This study is an investigation of the quantifier float (QF) phenomenon. Many studies on this topic are based on the fact that a floating quantifier (FQ) occurs to the right of the NP it quantifies (rightward QF), although it is well known that leftward QF is attested in a number of languages. To predict the distribution of both types of QF, Doetjes (1992, 1997) suggests the generalization that an FQ binds the trace of the NP it quantifies. The purpose of this study is to reduce this generalization to the property that FQs probe for a matching feature, thereby providing support to the hypothesis that FQs are adverbial elements.*

Keywords: floating quantifiers, feature checking, adverb analysis

1. Introduction

This paper provides an analysis of the quantifier-float (QF) phenomenon, from the viewpoint of the minimalist program (Chomsky (2000, 2001a)). QF has the effect of having a quantifier in a distant position, which is linked to the quantified NP. (1) illustrates this phenomenon:

(1) The children [would have been all [doing that]].

(Baltin (1995: 211))

In (1), all is a floating quantifier (FQ) quantifying the subject. Let us refer to the quantified NP as its antecedent. In recent years, three ways of understanding the syntax of QF have emerged. First, the theory of what I call Predication Analysis proposed by Takami (1998, 2001)
was developed from Asakawa (1983), Ike-uchi (1985) and Iwasawa (1988). This theory holds that an FQ is an argument requiring an appropriate predicate. Second, what is called Q(uantifier)-S(tranding) Analysis was originated by Sportiche (1988) and was subsequently developed by Giusti (1990a, b), Shlonsky (1991), Merchant (1996), Benmamoun (1999), McCloskey (2000), and Bošković (2001). According to Sportiche, an FQ is stranded in a constituent from which its antecedent NP is extracted. Third, what is called Adverb Analysis takes an FQ as an adverbial element modifying its antecedent (Klein (1977), Jaeggli (1982), Williams (1982), O'Grady (1982), Kayne (1984), Dowty and Brodie (1984), Doetjes (1992, 1997), Baltin (1995), Bobaljik (1995, 1998), Torrego (1996), Hoeksema (1996), Brisson (1998)).

The purpose of this study is to argue for Adverb Analysis, concentrating on a modification of a proposal made by Doetjes (1992, 1997) in order to predict the distribution of both leftward and rightward FQs.

This paper is organized as follows: In section 2, I will suggest problems associated with Predication Analysis and Q-Stranding Analysis and will adopt the theory of Adverb Analysis. In section 3, in order to account for Doetjes's observation, I will propose an alternative analysis on the basis of semantic property of FQs. I will show that problems with the other analyses do not arise when this theory is adopted.

2. Previous Analyses and Associated Problems

2.1. Problems with Predication Analysis

Takami (1998, 2001) argues that QF does not apply to a post-verbal noun phrase, unless the following phrase has a close semantic relation with the quantified NP, hypothesizing the Predication Constraint on Floated Quantifiers (PCFQ), formulated as (2):

(2) Since floated quantifiers function as (secondary) subjects, they must be followed by their (semantically appropriate) predicates. (Takami (1998: 155))

According to Takami, an FQ is a secondary argument parasitic on the predication relation between the antecedent NP and the predicate VP. Thus, in (3), the bracketed phrase is predicated of the plural primary argument and the secondary argument all/both:

(3) a. *The students all [came to the party].* (Takami (1998: 150))
b. Mary put *his books all [on her desk].* (ibid.: 154)
c. She called the men both [bastards]. (Maling (1976: 715))
d. Hang your coats all [up on hangers]. (ibid.)
e. Frank persuaded the men all [to leave]. (ibid.: 717)

In these examples, the PCFQ is satisfied. By contrast, in ungrammatical sentences such as (4a-e), FQs are not followed by appropriate predicating:

(4) a. *John saw the men all. (Fiengo and Lasnik (1976: 188))
b. *They read the papers both [yesterday]. (ibid.)
c. *She found the books all [quickly]. (cf. Maling (1976: 716))
d. *I worded the letters all [in a careful manner]. (Asakawa (1983: 8))
e. *Frank promised the men all [to leave]. (Maling (1976: 717))

The bracketed phrases are not predicated of the FQ. A similar approach is proposed by Asakawa (1983) and Ike-uchi (1985).

Although it is an intriguing observation, the PCFQ is not free from problems. We will now explore some of these. First, the PCFQ fails to exclude certain ungrammatical sentences. Let us first consider (5a, b):

(5) a. John found the two rooms both empty.
b. *John left the two rooms both angry. (Takami (1998: 155))

The PCFQ is satisfied in (5a), but not in (5b). In (5a), empty is an object-oriented depictive predicated of the object and FQ, while in (5b), angry is a subject-oriented depictive not predicated of the object and FQ. With this in mind, let us now consider (6a, b):

(6) a. John and Mary both died young.
b. *John and Mary died both young. (Asakawa (1983: 7))

In these sentences, each FQ is followed by its italicized predicate. The grammaticality of (6a) is expected under the PCFQ, but the ungrammaticality of (6b) is not. One might suggest that the predicates of primary and secondary arguments have to be exactly the same. However, this claim is not substantiated. In (1), for example, the predicate of the (primary) subject will be would have been doing that, while that of the secondary subject (i.e. all) is doing that.

Second, there are cases in which the PCFQ incorrectly excludes marginally acceptable sentences. Consider (7a, b), for example:

(7) a. The books, all of which I will have to read, are interest-
b. ?The books, which I will all have to read, are interesting.

(Doetjes (1992: 328))

In (7b), the object-oriented FQ to the left of a verb in the context of relativization is not followed by any appropriate predicate, since the whole verb phrase have to read is predicated of the subject rather than the FQ. The PCFQ would incorrectly exclude this marginally acceptable sentence.

Third, Takami’s claim that FQs are secondary arguments is based on his generalization that FQs can stand alone as a primary argument of the predicate in such sentences as (8) (cf. Takami (1998: 151)):

(8) The students came to the party and all danced together.

Let us call this type of quantifier a pronominal quantifier (PQ), following Paunovic (1997). Takami’s claim is undermined, given that FQs and PQs have different characteristics. Let us first consider sentences (9) below, cited from Paunovic (1997: 34, 35). Unlike FQs, PQs can serve as sentence fragments:

(9) a. A: Which of them are lying? B: Both. (PQ)
b. A: Which of them did they arrest? B: *Them both. (FQ)

Turning now to sentences (10), we observe that, unlike FQs, PQs may be followed by an optional of-phrase in their complement position:

(10) a. The students have all (*of them) passed the exam. (FQ)
b. All (of) my/the/these students were at the lecture. (PQ)
c. Both *(of) us were at the lecture. (PQ) (ibid.: 35)

If Takami’s (2001: 10) claim that the argumenthood of FQs is shown by their behavior as PQs were correct, then the above-mentioned differences between PQs and FQs are unexpected. This casts doubt on the argumenthood of FQs. Incidentally, the distribution of PQs is rather restricted in many languages. Thus, Doetjes (1997: 211, note 58) reports that in Dutch, PQ allemaal ‘all’ can function as a PP complement, but not as a subject or a direct object. In French, PQ tous (pronounced /tus/) meaning ‘all’ can function as a subject or a PP complement, but not as a direct object. In English, all, both, and each do not have genitive forms:

(11) a. *all’s/*both’s/*each’s opinion
b. the opinion of all/both/each

Fourth, the PCFQ account is not tenable in languages which allow for
sentence-final FQs. Consider a sentence from Icelandic (12), in which an object-oriented FQ is not followed by any predicate:

(12) Ég las bækurnar ekki allar.
I read the books not all
‘I didn’t read all the books.’ (Bošković (2001: 70))

The four arguments set out above show that the PCFQ is difficult to maintain.

2.2. Problems with Q-stranding Analysis

Sportiche (1988) proposes that an FQ is stranded in the NP from which its antecedent is moved. Thus, in (13b), the men and all form an underlying constituent, just like the quantified NP in (13a):

(13) a. [all the men] have seen this movie.
   b. [[The men], have [Vn [NP [QP all] [NP ti]]] [VP seen this movie]]

A number of linguists have put forward arguments against his Q-Stranding Analysis. One such argument is illustrated by (14), where, unlike FQs, non-floated counterparts are unacceptable:

(14) a. Seth, Pilar, and Diana have all left in one car.
   b. ??All (of) Seth, Pilar, and Diana have left in one car.
      (Bobaljik (1995: 225))

If (14a) and (14b) were related by Q-stranding, the unacceptability of (14b) would be unexpected. A similar argument comes from the co-occurrence of prenominal quantifiers and FQs, as shown in (15):

(15) Both (of the) boys each bought licorice. (Asakawa (1983: 4))

The fairly acceptable status of this sentence is unexpected under Q-stranding Analysis.

For these reasons, Q-Stranding Analysis is untenable. In the next section, I will review Adverb Analysis.¹


(i) a. *[The magicians] have arrived [all t]. (Bobaljik (1995: 205))
   b. *[The votes] have been counted [all t]. (ibid.)

As shown in (i), FQs (at least in English) are excluded from trace positions of unaccusative and passive subjects, which would be striking, given that FQs were stranded
2.3. Adverb Analysis

O’Grady (1982), Doetjes (1992, 1997), Bowers (1993), Baltin (1995), Bobaljik (1995, 1998) and Brisson (1998), among others, have suggested that FQs and certain adverbs behave alike. The arguments supporting this analysis are as follows. First, O’Grady (1982: 524) observes that FQs in (16a) and adverbs like *merely* in (16b) show distributional similarities:

\[ (16) \]

\[
\begin{align*}
\text{a. } & \text{ The men } \_\_\_ \text{ have } \_\_\_ \text{ shown } * \text{ the boys } \_\_\_ \text{ several books } * \\
\text{b. } & \text{ The men } \_\_\_ \text{ have } \_\_\_ \text{ shown } * \text{ the boys } \_\_\_ \text{ several books } *
\end{align*}
\]

FQs and adverbs cannot occur between a verb and its direct object:

\[ (17) \]

\[ *\text{The men lost } \{\text{each/accidentally}\} \text{ the books.} \]

(O’Grady (1982: 524))

The reader is referred to Bobaljik (1995: 231) for further discussion.

In trace positions. To resolve this problem, Sportiche (1998) stipulates the base-generation of an internal argument in subject position. Bošković (2001) provides an alternative solution, claiming that FQs, being adjuncts, cannot be inserted in \( \theta \)-positions (If this were correct, relative clauses could not be adjoined to an NP occupying a \( \theta \)-position, contrary to fact).

However, (i) remains an unsolved problem under other analyses, too. Thus, under Predication Analysis, (i) cannot be excluded by the PCFQ, as long as (6b) is wrongly ruled in by the constraint. Such solutions are undermined, given that German and French counterparts of (ia, b) are acceptable (Giusti (1990a: 638), Bowers (1993: 625), Bobaljik (1998: 5)). Under Adverb Analysis, (i) cannot be excluded by the distributional restriction on adverbs, since VP-internal adverbs can immediately follow unaccusative and passive verbs. Consider:

\[ (ii) \]

\[
\begin{align*}
\text{a. } & \text{ The men were told } \text{carefully} \ ((\text{that Bill had left}). \\
\text{b. } & \text{ The magicians have reappeared } \text{carelessly} \ \text{in a different position.}
\end{align*}
\]

Therefore, (i) remains an unsolved problem. I will leave this issue open to future research, although it might be correct to assume, following Doetjes (1992: 328), that FQs cannot be right-adjointed to predicates, at least in English (cf. (16) and (42)).

2 The insertion of an FQ or a VP-adverb before *been or being degrades the acceptability of a sentence (Akiyama (1994: 102)).

An FQ, but not an adverb, can immediately follow the indirect object of the double-object construction, since the quantifier is an integral part of the object (Baltin (1985), O’Grady (1982: 525) and Iwasawa (1988: 78)). See section 3.3.4, for this point.

Incidentally, examples such as (i) do not belong to the FQ construction, as Doetjes (1997: 213–215) correctly points out. I will therefore ignore such sentences.

\[ (i) \]

\[ \text{The men arrived, all/both at the same time.} \]
FLOATING QUANTIFIERS AS PROBES

Second, both FQs and adverbs like ever, usually, etc. partake of the same distributional restriction on VP-deletion or wh-movement (Sag (1978)): no gaps are allowed immediately after FQs or adverbs:

(18) a. *I don’t know what they are all ___.
 b. *My brother has studied karate, and my sisters have all ___, also.
 c. *I don’t know how happy they are ever ___.
 d. *The previous interrogators were taking you literally, and I was merely ___ also. (Sag (1978: 147–149))

Furthermore, there are reasons to believe that an FQ forms a constituent with the following phrase (i.e. a verb phrase). Consider (19). A parenthetical phrase cannot be inserted after the FQ:

(19) a. The boys, John said, all ran. (Iwasawa (1983: 76))
 b. *The boys all, John said, ran. (ibid.)

Moreover, an FQ can be moved, along with a verb phrase:

(20) They said that they would work on that, and all work on that they did. (Baltin (1982: 9))

These facts are taken to indicate that FQs occupy predicate-internal adverbial positions.

So far, we have enumerated arguments in favor of Adverb Analysis. In this connection, it should be noted that FQs in languages such as French, Spanish, and German can be found either to the right or left of the antecedent. Let us consider the following sentences:

(21) a. Les enfants ont tous t dormi. (French)
    the children have all slept
 b. Ella todos los quería leer t. (Spanish)
    she all them wanted to-read
    ‘She wanted to read them all.’

(cf. Bonneau and Zushi (1992: 14))

Rightward QF, as in (21a), is called R-tous, and leftward QF, as in (21b), L-tous (Kayne (1975: 5)). L-tous has been a puzzle for Adverb Analysis, as well as for the other two analyses. O’Grady (1982: 536), Jaeggli (1982: 84), Baltin (1995: 209) and Bobaljik (1995: 201, 244) imply that an antecedent NP must either c-command or precede its FQ, wherever their traces are located. These requirements wrongly exclude (21b).

To offer a unified account of both types of QF, Doetjes (1992, 1997) has introduced what is called the generalized L-tous analysis.
According to her, the licensing configuration of FQs is as shown in (22), in which \( t_i \) is a trace of the NP quantified by an FQ:

\[
(22) \quad \ldots [X_P \ FQ_i \ [X_P \ldots t_i \ldots]] \ldots \quad \text{(Doetjes (1997: 202))}
\]

The licensing condition is composed of the following assumptions:

\[
(23) \quad \begin{align*}
\text{a. FQs are generated in an adverbial position.} \\
\text{b. FQs must bind a trace of their antecedent.} 
\end{align*} \quad \text{(ibid.)}
\]

(21a, b) are correctly ruled in under these assumptions: each FQ binds the trace \( t_i \) of its antecedent. To put it another way, this account is based on the important observation that both \textit{R-tous} and \textit{L-tous} have the same binding requirement (23b).

Nevertheless, this observation is not without its problems. As Bobaljik (1998: 8) correctly suggests, Doetjes gives no answer to the question as to why an FQ has to bind the trace/copy of its antecedent, leaving (23b) as a mere descriptive generalization. In the next section, I will propose a more principled account of this problem, based on Adverb Analysis.

3. An Alternative Analysis

In the last section, I discussed several problems pertaining to the previous analyses of QF, and Doetjes’s suggestion of a generalization of both \textit{L-tous} and \textit{R-tous}. In this section, I will show that semantic consideration will enable us to reduce this generalization to a feature-checking theory.

3.1. The Semantics of FQs

To begin with, let us note the well-known fact that FQs force a distributive interpretation. This point is illustrated in (24), from Junker (1990a: 211, 212):

\[
(24) \quad \begin{align*}
\text{a. The children each took the bus at the same time.} \\
\text{b. The children each called their mother one after the other.} 
\end{align*}
\]

The expression \textit{at the same time} forces an interpretation in which the event of taking a bus in (24a) is both a simultaneous and the same event for all the children. The deviance of (24a) indicates that FQ \textit{each} forces a distributive interpretation in which the event denoted by a verb phrase distributes over the individuals denoted by the antecedent of \textit{each}: the event of taking a bus has to be mapped with each child (Junker (1990a: 212)). By contrast, FQ \textit{each} is compatible with such
adverbs as *one after the other* as shown in (24b), since they force the distributive interpretation: the event of calling his mother is distributed to each child. Similarly, these adverbs are compatible with FQ *all*, as illustrated by (25), from Junker (1990a: 212):

(25) The people all discovered the cave one after the other.

Junker concludes that FQs force the distribution of an event. FQ *both* also strongly prefers the distributive interpretation (Huddleston and Pullum (2002: 377)).

Note that, unlike *each*, *all* does not necessarily require true distributivity, as illustrated in (26a, b), from Bobaljik (1995: 196):

(26) a. The students all gathered in the hall.

b. *The students each gathered in the hall.

In (26a), *all* allows a collective reading, compatible with collective predicates such as *gather.* Bobaljik (1995) states that the notion relevant to this property of *all* is maximality or maximal distributivity, and not true distributivity. To illustrate this, let us consider (27):

(27) a. The students in this department have submitted abstracts to GLOW.

b. The students in this department have each submitted abstracts to GLOW.

c. The students in this department have all submitted abstracts to GLOW. (Bobaljik (1995: 198))

According to Bobaljik (pp.198, 199), (27a–c) differ from one another in the following fashion: “[(27a)] may be true even if only a subset of the students in the department have submitted abstracts.” In contrast, (27b) is true only if the predicate *submit abstracts* is “true individually of every member of the group denoted by the students in this department.” (27c) is different from (27b) in that it does not force distributivity. “It may be the case,” continues Bobaljik, “that all the students have submitted abstracts jointly, or some individually and some jointly .... [It] appears that the *maximality* enforced by *all* states that the predicate need be true of every member of the group denoted by the subject, but that it may hold collectively or partially collectively and partially distributively of the group.” Bobaljik (p. 201) then suggests that FQ *all* has the following semantic property: “adverbial *all* adjoined to a predicate causes that predicate to be maximally distributive with respect to a group (or mass) argument of that predicate.” In short, FQ *all* allows collective, partially collective, and partially distributive readings, while FQ *each* needs truly distributive ones.
Note also that FQ each as well as all/both requires a plural antecedent. Consider (28):

(28)  
   a. The {men/*man} have both left. (O'Grady (1982: 535))
   b. The {boys/*boy} promised to each leave on time.

(ibid.: 527)

It is plausible to say that (29a, b) hold true of FQs in general:

(29)  
   a. An event modified by an FQ has to be either (partially) collective, or (maximally) distributive.
   b. The collective/distributive force of FQs requires the plurality of their antecedent (cf. Heim et al. (1991: 72)).

With this in mind, let us return to the question of why (23b) holds true of the QF phenomenon.

3.2. Features of FQs

According to Doetjes, both R-tous and L-tous as in (21) above involve the configuration (22):

(22) ... [XP FQi [XP ... t; ...]] ...

(Doetjes (1997: 202))

Here, an FQ c-commands a trace of the antecedent. It is desirable to reduce the configuration of FQ-licensing to that of feature-checking, since checking theory is an integral part of the computational system for human language. Given the semantic property (29), it is plausible

3 FQ both requires the duality of its antecedent, so the plurality in (29b) is understood to be applied to sets with exactly two members or more than two.

Unlike both and each, all can take as its antecedent mass (non-count) arguments (e.g. water, data) and arguments referring to spaces (e.g. Lake Ontario, sky) (Bobaljik (1995: 199)):

(i)  
   a. The water might all have been spilled.
   b. This data has all been invented by the author.
   c. Lake Ontario might all have been polluted by the government.
   d. The sky might all have clouded over.  

(Bobaljik (1995: 199))

According to Huddleston and Pullum (2002: 375), universal quantification with such a non-count noun as water involves quantification over smaller parts/quantities of the noun. Thus, the water is subdivided into smaller quantities of water. It might be the case then that sub-divided parts/quantities qualify as the plural antecedent of FQ all. The plurality in (29b) needs to be understood to involve these instances. In any case, a further refinement of (29) is necessary, although we will leave this matter open in this paper.

Given (29), FQ all and completive all are distinguished from each other. Completive all has a meaning like entirely and lacks $\phi$-features, which is the reason why completive all is compatible with a singular, count noun (Bobaljik (1995: 207)).
to suppose that a checking relation among an FQ, (a trace of) the antecedent and the event ensures the plurality of the antecedent and collectivity/distributivity of the event. Let us then assume (30a), on the basis of (29a, b):

(30)  
a. An FQ bears a number feature [uNum] that is uninterpretable and (partially) collective or (maximally) distributive features [Col/Dist] that are interpretable.
b. [uNum] enters into an agreement relation with the closest interpretable number feature [Num] (cf. (31)).
c. A number-feature of NP serves as an intervener of the matching relation (cf. (32)).

(31) A matching feature G (=goal) is closest to P (=probe) if there is no G' in D(P) matching P such that G is in D(G'), where D(X) is the c-command domain of X.  

(cf. Chomsky (2000: 122))

(32) If probe P matches inactive K that is closer to P than matching M, the Agree relation between P and M is blocked (an intervention effect).  


Given that FQs in German, French and Hebrew, among others, show agreement in gender and number or even case (Shlonsky (1991) and Merchant (1996)), it is not implausible to conjecture that English FQs also bear incomplete \( \phi \)-features, i.e. a number feature [uNum], though this is not overtly realized. [uNum] enters into an Agree relation with the closest matching [Num] feature of an NP or its copy, under the copy theory of movement (Chomsky (1995)). The notion of closeness is defined in (31), and (30b, c) are derived from the notions of locality (31) and (32). An FQ, being \( \phi \)-incomplete, cannot delete any feature of the antecedent NP. The NP remains susceptible to further Agree/Move operations.

Let us move on to [Col/Dist] features. If Higginbotham (1985) and Bonneau and Zushi (1992) are correct, a verb/tense projection bears an event position E. If (29a) is correct, we can safely conjecture that an FQ also bears an interpretable feature [Col/Dist], selecting a collective/distributive event denoted by a verb/temporal phrase to which it is adjoined. That an FQ bears [uNum] and [Col/Dist] is motivated by Junker's (1990a, b) treatment of FQs as two-place operators selecting an NP and an event.

Let us turn to cases such as (28). Even if an FQ agrees with a singular antecedent, acquiring a non-plural value, the derivation does not
crash. Such structures will yield a deviant interpretation (cf. Chomsky (2001b: 10)). This is because the acquired non-plural value is inconsistent with the interpretable [Col/Dist] feature of the FQ or collective/distributive event (cf. (29b)). This amounts to saying that an FQ quantifies the plural NP with which it enters into an Agree relation, a claim I propose to support in the following sections.

Heim, Lasnik and May (1991: 66) argue that FQ each adjoins to its antecedent phrase at LF. For example, a sentence the men each left is mapped onto the LF-representation (33):

\[
\text{(33) IP [NP [NP the men] [QP each]]} \text{ tj left]}
\]

The whole subject NP inherits the distributive index of each, thereby yielding the distributive reading (p. 74). Under our assumptions, indices are abandoned in favor of interpretable [Col/Dist] features of FQs. This is consistent with the thesis of the minimalist program that no indices are introduced during the derivation (Chomsky’s (2000) inclusiveness condition).

Belletti (1982), Akiyama (1994) and Tonoike (1996), among others, also suggest that an FQ raises to its antecedent via QR (quantifier raising). There is an empirical reason, however, to believe that FQs do not undergo QR. Consider (34a, b), examples illustrating scope-freezing effects, i.e., FQs take scope only in their surface position:

\[
\text{(34) a. The students seemed not to all know French. (not>all)}
\]
\[
\text{b. The contestants could have all won. (could>all)}
\]


Here, the negation/modal can scope over all, but not vice versa. If the FQ were adjoined to the antecedent by such an operation as QR, then (34a, b) would be wrongly interpreted in such a way that all could have wider scope.

Suppose, on the other hand, that QL (quantifier lowering) were applied and the raised subject were moved back to one of its trace positions prior to FQ-adjunction. Then the desired scope relation in (34) could be yielded, since all would now adjoin to the antecedent in the position lower than not/could. Such a solution, however, would yield an unwanted scope reading, since the students, as in (34a), is always interpreted to have wider scope than seem. It follows that an FQ should not be linked to its antecedent by QR.

By contrast, our analysis links an FQ to its antecedent by feature-checking and correctly derives the observed scope relation. Let us see how (30) works. (We will not adopt Chomsky’s (2001a) phase theory,
since the discussion below neither requires nor supports the theory.
Suppose that the derivation of (34a) reaches the stage of (35a).

\[(35) \quad \text{a. } [\text{vP all}_{[\text{uNum}]} \ [\text{vP the students}_{[\text{Num}]} \ \text{know-v VP}]] \]
\b. \ [\text{TP The students, seemed not to } [\text{all } [t_i \ \text{know French}]]]

Here, preverbal all is adjoined to a light verb phrase vP. Its [uNum] feature enters into a matching relation with the closest [Num] feature of the vP-internal subject. The FQ is linked to its antecedent by this relation, and the verb phrase has a [Col/Dist] interpretation. The subject is then raised to a higher position, since the FQ, being \(\notin\)-incomplete, does not inactivate the goal. The overt derivation reaches (35b), yielding the desired scope relation (not>all). A similar remark will apply to (34b). Accordingly, we can most plausibly say that our checking analysis is preferable to FQ-raising analysis.

It is in order here to ask why an FQ, unlike other adverbs, serves as a probe seeking a matching number feature. As we have mentioned, an FQ bears an interpretable [Col/Dist] feature selecting a collective/distributive event denoted by vP/TP. If (29b) is correct, this feature always requires the plurality of its antecedent. However, nothing would ensure that the [Col/Dist] feature is associated with a local antecedent NP, if an FQ did not have a probe seeking the closest plural NP. This is because an interpretable feature does not probe into a search space, and because an FQ cannot be related to its antecedent by such operations as QR. The local dependency between a plural NP and the collective/distributive event is mediated by the [uNum] feature of an FQ. If this reasoning is tenable, it is not implausible to assume that an FQ, being an adverb, serves as a probe.

To summarize this section, I have proposed that FQs bear a [uNum] feature and that this feature is correctly checked in structures like (35a), thereby deriving the FQ-licensing condition (23b). I have shown that scope-freezing effects on FQs lend support to our feature-checking analysis. It remains to be seen whether the proposed analysis is free from the above-mentioned problems of the other analyses. The rest of this paper is devoted to this issue.

### 3.3. An Alternative Account

#### 3.3.1. Shifted Antecedents

Let us first consider subject-oriented FQs in (36) (= (1)):

\[(36) \quad \text{The children, (all) } [\text{would } [(\text{all}) \ [\text{have } [(\text{all}) \ [\text{been } [(\text{all}) \ [t_i \ \text{doing that}]]]]]]]]

Here, each occurrence of *all* is adjoined to the phrases headed by auxiliary verbs (cf. Tonoike (1996: 4)) and c-commands *ti*, so the [uNum] of *all* enters into an Agree relation with the [Num] of the subject. (3a) above is a parallel case, in which the subject-trace is in the complement position of the verb.

Lasnik (1999) claims that exceptionally Case-marked (ECM) subjects, unlike full NP objects, undergo overt shift from the base-position to a higher specifier position, and this provides convincing arguments for his claim.

This claim fares well with respect to the fact that ECM-subjects, but not full NP objects, tolerate QF. Consider ECM-cases (37):

(37) a. We consider [vP the meni [sc all [sc ti crazy]]]
   b. I expect [vP the meni [tp all [tp ti to leave at noon]]]  
   (cf. Bowers (1993: 620, 625))

I assume that an FQ can adjoin to a small clause or to a TP complement (cf. Bowers (1993: 625) and Tonoike (1996: 8)). In (37a, b), the FQs c-command the trace of their respective antecedent, satisfying (30a). (3c) is a parallel case.

A similar remark applies to QF in languages such as Icelandic (see (12)), which have overt shift of full NP objects (cf. Giusti (1990b: 144)). Thus, (12) is delineated as (38).

(38) Égi las [bækurnarj [vP ekki [vP ti tv [vP allar [vP tv tj]]]]]  
I read the books not all

Here, the direct object is shifted to a position higher than the negation marker *ekki*. *Ekki* indicates the left-edge of vP, since it precedes a subject when the subject remains in its vP-internal position (Jonas (1996: 3, 37)). Therefore, it is plausible to assume that FQ *allar* is adjoined to VP (or to some other position lower than the subject-copy) and that it takes the object-copy as its closest NP. It is then predicted that an FQ adjoined to vP will be subject-oriented since it takes the subject-copy as its closest NP. This prediction is indeed borne out. Consider the following sentence, in which the adverb *stundum* indicates the left-edge of vP:

(39) Í fyrra máluðu stúdentarinir; húsið; [vP stundum [vP allir  
Last year painted the students the house sometimes all  
[vP ti; tj rautt]]].
   red

‘Last year, all the students sometimes painted the house red.’  
(Bobaljik (1995: 145))
By contrast, full NP objects in other Scandinavian languages are not moved from verb phrases. It is therefore predicted that such objects cannot appear to the left of their FQs. This prediction is also borne out. Consider the following examples from Danish (40a) and Norwegian (40b):

(40) a. *læreren roste eleverne (uden tvivl) alle.
   the teacher praised the students undoubtedly all
b. *læreren gav elevene bøkene alle.
   the teacher gave the students the books all

(Giusti (1990b: 137, 144))

These FQs indicate the left-edge of a verb phrase (Giusti (1990b), Bobaljik (1995: 153)), and the objects cannot move across the FQ. This is consistent with Giusti’s (1990b) observation that languages that allow for object movement from VP also allow for object-oriented FQs.

In English, however, full NP objects are not overtly shifted. This is confirmed by the ban on extraction from a non-Ø-position (Lasnik (1999: 162)), as illustrated in (41).4 The ungrammaticality of (41b) indicates that ECM-subjects are overtly shifted.

(41) a. Who did John see [friends of t]?
   b. *Which one of us do you believe [a picture of t] to be on
      the agent’s wall?  
   (Runner (1995: 114))

The extractability of a wh-phrase shown in (41a) correlates with the impossibility of QF in (4a), delineated as (42a) or (42b):

(42) a. *John saw the menj [VP all [VP tv tj]]
b. *John saw [VP [VP tv the men] all]

Since the men in (4a) is not overtly shifted, it can never precede the VP-adjoined FQ. Therefore, (42a) is ill-formed. There are reasons to assume that FQs cannot be right-adjoined to verb phrases or to other categories in English. The assumption is needed in order to exclude postverbal FQs in unaccusative and passive sentences (cf. note 1) and to capture the parallelism between FQs and certain adverbs.5 Therefore,

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4 As Maling (1976) and Takami (1998) point out, example (i) is not an instance of QF, but Quantifier-Pro flip.

(i) The teacher scolded them all.  
   (Takami (1998: 153))

5 Recall that FQs and adverbs like merely are excluded from a sentence-final position (cf. (16)). By a sentence-final position, we mean the surface position in which a constituent is pronounced, regardless of where it is hierarchically located.
(42b) is also ill-formed.

A similar remark applies to other sentences. Thus, (4b–d) are parallel with (42). (5a) and (6a) are parallel with (37a) and (3a), respectively. We will shortly return to these two sentences. (5b) and (6b) are delineated here as (43a, b), respectively:

(43) a. *John [vP left the two rooms both angry]. (= (5b))
   b. *John and Mary [vP died both young]. (= (6b))

Depictive predicates are right-adjoined to a verb projection. Since full NP objects cannot be overtly shifted, the FQ cannot follow them in (43a) (cf. (42)). The FQs in (43a, b) are excluded under Adverb Analysis, since VP-adverbs are excluded from this position (cf. (42b)), as shown in (44a–c):

(44) a. *John left (the two rooms) unhappily angry.
   b. *John and Mary died unhappily young.
   c. *Mary ate the meat greedily raw. (Tsuzuki (1990))
   d. Mary ate the meat raw greedily. (ibid.)

It is natural to attribute the ungrammaticality of (44a–c) to a violation of what I call the licensing condition on predication (LCP), or a requirement that a secondary predicate (SP) and the θ-position of its subject be in the same cycle (Terada (2002)). Suppose that a cycle can optionally contain at most one instance of Set-Merge (substitution) and at most one instance of Pair-Merge (adjunction). In (44a), the SP and the preceding adverb are merged with vP by two different instances of Pair-Merge, as illustrated in (45):

(45) *... [vP1 [vP2 [vP3 John left] unhappily] angry]

The LCP is not met here, since John, left and unhappily, but not angry, are contained in the same cycle, i.e. vP2. This is because a cycle is closed off before more than one instance of Pair-Merge is applied to vP. The same holds true of (44b, c), since the internal argument, the verb

Whether they are in an adjunct position or not, quantifiers must be heavy enough to appear in a sentence-final position (Akiyama (1994: 111)):

(i) a. *The students came to the party all.
    b. ??The students came to the party all three.

The same is the case with adverbials such as much (ibid.; 112).

FQs followed by sentence-final elements as in (43a, b) are immune from such a heaviness requirement. They are excluded by a condition on predication, to which we will turn shortly.
and the V'-adjoined adverb, but not the V'-adjoined SP, are contained in the same cycle. In (44d), the internal argument and the SP are contained in the same cycle. Unlike SPs, adverbs are not subject to the LCP, simply because they are not predicated of a subject. A similar remark applies to (43b). ((43a) is on a par with (42a), as we mentioned above.) See Terada (2002), for details.

We must now establish how (5a) and (6a) meet the LCP. These sentences can be delineated as (46a, b), respectively.

(46) a. John found the two roomsi both [SC ti empty] (=(5a))
    b. John and Maryi both [VP [VP died ti] young] (=(6a))

In (46a, b) the predicate empty/young and its subject ti are contained in the same cycle (i.e. SC and VP) and the trace is the closest to the FQ. The LCP and (30a) are both satisfied.

Note that if this cycle-based explanation were adopted under Takami’s Predication Analysis, the ungrammaticality of (6b) would not undermine the PCFQ. However, it is not clear that the LCP fits into his framework, where FQs are treated as secondary arguments rather than adverbials. We will leave this matter open here.

Let us now turn to (3b, d). The full NP object in these sentences can be treated as the subject of a small clause that is shifted to a higher position. This treatment is motivated by the following example from Bošković (2001: 70):

(47) *Who did you put [the pictures of t] all on the table.

(47) manifests that the full NP antecedent is shifted to a non-θ-position. Accordingly, (3b, d) are parallel with (37a).

A similar treatment is possibly applied to (3e) and (4e), if it is correct to assume that all is adjoined to the embedded TP (for a similar assumption, see Baltin (1995)). Consider:

(48) a. Frank [VP persuaded [VP the meni tV [CP [TP all [TP PROi to leave]]]]] (=(3e))
    b. *Franki [VP promised [VP the men tV [CP [TP all [TP PROi to leave]]]]] (=(4e))

The PRO controlled by the object in (48a) counts as the plural NP closest to the FQ, but the PRO controlled by the subject in (48b) does not. (30a) is not satisfied in (48b).

3.3.2. Comparison with Doetjes’s (1992, 1997) Analysis

As we have seen in section 2.3, Doetjes’s licensing condition (23b) supersedes previous analyses, since it gives a unified account to both R-
tous and L-tous phenomena. We have improved (23b) in the form of (30), inheriting its benefits. Let us now consider French sentences (49a) (= (21a)) and (49b):

(49) a. les enfantsi [T ont] [vP tous [vP ti dormi]] (= (21a))
   the children have all slept

b. Jej veux [TP PROj [vP t j [v lesi voir-v] [vP tous [vP tv
   I wanted them see all
   ti]]]]]
   ‘I wanted to see them all.’ (cf. Doetjes (1992: 324))

In French, a finite verb is overtly raised to T while a non-finite verb cannot move out of a verb phrase (Chomsky (1995: Chapter 2)). In (49a), tous is adjoined to vP, while in (49b) the FQ, preceded by the complex verb [v V-v], occupies the VP-adjoined position. (49a, b) are ruled in by either (23b) or (30a), since the FQ c-commands, and enters into an Agree relation with, the copy ti of its antecedent in each sentence.

Similarly, the following sentences are excluded by (23b) and (30a), simply because the FQ fails to c-command (the copy of) its antecedent:

(50) a. *Les garçons ont dit que Pierre est tous parti.
   b. *The boys said that Pierre had all left.
   (Doetjes (1997: 206))

As far as these sentences are concerned, our alternative (30a) is no different from Doetjes’s (23b). In the rest of this section, I will show that there are reasons to reject (23b) in favor of (30a). Thus, consider (51), in which all cannot be construed with my friends:

(51) a. *John has all seen my friends.
   b. *The mother of my friends is all gone to the beach.

We have adopted the copy theory of movement (Chomsky (1995: Chapter 3)), so (51a, b) are delineated as in (52a, b), respectively:

(52) a. *Johni has [vP all [vP Johni seen-v [vP tv my friends]]]
   b. *[The mother of my friends]i is [vP all [vP gone [vP tv the mother of my friends]] to the beach]]]

(23b) would wrongly rule in (52a, b), since all c-commands (the copy of) my friends in each sentence. To avoid this situation, Doetjes (1997: 207) resorts to binding theory, arguing that the unwanted binding of a referential expression by an FQ in such sentences gives rise to a Condition C violation. This solution is untenable, however, because FQs are adverbs, as Doetjes assumes, and hence they do not qualify as A-binders. Note that if FQs were A-binders, no QF from wh-phrases
would be possible: wh-traces would be A-bound by FQs and such examples as (7b) above and (56) below would incorrectly violate Condition C.

No such problem arises under our assumptions. In (52a), the number feature closest to all is that of John, rather than my friends, a typical intervention effect (32). Similarly, in (52b), the NP closest to all is the mother, rather than my friends.

This copy-based account is bolstered by (53) (= (20)):

(53) They said that they would all work on that, and [all work on that] they did. (Baltin (1982: 9))

Here, [vP all [vP t(=they) work on that]] has been fronted, with the subject-copy occupying the Spec position (Huang (1993)). The copy of they counts as the closest NP to the FQ.

A further argument for the superiority of our analysis comes from Spanish examples (54a) (cf. (21b)) and (54b) (cf. Bonneau and Zushi (1992: 14)). I have omitted irrelevant details:

(54) a. Ella_j (todos) [los_i queria] [vP t_j t_v [vP tv PRO_j leer t_i]]
    she all them wanted to-read

b. Ella_j (*todos) [queria] [vP t_j t_v [vP tv PRO_j leer-los_i t_i]]
    she all wanted to-read-them

'She wanted to read them all.'

According to Bonneau and Zushi (p. 13), the long-distance movement of a clitic pronoun (clitic-climbing) is optional when the clitic is not quantified by an FQ, and a finite verb (e.g. queria in (54a, b)) is raised out of vP. Suppose that FQ todos is adjoined to some phrase headed by a functional category. Then, in (54a), nothing intervenes in a matching relation between the FQ and the pronoun cliticized to the verb, but in (54b) subject-trace t_j or PRO_j intervenes between the two. Todos in (54a), but not in (54b), meets (30a). However, this contrast is not captured under (23b), since in each sentence todos binds the clitic pronoun (or its copy).

A similar remark will apply to German L-tous. Bobaljik (1998: 8) suggests that (23b) tolerates ungrammatical instances like (55), in which sie is shifted to a pre-adverbial position:

(55) *Im Garten hat alle der Hans sie_1 gestern t_i gegessen.
    In the garden has all the Hans them yesterday eaten

(Bobaljik (1998: 8))

(55) would be wrongly ruled in under (23b), since the FQ binds the trace of the pronoun. (30a), in contrast, correctly excludes this sen-
tence, if it is correct to say that *der Hans* is closer to the FQ than *sie*.

In this section, I have shown that our proposal can avoid the problems arising with Doetjes’s proposal.

### 3.3.3. QF and Wh-movement

McCloskey (2000) argues that, unlike *Standard English*, West Ulster English (WUE) allows QF from wh-phrases (hereafter, QFWH):

(56) What (all) do you think (all) that he’ll say (all) that we should buy?

(McCloskey (2000: 62))

This example has been considered as an argument for successive cyclic *wh*-movement, since the FQ indicates the intermediate copies of *what*. In our terms, each occurrence of *all* c-commands the closest intermediate copy of *what*, so the [uNum] feature is satisfied.

This proposal is supported by the fact that an FQ in WHQF cases like (57) is not construed with the subject.

(57) What did you get all for Christmas? (ibid.: 58)

Under the present assumption, the object-copy in (57) is the closest to the VP-adjoined FQ, so we can correctly predict that the FQ can only be construed with the *wh*-phrase. Unlike WUE, Standard English disallows the adjunction of an FQ to a predicate in a postverbal position, as we will see in the next section (see also note 1 and (42)).

Let us consider marginally acceptable QFWH in Standard English, i.e. (7b). (7b) includes the following well-formed structure:

(58) the books, which I will [MP all [MP tj have to [vP tj read tj]]]

As we have seen in (36), an FQ can adjoin to the phrase headed by *have* (call it a modal phrase (MP) (cf. Tonoike (1996: 4))). It is plausible to conjecture that successive cyclic *wh*-movement leaves an intermediate copy of *which* in the Spec of MP or MP-adjoined position as well as in other A-bar positions. Therefore, as intermediate copy *tj* is closer to the FQ than subject-copy *ti*, the checking requirement of FQs is satisfied in (7b). If this is tenable, we can conclude, contrary to Bošković (2001: 61), that QFWH is not necessarily an argument for Q-Stranding Analysis, and that it provides further support to Adverb Analysis.6

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6 The marginality of (7b) might be due to the distributional restriction on FQs: FQ-adjunction to the maximal projections of auxiliary verbs is marginal for many
3.3.4. Further Arguments for the Present Analysis

In this section I will examine some apparent problems associated with (30a), showing that they actually provide support to the present assumption. First, consider the following examples:

(59)  a. I bought the girls both an ice cream.
     b. *John bought the books both for his mother.


As we have mentioned (see note 2), the quantifier in (59a) is an integral part of the indirect object NP. This is an option exceptionally allowed for the indirect object of the double-object construction. If this is correct, the present analysis can correctly predict that (59a) is grammatical, simply because the indirect object is the closest to the quantifier. We could ascribe this exceptional occurrence of a quantifier within a noun phrase to the peculiarity of the double-object construction, though I will leave the matter open here.

Consider next (59b). This example is predicted to be grammatical if the books is overtly shifted and the FQ agrees with its trace, on a par with (3b, d) and (37). The degraded status of (59b) apparently creates a problem with the present analysis. However, my informant judges this sentence to be acceptable, though slightly odd. The same inform-
ant judges the following example to be rather degraded.

(60) *What movie star did you buy [photographs of t] all for your daughter?

(60) manifests that the NP-antecedent is shifted to a non-θ-position, as we have seen in (47). It follows that our treatment of (3b, d) and (47) can be extended to (59b) and (60): the FQ agrees with the closest plural NP, i.e. the copy of the shifted antecedent.

Second, consider (61a–d) below. These sentences are ungrammatical if interpreted in such a way that all quantifies the boys:

(61) a. *Bill depends all [PP on the boys].
   b. *Bill is aware all that [TP the boys lost their money].
   c. *All yesterday [TP the boys arrived here].
   d. *Bill; has [vP ti [v' all [v' helped [vP tv the boys]]]].

In (61d), all would not c-command the subject-copy, if FQs were allowed to occupy an inner Spec of vP or a v'-adjoined position. If the boys were the closest to all, (61a–d) would be wrongly ruled in under (30a). This apparent problem is readily resolved, however. Note that each occurrence of the boys has its Case-feature checked by its Case-assigning P, T or v-head and is inactivated prior to FQ-checking. By contrast, in the grammatical QF-sentences we have seen so far, the antecedent NPs enter into an Agree relation with the FQ before they are inactivated. Sentences (61a–d) lend support to our checking analysis.

In this connection, consider (62a, b):

(62) a. *Bill has [vP ti written-v [all (easily) [VP tv the books]]]
   b. Bill has read [NP all the books].

In (62a), the [uNum] feature of all enters into a checking relation with its closest [Num] feature of the non-shifted direct object, although this sentence is ungrammatical. Adverb Analysis, however, gives a straightforward solution to this problem. Given the distributional restriction on adverbs, as illustrated in (16b) and (63), FQs may not be generated in a

(i) A: I met Paul at a nearby bookshop yesterday. I saw him buying two Christmas presents, a cookbook and a newly published novel. It seems to me that he bought the cookbook for his mother and the novel for his wife.
   B: I don’t think so. His wife walked out on him last month and he has lived with his mother since then. He bought the books both for his mother.
position immediately preceded by a verb (see also (17)).

(63) *Bill has written {completely/easily} the books.

It is fairly safe to say that the postverbal position of all in (62a) is a VP-adjoined position and that FQs in Standard English are not allowed in this position. However, the question of how an adjacency condition may be derived on a verb and its object is beyond the scope of this paper. We will therefore leave this issue for future research.

In this section, I have examined some apparent problems that might arise with (30a), showing that they support, rather than undermine, the present assumption.

4. Conclusion

In this paper, I have pointed out the shortcomings of Predication Analysis (Takami (1998, 2001)) and Q-Stranding Analysis (Sportiche (1988), Bošković (2001) etc.). I have also derived Doetjes’s (1992, 1997) generalization (23b) and Junker’s (1990a, b) semantic characterization of FQs from feature-checking requirements (30a). To the extent that it is successful, the current analysis provides further support to Adverb Analysis. I will reproduce here some of the conclusions the current analysis confirmed: FQs and certain adverbs behave alike; FQs have an uninterpretable number feature requiring an appropriate antecedent within their search domain; FQs also bear an interpretable collective/distributive feature to be associated with the phrase they are adjoined to, thereby cooccurring with a collective/distributive event; FQs do not undergo Q-raising in the logical form component; ECM-subjects and certain object NPs are subject to overt shift to a higher position; the locality of dependency between an FQ and (the copy of) its antecedent is regulated by the notion of closeness and intervention constraint; certain apparent counterexamples to our account have been derived from the distributional restriction on adverbials and feature checking properties.

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