

Floating Quantifiers: Handle with care

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What is the relationship between the two sentences in (1)?

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

More precisely, what is the nature of the relationship between *all* and [_{DP}the students] in (1b) and what can this relationship tell us about grammar? The meanings of the two sentences are obviously quite similar and they involve (apparently) the same collection of words. This observation has led to a series of proposals based on the idea that there is a transformational relationship between these sentences, and thus a syntactic relation between the DP and the “floating” quantifier (FQ), so-called since the earliest proposals took the quantifier to float rightwards, away from the DP.

In this brief overview, I will examine some of the central proposals concerning such constructions, and try to flesh out a sense of what we have collectively learned since attention was focused on this phenomenon in the early 70’s. I will argue that despite significant progress in our understanding of the syntactic, semantic and morphological properties of constructions such as (1b), there is still a great deal more to learn. One proposal in particular (i.e., that *all* in (1b) marks a subject trace, due to Sportiche (1988), if substantiated, offers a very powerful tool for the investigation of phrase structure and movement properties, and has had a significant influence on (especially the syntactic) literature of the past decade. Given the potential of this account, the hypothesis that FQs mark positions from (or through) which a DP has moved deserves close scrutiny. Such scrutiny reveals, however, that the evidence is not as clear as often assumed and that many crucial questions are still unanswered. I hope, though, to offer with this overview a sense

of where research into the matter stands currently, and what the major issues are that still loom before us.

1. Context

It was noticed early in the generative tradition (see especially Kayne 1969, 1975) that in some languages, sentences with certain quantified DPs may be paraphrased quite closely by sentences in which the quantifier [Q] is separated from the DP, surfacing in apparent adverbial positions. Example (1) is a canonical example from English and (2) gives a similar pair from French.

- (2) a. *Tous les enfants ont vu ce film.*
 all the children have seen this movie
 ‘All the children have seen this movie.’
- b. *Les enfants ont tous vu ce film.*
 the children have all seen this movie
 ‘All the children have seen this movie.’ (Sportiche 1988: 426)

Not all Qs may occur in such pairs; abstracting away from the presence of *of* or French *de* ‘of’ (see below) universal quantifiers *all*, *each* and *both* and French *tou(te)s* ‘all’, *chacun* ‘each’ may alternate between positions. In the earliest proposals, a transformation took the Q from its position at the left edge of the DP and moved it to a different position in the clause; the phenomenon was soon dubbed *Q-float*. Kayne (1969, 1975) identified two Q-float operations in French: *Q-Post/R-Tous*—in which the Q moves to the right from the DP with which it is associated (as in (2)), and *L-Tous*—in which the Q moves to the left from its associate (3).

- (3) *Elle a tous voulu les lire.*
 she has all wanted them to-read
 ‘She wanted to read them all.’ (Kayne 1975: 4)

There are two fundamental properties of Q-float which motivated the initial transformational proposals (see Kayne 1975: 2) and which have continued to be primary motivations for all approaches which maintain that there is a syntactic relationship between the FQ and the DP (see, e.g., Sportiche 1988: 426, Doetjes 1997: 201-205).

First is the intuition that the FQ quantifies over the DP in the (b) examples in (1) and (2) in the same way that it does in the (a) examples, i.e., that the sentences are logically equivalent, or that their “quantificational properties” are “identical” (Sportiche 1988: 426).

Second is the fact that in many languages, FQs show agreement (typically for case, number and gender) with the DP that they are associated with:

- (4) a. *Elles sont toutes/*tous allées à la plage.*
 they-F are all-F.PL/*all-M.PL gone-F.PL to the beach
 ‘They (the women) all went to the beach.’ (French, Doetjes 1997: 205)
- b. *Diesen Studenten habe ich gestern*
 These-DAT.PL students have I yesterday
*allen/*alle geschmeichelt.*
 all-DAT.PL/*-∅ flattered.
 ‘I flattered all of these students yesterday.’ (German, Merchant 1996: 4)

Agreement is a property of the nominal system and the agreement morphology borne by FQs in French and German is adjectival, the same morphology that these Qs bear when they occur at the left edge of the DP.

Having thus identified Q-float as a likely candidate for a transformation, a good deal work in the 1970s and early 1980s was devoted to discovering and refining the conditions under which the transformation could apply, that is, in describing and explaining the distributional properties of FQs (see, e.g., Baltin 1978 for data from a range of languages). For instance, it was understood early on that FQs occupy positions in which adverbs canonically surface, especially to the left of verbs and verbal elements (e.g., auxiliaries and modals) (5).

- (5) a. *The children {all} would {all} have {all} been {all} doing that.*
 b. *Les soldats ont {tous les deux} été {t.l.d.} présentés {t.l.d.}*
 the soldiers have all the two been all 2 introduced all 2
à Anne par ce garçon.
 to A. by this boy
 ‘Both soldiers were introduced to Anne by this boy.’ (Kayne 1975: 46)

This becomes clearer when one examines various contrasts between English and French: the differences in possibilities for adverb placement between the two languages correspond to differences in admissible sites for the FQ. For instance, English, but not French, allows an adverb or a FQ to immediately follow the subject.

- (6) a. *My friends all/probably will leave.*
 b. **Les enfants tous/bientôt vont partir.*
 the children all/soon will leave (Pollock 1989: 368)
 c. **Les soldats tous les deux ont été présentés à Anne par ce garçon.*
 the soldiers all the two have been introduced to A. by this boy
 (cf., (5b)) (Kayne 1975: 47)

As (6a) shows, this is true even in sentences with an auxiliary (or modal) which is standardly taken to be in Infl (or the highest functional projection in a split Infl). An additional English versus French contrast in which FQs pattern with adverbs concerns their use as a diagnostic for the left edge of the VP. Thus, the argument from Emonds (1978) (expanded by Pollock 1989) that English finite main verbs remain in the VP (at s-structure), while in French all finite verbs raise to Infl, is in part based on the fact that a certain class of adverbs must precede finite main verbs in English and follow them in French (7a-b). Examples (7c-d) show that FQs pattern with the left-edge of VP adverbs in this regard.

- (7) a. *Jean (*souvent)embrasse (souvent)Marie.*

John often kisses often Mary

‘John often kisses Mary.’

b. *John (often) kisses (*often) Mary.*

c. *Mes amis (*tous) aiment (tous) Marie.*

my friends all love all Mary

‘My friends all love Mary.’

d. My friends (all) love (*all) Mary. (Pollock 1989: 367)

Pollock (1989) uses adverbs, FQs and negation to diagnose the left edge of the VP. While negation and adverbs do not behave alike under all tests for position, Sag (1978) observes that FQs pattern with adverbs (and as opposed to negation) in tests such as the licensing of VP-ellipsis:

(8) a. *Otto has read this book, and my brothers have (all/certainly) read it, too.*

b. *Otto has read this book, and my brothers have (*all/*certainly) ____, too.*

c. *Otto has read this book, but my brothers have (n’t/not) ____.*

By and large then, it appeared (and was certainly assumed) that FQs occupy adverbial positions.

It was also known that there were certain locality restrictions on the dependency between an FQ and the DP it modifies. These were originally investigated in terms of linear precedence (e.g., Baltin 1978, though Fiengo and Lasnik 1976 already note the relevance of subjacency, the precursor to c-command). In the early 1980s an important discovery was made, namely, that the dependence between an FQ and a DP obeys in essence the same locality constraints as those holding between an anaphor and its antecedent (Kayne 1981:196, Belletti 1982:114). Thus, the DP must c-command the FQ (9) (and perhaps (10)), and no finite clause boundary or specified subject may intervene between them (11).

(9) a. **[The mother of my friends_i] has **all**_i left.*

b. **La mère de mes amis_i est **tous**_i partie.*

the mother of my friends is *all* left

intended: 'The mother(s) of all my friends left' (Kayne 1981: 196)

(10) **There (had) all hung on the mantelpiece Portraits by Picasso.*

vs. *The portraits by Picasso (had) all hung on the mantelpiece.*

There hung on the mantelpiece all (of) the portraits by Picasso. (Baltin 1978: 26).

(11) a. **My friends_i think that I have all_i left.*

b. **Mes amis_i pensent que je suis tous_i parti.*

my friends think that I am all left

intended: 'My friends all think that I have left.' (Kayne 1981: 196)

By the mid-1980s, the leading view of Q-float as an extraposition rule, a transformation moving the quantifier to the right, was being gradually replaced by a view in which FQs were "anaphoric adverbs", related to their hosts via Binding. To be sure, there were variations in the implementation of this idea. Belletti (1982), for example, proposed that the anaphoric status was not inherent, but rather the result of a requirement that distributive elements including reciprocals and FQs need to undergo LF A-movement to their host, an idea which is picked up in Heim, Lasnik and May (1991) and extended to anaphors generally in Lebeaux (1983), Chomsky (1986).

2. Stranding

2.1 Sportiche (1988), Shlonsky (1991)

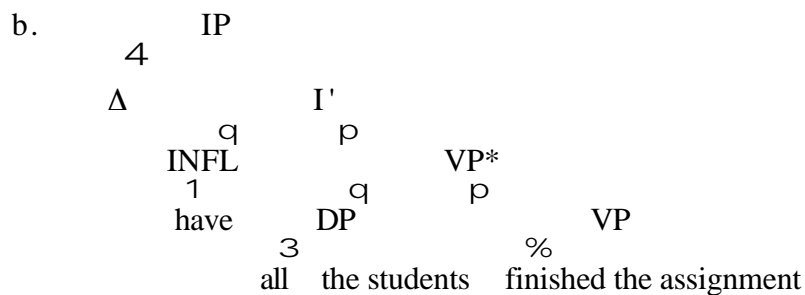
In the late 1980s, four properties of FQs were considered especially salient: (i) FQs appeared to modify DPs in the same way as DP-initial Qs; (ii) FQs in some languages display determiner-like agreement with the DP they modify; (iii) FQs surface in the left periphery of (certain) maximal projections, especially VP; and (iv) the relationship between an FQ and the DP it modifies obeys an anaphor-like locality condition. In this context,

Sportiche (1988) proposed that all of these properties can be made to follow from the observation (12), on certain independently motivated assumptions about movement and phrase structure (I turn to a contemporaneous proposal by Miyagawa (1989) in section 2.2).

(12) Qs may appear in [D]P-initial position. (Sportiche 1988: 427)

Sportiche argues that since (12) is an independently necessary statement, the most parsimonious theory of the distribution of FQs is therefore “one in which nothing essential needs to be said beyond [(12)]” (p.427). Now, since it was by this time well understood that the locality conditions applying to DP-traces (i.e., traces of A-movement) were the same as those for anaphors, Sportiche (1988) proposed that the cluster of properties of FQs discussed above could be explained if the FQs formed a constituent with the DP at D-structure, and the phenomenon of Q-float was actually the stranding of the Q in a position adjacent to the trace of the DP. Such a theory would work if the subject in Spec,IP occupied a derived position not only in raising, passive and unaccusative environments but also in simple clauses—i.e., the VP-internal subject hypothesis, a proposal independently gaining attention at that time (see, e.g., Koopman and Sportiche 1991). Thus, a sentence like (1b) was more accurately represented as (13a), i.e., with a D-structure as in (13b).

(13) a. *The students_i have [all t_i] finished the assignment.*



Sportiche’s proposal captured the observations that were the original motivation for a transformational relationship between (1a) and (1b): the Q is able to modify the DP, and in some languages to agree with it, since at D-structure, [Q DP] is a single constituent. Moreover, the proposal appeared to capture the major distributional properties of FQs: FQs

appeared to occupy adverbial positions such as the left periphery of VP since the adverbial positions were adjacent to the base position of the subject, and the locality conditions looked like those for NP-movement, since they were holding not between the DP and the FQ directly, but between the DP and its trace. While a number of questions were still unanswered (see below), Sportiche's proposal appeared to be a major breakthrough in our understanding of the phenomena, and at the same time, was considered to be compelling empirical support for the VP-internal subject hypothesis.

Shlonsky (1991) refines the stranding proposal in an important way, in doing so expanding its empirical coverage. While Sportiche (1988) remains vague about the mechanics of the extraction (just how does a subconstituent DP move out of the larger DP without violating conditions on extraction?), Shlonsky offers an account, drawing on Hebrew data of the following sort:

- (14) a. *Katafti ʔet kol / *kul-am ha-praxim bi-zhirut.*
 (I) picked ACC all / *all-[3MPL] the-flowers with-care.
 'I picked all the flowers carefully.'
- b. *Katafti ʔet ha-praxim kul-am / *kol bi-zhirut.*
 (I) picked ACC the-flowers all-[3MPL] / *all with-care.
 'I picked all the flowers carefully.'
- c. *Ha-yeladim yašnu kul-am / *kol.*
 the-children slept all-[3MPL] / *all
 'The children all slept.' (Shlonsky 1991: 160-1, 167)

In Hebrew, a Q such as *kol* 'all' may occur before or after the DP which it modifies. When it precedes the DP, the Q must be bare (14a), but following the DP, the Q obligatorily hosts a pronominal (agreement) clitic (14b). Shlonsky proposes that a quantified DP such as [*all the flowerts*] is a QP, headed by the Q which in turn takes the DP as its complement: [_{QP}*all* [_{DP}*the flowerts*]]. In (14b), the DP has raised to the specifier

of the QP, and the agreement clitic is a reflection of this movement (Shlonsky relates this to the ECP, it could also be interpreted as an instance of Specifier-Head agreement). Finally, Shlonsky demonstrates that Hebrew, like French and English, has a Q-float phenomenon. As illustrated in (14c), an FQ requires the appropriate clitic, just as does a post-nominal Q. This suggests that the stranding of the FQ involves a step of DP movement to the specifier of QP, allowing the DP to be further extracted.

Shlonsky's proposal appears also to shed light on English facts discussed in Postal (1974b) and dubbed Q-Pro-Flip in Maling (1976). Thus in constructions without *of*, the Q *all* cannot follow a plural DP, but must (or is strongly preferred to) follow a plural pronoun with which it forms a constituent:

- (15) a. **Sam saw [the students all].* vs. *Sam saw all (of) the men.*
 b. *Sam saw [us/them all].* vs. *Sam saw all *(of) us/them.*

Studies of DP syntax have often noted asymmetries between pronouns and NPs and Q-Pro-Flip can thus be seen as an example of such an asymmetry, wherein the pronoun obligatorily undergoes the short movement to the specifier of QP which Shlonsky takes to underlie Q-float in general.

2.2 Stranding in Japanese (Miyagawa 1989)

At roughly the same time as Sportiche (1988) introduced the stranding analysis for English and French Q-float, a similar proposal was advanced to account for the distribution of Japanese numeral quantifiers (NQ) (the analysis is developed and defended in Miyagawa (1989), chapter 2; the relevance of traces to the distribution of NQs is also mentioned in Kuroda (1980, 1983). NQs need not always appear adjacent to the NP they are associated with, and had already been treated as Q-float phenomenon in the literature. Miyagawa considers contrasts of the following sort.

- (16) a. *Gakusei ga kyoo 3-nin kita.*
 students NOM today 3-CL came.

‘Three students came today.’

b. ?* *Gakusei ga hon o 4-nin katta.*

students NOM book ACC 4-CL bought

(‘Four students bought books.’)

c. *Yuube, kuruma ga doroboo ni 2-dai nusum-are-ta.*

last night cars NOM thief by 2-CL steal-PASS-PAST

‘Last night, two cars were stolen by a thief.’ (Miyagawa 1989: 21, 38)

Miyagawa observed that an NQ occurring to the right of the DP it modifies could be separated from that DP if the DP is the subject of an unaccusative (16a), or passive (16c) verb, but that the direct object may not intervene between a transitive subject and an NQ (16b). (The classifier, glossed CL, like agreement shows clearly which DP the NQ is associated with.) Miyagawa proposes that the NQ must be in a relation of mutual c-command with the phrase it quantifies over, at D-structure [Miyagawa admits ternary-branching structures]. Since both passive and unaccusative subjects are taken to be derived by movement from a VP-internal position, the legitimate positions of the NQ in (16) are those which mutually c-command the trace of the moved DP. Miyagawa (1989) assumes that there is no subject trace to the right of the direct object in the (b) example, thus accounting for its ungrammaticality.

Since Miyagawa’s proposal makes reference to D-structure (or equivalently, relations among traces), he correctly rules out examples in which the DP fails to c-command the FQ at any level (17a), while admitting examples in which the c-command condition is met at D-structure, but not at S-structure, as when the NQ is scrambled (17b).

(17) a. * [_{NP} *Tomodati no kuruma*] *ga 3-nin kosyoosita.*

friends GEN car NOM 3-CL broke down

(‘Three friends’ cars broke down.’)

b. *3-mai, kodomo ga sara o t_i watta (koto).*

3-CL child NOM plate ACC broke (fact)

‘(The fact that) the child broke three plates.’ (Miyagawa 1989: 29-30)

Note that a subject trace following the direct object would not necessarily be unexpected under the VP-internal subject hypothesis, since examples such as (18a) indicate the possibility of short, leftwards movement of the direct object (i.e., across the adverb). Nakayama and Koizumi (1991) and Koizumi (1995) take (18a), together with the possibility of an NQ separated from the subject DP by an adverb (18b), to indicate that the base position of the transitive subject is VP-internal in Japanese, but is nevertheless above the position occupied by “shifted” objects.

18) a. *Hanako ga pen o kyoo 3-bon katta.*
 students NOM pen ACC today 3-CL bought

‘Hanako bought three pens today.’

b. *Gakusei ga kyoo 3-nin hon o katta.*
 students NOM today 3-CL book ACC bought

‘Three students bought the book today.’ (Miyagawa 1989: 28)

While Miyagawa’s analysis differs from those of Sportiche (1988) and Shlonsky (1991) in that for Miyagawa, the FQ at no level forms a constituent with the DP it modifies, the analyses share the fundamental idea that the FQ is underlyingly adjacent to the position of traces.

2.3 A refinement, re: PRO

Limiting the positions of FQs to those occupied by traces is known to be too restrictive. Indeed, though I follow common practice in referring to the analyses of Sportiche (1988), Miyagawa (1989) and others as “stranding” analyses, implying movement, Sportiche himself proposed that the FQ need only be sister to certain types of empty category, including, but not limited to, DP-traces. The positions available to FQs in non-finite clauses suggest that an FQ may also be adjacent to (arbitrary or controlled) PRO in French (19) and English (20).

- (19) a. *Il aurait fallu tous partir.*
 it would-have been-necessary all PRO to-leave
 ‘It would have been necessary for all to leave.’
- b. *Ils ont décidé de tous partir.*
 they have decided to all PRO leave.
 ‘They decided to all leave.’ (Sportiche 1988: 436)
- (20) a. *To **all** have been doing that would have been inconvenient.*
- b. *I persuaded the men **all** to resign.*
- c. *The men promised me **all** to resign.* (Baltin 1995: 211,222)

The proposal that FQs can modify PRO as well as traces offers a straightforward account of the following examples (mostly from Fiengo and Lasnik 1976 and Maling 1976), as noted by Sportiche (1988), Bowers (1993) and Baltin (1995).

- (21) a. *I gave the boys **both** {a quarter/quarters}.*
- b. *The tooth fairy promised the kids **each** a quarter.*
- c. *Cinderella’s fairy godmother turned the pumpkins **all** into handsome coaches.*
- d. *She called the men **both** bastards.*
- e. *The vision struck the shepherds **all** blind.*
- f. *Three of my friends came into the café **all** very drunk.*

Maling (1976: 716) notes that an FQ at the left edge of an NP, PP or AP constituent is felicitous “only if the following phrase can reasonably be associated (semantically) with the NP that the quantifier binds,” noting also that a similar restriction is suggested by Kayne (1975: 49) for French. Bowers (1993) and Baltin (1995) translate this proposal into a theory of predication, which involves PRO or DP-trace in the specifier of all predicative constituents. [Baltin does not adopt a stranding analysis, but argues that FQs are *preverbs*: a class of adverbs adjoined to the left edge of a predicate. The point is nevertheless that the

possibility of an FQ in the examples in (19)-(21) is tied to the presence of PRO or DP trace in that constituent: for Bowers, the PRO forms a constituent with the empty category, while for Baltin, the FQ adjoins to the class of XPs which require an empty category in their specifier, following from the theory of predication he develops.]

If the stranding analyses are correct that the FQs are adjacent to the positions of empty categories, then they constitute one of our most direct and thus most powerful tools for the investigation of phrase structure and movement. Indeed, FQs are now routinely and often unquestioningly used in this fashion, in introductory texts (e.g., Haegeman [1991] 1994) and in the syntax literature more generally. Given this potential, the hypothesis that FQs mark positions from (or through) which a DP has moved deserves close scrutiny. Such scrutiny reveals, however, that the evidence for this proposal is thin and that many crucial questions are still unanswered more than a decade later.

3. Some problems for stranding analyses

3.1 The passive / unaccusative problem

Returning to English and French, the possibility of FQs at the left periphery of VP (as in (1) and (2)) is taken, under the stranding analysis, to mark a subject DP-trace in that position. An initial problem for this approach, noted already by Sportiche, is that FQs are impossible in canonical NP-trace positions such as the complement of unaccusative and passive verbs:

- (22) a. *The students_i have arrived (*all) t_i.*
 b. *The students_i were seen (*all) t_i.*

Towards the end of the article, Sportiche (1988:444) is forced into a rather unwieldy analysis of English passive and unaccusative constructions, in which the surface subjects of these constructions originate neither in the base position of transitive subjects nor in the base position of direct objects. Similarly, Sportiche claims based on the

(somewhat degraded) acceptability of (23a-b), that FQs can mark passive and unaccusative subject traces in French, noting that the examples improve with emphasis on the Q or the addition of the modifier *presque* ‘almost’.

- (23) a. *Les enfants_i ont été vus t_i ?tous / presque tous.*
 the children have been seen all almost all
 ‘The children have (almost) all been seen.’
- b. *Les enfants_i sont venus t_i ?tous / presque tous.*
 the children are came all almost all
 ‘The children have (almost) all arrived.’
- c. *Les enfants_i ont t_i dormi ?tous / presque tous.*
 the children have slept all almost all
 ‘The children have (almost) all slept.’
- d. *Les enfants_i ont t_i vu ce film ?tous / presque tous.*
 the children have seen this movie all almost all
 ‘The children have (almost) all seen this movie.’ (French, Sportiche 1988: 427, 437)

This proposal is however undermined by examples like (23c-d). FQs may appear clause-finally in transitive and unergative clauses as well. Acceptability does not vary among the different clause types, though there is a DP-trace in the relevant position [adjacent to the FQ] only in the first two examples. [For some speakers, sentences like (23) are uniformly bad; what is important is that the predicted contrast (a-b) vs. (c-d) is unattested]. Sportiche suggests that the subject position (Spec,VP or [NP,VP]) must be on the left when overt, but may be ordered freely when it is headed by an empty category. However, the effect of heaviness on acceptability in clause-final position is exactly that attested independently for adverbs in French generally, as noted by Jaeggli (1982: 65).

In these cases then, the stranding analysis would seem to make the wrong predictions for the most well-motivated positions of DP-traces. Déprez (1989) has

suggested that the stranding analysis may be maintained if, in English and French (but apparently not Japanese and Hebrew), FQs may remain in the positions of intermediate DP-traces, but not in thematic (i.e., base) positions, though such a step would require rethinking the VP-internal subject hypothesis to have a DP-trace even lower than Sportiche originally proposed.

3.2 The A / A' distinction

Another potential problem for the stranding analyses is explaining the anaphor-like locality restrictions on FQs (see (9)). Thus, in addition to c-command, in (standard) English a DP which has undergone A-movement (24) may antecede an anaphor or an FQ, but a DP which has undergone A'-movement (25) may not (unless of course, it had previously undergone short A-movement; McCloskey 2000 reports on a dialect of Irish English which differs in this regard; see section 3.3 below).

- (24) a. *The runners_i seem to themselves_i [_{IP} trace_i to be moving very slowly].*
 b. *The lions_i might all seem (to you) [_{IP} trace_i to have large teeth].*
 c. *The lions_i might all have been seen trace_i (by the tourists).*
- (25) a. **[_{NP} the professors who Taylor will have **all** met before the end of term]*
 (relativization)
 b. **These professors, Taylor will have **all** met before the end of term.*
 (topicalization)
 c. **Which professors will Taylor have **all** met before the end of term?*
 (wh-question)

It has been assumed that the stranding analyses account for this restriction directly. For example, Shlonsky (1996: 14) states: “If FQs are adverbs, the fact that they must be c-commanded by an (A) antecedent requires a special explanation. The most intuitive explanation of this fact is that FQs are associated with DP-trace positions and hence mark a link in an A-chain.”

Though this seems to be appealing—since we know anaphors and DP traces have the same distribution, we can subsume an anaphora-like relation to movement theory—it only pushes the need for a “special explanation” back one step: why is it the case that in English, FQs must be associated with DP-trace positions, and not, e.g., *wh*-traces? Note that this is all the more peculiar a fact about Q-float in that other, well-attested stranding processes are not restricted to A-movement, and if anything, are licit only with A'-movement (e.g., left-branch violations in French, Split Topicalization and *was ... für* split in German).

Déprez (1989) suggests one account of the restriction to A-movement, proposing that intermediate traces of A'-movement, but not of A-movement, delete at LF, and that FQs must be licensed by LF-adjacency to an intermediate trace. If the deletion of intermediate traces of A'-movement at LF could be independently motivated, and the restriction to intermediate trace positions could be explained, then this account would provide the missing piece of the puzzle, showing why FQs may only be associated with DP-trace positions.

There is also some debate as to the universality of this restriction. For English (with the exception of the dialect reported by McCloskey (2000), the A/A' contrast represented in (24)-(25) appears to be straightforward, and something similar seems to be true for Hebrew (Shlonsky 1991:173). Regarding other languages, though, the situation is less clear. For German, Dutch and French, opposing views have been presented in the literature. Merchant (1996) and Doetjes (1997) for example argue that these languages do allow A' licensors for FQs, while Déprez (1989), Bobaljik (1995) argue that they do not. At issue are examples such as the following (note that some variation is reported concerning the French judgments, Marie-Hélène Côté, personal communication).

- (26) a. *Ces livres_p, que j'ai tous lus t_i sont très intéressants.*
 these books which I have all read are very interesting.
 'These books, all of which I read, are very interesting.' (French, Doetjes 1997:208)
- b. *Deze boeken_i heb ik allemaal t_i gelezen.*
 these books have I all read
 'I read all these books.' (Dutch, Doetjes 1997:209)
- c. *Welche Bücher_i hast du alle t_i lesen müssen?*
 which books have you all to-read had
 'All (of) which books did you have to read?' (German, handout to Merchant 1996: 3)

On the surface, these languages appear to differ from English in allowing DPs in A'-positions to license FQs. However there are complications lurking beneath the surface. Déprez (1989) observes that drawing a conclusion from (26a) is complicated by the existence of *L-tous*, the name given by Kayne to two processes which appear to move the FQ leftwards. One example of *L-tous* was given in (3) and contrasts minimally with (27).

- (27) **Elle a tous_i voulu lire ces livres_p.*
 she has all wanted to read these books.
 ('She wanted to read all these books.') (Kayne 1975: 5)

This pair shows that *L-tous* is not possible with an *in situ* DP object (27), while *L-tous* is possible when the object is a clitic (3). Déprez assumes (with Kayne 1975, Sportiche 1988) that *L-tous* and Q-float are distinct (if related) processes, and that (26a) is an example of *L-tous*. Doetjes (1992, 1997) has argued that *L-tous* and Q-float are in fact the same process, a position which would avoid this objection of Déprez's. (Doetjes's proposal is that the FQ must bind a trace of the DP over which it should quantify; this is discussed in section 5 below).

Independently of whether or not *L-tous* and Q-float are separate phenomena, there is a further set of complications noted also by Déprez (1989: 477ff), having to do with the possibility of short A-movement. Primarily on the basis of facts from past participle agreement Kayne (1989) has argued that A'-extraction in French involves (perhaps optionally) an intermediate stage of A-movement to the left of the participle and he posits an Agr-P dominating the participle. If this analysis could be sustained, it would mean that (26a) tells us nothing about the possibility of A'-movement licensing FQs in French, since it could be the prior, short A-movement which licenses the FQ. Likewise for Dutch and German, a now common analysis of A'-movement which originates with Vanden Wyngaerd (1989) and Mahajan (1990) posits intermediate A-movement through the specifier of an Agr-P. To the extent that such an analysis can be maintained, the possibility of an intermediate A-trace being responsible for the grammaticality of the FQ in (26b-c) cannot be excluded. It is therefore not clear from such examples that French and Dutch differ from English in permitting FQs licensed by A'-movement, but perhaps only that French and Dutch differ in having short A-movement as a (possible) prior step in A'-extraction.

These complications require more complex examples, involving, e.g., long-distance A'-movement and a FQ in a higher position than the highest A-position. The examples in (28) show that long-distance A'-moved DPs cannot license FQs in the matrix clause in French, German and Dutch.

- (28) a. * [_{NP} *ces hommes, que j'aurais tous cru*
 these men who I would have all believed
 qui auraient été arrêtés]
 who had been arrested
 ('these men, whom I had believed to have all been arrested')

(French, Déprez 1989: 94)

- b. *Welche Würste hat der Peter (*alle) bezweifelt*
 which sausages has the Peter all doubted
ob der Hund gegessen hat?
 whether the dog eaten has
 ‘Which sausages did Peter doubt whether the dog has eaten all (of)?’
 (German)
- c. *De dronken taalkundiger heeft Freek (*allemaal) gezegd*
 the drunk linguists has Freek all said
dat Marie uitlachte.
 that Marie made fun of
 ‘Freek said that Marie made fun of all the drunk linguists.’ (Dutch)

The ungrammaticality of the examples in (28) is of course expected on the stranding analyses if there are no intermediate trace positions in the higher clause. The examples in (29) demonstrate that it is also impossible to strand an FQ in an embedded Spec,CP, where, presumably, there is an intermediate trace of the *wh*-moved element. This is true whether the long-distance extraction takes place out of an embedded complementizer-initial CP (29a) or an embedded V2 clause (29b). Both examples are fine without the floated quantifier, as indicated.

- (29) a. *Welche Würste hat der Peter gesagt*
 which sausages has the Peter said
 [_{CP} (**alle*) *daß der Hund gegessen hat?*]
 all that the dog eaten has
 ‘Which sausages did Peter say (*all) that the dog ate?’

b. *Welche Würste hat der Peter gesagt*

which sausages has the Peter said

[_{CP} (**alle*) hat der Hund gegessen?]

all had the dog eaten

‘Which sausages did Peter wonder whether the dog has eaten all (of)?’

(German, S. Wurmbrand p.c. 4/01)

3.3 An Irish English

In many varieties of English (including those typically referred to as “standard”) it is quite clear that A’-movement does not license quantifier float. In addition, no unambiguous cases of A’-licensed quantifier float have been adduced from other well-studied languages, as just discussed. However, in a recent paper, McCloskey (2000) has presented data from a particular variety of Irish English (which he labels “West Ulster English” [WUE]) which displays a striking contrast with more familiar varieties. In WUE, *wh*-movement does license floating quantifiers, thus allowing examples like the following (which are sharply ungrammatical in other varieties, e.g., to my ear).

(30) a. *Who did you meet **all** when you were in Derby?*

b. *I can’t remember what I said **all**.*

c. *Where did they go **all** for their holidays?*

d. *What did he say **all** that he wanted?* (WUE, McCloskey 2000: 58)

That the data from this dialect is unlikely to fall to a short A-movement analysis (as mentioned above for French, German and Dutch) is suggested by: (i) examples like (30c) in which the FQ is associated with a *wh*-adjunct (an unlikely candidate for short A-movement) and (ii) the apparent stranding in an intermediate Spec,CP (30d) (contrast German (29)). Of course, one does need to ask if there are alternatives to analysing the FQ as occupying the intermediate Spec,CP in (30d). For example, it does not seem a priori implausible to analyse this example as involving adjunction of *all* to VP, either as right-adjunction (with

extraposition of the embedded CP), or as left-adjunction (with short verb movement, which McCloskey proposes for independent reasons). This may shed light on the observation that the sequence [main verb + *all*] in such examples “are prosodic units whose most prominent element is the verb” and that “[t]here is a strong intonational break following this prosodic unit.” McCloskey (2000). While such an analysis is suggested by parallels with adverbs like *exactly*, *precisely* in standard English noted in McCloskey’s fn. 8 (p. 63) (e.g., *What did he say exactly that he wanted?*) the parallels are not exact and developing such an analysis would not be trivial.

Minimal pairs like (31) also weigh in against an analysis invoking short A-movement for this variety of English to the extent that *wh*-movement licenses FQs in positions where normal A-movement does not.

- (31) a. *Who was throwing stones **all** around Butcher’s Gate?* [=who ... all]
 b. **They were throwing stones **all** around Butcher’s Gate.*(WUE, McCloskey (2000: 77))

The search for the proper analysis of the West Ulster English facts poses interesting challenges for any theory, but more pressingly is the question of accounting for the variation. Quite simply: if the distribution of FQs in standard English and other languages (e.g., the restriction to A-movement) follows in any straightforward way from deeper principles (as I will suggest in section 5) then it is not at all clear how West Ulster English could be permitted to show the properties it does. At the same time, it would be unfortunate (and would raise familiar questions about acquisition) if the restriction to A-movement for English and other languages’ FQs needs to simply be stipulated. Without having shed any particular light on this issue, we may note that there are really only two avenues to pursue, namely, attributing the difference to different lexical properties of the quantifier *all*, or pinning the difference on some yet-to-be uncovered independent syntactic parameter

distinguishing WUE on the one hand and other varieties of English (including apparently other varieties in Ulster) on the other.

3.4 The underlying constituents problem

Returning to the main thread of this section, we might consider a final class of examples which are challenging for the hypothesis that the FQ and DP are derived from an underlying constituent [Q-DP] (or [Q-PRO]). These are cases in which the (floated) Q and DP cannot form a grammatical constituent together, for example, cases in which the Q occurring pre-DP, requires the preposition *of* (French *de*). The examples in (32)-(33) illustrate this for English *each*, and French *chacun* ‘each’ which float easily yet require a preposition *of/de* when combining with a plural DP. (Determiner *each* which requires no preposition when combining with a singular noun—*each child*— cannot float: **Child has each read a different book.*]

(32) a. *These children have each (*of) read a different book.* DP_{PL} ... *each*

b. [_{NP} ***Each*** *(*of*) *these children*] *has read a different book.* * [*each* DP_{PL}]

(33) a. *Ces enfants ont chacun lu un livre différent.*

these children have each read a book different

‘These children have each read a different book.’

b. ***Chacun*** *(*de*) *ces enfants a lu un livre différent.*

each of these children has read a book different

‘Each of these children has read a different book.’ (Doetjes 1997: 201)

The mismatch here is relatively minor, and has (perhaps correctly) generally been relegated to the dustbin of morphological or phonological processes inserting (or deleting) *of* (see Sportiche 1988, fn.3, though note the obligatory contrast in number agreement in the (a) vs. (b) examples).

Further examples in which an FQ is licit, but the hypothetical underlying NP is not are illustrated by the following pairs (on examples like (34) see Carden 1976: 94; parallel facts obtain in French, Sportiche 1988: 440, Junker 1995: 88):

- (34) a. *Larry, Darryl and Darryl have **all** come into the café.*
 b. *?*All (of) Larry, Darryl and Darryl have come into the café.*
- (35) a. *Some (of the) students might **all** have left in one car.*
 b. **All (of) some (of the) students might have left in one car.*

A final, and striking set of apparent problems for analyses based on (12) include complex quantifying expressions in apparently floated positions, which cannot occur prenominally at all, and which in some cases even include pronouns and determiners (see also section 4.1, below). This includes expressions such as *all/none of them*, *the both of them*, *all three (of them)*, and similar complex FQs in French as in (5b) above and (36) (see especially Baltin 1978, Kayne 1975, Torrego 1996).

- 36) a. *We have **all three of us** completed the assignment on time.*
 *_[NP]All three of us we]...
- b. *Elles sont [**toutes les trois**] intelligentes.*
 They-F are all-F.PL the three intelligent.
 ‘They are all three (of them) intelligent.’
 *_[NP]Toutes les trois elles]... (French, Kayne 1975: 44).

Examples (5b) and (36b) illustrate another important point. Recall that a significant part of the motivation for the stranding analysis is the fact that the FQ in languages such as French shows agreement with the DP, manifesting the same agreement paradigm as when the Q occurs as a part of the DP constituent. Thus, when Sportiche asserts that “nothing essential needs to be said beyond [(12)]” (p.427) in order to explain the occurrence of agreement on the FQ, he is claiming that agreement arises as a result of the FQ forming an underlying constituent [Q DP]. However, the larger quantifying expressions as in (36b)

also agree obligatorily, again manifesting the standard agreement paradigm for *tous*. In such cases, though, there is no corresponding constituent which would underlie the example. Examples of the sort considered here thus appear to present a strong challenge to the assumption that agreement on FQs entails underlying constituency.

4. The Semantics of FQs

Given the vast literature on the semantics of quantification, it is somewhat surprising that FQs have received very little attention from a semantic perspective (notable recent exceptions being Junker 1995 and Doetjes 1997). One question which has, to my knowledge, never been answered is why only a specific class of quantifiers may float, in particular, universal Qs: English *each, all, both*, (but not *every*) French: *tous, chacun*, German *alle*, but not other partitive quantifiers such as *many, some, most*, nor the universal *every*. But there are other aspects of the semantics which have been partially investigated and which should shed light on the syntax as well as the semantics of the construction.

Recall that an initial motivation for investigating pairs such as (1)-(2) is the intuition that they are equivalent in meaning. Moreover, transformational approaches (floating or stranding) are built on the sometimes implicit assumption that such equivalence implies an underlying constituency. The clearest formulation of this is again Sportiche's parsimony argument from (12). The alternative to stranding analyses take FQs to be adverbs, e.g., VP-modifiers (Klein 1976, Dowty and Brodie 1984, Milner 1987). Sportiche argues, in part, that the stranding analysis is superior to the VP-modifier analysis since "the semantics of floating Q constructions and partitive Q constructions are so similar" and thus it would be "a priori undesirable to assign the 'same' Q to two different logical types—[DP] quantifiers and VP quantifiers..." (p. 446). This last claim requires a certain qualification, though, as the following examples illustrate.

- (37) a. *Jean a lu [beaucoup de livres].* DP-Q
 Jean has read a lot of books
 ‘John has read a lot of books.’ (Doetjes 1997: 254)
- b. *Jean a beaucoup travaillé.* Adv-Q
 John has a lot worked.
 ‘John has worked a lot.’ (Doetjes 1997: 271)

The French examples in (37) (and the English glosses) show that it is independently necessary to assign the “same” quantifying expression [French *beaucoup* ‘a lot’ English *a lot*] to two logical types, DP quantifier and VP quantifier (or, as Doetjes proposes, to allow the quantifiers to be underspecified in some way, and therefore permissible in either context). In order to maintain the view that (12), along with similarity in meaning, entails an underlying constituent [Q DP], what is important to show are the following:

- (38) a. FQs quantify over the DPs in a way that adverb Qs cannot, and
 b. FQs quantify over DPs in the way that (pre-)determiner Qs do.

Without showing these, the semantic motivation for an underlying constituent analysis would disappear, especially given the examples above which show that (12) is perhaps not always (surface) true. Let us therefore examine each thesis in turn.

4.1 FQs and adverbial quantification

Consider in light of the above the examples in (39) and (40); (39a) illustrates adverbial quantification, and (40a) is an example of “Quantification at a Distance”.

- (39) a. *Horses will **always** eat sugar.*
 b. *Horses will **all** eat sugar.*
 c. ***All** horses will eat sugar.*
- (40) a. *Jean a **beaucoup** lu de livres.*
 Jean has a lot read of books.
 ‘John has read a lot of books.’

- b. *Jean a lu [beaucoup de livres].*
 Jean has read a lot of books
 ‘John has read a lot of books.’ (Doetjes 1997: 254)

Examples (39a-c) can all be read as effecting universal quantification over horses, i.e., all three have the reading: *For every x, x a horse, x will eat sugar*. It is of course true that (39a) has readings which are not available to the other two sentences, but these are not at issue. What is at issue is the following: for those readings in which (39a-b) are synonymous, is the effect of universal quantification over horses achieved in the same manner in both examples? Proponents of a transformational or movement analysis of FQs must show that it is not (i.e., that (38a) holds). This point can be made clearer perhaps with examples such as (41), after Lahiri (1991:120f), in which it is not at all immediately clear that there is a significant difference in meaning between a sentence with an adverbial quantifier and a paraphrase with a DP-quantifier:

- (41) a. *Media experts in the U.S. tend **mostly** to be too indoctrinated.*
 b. *The children, **for the most part**, were playing in the garden at 6pm.*
 a'. *Most media experts in the U.S. tend to be too indoctrinated.*
 b'. *Most of the children were playing in the garden at 6pm.*

Such examples provide a *prima facie* challenge the validity of (38a) and lead to the conclusion that a similarity in meaning or quantificational properties does not lead inescapably to a transformational relationship. In order to establish that (38a) holds, it must be shown (assuming that the boldfaced elements in (41) are adverbs) that the quantification in these examples is of a different sort than that which obtains with determiner quantifiers, despite the similarity in meaning.

Of the two major approaches to adverbial quantification only one might have this property. Thus, on the approach which takes adverbial Qs to be unselective binders (e.g., the line initiated by Lewis (1975), universal quantification over horses is achieved in both

(39a) and (b) via binding of an open variable in the DP. In an important sense, then, this approach fails to support (38a) to the extent that the unselective nature of the Q in (39a) does not follow necessarily from its status as a VP-modifier. The second set of approaches to adverbial quantification takes the adverb in (39a) to quantify over situations, times or events and not directly over individuals such as horses (see, e.g., de Swart 1991, von Stechow 1994). If it can be shown that event quantification is excluded in sentences such as (39b), then this type of analysis of adverbial quantification would support the claim in (38a); *always* would quantify over events, and *all* over individuals.

Similarly, the literature on QAD constructions (see, e.g., Obenauer 1994, Doetjes 1997 and references therein) has argued persuasively that there are (sometimes subtle) interpretive differences between (40a-b), but it is somewhat less clear that these differences entail a difference in logical type between the two uses of the degree quantifiers. Doetjes (1997) argues that degree Qs such as *beaucoup* ‘a lot’ are underspecified for their categorial type and that the differences in meaning between (40a-b) follow from the positions in which such quantifiers occur, and not the other way around.

A final, but important point to make concerning the claim that “sameness” in meaning entails underlying constituency is that there are many languages in which sentences parallel to (1b)—i.e., putative examples of FQs—involve quantificational elements which are morphologically distinct from their pre-nominal counterparts. This is true of Dutch *allemaal* ‘all’ (42) and Mandarin Chinese *dou* ‘all’ (43), both of which occur in floated positions, but neither of which is generally permitted prenominal as a strong universal Q (Hoeksema 1996, Dowty and Brodie 1984).

- (42) a. *De kinderen zijn **allemaal** gekomen.*
 the children are all come
- b. * ***Allemaal** (de) kinderen zijn gekomen.*
- c. *Alle kinderen zijn gekomen.*
 All the children are come
 ‘The children have all come.’ (Doetjes 1997: 210-11)

- (43) a. *ren **dou** zou le*
 people all left ASP
 ‘The people have all left.’
- b. *suo you de ren zou le*
 all PRT people left ASP
 ‘All the people have left.’ (Dowty and Brodie 1984: 82)

In Dutch, the FQ is *allemaal* (although the prenominal Q *alle(n)* may apparently be used in floated positions, at least in more formal or older registers). This Q contains the adverbial suffix *-maal* which occurs in frequency expressions such as *eenmaal* ‘once’, *andermaal* ‘once more’ (from *een* ‘one’ and *ander* ‘other’). To my knowledge, it has not been fully investigated to what extent quantification by *allemaal* in examples like (42a) differs from quantification by *alle* in (42c) (though Doetjes 1997 does not discuss any difference). If sentences (42a-c) are truly equivalent in meaning, even though the Qs are different *alle* vs. *allemaal*, then this would appear to pose a cross-linguistic challenge to the claim that sameness of meaning entails an underlying constituency. The Mandarin examples make the same point (see Chiu 1990, 1993 for an analysis taking *dou* to be an FQ, and Cheng 1995, 1997) for arguments that *dou* is an adverb). If it is to turn out that floating quantifiers are semantically distinguishable from true adverbial quantifiers, and moreover, that the examples in (42)-(43) truly do have the semantics of floating quantifiers, then these examples add to the problems for a stranding account mentioned in 3.4. As it

stands, these examples constitute a challenge to the thesis in (38a) in that they appear to be adverbial quantifiers, but have not been shown to have a semantics distinct from true floating quantifiers.

The examples in this section have been intended to show that apparently similar quantificational readings appear to arise in independent configurations, thus challenging (38a). Note though that the truth of (38a) is not necessary for a stranding analysis of FQs. It could well be that FQs and adverbial Qs do (or may) quantify over DPs in the same way (e.g., by binding a variable in the DP), but that nevertheless FQs do not occur in adverbial positions and that the constructions have quite different derivations. What is important about (38a) is that it is often implicitly assumed to be true, and that it is generally given as a primary motivation for transformational analyses, including stranding. The claim that *since* (1a) and (1b) “mean” the same, they must be transformationally related relies on the tacit assumption that there would be no other way for the two sentences to mean the same. The brief discussion of adverbial quantification above is intended to show not that this assumption is false, but that the question is certainly still open.

4.2 FQs and determiner Qs

The other aspect of the “sameness of meaning” motivation for a transformational analysis of floating quantifiers is (38b)—the thesis that floating quantifiers quantify over DPs in the same manner as their non-floating counterparts. While most of the sentences with FQs considered thus far seem to mean the same as their counterparts with a DP-Q, it is not always clear that this is true. For example, there are cases in which an interpretation is possible or preferred with an FQ which is not possible when the Q is in prenominal position. Consider the interpretative differences in the following pairs (originally drawn to my attention by Heidi Harley, personal communication, ca. 1995).

- (44) a. *All lions, tigers and bears are scary.*
 b. *Lions, tigers and bears are all scary.*

- (45) a. *All students, professors and clowns have come to the meeting.*
 b. *Students, professors and clowns have all come to the meeting.*

The example in (44a), on its most salient reading, asserts that *every lion* is scary, *every tiger* is scary, and *every bear* is scary, that is, *all* quantifies over [lions, tigers and bears]. Example (44b) allows this reading as well. However, there is an additional reading which is available only with the FQ. That is, (44b) can be taken to assert that *lions are generally scary*, and *tigers are generally scary*, and *bears are generally scary*. Loosely put, the requirement is that the predicate *be scary* be true of all of the terms in the subject DP, but it allows for the individual plural nouns to be interpreted as generics. This generic reading is unavailable in (44a). The pair in (45) shows a similar contrast: in (45a), *all* quantifies over [students, professors and clowns], asserting roughly that every member of each group is in attendance. The sentence (45b) makes a different assertion, namely that each of the groups is represented at the meeting, but it does not require that *all* students, *all* professors, and *all* clowns have been at the meeting. (Note that contrary to Bobaljik 1995: 225, the same is not true of *both* which, with the proper intonation, allows the non-quantificational reading in both floated and DP-initial position; that is *Both students and professors came to the show* does not necessarily mean *both students and both professors came to the show*.)

Another important semantic difference between sentences with FQs and those in which the Q is a part of the DP constituent was apparently first observed in Williams (1982) and elaborated on in Dowty and Brodie (1984) and Déprez (1994b). FQs are restricted to taking scope in their surface position, while Qs which are part of DPs may undergo scope-changing operations such as Quantifier Raising and Reconstruction. Consider (46).

- (46) a. *All the contestants could have won.* $\diamond > \forall, \forall > \diamond$

- b. *The contestants could have all won.* $\diamond > \forall, * \forall > \diamond$

Dowty and Brodie (1984) observe that a sentence such as (46a) is ambiguous with respect to the relative scope of the universal quantifier and the modal. On one reading (wide scope for the universal), the sentence asserts that the predicate [*can win*] is true of all the contestants, i.e., that any one of them can win. On the second reading, the universal takes scope under the modal, and on this latter reading, (46a) would be taken to assert that a universal tie is possible, e.g., every one of the contestants will receive a prize. The example in (46b), however, has only the second reading, i.e., in which the FQ takes scope in its surface position, beneath the modal.

There is one class of exceptions, noted already by Dowty & Brodie: An FQ seems to be able to take scope under a following negation just in case that negation immediately follows the finite auxiliary. Thus, while (46b) is unambiguous (47) is ambiguous. On one reading no contestants won, while on the second, i.e. lowered, reading, it asserts only that some contestants didn't win (i.e., it could be paraphrased as *Not all the contestants won*). The existence of the covert, lowered reading is demonstrated by considering contexts in which some (but not all) contestants did win. As the truth conditions for the surface scope reading are not met, the fact that (47) may be truthfully uttered in such a context establishes that the negation can scope over the universal.

- (47) *The contestants all didn't win.* $\forall > \text{not}, \text{not} > \forall$

Controlling for this local interaction with negation requires rather complex examples. However, when such examples are constructed, Dowty & Brodie's observation that FQs must take scope in their surface positions appears to be valid. This is perhaps clearer when one of the readings is pragmatically infelicitous. Consider in this light the pair in (48) where only one of the two FQ positions relative to the modal expression yields a felicitous interpretation.

- (48) a. *Gore and Bush should **each** be 50% likely to beat the other.*

- b. # *Gore and Bush should be 50% likely to **each** beat the other.*

Related examples discussed by Williams (1991) show that a quantified DP in embedded subject position may enter into scope relations with elements in the matrix clause (at least for some speakers); (49a) is modeled on Williams's (43), p.171. However, an FQ related to an embedded subject DP is frozen with respect to scope.

- (49) a. *Someone said that [_{IP} [**each/all** of the men] have/had voted for Mary.]*
 b. *Someone said that [_{IP} [the men] have **each/all** voted for Mary.*

Déprez (1994b) also arrives at the conclusion that FQs scope in their surface positions from a consideration of the possibilities for pair-list answers for questions in which there is an FQ.

A final environment in which FQs and Q-DPs seem to differ semantically has to do with distributivity and interaction with certain adverbials. Consider the pair in (50) (including the parallel English paraphrases) from Junker (1995: 82-83).

- (50) a. *Les enfants prendront chacun un ballon l'un après l'autre.*
 the children took each a ball the one after the other
 'The children each took a ball one after the other.'
- b. ??? *Chacun des enfants prendra un ballon l'un après l'autre.*
 each of the children took a ball the one after the other.
 'Each of the children took a ball one after the other.'

The Q *each* (French *chacun*) enforces a distributive reading in both floated and non-floated uses; i.e., in both (50a) and (b) there is one ball per child. Junker notes that adverbial such as "one after the other" and "at the same time" can only modify multiple events, and these adverbials are only felicitous with floated *each*. From this, she makes the argument that the FQ distributes over events, not over individuals. Further evidence that an analysis along these lines is on the right track may come from the fact that in both English

and French, the partitive Qs *each (of)* (*chacun des*) triggers singular agreement on the verb, while in the FQ constructions, the verb shows plural subject agreement.

The interaction of FQ *all* with distributivity is more difficult to pinpoint. Junker gives pairs parallel to (50a-b) with *tous* ‘all,’ arguing that the universal FQ distributes over events, and it is often claimed in the literature that *all* is distributive, it is well-known that *all* may combine with collective (i.e., non-distributive) predicates, e.g., *The students all gathered in the hall* (see Dowty 1986 for a discussion of *all*, and the suggestion that collective predicates involve a specific type of distributive “sub”-entailment). The importance of (50) and the further evidence presented by Junker (1995) is that they provide a range of evidence suggesting that (38b) may not be true: perhaps FQs and partitive (i.e., pre-DP) Qs in fact do involve different types of quantification.

Sections 4.1-4.2 together question part of the initial motivation for a transformational or movement based approach to FQs. A central assumption which has driven these analyses is that the floated and non-floated alternates in pairs such as (1) have the same meaning, and that moreover, the same meaning is indicative of an underlying constituency. The examples in section 4.2 question the first part of this assumption, i.e., that the meaning is always the same, while those in section 4.1 question the notion that sameness of meaning entails a derivational relationship.

More thorough investigation of quantification may reveal that these questions do not threaten analyses positing a syntactic relationship between the FQ and the DP. For instance, one could imagine that the effects of scope freezing are derivative of the syntactic derivation which underlies Q-float and do not imply a different logical type for FQs. For the time being, though, this has not been shown and we would thus be premature in concluding either that the relationship of (1b) to (1a) is one of systematically identical meaning, or that to the extent they are the same, this sameness must be the reflection of a derivational relationship between them (e.g., a common D-structure).

4.3 On variation: Japanese Numeral Quantifiers Once More

The discussion of scope allows us to return once again briefly to the Japanese numeral quantifiers discussed above. In addition to the fact that the elements involved are different (only universals and distributive quantifiers in English, French, Hebrew etc., while in Japanese numerals as well as certain universal and existential quantifiers may be discontinuous with their host NP), a striking point of difference between Japanese NQs (on the one hand) and English and French FQs (on the other) is in the possibility of stranding in a canonical trace position such as passive or unaccusative (see (16a), (c)). In a series of recent papers, Yamashita (2000, 2001) has brought to light another difference between Japanese and the other languages studied, a difference concerning interpretive properties such as scope and binding. Yamashita starts with the much-discussed observation that the relative scope of subject and object quantifiers, and binding possibilities among subject and object, in Japanese are fixed in a simple transitive clause (e.g., the object cannot scope over the subject in (51a)), but scope ambiguities (51b) and new binding relations (not shown here) emerge when the object is scrambled to the left of the subject. The examples in (51) illustrate with numeral expressions.

- (51) a. [Otoko-ga 3-nin] [neko-o 2-hiki] mita (koto)
 man-NOM 3-CL cat-ACC 2-cl saw (fact)
 ‘Three men saw two cats.’ (3 > 2, *2 > 3)
- b. [Neko-o 2-hiki]_i [otoko-ga 3-nin] t_i mita (koto)
 cat-ACC 2-CL man-NOM 3-CL saw (fact)
 ‘Three men saw two cats.’ (3 > 2, ^{OK}2 > 3)

(Yamashita 2001: 231,238)

Interestingly, the possibility that scrambling has of altering scope and binding relations does not arise if the NP is scrambled alone stranding the NQ (52).

- (52) [Neko-o]_i [otoko-ga 3-nin] (kinoo) t_i 2-hiki mita (koto)
 cat-ACC man-NOM 3-CL (yesterday) 2-CL saw (fact)

to pursue this hypothesis that the differences among the two processes have been brought into sharp focus. Importantly, as we understand the differences better, we find that it is only the Japanese NQ-type phenomena that display the kinds of behaviour we might expect from a straightforward stranding analysis.

5. Taking Stock: What's Really At Issue?

The hypothesis advanced by Sportiche (1988) is that the distribution and semantics of FQs would follow directly from the statement in (12) on independently motivated assumptions about phrase structure and movement, prominent among these being the VP-internal subject hypothesis. A corollary of Sportiche's proposal (and related ones) was that FQs could be used as a convenient diagnostic for the exact positions of empty categories, including traces of A-movement and PRO. Though this hypothesis has gained widespread currency, it should come as no surprise that language is not so obligingly straightforward. In the critical examination above of the stranding hypotheses and of the assumptions underlying transformational analyses generally, I have suggested that there are numerous significant questions which remain unanswered, but which suggest caution in using FQs as direct reflections of D-structure or the positions of empty categories.

This conclusion of course does not entail that the stranding hypotheses are entirely wrong, nor does it entail that the positions of FQs can tell us nothing about the positions of empty categories. A series of works by Doetjes (1991, 1992, 1997) has argued that FQs are indeed adverbial in their distribution and thus not related to the DPs they appear to quantify over through movement, but that nonetheless FQs must c-command and bind a trace of that DP. One of the primary motivations for this proposal is that it permits a unified account of *L-tous* (3) with the more widely investigated cases where the Q is to the right of its antecedent. Importantly, it explains the fact that *L-tous* is possible when the object is a

clitic, but not when the object is a full DP. [Again, some variability in judgments is reported. For some, the clitic/pronoun versus DP contrast does not obtain in (55), though it surfaces in other *L-tous* environments such as (57), below (Marie-Hélène Côté, p.c.).

(55) a. *Elle a tous voulu les lire.*
 she has all wanted them to-read
 ‘She wanted to read them all.’ (=3))

b. **Elle a tous voulu lire ces livres.*
 she has all wanted to-read those books
 (‘She wanted to read all those books.’) (=27))

Some earlier accounts have treated *L-tous* as a form of cliticization or head-movement (see especially Bonneau and Zushi 1993), who point out that *L-tous* is possible in certain varieties of Spanish as well, but that in all these languages, long-distance *L-tous* i.e., out of an infinitival or subjunctive clause is restricted to the class of “restructuring” verbs, e.g., those which allow clitic-climbing in other Romance languages (see Wurmbrand to appear for an overview and recent treatment of restructuring). On Doetjes’s account, *tous* is instead base-generated in the floated (adverbial) position in (55a), and is licit there by virtue of the trace of the clitic in direct object position, which the FQ binds. Movement is necessary to leave a trace for the FQ to bind, and most movement operations take the relevant DP to a position higher than the FQ. Short clitic movement is one case (in French) in which the moved element does not move to a position c-commanding the FQ. Like the stranding analyses, then, Doetjes’s account sheds light on the distribution of empty categories, though it does not require that there be a trace in every position which may host an FQ in, e.g., (5). This difference between the stranding analyses and Doetjes’s analysis is especially clear in examples such as (56).

(56) *The students_i don’t all seem [t_i to be from New York City].*

Since *all* in this example is lower than the negation in the matrix clause, it must be at the left periphery of the matrix VP. On the stranding analyses, this example would entail that raising, i.e., movement from the embedded Spec,IP position to the matrix Spec,IP position, had an intermediate (A)-movement through the matrix Spec,VP position, a surprising conclusion on many current assumptions about raising. Doetjes's account would take the FQ *all* to be in an adverbial position (left edge of VP), licensed presumably by the trace of the subject in the embedded clause. No intermediate movement is required.

Another environment which licenses *L-tous* takes the FQ in a matrix clause to be associated with the subject of a subjunctive (i.e., tenseless) complement of a restructuring verb, as in (57).

- (57) a. *Je veux tous qu' ils viennent.*
 I want all that they come (SUBJUNCTIVE)
 'I want them all to come.'
- b. **Je veux tous que les enfants viennent.*
 I want all that the children come (SUBJUNCTIVE)
 ('I want the children all to come.')
- (Doetjes 1997: 207)

Doetjes (1997: 207-8) proposes that even though there is a trace for the FQ to bind in both the (a) and (b) examples, the ungrammaticality of (57b) should be attributed to a Binding Theory (Principle C) violation [the pronouns and clitics in (55a) and (57a) are licit since *tous* is outside of their binding domain]. Though Doetjes does not note it, a consequence of the hypothesis that FQs are relevant for Binding Theory is that the A/A' distinction (24)-(25) is predicted. If the FQ can trigger a Principle C violation, then A'-extraction across it should trigger a strong crossover violation, while A-movement should be unproblematic.

If correct, Doetjes's analysis would imply that FQs do indicate something about the position of empty categories: though not revealing the exact position of subject traces, it

would entail that there is a subject trace somewhere low in the structure, e.g., internal to VP. Certain important questions remain nevertheless. Besides some of the problems discussed in section 4.2, Doetjes's analysis leaves unanswered the question of why FQs need to bind a trace, as opposed, e.g., to an analysis in which it is the FQs themselves which need to be bound. For example, an analysis in which the FQs are themselves anaphors (subject to Principle A) would equally predict the A/A' differences and would be empirically distinguished only by the *L-tous* cases. Should the clitics raise at LF across *tous* (plausible, since clitics raise overtly in these environments in, e.g., Italian) then Doetjes's analysis and one in which the FQs are themselves anaphors, would perhaps be empirically indistinguishable.

Note that Doetjes's analysis appears to make the wrong prediction with respect to the generality of *L-tous* cross-linguistically. It is commonly assumed that the pre-adverbial position of the pronominal object in German examples such as (58a) (or their Dutch equivalents) is the result of a short, leftwards movement of the DP. The definite DP object is assumed to be base-generated in a position following the adverb *gestern* 'yesterday', i.e., the position occupied by the indefinite *Kekse* 'cookies' in (58b). Indeed, on Doetjes's analysis, this must be true in order for the FQ in (58a) to be licensed. For discussion of Q-float and scrambling/object shift in German, see especially Giusti (1990a, 1990b) and Merchant (1996).

- (58) a. *Im Garten hat der Hans sie_i gestern (alle_i) gegessen.*
 In the garden has the Hans them yesterday all eaten
 'Hans ate them all yesterday in the garden.'
- b. *Im Garten hat der Hans gestern Kekse gegessen.*
 In the garden has the Hans yesterday cookies eaten
 'Hans ate cookies yesterday in the garden.'

Doetjes's analysis of *L-tous* takes it that the FQ in (55a) is licit preceding the DP it modifies because the DP has undergone a short movement (cliticization) leaving a trace. In her analysis, there is nothing special about cliticization per se, and unlike other analyses, no requirement that the DP being modified c-command or precede the FQ. Her analysis thus predicts that an FQ in Dutch or German should be able to precede the pronoun it modifies, so long as that pronoun has undergone the short scrambling exemplified in (58a) leaving a trace. The sharply ungrammatical (59a) is therefore incorrectly predicted to have the same status as French *L-tous* (55a). On Doetjes's assumptions, it is hard to see how to exclude (59a) without also excluding (55a). (The (b) example is included as a control to show that the position of *alle* in (59a) is independently available.)

- (59) a. * *Im Garten hat alle_i der Hans sie_i gestern gegessen.*
 In the garden has all the Hans them yesterday eaten
 ('Hans ate them all yesterday in the garden.')
- b. *Die Kekse_i hat alle_i der Hans gegessen.*
 The cookies has all the Hans eaten
 'Hans ate all the cookies.'

Junker (1995) and Doetjes (1997) propose to relate their analyses of FQs to other analyses of adverbial quantification and of "binominal each" (i.e., as in *The children received three balloons each*), by positing that even the simplest FQs (e.g., *all*) have a complex internal structure. In particular, they argue that FQs contain empty nominal positions, which are involved in the binding relations, and (for Junker) in agreement. For example, while Sportiche (1988) would assign the surface representation [*tous e*] to an FQ with the restriction that the *e* be a trace, pro or PRO, Doetjes (1997) assigns FQs essentially the same structure, arguing that it is this empty category (and not the quantifier) which must bind the trace. One might also interpret Belletti (1982) proposals in these terms as well, suggesting that the empty category in FQs could itself be anaphoric. This is the

route taken by Sportiche (1988: 445) in analysing larger FQs which cannot form legitimate surface constituents with their DP antecedents, such as in (36). Sportiche assigns this the structure [*tous les trois* [_N *e*]], where *e* is an empty anaphor, forming a chain with its antecedent, and not a trace of movement. Such an account might treat the pronominal clitics in Hebrew as overt manifestations of the covert pronominal or anaphoric element. Intriguingly, such proposals could also relate the distribution of FQs to other anaphor-like elements which display agreement and seem to appear in adverbial positions or the left periphery of VPs, under ill-understood conditions (on the origin and rise, c. 1000 AD, of *himself* forms used as “subject intensifiers” as in (60c-d), see Keenan 1996; see Tremblay 1990 for discussion of the French examples, and the suggestion that they are related to FQs; see also Torrego 1996 for an analysis of certain NPs and pronouns in Spanish as FQs, roughly along these lines).

- (60) a. *The professors have all been working on this very problem.*
 b. *Chomsky and Halle have the two of them been working on this very problem.*
 c. *Chomsky has himself been working on this very problem.*
 d. *You know yourself that this can't be all there is to say.*

- (61) *Les enfants_i ont eux-mêmes_i donné un cadeau à Marie.*
 the children have them-selves given a present to Marie
 ‘The children have themselves given a present to Marie.’ (French, Tremblay 1990: 236)

- (62) *Mne budet samomu interessno.,*
 Me-DAT will.be self-M.SG.DAT interesting,
kak reshitsja ètot vopros
 how resolves this question.
 ‘It will be interesting to me myself, how this question turns out.’ (Russian)

Finally, the investigation is made more complex if we accept that what appear to be FQs may be different elements in different languages (Bonneau and Zushi 1993) or even internal to one language (Shlonsky 1996: 14) (see also sections 3.3 and 4.3 above). Indeed, most authors who take *all* to be the same element in both prenominal and floated positions, would presumably nevertheless accept an adverbial analysis of *all* in phrases such as [*all alone*], [*all wet*], where it cannot float and has the meaning ‘completely, entirely’.

In this article, I have lumped together various approaches to Q-float to highlight aspects salient for the present discussion. To be sure, they differ in many ways as well, and I have not attempted to provide a thorough listing of important details of many of the approaches. I have instead focused on what I see as a deeper issue, namely, can the position of FQs be taken as a diagnostic for traces and their positions? I have suggested that no analysis to date has been successful in predicting the distribution and properties of FQs with full generality. Nevertheless, in the years since pairs such as (1) became an object of study from a transformational perspective, and in particular in the decade or so since the stranding analysis was formulated by Sportiche (1988) and Miyagawa (1989), we have learned a great deal. Though FQs cannot be used unequivocally as tests for underlying constituent structure, it is clear that they are in some way intimately connected to predication and their distribution is connected to either movement or binding (or both). While we may not have found the answer to the question with which we began the article, we at least know now some of the major questions that may lead us to the answers:

- (63)
- Why do only certain universal Qs float ?
 - Why is the scope of an FQ fixed ?
 - Why do A and A’ antecedents/traces behave differently in (standard) English ?
 - What is the relationship of Q-float to split NP constructions ?
 - What permits and constrains the attested cross-linguistic variation ?

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minor corrections July 24, 2001

Floating quantifiers: Handle with care. Jonathan David Bobaljik. Published: 22 July 2014. Quantifier float (as in *The kids are all reading*) has received two main analyses, with no consensus emerging as to which is superior. Under the stranding analysis (Sportiche 1988, a.m.o.), a floated...
Quantifier float Stranding analysis Adverbial analysis Clause structure DP positions Case-matching
Purhepecha. This is a preview of subscription content, log in to check access. Notes.
Possibility of floating (French
quantifier at a distance).
Weak quantification: "Many Scandinavians have won the Nobel Prize" (about Nobel winners than Scandinavians).
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