta}$ Z_{β} [$_{\alpha}$ <$XP_{\alpha, \beta}$> Y_{α} … <$XP_{\alpha, \beta}$>]] (the LA-based CF)

b. * [$_{\beta}$ <$XP_{\alpha, \beta}$> Z_{β} [$_{\alpha}$ $XP_{\alpha, \beta}$ Y_{α} … <$XP_{\alpha, \beta}$>]] (the LA-based CF)

c. [$_{\beta}$<$XP_{\alpha, \beta}$> Z_{β} [$_{\alpha}$ <$XP_{\alpha, \beta}$> Y_{α} …$XP_{\alpha, \beta}$]] (the semantic-based CF)

(where α, β = criterial feature; <XP> represents an unpronounced copy)

Note here that Rizzi's (2006) semantic-based criterial freezing wrongly expects that all the patterns in (5) to be ungrammatical, as the chain contains more than one criterial position and violates the economy condition on a chain (i.e., one theta-position and one discourse-related position in a single chain). Hence, in order to accommodate the grammaticality of (5c), I modify Rizzi's (2006) semantic-based criterial freezing and propose that criterial freezing is sensitive to exhaustive satisfaction of criterial features; an XP with a single criterial feature cannot be related with multiple

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(i) ?[$_{CP}$ [Di quale autore]$_j$ C [ti domandi [$_{CP}$ [quanti libri t_j]$_i$ C [siano stati censurati t_i]]]]?

by which author you wonder how many books have been censored

'By which author do you wonder how many books have been censored?' (Rizzi 2006: 114)

Given that overt subextraction out of an overtly-moved element is not restricted by criterial freezing, it is expected that covert subextraction out of an overtly-moved element should be possible as well. Since I could not find the relevant data so far, I leave the research on covert subextraction out of an element that has reached a criterial position by overt movement for future research.

criterial positions (4b), whereas an XP with multiple criterial features may move from one criterial position to another (5c). Section 2 reviews Rizzi's (2015) LA-based criterial freezing and Rizzi's (2006) semantic-based criterial freezing, and further introduces some cases that are not accounted for under Rizzi's (2015, 2006) definition of criterial freezing. Based on these data, I argue that Rizzi's (2006) semantic-based criterial freezing is more suitably defined as the feature-based criterial freezing. Section 3 concludes the discussion.

2. A Hybrid Theory of Criterial Freezing

2.1 The LA-based Criterial Freezing

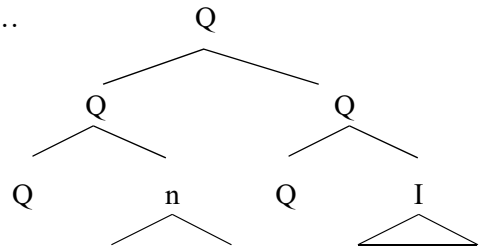
Rizzi (2015) argues that criterial freezing is deduced from the interaction of Chomsky's (2013, 2015) LA with the maximality principle. Chomsky argues that syntactic operations and interpretation at the interfaces require LA, which provides a proper label to a constituent formed by external merge/internal merge and makes the constituent visible for further computation. Specifically, Chomsky suggests the following LA: (i) Suppose SO = {H, XP}, H a head and XP not a head. Then the labeling algorithm will select H as the label. (ii) Suppose SO = {XP, YP}, neither a head. In this case, the most prominent feature shared by X and Y becomes the label.[3, 4] Chomsky

[3] Chomsky (2013) argues that SO={H, H}, both of which are heads, should be excluded from the syntactic computation, because such a constituent cannot be labeled.

states that the most prominent, shared feature should be an agreement feature, such as φ features or a Q feature. From this, it follows that a criterial feature α, which is an agreement feature between an A'-moved element XP_α and a criterial head in the left periphery C_α, serves as the label of $\{XP_\alpha, CP_\alpha\}$. In (6a), for example, the wh-phrase moves to the criterial Q-position in the embedded CP and the feature-sharing strategy of LA fixes the label of $[wh_Q, CP_Q]$ as Q, as schematized in (6b).

(6) a. *Which book does John wonder Bill read?

b. wonder…



(Rizzi 2015: 328)

Rizzi argues that in the configuration $Q = \{wh_Q, CP_Q\}$, the wh-phrase becomes non-maximal, as it is dominated by the element with the same label.[5]

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[4] Chomsky (2013) proposes another way of labeling SO={XP, YP}. He suggests that if either XP or YP moves, the remaining constituent becomes the label. This is a case of obligatory extraction out of small clause or successive-cyclic movement. Since I focus mainly on criterial positions, LA taken here is the feature-sharing method, and not the escaping method.

[5] Rizzi (2015) assumes that labeling takes place as soon as the conditions are met (that is, as soon as a criterial configuration is created), following Pesetsky's (1989) Earliness Principle.

(7) α is a maximal projection iff α is labeled, and the node immediately dominating α does not have the same label. (Rizzi 2015: 328)

He further argues that in this configuration, further movement of the wh-phrase is blocked because non-maximal projections cannot undergo any operation, including movement.

(8) Maximality Principle

Only maximal objects with a given label can be moved. (Rizzi 2015: 327)

Hence, the feature-sharing strategy of LA, in conjunction with the maximality principle, leads to the criterial freezing effect, as is schematized in (4a).

The LA-based criterial freezing predicts that no overt movement of an XP with more than one criterial feature should be possible from a criterial position that it has reached through overt movement, as the XP becomes non-maximal projection when it satisfies a criterion (see the schema (5a)). This is borne out in (3b), repeated as (9b). (9b) involves the overt movement of an XP with its Q-feature checked in the embedded clause, followed by further focus movement of the XP (see Rizzi 2015).

(9) a. Mi domandavo quale RAGAZZA avessero scelto, non quale ragazzo.

I wondered which girl had chosen, not which boy

'I wondered which GIRL they had chosen, not which boy'

b. *Quale RAGAZZA mi domandavo ___ avessero scelto, non quale ragazzo.

which girl I wondered had chosen, not which boy

'Which GIRL I wondered they had chosen, not which boy' (Rizzi 2006: 113)

The LA-based criterial freezing also restricts covert movement of an XP with multiple criterial features out of a position that it has reached by overt movement, as is schematized in (5b). This is because an element becomes a non-maximal projection once it moves to a criterial position, thereby it cannot undergo any further operation. Example (10), for instance, involves overt topic movement of *which problem* to the embedded clause, followed by covert wh-movement to the main clause.

(10) *Who thinks that which problem, Mary hates? (Bošković 2008: 254)

Here, *which problem* is endowed with a topic feature as well as a Q-feature. At the derivational point of the embedded CP, the labeling algorithm finds the label of {which problem$_{[Top, Q]}$, CP$_{[Top]}$} as [Top], leading *which problem* to become non-maximal by being dominated by the same label [Top]. This in turn makes it impossible for *which problem* to undergo any further operation, including covert wh-movement to the matrix clause.

In sum, the LA-based criterial freezing accounts for the following three patterns, where an element cannot move out of a criterial position that it has reached by overt movement.

(11) a. *[XP_{α} [$_{\alpha}$ <XP_{α}> Y_{α} … <XP_{α}>]] (=schema (4a), example (2))

b. *[$_{\beta}$ $XP_{\alpha,\beta}$ Z_{β} [$_{\alpha}$ <$XP_{\alpha,\beta}$> Y_{α} … <$XP_{\alpha,\beta}$>]] (=schema (5a), example (3b))

c. * [$_{\beta}$ <$XP_{\alpha,\beta}$> Z_{β} [$_{\alpha}$ $XP_{\alpha,\beta}$ Y_{α} … <$XP_{\alpha,\beta}$>]] (=schema (5b), example (10))

Note now that the standard but tacit assumption with LA is that only copies with phonological features are visible for the purposes of the application of LA (Chomsky 2013, 2015). Given the assumption that labeling is only related to elements with phonological features, the LA-based criterial freezing should be agnostic about covert elements; that is, it fails to block further movement of an XP that has reached a criterial position by covert movement. The next section, however, shows that an element cannot move further from a criterial position it has reached by covert movement, which indicates the existence of another type of criterial freezing.

2.2 The Semantic-based Criterial Freezing

Although covert movement does not obey the LA-based criterial freezing, an XP that has undergone covert movement to a criterial position may show the criterial freezing effect. Saito (2017) assumes that wh-elements in Japanese undergo covert movement to have their unvalued operator valued through the criterial agreement with the interrogative *–ka*. Consider the examples in (12). Example

(12a) shows that a clause headed by *ka*, a question marker, may yield a Yes－No question reading. Example (12b), on the other hand, shows that *ka* may be associated with a wh-phrase that has undergone covert wh-movement to its specifier. (12b) also manifests that the covert movement may be long-distance. The crucial example is (12c), where a wh-phrase cannot move to the secondly-embedded interrogative clause, passing by the most embedded interrogative clause headed by *ka* (Nishigauchi 1990). Saito (2017) argues that the absence of higher *wh*-interrogative reading is the manifestation of criterial freezing.[6]

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[6] A reviewer points out the possibility that the relationship between the interrogative C and a wh-phrase in examples like (12b, c) is accomplished by Agree operation, not covert movement (see Watanabe 2006, Bošković 2007). The reviewer suggests that under the Agree-based account, the ungrammaticality of (12c) is an instance of the intervention effect induced by the embedded C_Q. In a similar vein, Luigi Rizzi (personal communication) suggests the possibility of overt null interrogative operator movement in Japanese (Watanabe 1992). Under the null operator-approach, covert wh-movement of an XP out of a criterial position is in fact overt subextraction of a null interrogative operator out of the XP that has satisfied a criterion. Under the assumption, the ungrammaticality of (12c) should receive another kind of explanation because criterial freezing does not restrict subextraction out of an element which has satisfied a criterion (see note 1). Although the two approaches, the Agree-based approach and the null operator-movement approach, are worth considering, there is at least one phenomenon that is not straightforwardly accounted for under the two approaches: long-distance binding of *zibun-zisin* 'oneself'. First, as (ia) shows, an anaphoric

expression such as *himself* in English must find a local binder. If the anaphoric expression is moved as a part of a wh-phrase, as in (ib), the anaphor may be bound by the matrix subject.

(i) a. John$_i$ thinks that Bill$_j$ saw a picture of himself$_{*i/j}$.

b. John$_i$ wondered which picture of himself$_{i/j}$ Bill$_j$ saw. (Chomsky 1995: 205)

Morita (2009) shows that the same kind of contrast is observed in Japanese; although the long-distance construal of the anaphoric expression *zibun-zisin* 'oneself' is degraded in (iia), long-distance binding becomes totally acceptable when the anaphor is included within the wh-phrase, as shown in (iib).

(ii) a. John$_i$-wa [musume$_j$-ga zibun-zisin$_{?i/j}$-no syasin-o kiratteiru to] omotteiru.
John-TOP daughter-NOM oneself-GEN picture-ACC dislike C think
'John thinks that his daughter dislikes the picture of ?himself/herself.'

b. John$_i$-wa [musume$_j$-ga [dotira-no zibun-zisin$_{i/j}$-no syasin-o] kiratteiru ka]
John-TOP daughter-NOM which-GEN oneself-GEN picture-ACC dislike Q
siritagatteiru.
want.to.know
'John wants to know which picture of himself/herself his daughter dislikes.'

(Morita 2009: 390)

(12) a. [[Hanako-ga sono toki [[Taroo-ga kuru] to] itta] ka] osiete kudasai.

Hanako-NOM that time Taro-NOM come C said Q teach please

'Please tell me if Hanako said then that Taro was coming.'

b. [[Hanako-ga sono toki [[dare-ga kuru] to] itta] ka] osiete kudasai.

Hanako-NOM that time who-NOM come C said Q teach please

'Please tell me who Hanako said then was coming.'

c. [[Hanako-ga sono toki [[dare-ga kuru] ka] tazuneta] ka] osiete kudasai.

Hanako-NOM that time who-NOM come Q asked Q teach please

A. Please tell me if Hanako asked then who was coming.

B. ??Please tell me who Hanako asked then if she/he is coming. (Saito 2017: 2)

To make a picture clearer, let us consider Yoshida's (1999, 2016) observation that the sentence-final particle *no kai* is only compatible with Yes-No question reading, while *n dai* is only compatible with wh-interrogative reading. I interpret this as an indication that the *n dai* complementizer must be merged with a wh-phrase that has reached CP by covert movement.

Morita argues that the long-distance binding of (iib) is accounted for along the same line as (ib), if we adopt the covert movement approach to wh-phrases in Japanese. Following Morita (2009) and Saito (2017), I assume that wh-phrases in Japanese undergo covert movement.

(13) a. John-ga kita no kai?
John-NOM came C Q
'Did John come?'

b. *Dare-ga kita no kai?
who-NOM came C Q
'Who came?' (Yoshida 2016: 59)

(14) a. *John-ga kita n dai?
John-NOM came C Q
'Did John come?'

b. Dare-ga kita n dai?
who-NOM came C Q
'Who came?' (Yoshida 2016: 59)

Given that the particle *n dai* must be related to a wh-phrase, the ungrammaticality of (15b) shows that the wh-phrase cannot undergo covert long-distance movement to the matrix clause, passing by the embedded interrogative clause. Hence, (15b) counts as another piece of evidence for criterial freezing.

(15) a. John-wa [Mary-ga nani-o katta ka] sitteiru no kai?
John-TOP Mary-NOM what-ACC bought Q know C Q
'Did John know what Mary bought?'

b. * John-wa [Mary-ga nani-o katta ka] sitteiru n dai?
John-TOP Mary-NOM what-ACC bought Q know C Q
'What did John know whether Mary bought?' (Yoshida 2016: 60)

I assume that criterial freezing in (12c) and (15b), which is operative on covert movement, is motivated by the syntax-semantics interface, as proposed by Rizzi (2006). This is schematized in (4b), repeated as (16).

(16) *[<XP>$_\alpha$ [$_\alpha$ <XP$_\alpha$> Y$_\alpha$ ... XP$_\alpha$]] (the semantic-based CF)

First, Rizzi (2006: 100) assumes that movement is a last-resort operation: movement takes place to satisfy some interface requirement. Rizzi then argues that "criterial freezing is an economy condition that contributes to minimizing movement and determines optimally simple chains with unique occurrences of the fundamental ingredients: unique theta-role (or s-selection licensing), unique scope-discourse marking and so on (Rizzi 2006: 112)." Under this semantic-based criterial freezing as advocated by Rizzi (2006), the chains in (12c) and (15b) are illicit because they violate the economy condition on a chain by holding occurrences in multiple criterial positions.

Under Rizzi's (2006) semantic-based criterial freezing, it is further expected that an element with more than one criterial feature cannot covertly move out of a criterial position that it has reached by covert movement, as the resulting chain would contain occurrences in multiple discourse-related positions. However, as will be shown in the next section, this expectation is not borne out; covert movement of an element out of a criterial position that it has reached by covert movement is allowed when the element is endowed with multiple criterial features, as schematized in (5c), repeated as (17).

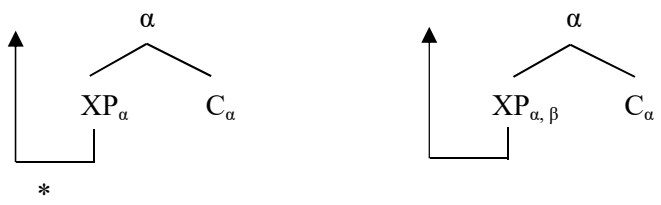
(17) $[_{\beta}<XP_{\alpha,\beta}>\ Z_{\beta}\quad [_{\alpha}<XP_{\alpha,\beta}>\ Y_{\alpha}\ \ldots XP_{\alpha,\beta}]]$ (the semantic-based CF)

In order to accommodate such data, I will modify Rizzi's (2006) semantic-based criterial freezing, and argues that the semantic-based criterial freezing is not sensitive to the economy condition on a chain, but it is sensitive to exhaustive satisfaction of criterial features of a moved element.

2.3 Feature-relativized Criterial Freezing

I argue that the semantic-based criterial freezing must conform to optimal yet exhaustive satisfaction of criterial features (the feature-relativized criterial freezing); when an element XP has one criterial feature and satisfies a criterion in the left periphery, it has no motivation to move further for the purposes of LF-convergence, as schematized in (18a). Hence, such a covert movement is blocked as illustrated in (12c) and (15b). On the other hand, when an XP that has reached a criterial position by covert movement is endowed with more features than C in a criterial configuration, the element may move further to satisfy another criterial feature, as schematized in (18b). In the following, I argue that wh-*sae* 'wh-at.least' in Japanese serves as a supporting evidence for the derivation in (18b).

(18) a. $[XP_{\alpha}, C_{\alpha}]$ b. $[XP_{\alpha,\beta}, C_{\alpha}]$



Following Numata (2000), Kusumoto (2001) assumes that the uses of *sae* may be divided into two types: *sae* which corresponds to 'even' in English (19a) and *sae* with the meaning of minimum requirement 'at least' (19b).

(19) a. Taroo-sae sono party-ni kita.
Taro-even the party-DAT came
'Even Taro came to the party.'

b. [Taroo-sae kure-ba], sono party-wa moriagaru daroo.
Taro-at.least come-if the party-TOP fun will
'If at least Taro comes, the party will be fun.' (Kusumoto 2001: 1)

Based on the fact that *sae* 'at least' occurs only in conditional clauses, Kusumoto argues that DP(PP)-*sae* 'at least DP(PP)' is licensed by C headed by *(re)ba*/*tara* 'if' by means of syntactic covert movement to Spec, CP. This analysis is supported by the fact that *sae*-licensing may be long-distance, as shown in (20), and yet the licensing is island-sensitive, as in (21).

(20) [Taroo-ga [Ziroo-ni [nomimono-sae kattekuru yooni] iu no-o] oboeteoke ba],

Taro-NOM Jiro-DAT drink-at.least buy C tell C-ACC remember if],

hokanomono-wa kondodemo yoi.

other.things-TOP at.another.time good

'If Taro remembers to tell Jiro to buy drinks, other things can be prepared at another time.'

(Kusumoto 2001: 7)

(21) ??[Taroo-ga Hanako-ni [[medamasyoohin-sae nakunatta] zizitu]-o hanase ba],

Taro-NOM Hanako-DAT bargain-at.least sold.out fact-ACC tell if

moo sono mise-ni iku koto-wa nai daroo.

anymore the store-DAT go fact-TOP never will

'If Taro tells Hanako that the bargain item is sold out, she will never go to the store.'

(Kusumoto 2001: 9)

Following Kusumoto, I assume that an XP-*sae* undergoes covert movement to CP to have its *sae*-feature licensed. I also adopt Saito's (2017) assumption that wh-elements in Japanese undergo covert movement to CP. With these analyses in mind, the grammaticality of (22a) is telling. Here, *nani-sae* 'what-at.least' possesses two criterial features: [sae, Q], thereby wh-*sae* undergoes covert movement to the embedded conditional CP before it further moves to the matrix Q-position, which would be erroneously blocked by the definition of criterial freezing à la Rizzi (2006/2015).

(22) a. [Kenta-wa [nani-sae tabere ba] yorokobu no]?

Kenta-TOP what-at.least eat if glad Q

'What is it that Kenta is glad if he at least eats?'

b. Yuki-wa [[Kenta-ga nani-sae tabeta ka] wakare ba] manzoku desu.

Yuki-TOP Kenta-NOM what-at.least ate Q know if satisfied is

'Yuki is satisfied if she knows what Kenta at least ate.'

On the other hand, the feature-based criterial freezing accounts for the grammaticality of (22a). Given that syntactic derivation should yield licit representation for the semantic interface, the presence of multiple criterial features allows, in fact forces, movement from a criterial position; wh-*sae*$_{[sae, Q]}$ first undergoes covert movement to satisfy *sae*-criterion in the embedded conditional clause, and then it undergoes further covert movement to the Q-criterial position in the matrix clause, satisfying the Q-criterion. The same analysis holds true for the example in (22b) where the order of the two heads is reversed. Note that movements in (22) are not constrained by the LA-based criterial freezing, as they are purely covert movements and irrelevant to labeling.[7]

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[7] A reviewer asks why we need an LA-based criterial freezing for overt movement, given the assumption that the semantic-based criterial freezing in principle operates both on overt and covert movements. Although such unification is simpler and more desirable under the Minimalist Program, the feature-based criterial freezing cannot account for the patterns in (5a) and (5b): ban on movement of an XP with multiple criterial features out of a criterial position that it has reached by

3. Conclusion

The proposed theory has shown two different motivations for criterial freezing – labeling and exhaustive feature satisfaction. Given that the phonological component can only "see" phonologically visible materials and that labeling is optimally required for phonological interpretation (as well as it is for the semantic interpretation), it follows that LA can make recourse to only overt movement, hereby deducing the LA-based criterial freezing strictly from PF requirements (see also Takita 2018 for the proposal to label exclusively for the phonological interface). By contrast, the exhaustive satisfaction of the criterial features is required by LF convergence; if an XP has one criterial feature, then the standard criterial freezing effect is obtained. If an XP has two criterial features, it must satisfy both at the cost of "non-criterial freezing-compliant" movement. Under the Minimalist Program, it is assumed that core operations in syntax is restricted to agreement and merge, which are regulated by the third factor like Minimal Search and restrictions by the interfaces. The dualistic interface-based definition of criterial freezing proposed in this paper meets such central minimalist desiderata by proposing that criterial freezing is a hybrid outcome of the conditions on internal merge, which optimally conforms to both the phonological and semantic interfaces.

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overt movement. Hence, in order to rule out examples like (9b) and (10), we need the LA-based criterial freezing.

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