Last Resort Movement in *Wh*-questions

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1. Introduction

In Phase Theory (Chomsky 1999, 2000, 2001, 2006), different portions of a derivation are sent to Spell-Out at different times. Once a phrase is sent to Spell-Out, its contents can no longer be accessed by higher operations. Thus, an element contained within a phrase that has been sent to Spell-Out cannot move to a higher phrase. *Wh*-movement poses a problem, since a *wh*-phrase must move out of a phrase before that phrase is sent to Spell-Out. In this paper, I present a new account of *wh*-question formation that resolves some problems posed by the typical Phase Theory account of *wh*-movement and I demonstrate how this account successfully derives *wh*-questions in English and Japanese.

In Phase Theory, a derivation proceeds via selection and Merge of Lexical Items (LIs) from a numeration, which contains subnumerations that correspond to phases or to phrases (subjects or adjuncts) that must be formed outside the main spine of a derivation (cf. Johnson 2002). A probe in the head of a projection can Agree with a goal in a lower projection, as long as the goal is accessible. According to the Phase Impenetrability Condition (PIC), when the head of a (strong) phase head is Merged, the complement of the lower strong phase (Chomsky 2001) is sent to Spell-Out.[1] Thus, in (1), when C is Merged, the VP, which is the complement of the lower phase head *v** is sent to Spell-Out.

(1) $[_{CP}$ C $[v$*P v* $[_{VP}$ V $]]]$

Wh-movement poses a problem for this view. In (2), when C is Merged, C cannot attract the *wh*-phrase *what* from within the VP since the VP has been sent to Spell-Out.

[1] In the original formulation of the PIC (Chomsky 1999, 2000), the complement of a phase head is sent to Spell-Out when a phase head is Merged. See Grewendorf & Kremers (2009) for discussion of the different versions of the PIC.

(2) [$_{CP}$ C [*v**P *v** [$_{VP}$ V what]]]

To get around this problem, Chomsky (1999) suggests that a phase head can optionally have an EPP feature that attracts a *wh*-phrase. This accounts for successive cyclic *wh*-movement. In (3), an EPP feature in *v** attracts the *wh*-phrase *what* to the *v**P edge, from where it can be attracted by the EPP feature in C.

(3) [$_{CP}$ What C$_{[EPP]}$ … ~~what~~ *v**$_{[EPP]}$ … V ~~what~~]

However, this creates a 'look ahead' problem (cf. Felser 2004). Consider (4a), with the structure in (4b).

(4) (a) What did you think that Bob thought Mary ate?
(b) [$_{CP}$ what C$_{[EPP]}$+[$_{T}$did] you ~~T~~ [$_{v*P}$ ~~what~~ ~~you~~ *v**$_{[EPP]}$ think [$_{CP}$ ~~what~~ that$_{[EPP]}$ Bob T [$_{v*P}$ what ~~Bob~~ *v**$_{[EPP]}$ thought [$_{CP}$ ~~what~~ C$_{[EPP]}$ Mary T [$_{v*P}$ ~~what~~ ~~Mary~~ *v**$_{[EPP]}$ ate ~~what~~]]]]]]

Six phase heads must have EPP features to bring the *wh*-phrase to its scope position. In this example, five EPP features occur in non-interrogative phase heads, and these EPP features appear to exist simply for the purpose of bringing a *wh*-phrase to its scope position. However, it is not clear how each phase head can 'know' that it requires an EPP feature. Furthermore, note how the intervening *v** phase heads have specifiers (subjects) in addition to having an EPP feature that somehow attracts a *wh*-phrase. It is not clear why a subject in specifier position of *v** would not simply eliminate the EPP feature, which would mean that there should be no EPP feature to attract a *wh*-phrase.

In this paper, I do away with the stipulation that there can be optional EPP features that exist simply for the purpose of bringing a *wh*-phrase to a scope position. Instead, I propose that movement of a *wh*-phrase is the result of a process in which a *wh*-phrase with an unvalued feature is reinserted into a numeration as a Last Resort, as a means of avoiding linearization of a phrase that contains an unvalued feature. Once reinserted in a subnumeration, a *wh*-phrase can be re-Merged into a derivation. I demonstrate how this analysis accounts for *wh*-question formation in English and Japanese.

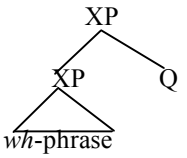
The organization of this paper is as follows. In section 2, I present the details of my proposals. In section 3, I demonstrate how these proposals account

for *wh*-question formation in English, and in section 4, I demonstrate how they account for *wh*-question formation in Japanese. Section 5 discusses the formation of *wh*-questions with subject *wh*-phrases and section 6 is the conclusion.

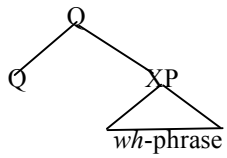
2. Proposals

I follow the Q-movement analysis of *wh*-constructions proposed by Cable (2007), which follows work by Hagstrom (1998) and Kishimoto (2005). Cable demonstrates, based primarily on data from the language Tlingit, that C attracts a Q element, and not a *wh*-phrase. Q, depending, on the language, may be adjoined to a wh-phrase (5a), or a *wh*-phrase may be the complement of Q (5b).

(5) (a)



(b)



Cable takes the position that an interrogative C has an uninterpretable Q-feature that probes for Q, which has an interpretable Q-feature. When the probe C and the goal Q successfully establish an Agree relation, the uninterpretable Q-feature on C is eliminated and Agree triggers movement of Q, which Cable argues moves overtly in languages such as Japanese and English.[2] Under this view, in a language with a Q/*wh*- structure of type (5a), Q is able to undergo movement by itself, since it originates in an adjoined position. In a language with a Q/*wh*-structure structure of type (5b), when Q moves, it brings its *wh*-phrase complement.

Cable attempts to show that Tlingit is a language with a Q*wh*-phrase structure of the form in (5b). Evidence is that in Tlingit, there is overt *wh*-movement to the CP domain, a *wh*-phrase is the complement of Q, and C attracts Q (not a *wh*-phrase). Important evidence that C attracts Q is that Q cannot appear in an island, but a *wh*-phrase can. This fact is accounted for straightforwardly if C attracts Q, and attraction is blocked by an island, but C

[2] According to Cable, Q can also move covertly, as is usually the case in Sinhala.

does not attract a *wh*-phrase. Thus it does not matter if a *wh*-phrase is contained within an island.

In this paper, I assume the Q/*wh*-phrase structure proposed by Cable, although I take a modified approach to the relation between C and Q. Specifically, I propose that C contains an unvalued Type feature '[Typ:_]' and a valued Scope feature '[Scp:X]', and Q contains a corresponding valued '[Typ:Q]' and an unvalued Scope feature '[Scp:_]'. The symbol ":_" indicates a feature that lacks a value. In a *wh*-question, at least in some languages, there is initially a configuration (6a), in which there is a C with an unvalued Type feature and valued Scope feature and a Q with a valued Type feature and unvalued scope feature. C and Q form an Agree relation, whereby the valued '[Typ:Q]' of Q values the unvalued corresponding '[Typ:_]' of C and the valued '[Scp:X]' of C values the corresponding unvalued '[Scp:_]' of Q, resulting in a (6b) in which the unvalued features from (6a) are valued.

(6) (a) $C_{[Typ:\_,Scp:X]}$ …. $Q_{[Typ:Q,Scp:\_]}$ (b) $C_{[Typ:Q,Scp:X]}$ …. $Q_{[Typ:Q,Scp:X]}$

I assume that C is the locus of clausal typing,[3] and comes with a Type feature, based on the fact that in certain languages, there are a variety of clausal typing particles that appear to determine clause type, and that appear to establish a relationship with the CP. For example, Sinhala (Sumangala 1992) contains several particles that determine clause type and that can occur in the clause periphery. Among them are the particles *də* 'Q', *tamay* 'certainty', *lu* 'reportative', *nee* 'Tag-Q', and *yae* 'dubitative' (Sumangala 1992:131). This fact can be accounted for if these particles value a clausal typing feature in C.[4] I also assume that an interrogative C has a Scope feature because C is a position that is generally associated with scope; for example see May (1985).

Under this analysis of *wh*-questions, English is a language with a Q/*wh*-phrase structure of the type (6b) in which a *wh*-phrase is the complement of Q. When Q moves, it brings its *wh*-phrase complement with it, thereby resulting in *wh*-movement. Japanese is a language with a Q/*wh*-phrase structure of type (6a). Q is base generated in a position adjoined to a *wh*-phrase. Since Q is in an adjoined position, it can move without bringing its associated *wh*-phrase along.

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[3] See Katz & Postal (1964), Chomsky & Lasnik (1977), and Aoun & Li (1993) for proposals that clausal typing occurs in the CP.

[4] See Ginsburg (2009) for further discussion.

In addition, I propose that the human grammar module makes available a process of Last Resort (7),[5] akin to that proposed by Chomsky (1995), whereby a derivation can be saved in certain specific situations.

(7) Last Resort: When an LI with an unvalued feature is contained within a phrase that is about to be sent to Spell-Out, if possible, the LI is reinserted into a subnumeration.

Assume that in (8), X and Y are phase heads and α is an LI with an unvalued feature (a feature that needs to be valued by forming an Agree relation with a matching valued feature). Initially, the Y phase is constructed from a subnumeration. The LI α is selected and Merged within Y. Then the X phase is constructed from a higher subnumeration. When X is Merged, the phrase containing α will be sent to Spell-Out. Since α has an unvalued feature, the Last Resort process applies. The LI α leaves a copy in its base position (signified by the line through α) and it is reinserted into the higher subnumeration. It then can be selected and re-Merged into the derivation at the edge of the higher X phase.

(8) Last Resort: [X α… [Y…~~α~~…]]

I propose that *wh*-movement, at least in certain instances, is the result of this Last Resort process. A Q morpheme has an unvalued feature, '[Scp:_]'. Thus, when Q is contained within a phrase that is about to be sent to Spell-Out, it will undergo a process of Last Resort reinsertion into a higher subnumeration. As a result, it can be selected and re-Merged into a derivation. As I will demonstrate in the following sections, this process accounts for *wh*-movement without the need to postulate an optional EPP feature in a non-interrogative phase head.

According to the Phase Impenetrability Condition, the complement of a phase head is sent to Spell-Out separately from a phase head (see section 1). However, the Last Resort process (7) does away with the need to stipulate separate Spell-Out domains for a phase complement and a phase edge, since an LI can 'move' out of a phase via the Last Resort process of reinsertion into a subnumeration. In this paper, I will utilize a revised view of the Phase Impenetrability Condition, given in (9).

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[5] I thank Sandiway Fong, with whom I developed this idea of Last Resort. Any problems with this idea are my own.

(9) Spell-Out applies in the following situations:
(a) When a phase head is Merged, a lower phase, if present, is sent to Spell-Out.
(b) A numeration is emptied.

According to (9a), in (8) above, when phase head X is Merged, the entire Y phase is sent to Spell-Out. According to (9b), Spell-Out also must apply when a numeration is emptied.

My main proposals are summarized as follows. I follow Cable's (2007) view of *wh*-phrases as having an associated Q element. In a *wh*-in-situ language, the Q/*wh*-phrase has the structure in (5a) and in a *wh*-movement language, the Q/*wh*-phrase has the structure in (5b). Q must form an Agree relation with C that results in the valuation of an unvalued Type feature on C and an unvalued Scope feature on Q. Furthermore, there is a process of Last Resort (7) that the grammar module makes available, whereby an element with an unvalued feature can be reinserted into a subnumeration just before the phrase that it is contained in is to be sent to Spell-Out. Lastly, I proposed that an entire phase is sent to Spell-Out as a single unit (9). I next demonstrate how these proposals account straightforwardly for the structures of *wh*-questions in English and Japanese.

3. English *wh*-questions

English is a *wh*-movement language. Following the discussion of the last section, the English *wh*-phrase has the structure (5b) above, in which a *wh*-phrase is a complement of Q. When Q moves, it brings its complement *wh*-phrase with it.

The proposals of the previous section account for a *wh*-question such as (10) as follows.

(10) What did John buy?

Assuming that each phase begins with its own subnumeration, the underlying subnumeration of the *v**P of (10) is given in (11). I assume that the subject 'John' has its own embedded subnumeration, since subjects and adjuncts must be formed outside the main spine of a derivation (cf. Johnson 2002). Crucially, Q contains a valued '[Typ:Q]' feature and an unvalued '[Scp:_]' feature. The

initial Merged *v**P (with irrelevant details omitted) is shown in (11b).[6] Note that the *wh*-phrase *what* is the complement of Q, which is the head of a QP phrase.

(11) (a) Subnumeration: {*v**, buy, {John}, $Q_{[Typ:Q,Scp:\_]}$, what}
(b) [$_{v*P}$ John *v** buy [$_{QP}Q_{[Typ:Q,Scp:\_]}$ what]]

Once the *v**P subnumeration is emptied, the next subnumeration is that of the CP, shown in (12a). T and C, with an unvalued '[Typ:_]' feature and a valued '[Scp:X]' feature, are selected and Merged, resulting in (12b).

(12) (a) Subnumeration: {T, $C_{[Typ:\_,Scp:X]}$}
(b) [$C_{[Typ:\_,Scp:X]}$ John T [$_{v*P}$ ~~John~~ *v** buy [$_{QP}$ $Q_{[Typ:Q,Scp:\_]}$ what]]]

As soon as C is Merged, according to (9), the lower *v**P phase will be sent to Spell-Out. However, this phrase contains Q, which has an unvalued Scope feature '[Scp:_]'. Thus, the Last Resort operation (7) applies and the QP is reinserted into the current subnumeration, as shown in (13a). Crucially, Q carries its complement *wh*-phrase with it. The Spell-Out operation then linearizes the *v**P, which now contains a copy of the QP, signified by the strike-through line, as shown in (13b). Since the QP has been reinserted into the subnumeration, it is selected and Merged directly in the scopal C. When Merged, there is an Agree relation established between C and Q. The '[Typ:_]' feature of C is valued by the '[Typ:Q]' of Q, resulting in '[Typ:Q]' on C, and the '[Scp:_]' on Q is valued by the '[Scp:X]' on C, resulting in '[Scp:X]' on Q.[7]

(13) (a) Subnumeration (Last Resort): {[$_{QP}Q_{[Typ:Q,Scp:\_]}$ what]}
(b) [$_{CP}$ [$_{QP}Q_{[Typ:Q,Scp:X]}$ what] $C_{[Typ:Q,Scp:X]}$+[$_{T}$did] John ~~T~~ [$_{v*P}$ ~~John~~ *v** buy ~~[$_{QP}Q_{[Typ:Q,Scp:\_]}$ what]~~]]

A tree of the final structure of this question is shown in (14).

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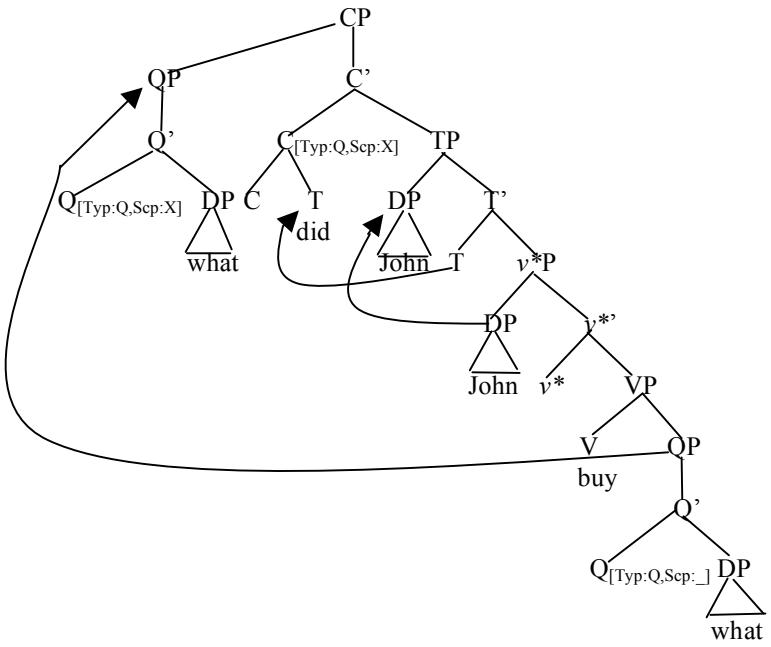
[6] For the sake of simplicity, I have represented the *v**P as having linear order, but in Phase Theory, this structure is not linearized until it is sent to Spell-Out.
[7] T raises to C, resulting in pronunciation of 'did'. I leave aside the issue of why T moves to C, but see Pesetsky & Torrego (2000). Also see Bobaljik (1994) for discussion of T to C movement in English subject *wh*-questions.

(14)



This analysis can also account for cases of long distance *wh*-movement, as in (15).

(15) What did you think that Bob thought Mary ate?

The derivation of the lower CP is shown in (16). The subnumeration (16a) forms the lower *v**P (16b), in which the QP is Merged in object position. Then T and C are Merged, resulting in (16d). After Merge of C, at the point at which the lower *v**P phase is about to be sent to Spell-Out, the Last Resort process (7) applies and the QP is reinserted into the subnumeration (16e). Then, as shown in (16f), I propose that the QP is re-Merged in an adjoined position at the CP edge. Although the QP does not undergo a feature valuation with the non-interrogative C, the QP must be selected out of a need to empty out a numeration.

(16) (a) Subnumeration: {*v**, ate, {Mary}, $Q_{[Typ:Q,Scp:\_]}$, what}

(b) [$_{v*P}$ Mary v* ate [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]]
(c) Subnumeration: {T, C}
(d) [C Mary T [$_{v*P}$ ~~Mary~~ v* ate [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]]]
(e) Subnumeration (Last Resort): {[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]}
(f) [$_{CP}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] C Mary T [$_{v*P}$$v$* ~~Mary~~ ate ~~[$_{QP}Q_{[Typ:Q,Scp:_]}$ what]~~]]]

The derivation of the next higher v*P is shown in (17). After v* is Merged (17b), the lower CP will be sent to Spell-Out. Thus, the Last Resort operation again applies and the QP, which still has an unvalued '[Scp:_]' feature is reinserted into the subnumeration (17c). Then it is re-Merged in an adjoined position at the v*P edge (17d).

(17) (a) Subnumeration: {v*, {Bob}, thought}
(b) [$_{v*P}$ v* Bob thought [$_{CP}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] C Mary T [$_{v*P}$$v$* ~~Mary~~ ate ~~[$_{QP}Q_{[Typ:Q,Scp:_]}$ what]~~]]]
(c) Subnumeration (Last Resort): {[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]}
(d) [$_{v*P}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] Bob v* thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$$v$* ~~Mary~~ ate ~~[$_{QP}Q_{[Typ:Q,Scp:_]}$ what]~~]]]

(18) shows the derivation up to the next higher CP. When C, pronounced as *that*, is Merged, the lower v*P will be sent to Spell-Out. Thus, the Last Resort process applies (18c), and the QP is again re-Merged in an adjoined position at the CP edge (18d).

(18) (a) Subnumeration: {T, that}
(b) [that Bob T [$_{v*P}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] ~~Bob~~ v* thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$$v$* ~~Mary~~ ate ~~[$_{QP}Q_{[Typ:Q,Scp:_]}$ what]~~]]]]
(c) Subnumeration (Last Resort): {[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]}
(d) [$_{CP}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] that Bob T [$_{v*P}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ ~~Bob~~ v* thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$$v$* ~~Mary~~ ate ~~[$_{QP}Q_{[Typ:Q,Scp:_]}$ what]~~]]]]

The matrix v*P is shown in (19). When v* is Merged, the QP undergoes Last Resort reinsertion into the subnumeration, and it is selected and re-Merged at the v*P edge (19d).

(19) (a) Subnumeration: {*v**,{you}, think}
(b) [$_{v*P}$ you *v** think [$_{CP}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] that Bob T [$_{v*P}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ ~~Bob~~ *v** thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$*v** ~~Mary~~ ate ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~]]]]]
(c) Subnumeration (Last Resort): {[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]}
(d) [$_{v*P}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] you *v** think [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ that Bob T [$_{v*P}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] ~~Bob~~ *v** thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$*v** ~~Mary~~ ate ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~]]]]]

The final stage of the derivation is shown in (20). When the interrogative C is Merged, the QP undergoes Last Resort reinsertion into the subnumeration. Then it is selected and re-Merged at the matrix CP edge. In this case, it is now in a local relation with the interrogative C, and thus a feature checking Agree relation is established, whereby the Type and Scope features of C and Q are valued.

(20) (a) {T, C$_{[Typ:_,Scp:X]}$}
(b) [C$_{[Typ:_,Scp:X]}$ you T [$_{v*P}$ [$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what] ~~you~~ *v** think [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ that Bob T [$_{v*P}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ ~~Bob~~ *v** thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$*v** ~~Mary~~ ate ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~]]]]]]
(c) Subnumeration (Last Resort): {[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]}
(d) [$_{CP}$ [$_{QP}$Q$_{[Typ:Q,Scp:X]}$ what] C$_{[Typ:Q,Scp:X]}$+[$_{T}$do] you ~~T~~ [$_{v*P}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ ~~you~~ *v** think [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ that Bob T [$_{v*P}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ ~~Bob~~ *v** thought [$_{CP}$ ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~ C Mary T [$_{v*P}$*v** ~~Mary~~ ate ~~[$_{QP}$Q$_{[Typ:Q,Scp:_]}$ what]~~]]]]]]

In this manner, successive cyclic *wh*-movement results from multiple applications of the Last Resort operation. A *wh*-phrase (actually a QP) 'moves' through non-interrogative phase edges, but this movement is not motivated by an EPP feature.

In this manner, in certain English *wh*-questions, *wh*-movement is the result of the Last Resort process (7), which can carry a *wh*-phrase to a scopal interrogative C.

4. Japanese *wh*-questions

This analysis also accounts for Japanese *wh*-questions such as (21).

(21) Taro-ga nani-o kai-mashita ka?
Taro-NOM what-ACC bought-PAST Q
'What did Taro buy?'

Crucially, the Japanese *wh*-phrase has the structure in (5a) above in which Q is adjoined to a *wh*-phrase. Thus, when Q moves it does not bring its associated *wh*-phrase with it.

The derivation of (21) proceeds as follows. (22a) shows the subnumeration of the *v**P and (22b) shows the resulting Merged *v**P. Note that *ka* 'Q' is adjoined to the *wh*-phrase *nani* 'what'. The Q particle *ka* contains a valued Type feature '[Typ:Q]' and an unvalued Scope feature '[Scp:_]'.[8]

(22) (a) Subnumeration: {*v**, {Taro}, nani, $ka_{[Typ:Q,Scp:\_]}$, kai-}
(b) [$_{v*P}$ Taro [$_{DP}$[$_{DP}$nani] $ka_{[Typ:Q,Scp:\_]}$]-o kai *v**]

The subnumeration for the matrix CP is shown in (23a), where *–mashita* 'Past' is a T head. The result after Merge of T and C is shown in (23b). I assume, following Miyagawa (2001), that an EPP feature in T attracts the subject. As in English, C contains an unvalued '[Typ:_]' feature and a valued Scope feature '[Scp:X]'.

(23) (a) Subnumeration: {-mashita, $C_{[Typ:\_,Scp:X]}$}
(b) [Taro-ga [$_{v*P}$ ~~Taro-ga~~ *v**[$_{DP}$[$_{DP}$nani] $ka_{[Typ:Q,Scp:\_]}$]-o kai *v**] -mashita $C_{[Typ:\_,Scp:X]}$]

As soon as C is Merged, the lower *v**P will be sent to Spell-Out, in accord with (9). Thus, the Last Resort operation applies. Since, *ka* 'Q' contains an unvalued feature, '[Scp:_]', *ka* is reinserted into the subnumeration (24a). Then it is selected and re-Merged into the derivation (24b). It Merges with the C head and

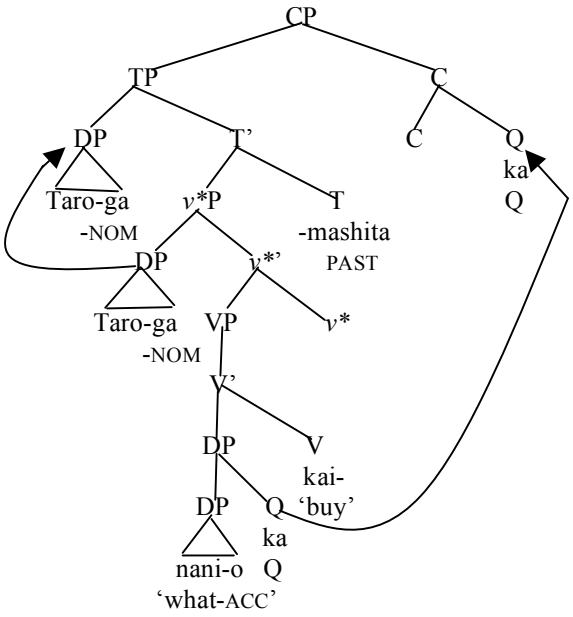
[8] I assume that the Case particles appear after Case assignment. In (22b), the object *nani* 'what' gets Case from *v**, and thus the object appears with the accusative Case particle *–o*. The subject *Taro* does not have Case until after T is Merged, and thus it does not appear with the nominative Case particle *–ga* until later in the derivation.

a feature checking relation between C and *ka* values the unvalued Scope and Type features on Q and C respectively.

(24) (a) Subnumeration (Last Resort): {[ka$_{[Typ:Q,Scp:_]}$]}
(b) [$_{CP}$ Taro-ga [$_{v*P}$ ~~Taro-ga~~ *v** [$_{DP}$[$_{DP}$nani] ~~ka$_{[Typ:Q,Scp:_]}$~~]-o kai *v**]
-mashita C$_{[Typ:Q,Scp:X]}$+ ka$_{[Typ:Q,Scp:X]}$]

A tree diagram of this structure is shown in (25).

(25)



Just as with the English (15), Japanese allows long distance movement of a Q element. Consider the *wh*-question (26), which contains a *wh*-phrase in an embedded clause.

(26) Anata-wa Chie-ga **nani**-o tabeta to omoi-mashita ka?
You-TOP Chie-NOM what-ACC ate COMP think-PAST Q
'What did you think that Chie ate?

The subnumeration and derivation of the embedded *v**P are shown in (27), which contains *ka* 'Q' with an unvalued Scope feature and a valued Type feature. The Q particle is Merged in a position adjoined to the *wh*-phrase.

(27) (a) Subnumeration: {*v**, {Chie}, nani, $ka_{[Typ:Q,Scp:\_]}$, tabe-}
(b) [$_{v*P}$ Chie [$_{DP}$[$_{DP}$nani] $ka_{[Typ:Q,Scp:\_]}$]-o tabe *v**]

(28a) shows the subnumeration of the embedded CP, in which *ta* is a past tense T head and *to*, a complementizer, is a C head. After C is merged, the structure is (28b). At this point, since the lower *v**P will be sent to Spell-Out, in accord with (9), the Last Resort process applies and *ka* is reinserted into the subnumeration (28c), due to its unvalued Scope feature. Then *ka* is re-Merged in an adjoined position at the CP edge (28d).

(28) (a) Subnumeration: {ta, to}
(b) [Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] $ka_{[Typ:Q,Scp:\_]}$]-o tabe *v**] –ta to]
(c) Subnumeration (Last Resort): {[$ka_{[Typ:Q,Scp:\_]}$]}
(d) [$_{CP}$ Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] ~~$ka_{[Typ:Q,Scp:\_]}$~~]-o tabe *v**] –ta to $ka_{[Typ:Q,Scp:\_]}$]

The matrix *v**P is built as shown in (29). After *v** is Merged, as shown in (29b), the Last Resort process again applies (29c). The Q particle *ka* is reinserted into the subnumeration and then Merged again in an adjoined position at the *v**P edge (29d).

(29) (a) Subnumeration: {*v**, anata, omoi-}
(b) [$_{v*P}$ anata [$_{CP}$ Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] ~~$ka_{[Typ:Q,Scp:\_]}$~~]-o tabe *v**] –ta to $ka_{[Typ:Q,Scp:\_]}$] omoi- *v**]
(c) Subnumeration (Last Resort): {[$ka_{[Typ:Q,Scp:\_]}$]}
(d) [$_{v*P}$ anata [$_{CP}$ Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] ~~$ka_{[Typ:Q,Scp:\_]}$~~]-o tabe *v**] –ta to ~~$ka_{[Typ:Q,Scp:\_]}$~~] omoi- *v** $ka_{[Typ:Q,Scp:\_]}$]

Lastly, the matrix CP is built (30). Crucially, the matrix C is an interrogative C with the unvalued Type feature '[Typ:_]' and the valued Scope feature '[Scp:X]'. After C is Merged, the Last Resort process again applies (30c), resulting in *ka* being reinserted into the subnumeration. Then *ka* is selected and

Merged again at the matrix CP edge (30d), where it undergoes an Agree relation with C, thus resulting in the unvalued Type feature of C being valued and the unvalued Scope feature of Q being valued.

(30) (a) Subnumeration: {T, $C_{[Typ:\_,Scp:X]}$}
(b) [$_{CP}$ anata-wa [$_{v*P}$ ~~anata~~ [$_{CP}$ Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] ~~ka~~$_{[Typ:Q,Scp:\_]}$]-o tabe *v**] –ta to ~~ka~~$_{[Typ:Q,Scp:\_]}$] omoi- *v** ka$_{[Typ:Q,Scp:_]}$] -mashita $C_{[Typ:\_,Scp:X]}$]
(c) Subnumeration (Last Resort): {[ka$_{[Typ:Q,Scp:_]}$]}
(d) [$_{CP}$ anata-wa [$_{v*P}$ ~~anata~~ [$_{CP}$ Chie-ga [$_{v*P}$ ~~Chie~~ [$_{DP}$ [$_{DP}$nani] ~~ka~~$_{[Typ:Q,Scp:\_]}$]-o tabe *v**] –ta to ~~ka~~$_{[Typ:Q,Scp:\_]}$] omoi- *v** ~~ka~~$_{[Typ:Q,Scp:\_]}$] -mashita $C_{[Typ:Q,Scp:X]}$ +ka$_{[Typ:Q,Scp:X]}$]

In this manner, movement of a Q element in certain Japanese *wh*-questions results from the Last Resort process (7).

5. Subject *wh*-phrases

I have attempted to demonstrate that *wh*-movement phenomena, in certain cases, result from a process of Last Resort reinsertion of a Q element into a subnumeration. This analysis does not, however, apply to certain subject *wh*-phrases. Assuming that a subject *wh*-phrase moves to [Spec, TP] in English and Japanese, in constructions such as (31) and (32), there is no point in the derivation in which the Last Resort process can apply to bring the Q/*wh*-element to CP.

(31) (a) Who ate dinner?
(b) [$_{TP}$ who T [$_{v*P}$ ~~who~~ ate dinner]]

(32) (a) Dare-ga tabemono-o kaimashita ka?
who-NOM food-ACC bought Q
'Who bought food?'
(b) [$_{TP}$ dare-ga T [$_{v*P}$ ~~dare-ga~~ tabemono-o kai] –mashita]

When the matrix interrogative C is Merged, at the point at which the *v**P complement will be sent to Spell-Out, the subject *wh*-phrase is in [Spec, TP], as

shown in (31b) and (32b). The *wh*-phrase is not contained within a phrase that is about to be sent to Spell-Out and the Last Resort operation cannot apply.

There is, however, no need to rely on Last Resort in these constructions if an interrogative C in English and Japanese simply contains an EPP feature. This is shown in (33a) for English and (33b) for Japanese, where the matrix C has an EPP feature that attracts Q. In English, Q brings along its complement *wh*-phrase (33a) and in Japanese, Q, being an adjunct, moves by itself (33b).

(33) (a) $[_{CP}\ [_{QP}Q_{[Typ:Q,Scp:X]}$ ~~who~~$]\ C_{EPP[Typ:Q,Scp:X]}\ [_{TP}$ ~~$[_{QP}Q_{[Typ:Q,Sep:\_]}$ who~~$]$ T $[_{v*P}$ ~~$[_{QP}Q_{[Typ:Q,Scp:\_]}$ who~~$]$ ate dinner]]]

(b) $[_{CP}\ [_{TP}\ [_{DP}$dare-ga ~~ka$_{[Typ:Q,Sep:_]}$~~$]\ [_{v*P}$ ~~$[_{DP}$dare-ga $Q_{[Typ:Q,Sep:\_]}$~~$]$ tabemono-o kai-] -mashita $]\ C_{EPP[Typ:Q,Scp:X]}$ +ka$_{[Typ:Q,Scp:X]}]$

Once the Q/*wh*- element moves to the CP, it undergoes a feature valuation relation with C and the unvalued Type and Scope features of C and Q, respectively, are valued.

An interrogative C in English and Japanese contains an EPP feature. This EPP feature attracts a Q element if the Q is accessible; i.e., if it is not in a domain that has been sent to Spell-Out. In other cases, such as those discussed in sections 4 and 5, the Last Resort process is responsible for bringing the Q element to the CP. In these latter cases, when the Q element Merges with C, the EPP feature on C is eliminated.

6. Conclusion

In conclusion, this proposal accounts for *wh*-question formation without reliance on optional EPP features in non-interrogative phase heads. Rather, non-local Q/*wh* movement in English and Japanese is the result of a process of Last Resort, which under the appropriate circumstances, enables a Q/*wh*-element to 'move' to an interrogative CP as a result of being reinserted into a subnumeration and re-Merged at a higher point in a derivation. Q/*wh*-movement can be driven by an EPP feature, but only if the *wh-phrase* is close enough to an interrogative C to be attracted by it. This analysis does away with the need to stipulate EPP features when convenient. It also has the advantage of allowing an entire phase to be sent to Spell-Out as a unit. I leave for future work analyses of *wh*-questions in other languages, as well as examination of the Last Resort process with respect to other phenomena.

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