A Labeling Analysis of Quantifier Float in English

Kawamitsu, Jun
Graduate school of Humanities, Kyushu University : Master's Program

https://doi.org/10.15017/4480684

出版情報：九大英文学. 63, pp.107-128, 2021-03-31. The Society of English Literature and Linguistics, Kyushu University
バージョン：
権利関係：

A Labeling Analysis of Quantifier Float in English*

Jun Kawamitsu

1. Introduction

This paper investigates the property of Floating Quantifiers (FQs) and the mechanism that FQs occur in sentences. Quantifier Float (Q-float) is a phenomenon in which FQs are separated from nominal expressions they associate with.[1]

(1) a. All the students have finished the assignment.
b. The students have all finished the assignment.

(Bobaljik (2003: 1))

As can be shown in (1), both sentences seem to have the same interpretation. However, the positions in which the quantifier *all* appears are different. In (1a), the quantifier *all* construes with its associate *the student*. On the other hand, in (1b), the quantifier floats from its associate nominal.

Two different analyses have been made to capture the property of FQs. One is the stranding analysis, and the other is the adverbial analysis. The stranding analysis argues that Q-float results from leftward movement, in which the associates move out of constituents that include FQs and them. The other one, adverbial analysis, treats FQs as adverbial elements, and FQs semantically modify the predicates they combine with or modify their associate nominals.

Bošković (2004) proposes a descriptive generalization of the FQs in terms of the stranding account. This suggests that quantifiers cannot be floated in θ-positions. In this paper, we try to suggest a theoretical explanation for his generalization. Precisely, we will give an argument in favor of stranding analysis based on the Labeling Algorithm (LA) proposed by Chomsky (2013, 2015). In a standard variety of English,

FQs and their associate nominals are merged and form a set {Q, DP}. When Q-float occurs, the associates move out of this set with stranding FQs. In contrast, when the set {Q, DP} moves as a whole, which means both FQs and their associates move together, the non-Q-float sentence is derived. In the case that Q-float sentences show ungrammaticality, it is caused by the labeling failure.

We begin by presenting some previous research on stranding and adverbial analyses of Q-float in Chapter 2. Chapter 3 outlines this paper's main theoretical background, including the Labeling Algorithm proposed by Chomsky (2013, 2015). Chapter 4 proposes the labeling analysis of Q-float in terms of the stranding account and investigates the derivation of Q-float in English. The overall conclusion is given in Chapter 5.

2. Stranding analysis

2.1. Sportiche (1988)

Sportiche (1988) proposes a stranding analysis of Q-float. He argues based on the VP-internal Subject Hypothesis, which is the idea that subjects are initially merged in the Spec-VP position, that Q-float arises by stranding FQs in the NP-initial position and put forth the following assumption.

(2) (Floating) Qs may appear in NP-initial position.

(Sportiche (1988: 427))

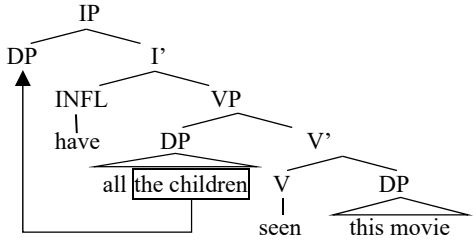
In terms of (2), Q-float sentences such as (3b) are derived as in (4).

(3) a. Tou les enfants ont vu ce film.
all the children have seen this movie

b. Les enfants ont tous ____ vu ce film.
the children have all ____ seen this movie

(Sportiche (1988: 426))

(4)



In (3), quantifier *tous* 'all' and their associate nominal *les enfants* 'the children' are firstly merged in Spec-VP based on VP-internal Subject Hypothesis. In the non-floating sentence (3a), both the quantifier and its associate NP move to the surface subject position, Spec-TP, while as for Q-float sentence (3b), only associate NP moves to Spec-TP, leaving behind FQ in the initial-NP position. This proposal also corresponds with English sentences in (1), repeated below in (5), and provides an effective account for why (5a) and (5b) are syntactically and semantically related even if they have a different word order.

(5) a. All the students have finished the assignment.
b. The students have all finished the assignment.

However, Sportiche's analysis comes into question as pointed out by many linguists (McClosky (2000), Bobaljik (2003), Bošković (2004), among others.)

(6) a. * The students arrived all.
b. * The students were arrested all.

(Bošković (2004: 682))

In unaccusative and passive sentences, the subject initially merged in the postverbal position, VP-complement, in general. These examples, however, are ungrammatical even if FQ remains in the initial position. If FQs are stranded in the initial-NP position, according to Sportiche, this ungrammaticality cannot be expected. The fact that FQs cannot be stranded in the initial position in the unaccusative and passive sentences is one of the serious problems for the stranding analysis of Q-float.

2.2. Bošković (2004)

Bošković (2004) proposes the following descriptive generalization on Q-float to

overcome the shortcomings of the Sportiche style stranding analysis.

(7) Quantifiers cannot be floated in θ-positions.

(Bošković (2004: 685))

This generalization provides a strong explanation of why quantifiers cannot be stranded in the postverbal position in unaccusative and passive sentences like (6), which is repeated as (8).

(8) a. * The students arrived all.

b. * The students were arrested all.

In unaccusatives and passives, the subject is initially merged in the VP-complement position and assigned a θ-role in this position. Since quantifiers are stranded in the θ-position, example (8) shows ungrammaticality. Furthermore, Bošković's generalization gains additional support from the following sentence.

(9) *Mary hates the students all.

(Bošković (2004: 682))

In English, Q-float cannot appear in the object position, which is the complement of the phrase headed by the transitive verb *hate*. Hence, this ungrammaticality is appropriately predicted by the generalization in (7). While this generalization works well on Q-float in object θ-positions, FQs seem to be stranded in a subject θ-position. Let us consider the example in (10).

(10) The students all left.

(Bošković (2004: 693))

For unergative sentences, as in (10), it appears at first glance for FQ to be left behind in the subject θ-position. Supposing that VP or TP periphery have rich clausal structures, Bošković suggests that the FQ in (10) is not indeed stranded in the subject θ-position. Rather, FQ *all* is merged with the associate *the students* that comes from its θ-position in a higher position. This derivation is shown in (11).

(11) The students$_i$ [all t_i] [$_{VP}$ t_i left]

(Bošković (2004: 693))

Example (11) above indicates that the subject DP *the students* is initially merged in Spec-VP and then internally merged in VP peripheral position. FQ *all* is late-merged

with the subject, which means FQ adjoins to DP that moved from initially merged position. By assuming this derivation, Bošković points out that FQ is not stranded in the subject θ-position. The distribution of adverbs supports the fact that FQ cannot be occupied in the subject θ-position.

(12) a. The students all completely understood.

b. * The students completely all understood.

(Bošković (2004: 685))

Given the standard assumption that low-adverb like *completely* is positioned above the subject θ-position, Spec-VP, Examples in (12) provide evidence that FQ *all* cannot be floated in a θ-marked position.

However, there are some unacceptable examples, which cannot be explained only with Bošković's generalization.

(13) a. ?* The patients may have been being all examined.

(Cirillo (2009: 26))

b. * The vegetables will have been being all roasted for an hour by the time you arrive.

(Fitzpatrick (2006: 48))

(13) shows that FQ *all* cannot appear between the progressive and passive forms. Since this is not a θ-marked position, FQs cannot be stranded in other than θ-positions. This indicates that further research should be needed for the distributional properties of FQs. Although Bošković's generalization has a robust descriptive explanation, there remain empirical problems to be dealt with. In the following section, our analysis can overcome the shortcomings of Bošković (2004), and we also suggest a theoretical explanation for his descriptive generalization under the labeling analysis of Q-float.

3. Theoretical Background and Proposals

This chapter will outline this paper's main theoretical background, including the Labeling Algorithm suggested by Chomsky (2013, 2015), and propose the labeling analysis of Q-float in terms of the stranding account.

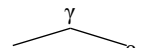
3.1. Merge and the Labeling Algorithm

The phrasal structure is constructed by Merge, the minimal operation required for language in general. It takes two syntactic objects α and β, and forms an unordered set as follows.

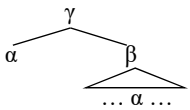
(14) $\gamma = \{\alpha, \beta\}$

When α and β are independent elements as in (15a), this is called external Merge (EM), or more precisely external Set-Merge. On the other hand, when α is contained within β, and Merge applies α and β as in (15b), this is called internal Merge (IM), or internal Set-Merge.

(15) a.



b.



The operation in (15b) used to be treated as Move, but now it is also an instance of Merge, which means internal Merge. Hence, both of them in (15) and external or internal Pair-Merge, which will be described later, are kind of minimal operation, Merge. One more important assumption about the conception of Merge is that under Chomsky's (2015) framework, Merge is applied freely (Free Merge). There is no restriction on Merge operation. We follow this concept and assume that internal and external Merge can be applied freely in the derivation.

We will now look over the Labeling Algorithm (LA) proposed by Chomsky (2013, 2015). He argues how to define the label of the set created by Merge. For instance, when a verb and a nominal element are merged, the interpretation requires whether the created object is verbal (VP) or nominal (DP) as its label. Chomsky proposes a minimal computation-based mechanism named Labeling Algorithm in which the first-located head within a relevant syntactic constituent is selected as the label. He considers the three cases as in (16).

(16) a. $\gamma = \{H, XP\}$

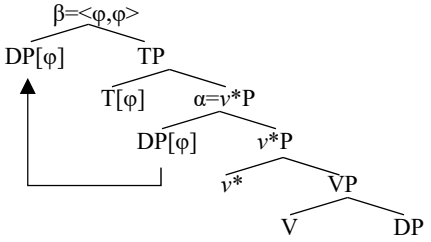
b. $\gamma = \{XP, YP\}$

c. $\gamma = \{H_1, H_2\}$

When the head and phrasal elements are Set-Merged as in (16a), the unordered set {H,

XP} and its label γ is determined as H by the LA. This is because the LA seeks the closest head, so it is H that determines the label of γ in (16a). On the other hand, the problems of projection arise as in (16b) because two phrasal expressions are merged, which are XP and YP. Since the head X of XP and Y of YP are both equidistant for the LA, it cannot decide the label. The same environment can be seen in (16c), where two heads, H_1 and H_2, are Merged. Both of them are equidistant for the LA, causing the labeling failure. In order for γ to be labeled appropriately, Chomsky proposes two solutions. Let us consider the structure below. There appear two problems of projection in this structure. First is the label α in which the external argument is merged with v*P, and then create XP-YP configuration. The second is the label β. This is the surface subject position in English in which DP is internally merged with TP, and then it also has XP-YP configuration.

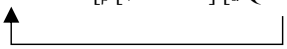
(17)



The first solution to eschew the labeling failure for α needs to modify the structure, which means that DP moves out of the set {DP, v*P}. By modifying the structure, the LA can determine the label α as v*P because it is stipulated that the copy of DP is not invisible to the LA. This is the first solution that the LA can find the unique head and avoid the labeling ambiguity of the XP-YP configuration and can be termed as the movement solution. However, it is obvious that the position, which the external argument DP moves to, has the XP-YP configuration, {DP, TP} in this case. Chomsky provides the second solution that feature sharing makes it possible to label. In order to label β, the LA searches the inside of DP and TP, then finds for them to share the same φ-features, allowing to label β as <φ, φ>. This is the feature-sharing solution. In addition to the solutions for the XP-YP configuration above, we propose one assumption. Let us consider the following sentence.

(18) a. * The students arrived all.

b. DP ….. [β [v arrived] [α Q DP]]



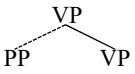
In (18), the FQ *all* is stranded in the complement position of unaccusative verb *arrive*. We suggest that when the XP moves out of the set {H, XP}, the label is determined as H, not HP. Hence, in example (18b), the label α is identified as Q, so the label β cannot be identified by the LA because of the H-H configuration. Then, the labeling failure arises, and we can expect the sentence in (18) to be unacceptable.

The labels are required to be interpreted at the Conceptual-Intensional (CI) interface and Sensorimotor (SM) interface. The CI interface is related to the meanings of sentences. For instance, the sentences are detected, such as declarative, interrogative, or imperative, based on the labels. On the other hand, The SM is the interface that contributes to the phonological interpretations. Both interfaces require properly labeled structures for interpretations, and unlabeled structures cannot be interpreted at the interfaces.

3.2. The Pair-Merged Elements

The Set-Merged elements create an unordered set {α, β}, but the Pair-Merged elements, on the other hand, form an ordered set <α, β>. Chomsky (2004) introduces the concept of Pair-Merge and suggests that the Pair-Merged elements are attached to a separate plane, so they become invisible within the syntax. Let us look at the specific example below (the dotted line denotes Pair-Merge).

(19)



As shown in (19), when the prepositional phrase (PP) is Pair-Merged with VP, the PP becomes invisible in syntax, so the set is determined as VP. As can be seen in (19), traditionally, adjuncts are treated as Pair-Merged elements, and given that the Pair-Merged elements are in a separate plane, this provides the reason why the movement out of adjuncts is prohibited (adjunct island) as shown in (20).

(20) a. * Who$_i$ did John go home [before he talked to t_i]?

b. * Who$_i$ did John go home [after he talked to t_i]?

c. * Who$_i$ did John fall asleep [while he was talking to t_i]?

(Truswell (2011: 176))

In (20), *Wh*-phrases move from the adjunct island, which is bracketed. The movement out of the adjunct island seems unacceptable in English. However, it is not always true. It is observed that *Wh*-extraction from nonfinite adjunct clauses is generally possible as in (21).

(21) a. What$_i$ did you come round [to work on t_i]?

b. Who$_i$ did John get upset [after talking to t_i]?

c. What$_i$ did John come back [thinking about t_i]?

(Truswell (2011: 176))

Sakumoto (to appear) focuses on the contrasts between (20) and (21) and proposes the following.

(22) A Pair-Merged syntactic object does not contribute to labeling but is visible in syntax.

(Sakumoto (to appear))

Under his approach, Pair-Merged elements cannot participate in the label identification, but they are visible in syntax. Therefore, the extraction out of adjuncts is theoretically possible. He analyzes the contrasts in (20) and (21) based on the phase theory. The concept of a phase is considered explicitly in Chomsky (2000, 2004, 2008, 2015). He regards the v* and C as a phase head and suggests that they form computational units of syntactic derivation, that is, a phase. When v* and C are introduced in the derivation, the phase complement, which is the complement of v* and C, is transferred to CI and SM interfaces. Once the elements are transferred to the interfaces, they are not accessible from further syntactic operations. Chomsky formulates this restriction as Phase Impenetrability Condition (PIC), as in (23).

(23) Phase Impenetrability Condition

In phase α with Head H, the domain of H is not accessible to operations outside α, only H and its edge are accessible to such operations.

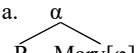
(Chomsky (2000: 108))

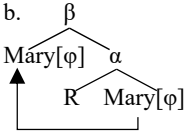
On the basis of the phase theory, Sakumoto (to appear) suggests that while the finite adjunct clauses in (20) form phases, the nonfinite adjunct clause in (21) do not constitute phases. Hence, this difference contributes to the acceptability of the extraction out of the adjunct island. We will adopt his proposal and suggest that the movement out of the Pair-Merged elements is possible in general. The specific analysis will be shown in Chapter 4.

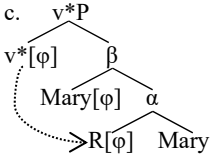
3.3. The Structure of Transitives

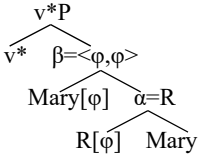
Under the mechanism of the Labeling Algorithm, Chomsky (2015) suggests that the derivation of transitive sentences. Let us consider the structure below. The transitive sentence in (24) is derived as in (25).

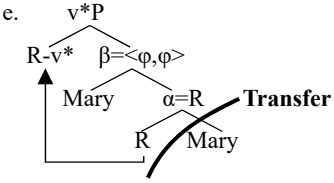
(24) John met Mary.

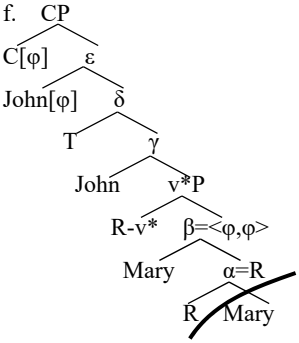
(25) a. 

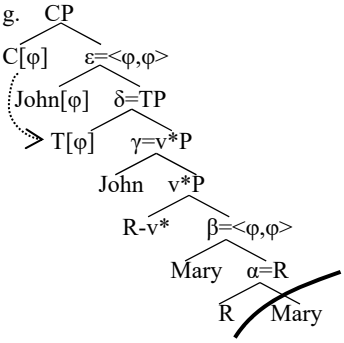
b. 

c. 

d. 

e. 

f. 

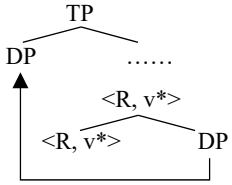
g. 

First, the Root, which is the verb *met*, and the object DP *Mary* are externally merged in (25a). It should be noted that Chomsky supposes R and T in English are too weak to serve as a label, so R and T should be strengthened by the feature inheritance, which will be shown later. Secondly, DP *Mary* raises to Spec-R (object-raising) in (25b), forming β. In (25c), v* merges with β, reaching the phase level, and φ-features inherit from v* to R (Feature Inheritance). Then, the LA applies as is shown in (25d), and the label β can be determined as <φ, φ> due to feature sharing between DP and R. Also, R is now strong to serve as a label due to the φ-feature sharing, so the LA can find R as the closest head, deciding the label α as R. In (25e), the internal Pair-Merge from R to v* arises, forming <R, v*>. This makes v* invisible, so the phasehood is activated on the copy of R. Hence, the complement of R's copy is transferred to the interface. The derivation continues, as shown in (25f). The subject DP *John* is externally Set-Merged with v*P, forming label γ, and then T is externally Set-Merged with γ, forming the label δ. Subject DP is internal Set-Merged with δ, which is the surface position, and C is externally Set-Merged with ε, reaching the phase level. Therefore, in (25g), the φ-features in C are inherited to T. The LA occurs and determines the label ε as <φ,φ>, δ as TP, and γ as v*P. Finally, the complement of C is transferred to the interfaces. Again, labeling ε needs feature sharing, δ needs for T to be strengthened by feature sharing with the subject DP. This mechanism of labeling in the CP area can be considered parallel to that of in the v*P area.

3.4. The Structure of Unaccusatives and Passives

Epstein, Kitahara, and Seely (EKS) (2016) focus on the non-phasehood property of passive and unaccusative verbs, and propose the phase cancellation by external Pair-Merge. Specifically, a lexical passive participle such as *arrested* is externally Pair-Merged with v* pre-syntactically, creating the ordered set <R, v*>. Then, v* including unvalued φ-feature is invisible in syntax, so the phasehood of v* is canceled. The mechanism in which the R is externally Pair-Merged with v* is shown in the following.

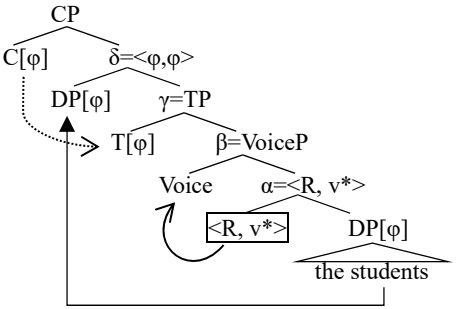
(26)



We should note that R and T in English are too weak to serve as a label, but once they are amalgamated with another element, as R and v* are amalgamated in the case above, they are able to serve as a label (see Chomsky (2015: 12)). EKS's proposal is possible to capture the fact that passive morpheme does not assign the accusative Case to the object, which has been explained as Case absorption, and it is also possible to capture the fact that passives do not constitute a phase. Furthermore, the strong theoretical advantage under the EKS's proposal is that there is no need for distinguishing between v* and v. Generally speaking, v* constitutes a phase, so-called strong-phase. On the other hand, v does not always constitute a phase, so it is treated as a weak-phase. Under this analysis, however, only a v* exists, and when it is externally Pair-Merged with R and forms the ordered set <R, v*>, the v* loses the phase property. This is because the v* is invisible in syntax. According to EKS's analysis, we suggest that one assumption should be added to EKS's analysis. EKS (2016) do not mention the position that the copular *be* occupies in the passive sentence. We propose that the copular *be* is base-generated in Voice and <R, v*> amalgam undergoes head-movement to Voice after the labeling, so the derivation in the passive sentence is shown in the following.

(27) The student was arrested.

(28)



The passive sentence in (27) is derived as in (28). First, the v* and R are externally Pair-Merged, and this amalgam is externally Set-Merged with the DP *the student*, forming label α. At this time, v* is invisible in syntax, so the phasehood of v* is canceled in a passive and unaccusative sentence. Secondly, the Voice head is externally Set-Merged with α, creating label β. Next, T is externally merged with β, and the DP is internally Set-Merged with γ, then makes label δ. When C is externally Set-Merged, the derivation reaches the phase level. Then, φ-features inherit from C to T. After FI, the LA occurs, and each label is determined. Finally, <R, v*> amalgam undergoes head-movement to Voice.[2] Then, the phase complement, which is the complement of C, is transferred to the interface.

4. A Labeling Analysis of Quantifier Float in English

4.1. The Distribution of FQs in the v*P Peripheral Position

As can be seen below, many studies have suggested that FQs have relatively free distribution.

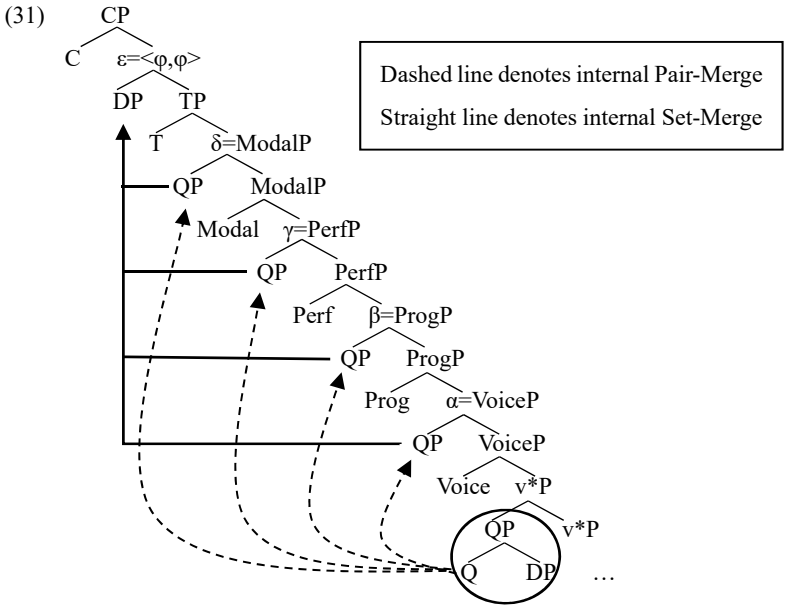
(29) The doctors (all) may (all) have (all) been (all) examining the patient.
(Cirillo (2012: 812))

In this subsection, we will show that under the labeling analysis of Q-float, FQ's distribution can be expected appropriately. We first assume that the v*P peripheral structure is rich enough for auxiliaries to place into. Cinque (1999) observes under the cartographic approach that there is a universal functional hierarchy above the v*P. The brief version of the clausal structure in the v*P periphery is the following.

(30) Tense > Modality > Perfect aspect > Progressive aspect > Voice > Verb

Based on the articulated structure in (30), we consider the FQ's distribution in the v*P periphery. As shown in (29), FQs strand in the preceding position of Modal *may*, between the modal and the perfective aspect *have*, between the perfective aspect and progressive aspect *been*, and preceding position of the verb *examining*. This distribution of FQs can be captured in terms of the stranding account. The derivation is considered in the following.

(31)



First, based on Shlonsky (1991), quantifiers as functional heads select associate nominals for their complement position, so the FQ and its associate DP are externally Set-Mered in Spec-v*P, the initial subject position. The QP, which contains FQ and its associate internally Pair-Merged with the v*P peripheral projection such as VoiceP, ProgP, PrefP, and ModalP. The set {Q, DP} does not participate in label identification because this is a Pair-Merged element. Therefore, at the time the C is Set-Merged, reaching phase level, the LA can determine the label α, β, γ, and δ as VoiceP, ProgP, PerfP, and ModalP, respectively. In this case, {XP, YP} configuration between QP and the peripheral projection does not occur. Furthermore, the crucial point is that although the QP does not take part in the label identification, the QP itself is visible in syntax, according to Sakumoto's (to appear) proposal. Hence, the associate DP inside QP can be a target for further movement. It is internally Set-Merged with Spec-TP position in order to provide the <φ, φ> label for ε. Then, the subject-oriented quantifier is floated in the v*P peripheral site. Theoretically speaking, two ways, internal Set-Merge and internal Pair-Merge, are possible for QP to move to the

peripheral positions. In contrast to the derivation considered above, even if the QP is internally Set-Merged with peripheral structures, the problems of projection do not arise. Since the associate DP should move out of the QP structure in order to provide the <φ, φ> label in the Spec-TP position, the stranded Q as a head forms the set {Q, XP} in the v*P peripheral position. This set is labeled as QP by the LA, so labeling failure does not arise in the FQ's floating position. However, this is problematic for the selectional property of auxiliaries. The auxiliaries, such as Modal, Perfective, and Progressive, do not select QP as its complement. For instance, Modal *may* can select perfective as its complement, so the perfective aspect is marked as *have*, not marked as *has* or *had*. If the QP intervenes between the auxiliaries, the selectional relationship may be broken. In terms of the selectional perspective, we assume that the QP is internally Pair-Merged with the peripheral projection because the Pair-Merged elements do not participate in the label identification, so they are not obstacles for the selectional relationship for the auxiliaries.

We will now look over the cases in which FQs cannot be strand in the peripheral position. As pointed out in Chapter 2, Fitzpatric (2006), and Cirillo (2009), among others, observe that when FQs are stranded in the low v*P periphery position in passive sentences, these sentences are not acceptable. Let us compare the following examples.

(32) ?* The patients may have been being all examined.

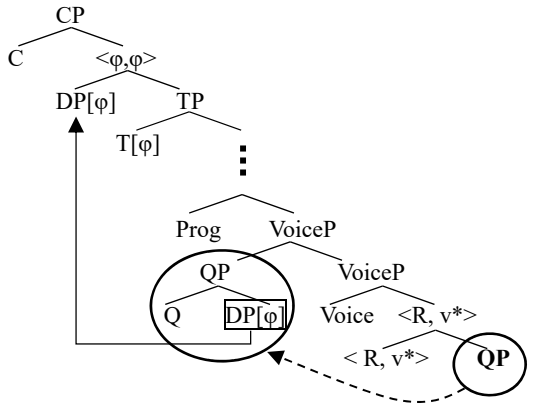
(Cirillo (2009: 26))

(33) The patients (all) may (all) have (all) been (all) being examined.

(*ibid.*)

In (32), the FQ is not permitted to occupy between the progressive form *-ing* and passive participle *-ed/-en*. These ungrammaticalities are also expected under our analysis. Let us consider the following derivation.

(34)



Under the phase cancellation approach that EKS proposes, R is externally Pair-Merged with v* pre-syntactically, so v* is invisible in syntax. Hence, the phasehood of v* is canceled. Then, the <R, v*> amalgam is externally Set-Merged with the QP, including FQ and its associate. Under the Free Merge mechanism, the QP can internally Pair-Merge to the peripheral position with successive-cyclic fashion or directly move to the position that the quantifier floats in. Either way is possible, but we cannot expect that quantifier is floated between the progressive participle *-ing* and passive participle *-ed/-en.* As we have proposed in Chapter 3, copular *be* is base-generated in Voice. The amalgam <R, v*> undergoes head-movement to Voice after the labeling, and to be selected by Progressive phrase, the progressive affix attaches to *be*, resulting in the *-ing* spell-out.[3] Consequently, FQ has no position to be stranded between the progressive and passive participle under this analysis. Therefore, we can give the theoretical account for the ungrammatical sentences above in (32).

4.2. The Distribution of FQs in the v*P Complement Position

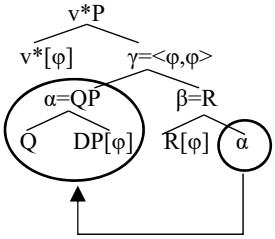
As we have seen in Chapter 2, Bošković (2004) provides robust descriptive generalization and suggests that Quantifiers cannot be floated in θ-positions. We will give a theoretical explanation and show that when FQs appear in object θ-positions, their ungrammaticality can be captured under the labeling analysis of Q-float. Specifically, FQs that appear in θ-positions result in labeling failure.

4.2.1. Transitive Sentences

Here, we focus on the object-oriented FQs associated with the object nominals in the transitive sentences. In standard English, FQs cannot be placed in the object θ-position. The asymmetry between Q-float and non-Q-float sentences comes from whether they are appropriately labeled or not. Let us consider the derivation of these facts below.

(35) Mary hates all the students.

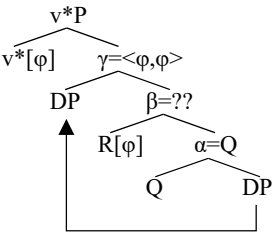
(36)



As for the non-Q-float example in (35) and its derivation in (36), the set α is externally Set-Merged with R, which forms β. The set α as a whole undergoes object raising to Spec-R position and creates the label γ. When the v* is introduced in the derivation, reaching the phase label, the label α is determined by the LA as QP, label γ as <φ, φ>, and label β as R. Since each label is decided appropriately by the LA, the derivation converges. Next, let us consider the Q-float example, which is ungrammatical.

(37) * Mary hates the students all.

(38)



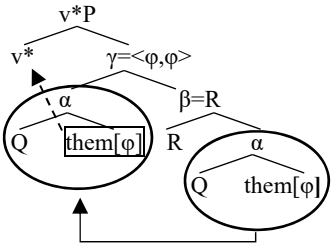
In this derivation, the R and the set α containing Q and its associate DP are externally Set-Merged. Then, when only the DP moves out of the set α and undergoes object raising to Spec-R, the problem of projection arises. Although the set α and γ are correctly labeled when reaching the phase level, the label β fails in the labeling

identification. The label α is detected as Q by the LA because the copy of DP cannot contribute to the labeling. Therefore, the Head-Head relation arises in the set β, in this case {R, Q}, so the LA cannot identify the label β, resulting in the derivation to crash. One may suppose that the φ-features on Q and R can provide the <φ, φ> label for β. However, even if this meets the requirement of β, there is another labeling failure to appear. The label γ is now impossible to be labeled because there is no option to share the same feature for the labeling. The φ-feature on R has already been valued by the relationship between R and Q, so the LA cannot find a shared feature between DP and R. Hence, the label γ fails in the labeling, and the derivation crashes.[4] On the other hand, if the associate nominal of the FQ is a pronoun, the sentence's acceptability improves.

(39) Mary hates them all.

Let us first mention the properties of pronouns. Bošković (1997) suggests that a pronoun has the same behaviors as a clitic, and it attaches to the verbs. Assuming that pronouns have a clitic-like property, it is natural for them to be criticized on the verb and pronounced at the suffixal position of v*. According to Bošković's assumption, we can get the right prediction for the sentence in (39). The derivation will be the following.

(40)



Firstly, the R and the set α are externally Set-Merged, and form β. Then, α internally Set-Merged with β and creates the label γ, and v* is introduced into the derivation, reaching the phase level. The LA occurs, and each label can be correctly decided. The label α is QP (or Q), β is R, and γ is <φ, φ>, respectively. We will not argue whether the pronoun criticizes with the v* before or after the labeling. However, suppose that criticization is the phonological operation and occurs after the labeling, probably at

the SM-interface, in that case, there is no problem for the labeling. The label γ is predicted to be determined as <φ, φ>. On the other hand, if the pronoun attaches to the v* before the labeling, γ is also identified as <φ, φ> between Q and R's shared φ-features.[5] Either way does not cause labeling failure, so this derivation converges.

4.2.2. Unaccusative and Passive Sentences

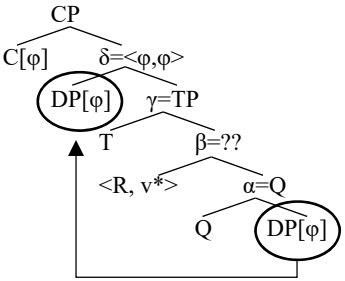
In unaccusative and passive sentences, as well as transitive ones, FQs cannot be floated in the v*P complement position. The ungrammaticality of these cases can also be captured as labeling failure of the projection which includes the FQ.

(41) a. * The students arrived all.

b. * The students were arrested all.

Let us take the example in (41a) and see the following structure.

(42)



In unaccusative and passive sentences, R is externally Pair-Merges with the v* and makes v* invisible in syntax. The <R, v*> amalgam is externally Set-Merged with the set α, and forms the label β. After T is merged, the DP is internally Set-Merged with γ. After that, C is Merged, and the derivation reaches the phase level. Then, the LA starts to identify each label, but the β is cannot be labeled. Since the label α determined as Q, the β forms the set {<R, v*>, Q}. Again, the Head-Head relation fails in the label identification, so the unlabeled β cannot be legible in the interfaces, leading the derivation to crash. We should note that φ-feature on v* is now invisible in syntax due to the external Pair-Merge of R to v*, so the label β cannot be determined with the feature sharing.

5. Concluding Remarks

In this paper, we have investigated the property of FQs and the mechanism that Q-float arises in sentences. Based on the Labeling Algorithm proposed by Chomsky (2013, 2015), we have presented the labeling analysis of Q-float in terms of stranding account. Our proposal consists of two assumptions. One is the mechanism of labeling in which the copy of the moved elements does not contribute to the labeling. When the XP moves out of the set {Q, XP}, the label of this set is determined as Q, not QP by the LA. The second assumption is on the Pair-Merged elements. Pair-Merged elements do not participate in the labeling identification but visible in syntax. Our analyses have accounted for the reason FQs cannot be stranded in θ-position. When FQs are floated in object θ-position, these cause the labeling failure. In addition, provided that the rich architecture in the v*P periphery, we also have shown that when FQs and their associates subject DPs are internally Pair-Merged with the v*P periphery, they do not contribute to the labeling identification, avoiding labeling failure.

Notes

* I would like to express my gratitude to Nobuaki Nishioka for his invaluable comments and suggestions. Needless to say, all remaining errors and inadequacies in this paper are my own.

1. Throughout the article, we focus on the Floating Quantifier *all*, and we do not concern about the differences between *all* and other FQs, such as *both* and *each*.

2. In English, the copular *be* can undergo head-movement to T. We assume that the head-movement from <R, v*> to Voice and Voice to T can simultaneously occur.

3. In this case, <R, v*> undergoes head-movement and attaches to copular *be,* which occupies the Voice position. Copular *be* is selected by Progressive phrase so the progressive *-ing* form can be expected.

4. Maling (1976: 712) points out that when PP follows FQ, which is stranded in the object position, the sentence is judged grammatical.

(i) Mary put the books all on the proper shelf.

Given that the object QP *all the books* and PP *on the proper shelf* constitute the small clause, this grammaticality is correctly expected under our analysis.

(ii) a. [$_{\gamma}$ [$_{\beta}$ all the books] [$_{\alpha}$ on the proper shelf]]

b. [the books] … [$_{\beta}$ [$_{\alpha}$ all (the books)] [$_{PP}$ on the proper shelf]]

When Q-float arises, the DP moves out of the set {all, the books} as in (ii). In this structure, the labeling failure never happens because the LA determines α as Q. Consequently, the label β is identified as QP due to the H-XP configuration.

5. From the fact that FQs and their associates agree in φ-feature or Case in some languages, the quantifier *all* in English has also φ-feature.

References

Bobaljik, Jonathan David (2003) “Floating Quantifiers: Handle with Care,” in Lisa Cheng and Rint Sybesma (eds.). *The Second Glot International State-of-the-Article Book*. Berlin, New York: Mouton de Gruyter.

Bošković, Željko (1997) *The syntax of Nonfinite Complementation*, MIT Press, Cambridge, MA.

Boškovic, Željko (2004) “Be careful where you float your quantifiers,” in *Natural Language & Linguistic Theory* 22, 681-742.

Chomsky, Noam (2000) “Minimalist Inquiries: The Framework,” *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Uriagereka, 89‐155, MIT Press, Cambridge, MA.

Chomsky, Noam (2004) “Beyond Explanatory Adequacy,” *Structures and Beyond: The Cartography of Syntactic Structures* 3, ed. by Adriana Belletti, 104‐131, Oxford University Press, Oxford.

Chomsky, Noam (2008) “On phases,” *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, ed. by Robert Freidin, Carlos Peregrin. Otero, and Maria Luisa Zubizarreta, 133–166, MIT Press, Cambridge, MA.

Chomsky, Noam (2013) “Problems of projection,” *Lingua* 130, 33-49.

Chomsky, Noam (2015) “Problems of Projection: Extentions,” *Structures, Strategies and Beyond*, ed. by Elisa Di Domenico, Cornelia Hamann, and Simona Matteini, 3-16, John Benjamins, Amsterdam.

Cinque, Guglielmo (1999) *Adverbs and Functional Heads: A Cross-Linguistic Perspective*, Oxford University Press, Oxford.

Cirillo, Robert John (2009) *The Syntax of Floating Quantifiers: Stranding Revisited,* PhD thesis, Universiteit van Amsterdam.

Cirillo, Robert (2012) “A Fresh Look at the Debate on Floating Quantification,” *Language and Linguistic Compass,* 6. 796-815

Epstein, Samuel, Kitahara Hisatsugu and Daniel Seely (2016) “Phase Cancellation by External Pair-Merge of Heads,” *The Linguistic Review,* 33, 87-102.

Fitzpatrick, Justin Michael (2006) *The syntactic and semantic roots of floating quantification*, PhD thesis, MIT

Maling, Joan (1976) “Notes on quantifier postposing,” *Linguistic Inquiry* 7, 709-718.

McCloskey, James (2000) “Quantifier float and wh-movement in an Irish English,” *Linguistic Inquiry* 31, 57-84.

Sakumoto, Yuya (to appear) “What defines Phases?,” *JELS*.

Shlonsky, Ur (1991) “Quantifiers as Functional Heads: A Study of Quantifier Float in Hebrew,” *Lingua* 84. 159–180.

Sportiche, Dominique (1988) “A Theory of Floating Quantifiers and its Corollaries for Constituent Structure,” *Linguistic Inquiry, 19*, 425-449.

Truswell, Robert (2011) *Events, phrases and questions,* Oxford University Press, Oxford.