

CH 95 Quantifier-float*

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1. Introduction¹

Quantifier-float (QF), i.e. the non-local dependency between the quantifier Q and its nominal associate in English (1a) is attested in many languages. QF has been at the center of linguistic research since Kayne (1975), where it is viewed as a transformational variant of the non-floated structure (1b):

- (1) a. *Linguists* have *all* read Aspects
 b. *All linguists* have read Aspects

Kayne analyzes (1a) as an instance of what he calls ‘Q-Post’/‘R-tous’, a quantifier movement operation to the right of its associate. The main arguments for the transformational approach are semantic as well as syntactic and morphological. Semantically, there seem to be no differences in meaning between (1a) and (1b). Morphologically, Q and its associate manifest adjectival agreement in several languages. In French, the focus of Kayne's proposal, both floating (2a) and non-floating quantifiers (2b) must overtly agree with their nominal associates in gender and number, suggesting a syntactic dependency between the Q and its associate:

- (2) a. *Les garçons* sont *tous/ *toutes* allés à la plage
 the:M;PL boy:M;PL are all:M;PL all:F;PL gone to the beach
 ‘The boys have all gone to the beach’
 b. *Tous/ *Toutes les garçons* sont allés à la plage
 all:M;PL all:F;PL the:M;PL boy:M;PL are gone to the beach
 ‘All the boys have gone to the beach’

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The authors' names appear in alphabetical order.

¹ Throughout we maintain the use of terms such as A/A' movement, traces (with or without indices), NP-Movement, NP-Trace and others, which guided the investigation of QF from a historical perspective. Many of these terms do not have a theoretical status in current minimalist frameworks. We also ignore potential differences between NPs and DPs, referring to all as NPs.

Kayne notes that the quantifier can be to the left of its associate as well, which results in the structure he then labels ‘L-tous’ (3):

- (3) Elle a tous voulu les lire
 she has all:M;PL wanted them:M;PL to.read
 ‘She has wanted to read them all’

The literature expanded the search to many other languages (e.g. Baltin 1978), concentrating on determining the exact relationship between Q and its associate. It was discovered that distribution of floating Qs is subject to the same locality restrictions as anaphors: the nominal must c-command the floating Q, as in (4), and no finite clause boundary (or specified subject) can intervene between the two, as in (5) (Kayne 1981; Jaeggli 1982).

- (4) a. A review of all the books has come out
 b. *[A review of *the books*] has *all* come out
 c. All the books have come out
 d. *The books* have *all* come out
- (5) a. All the students think that his teacher has left
 b. **The students* think that his teacher has *all* left
 c. The students all think that his teacher has left

The anaphoric behavior of the Q of QF gave rise to discussions of how to derive it (see, e.g. Belletti 1982), but soon three other main approaches emerged: the ‘stranding (or adnominal) approach’ (SA), the ‘adverbial approach’ (AA), and the ‘hybrid approach’ (HA). The SA, which is due to Sportiche (1988), holds that the quantifier and its nominal associate start out as a single constituent, and the quantifier then moves leftward (Shlonsky 1991; Merchant 1996; Bošković 2004; Miyagawa and Arikawa 2007; among others).² The AA, rooted in Kayne (1975, 1981), claims, on the other hand, that there is no transformational relation between the associate and the FQ: the quantifier is an adjunct in the lower clausal domain, generally the VP (Dowty and Brody 1984; Doetjes 1992, 1997; Baltin 1995; Bobaljik 1995; Torrego 1996; Brisson 1998 and others). Finally, the more recent HA contends that floating quantifiers can be either adnominal or adverbial, and languages may have just one type or both (Benmamoun 1999; Ko 2005; Fitzpatrick 2006; etc.).

2. The ‘stranding approach’

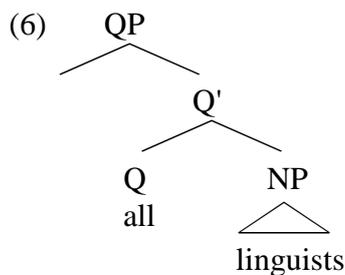
The SA appears in the late eighties, in the background of the debate about the asymmetry between subjects and objects. Chomsky (1986) links theta-role assignment with sisterhood, in clear conflict with the clausal architecture in Chomsky (1981): according to this model, objects are sisters to V but subjects are base-generated in the specifier of IP, which poses the question why both can, nevertheless, be theta-role assigned. In a similar vein, on the assumption that extraction may proceed only from a theta-position, Koopman and Sportiche (1985) conclude that the subjects of Japanese and Chinese, out of which *wh*-movement is possible, cannot be located in Spec, IP. The

² See also Miyagawa (1989), who is based in part on Kuroda (1980).

debate crystallizes in the ‘VP-internal Subject Hypothesis’ (Fukui and Speas 1986; Kitawaga 1986; Kuroda 1986; Koopman and Sportiche 1991; among others), according to which subjects are cross-linguistically base-generated within the VP and only in some languages subsequently move to Spec, IP.

The ‘VP-internal Subject Hypothesis’ is one of the bases for Sportiche's treatment of QF in terms of Q-stranding. Another one is the assumption that the quantifier and its associate are members of the same constituent. Sportiche observes that locality restrictions on NP-Movement (‘DP-Movement’ after Abney 1987) match those observed in QF structures. By making subjects to be an instance of A-Movement within a single clause, the locality restrictions of QF structures follow. Furthermore, the absence of semantic differences between floated and non-floated structures, the agreement patterns of languages like French, as well as the VP-like distribution of QF all follow as well.

Although Sportiche's specific proposal treats the quantifier as an adjunct to the NP it is associated with,³ under further refinements by Giusti (1990), Cardinaletti and Giusti (1992), and by Shlonsky (1991), the structure that results is a QP rather than an NP:



The empirical motivation for the shift from an NP-structure to a QP-structure is Shlonsky's (1991) analysis of Hebrew data. Quantifiers such as Hebrew *kol* appear with an agreement marker when they follow the nominal, as in (7b), whereas no such an agreement marker appears when Q precedes the nominal, as in (7a). Crucially, in QF contexts, the agreement marker is obligatorily present, as illustrated in (7c):

- (7) a. [_{QP} *kol* [_{NP} *ha-yeladim*]] *yašnu*
 all the-children slept
 ‘All the children slept’
- b. [_{NP} *ha-yeladim*]_i *yašnu* [_{QP} *t_i kul-am t_i*]
 the-children slept all-3PL;M
 ‘The children all slept’
- c. [_{QP} [_{NP} *ha-yeladim*] *kul-am t_i*] ? *ohavim le-saxek*
 the-children all-3PL;M love to-play
 ‘The children all love to play’

³ In fact, the exact analysis Sportiche proposes is a structure in which the quantifier is adjoined to an NP headed by an empty category (i), where *ec* stands for a trace left by movement, *pro*, *PRO*, or an empty category other than *pro* and *PRO* and bound by a constituent crucially base-generated in a c-commanding position:

(i) ... [_{NP} Q [_{NP} *ec*]]

Shlonsky argues that the overt marker in (7b) and (7c) is the result of an agreement relation between Q and its nominal associate, with the only difference that in (7b) just the NP has raised, whereas in (7c) the entire QP has raised.

Giusti (1991) (upon a suggestion by Sportiche, p.c.), extends Shlonsky's approach of Hebrew (7c) to pronominal structures like those of English (8a), French (8b) and Italian (8c), which were previously analyzed by Maling's (1976) as 'Q-Pro-Flip':

- (8) a. [_{NP} them [_{QP} all t]]
- b. [_{NP} eux [_{QP} tous t]]
 them:M;PL all:M;PL
 'them all'
- c. [_{NP} loro [_{QP} tutti t]]
 them:M;PL all:M;PL
 'them all'

The Stranding Analysis of QF as formulated in Sportiche's and Shlonsky's analyses makes several important predictions. The first one relates to the distribution of floating quantifiers: if the SA hypothesis is right, one would expect floating quantifiers to be invariably possible in Spec, VP as well as in other A(argument)-positions, at least in cases in which the associate can strand the Q by means of, in principle, either A- or A'- movement. The second prediction is directly connected to the first one. Given that QF is treated as a movement operation, we expect that QF will be sensitive to islands. Finally, if, as defended by the proponents of the SA, floated and non-floated structures share a common internal structure, there should be no mismatches between the two with respect to issues like the kind and number of quantifiers allowed or their semantic meaning. The following subsections are devoted to discussing whether and to what extent these predictions are empirically borne out.

2.1. *The distribution of floating quantifiers*

Research in the last two decades has shown that, as it stands, the pioneering formulation of the SA in Sportiche (1988) and its followers is not valid for the distribution of floating quantifiers. The focus has been cross-linguistic and intra-linguistic asymmetries not only with respect to the possibility of floating off a complement, a fact already observed by Sportiche (1988) himself, but also with respect to the apparently unproblematic cases of floating off a VP-internal subject. Additionally, there remains the question whether Kayne's (1975) 'L-tous' in (3), in which the quantifier precedes its nominal associate, must be excluded from the inventory of QF cases, as Sportiche (1988) proposes.

2.1.1. *Floating off a complement*

If, as argued by proponents of the SA, QF is the result of stranding, floating off a complement to V should be generally licit in all those cases in which an associate nominal moves out of VP. This is, in fact, the situation in languages like Japanese (Miyagawa 1989; Saito 1985) and German (Déprez 1989; Giusti 1990, Merchant 1996). The complement of a transitive verb in Japanese is displaced by operations such as

object scrambling in (9a) and (9b). The same happens in French (Kayne 1989), where non-focused pronominal objects undergo clitic movement, example (9c). From this perspective, the ungrammaticality of the English transitive structure in (9d) would simply reduce, although not uncontroversially (Lasnik 1999; Bošković 1997; etc.), to the unavailability of object movement in English.

- (9) a. [Gakusei-o]_i sensei-ga [t_i huta-ri] sikatta⁴
 student-ACC teacher-NOM two-CLF scolded
 ‘The teacher scolded the two students’
- b. Der Lehrer hat [den Schülern]_i die
 the:N;SG teacher:N;SG has the:D;PL student:DAT;PL the:ACC;PL
 Bücher [allen t_i] gegeben
 book:ACC;PL all:DAT;PL given
 ‘The teacher gave the books to all students’
- c. Je [les]_i repare [tous t_i]
 I them:M;PL repair all:M;PL
 ‘I repair them all’
- d. *The teacher has seen [the students]_i [all t_i]

The picture is, however, blurred by passive and unaccusative structures, where, in the light of Perlmutter's (1978) and Burzio's (1986) ‘Unaccusativity Hypothesis’, movement of the object to Spec, IP should suffice for licensing the quantifier in the first merged position. The prediction is actually fulfilled in the case of Japanese⁵ (10a), (10b), but not in French (10c), (10d), and English (10e), (10f).

- (10) a. [Gakusei-ga]_i ano otoko-ni [t_i huta-ri] korosareta
 student-NOM that man-by two-CLF were-killed
 ‘Two students were killed by that man’
- b. [Gakusei-ga]_i ofisu-ni [t_i huta-ri] kita
 student-NOM office-to two-CLF came
 ‘Two students came to the office’
- c. [Les enfants]_i ont été vus ?[tous t_i] / [presque tous t_i]⁶

⁴ CLF stands for classifier.

⁵ In an OV language like Japanese, that the floating numeral quantifier is, in fact, in the complement of V is ensured by linear precedence of the adjunct *otoko-ni* ‘by that man’ in (10a) and *ofisu-ni* ‘to the office’ in (10b).

⁶ Sportiche (1988) capitalizes on the apparent mild deviancy of the French examples in (10c), (10d) to argue that floating off a complement position is possible in French. However, both Bobaljik (2003) and Bošković (2004) show that Sportiche's judgments and analysis are not correct. Against Sportiche's claims, they consider the variant with the unmodified quantifier (*tous*) as ungrammatical, and treat the structure including the modified quantifier (*presque tous*) as a case of heavy Q-shift, along the lines of Jaeggli's (1982) analysis of French adverbs in final position. The main piece of evidence is (i), an unergative structure where clause-final *tous/presque tous* is as (un)acceptable as it is in (10c), (10d), although the subject must have moved from Spec, VP:

the:M;PL child:M;PL have been seen all:M;PL almost all:M;PL
 ‘The children have (almost) all been seen’

d. [Les enfants]_i sont venus ?[tous t_i] / [presque tous t_i]
 the:M;PL child:M;PL are come all:M;PL almost all:M;PL
 ‘The children have all come’

e. *[The students]_i were seen [all t_i]

f. *[The students]_i have arrived [all t_i]

In sum: the SA of QF predicts a connection between the availability of QF in complement position and the availability of movement out of VP. The prediction is empirically confirmed in the case of transitive structures, where processes such as object scrambling or object cliticization may strand a floating quantifier in VP. However, subject movement in passive and unaccusative structures apparently fails to allow a floating Q except in Japanese.

2.1.2. Floating from Spec, VP

In contrast to what is predicted in Sportiche (1988), the SA surprisingly faces empirical difficulties in the case of floating off a subject in Spec, VP. The most relevant structures are discussed in the introductory sections in Bošković (2004). The first one, originally due to Bobaljik (1995), is illustrated by the English examples in (11): if, on standard assumptions, manner adverbs like *completely* are attached higher than Spec, VP, there is no reason for the ungrammaticality of one of the variants in (11), namely that in which *all* follows *completely*. The same conclusion can be drawn from examples in which the quantifier sits on the specifier of a lexical projection other than VP: in (12), *all* is disallowed in Spec, AP.

(11) The students <all> completely <*all> understood

(12) They are <all> being <*all> noisy

Similar facts are, according to Bošković, attested in Spanish. Postverbal subjects, which are assumed to occupy Spec, VP (Ordóñez 1997; Alexiadou and Anagnostopoulou 1998; Zubizarreta 1998; among others) can follow manner adverbs (13a), but floating quantifiers cannot (13b):

(13) a. ?Entenderán completamente los estudiantes ese problema
 will.understand completely the:M;PL student:M;PL that problem
 ‘The students will completely understand that problem’

b. *Los estudiantes entenderán completamente todos
 the:M;PL student:M;PL will.understand completely all:M;PL
 ese problema
 that problem

(i) [Les enfants]_i ont t_i dormi ?tous / presque tous
 the:M;PL child:M;PL have slept all:M;PL almost all:M;PL
 ‘The children have all/almost all slept’

‘The students will all understand that problem’

Another set of problematic data comes from French, where, despite the fact that participles undergo short verb movement (14a), a quantifier cannot be stranded after them (14b):

- (14) a. Pierre_i a vu_j [_{VP} à peine [_{VP} t_i t_j Isabelle]]
 Pierre has seen hardly Isabelle
 ‘Pierre has hardly seen Isabelle’
- b. *[Les enfants]_i ont vu_j [_{VP} [_{QP} [tous t_i] t_j ce film]]]
 the:M;PL child:M;PL have seen all:M;PL this movie
 ‘The children have all seen this movie’

Some other facts such as those from Swedish (15) and from Japanese (16) point to the same direction. According to Holmberg (1999), a subject quantifier cannot appear stranded between the lexical predicate and an auxiliary, which is commonly taken not to undergo head movement. In a similar vein, floating in Spec, VP in Japanese is apparently forbidden (Haig 1980; Kuroda 1980; Saito 1985):

- (15) Jag undrar varför studenterna inte <alla> har <*alla> läst boken
 I wonder why student.the:PL not all:PL have all:PL read book.the
 ‘I wonder why the students have all not read the book’
- (16) *[Gakusei-ga]_i sake-o [_{VP} [_{QP} t_i san-nin] nonda]
 student-NOM sake-ACC three-CLF drank
 ‘Three students drank sake’

Far from leading scholars to abandon the SA, the sets of conflicting data reviewed so far have served, in the last years, as the basis for one of the most recent and articulated proposals assuming the main guidelines of Sportiche's (1988) analysis. Such a proposal is Bošković (2004).

2.1.3. Stranding as acyclic adjunction: Bošković (2004)

Bošković (2004) offers a reformulation of the SA which resolves the problematic cases above, both for floating off from a complement to V and from a subject in Spec, VP. The core of his proposal is that stranding is possible only if movement of the nominal associate results in a non-trivial chain with at least three links. Such a requirement is, in turn, derived from two assumptions: (i) floating quantifiers are adjoined acyclically to the projection headed by their nominal associates (similar to Sportiche's (1988) original analysis, and *contra* Shlonsky (1991)); and (ii) there is no adjunction to arguments (Chomsky 1986). This entails, in effect, a ban on stranded quantifiers that are on a theta-marked position, previously suggested in Déprez (1989). Bošković follows Lebeaux (1988) and assumes that adjuncts can enter the structure acyclically. Therefore, the prediction is that stranded quantifiers can appear in any of the links of the non-trivial chain created by the nominal associate's movement with exception of the tail (17a). Adjunction targeting the head of the chain results in an apparent non-floated structure (17b); adjunction targeting any of the intermediate positions results in floating (17c):

(17) a. [Q-XP ... Q-XP ... Q-XP ... *Q-XP]

b. [Q-XP ... ~~XP~~ ... ~~XP~~ ... ~~XP~~]

c. [XP ... Q-~~XP~~ ... Q-~~XP~~ ... ~~XP~~]

In support of his proposal, Bošković gives the important empirical contrast in (18): floating off a complement to V, generally impossible in English (18a), becomes licit in ECM structures (18b). On the assumption that in English the subject of a non-finite complement clause moves out of the clause and is licensed in the accusative by the ECM verb (Lasnik 1999; Bošković 2002; etc.), (18b), unlike (18a), contains an intermediate, “non-theta position”, in its derived structure:⁷

(18) a. *Mary hates the students_i [_{VP} [all t_i]]

b. Mary believes them_i/the students_i [_{IP} [all t_i] to [_{VP} t_i know French]]

The problematic English structures in (19) and (20) ((11) and (12) above) receive a principled explanation if the quantifier *all*, which cannot be attached to the lower theta-position in either (19) or (20), can, however, be acyclically adjoined to its nominal associate in the intermediate, “non-theta position” Spec, FP⁸ in (19), and in the specifier of the VP headed by *being* in (20). This requires adopting the strict cyclic view of A-movement in Takahashi (1994), Boeckx (2001) and Bošković (2002), according to which A-movement must stop in every A-Spec.

(19) The students_i [_{FP} [all t_i] [_{VP} completely [_{VP} [*all t_i] understood]]]

(20) They_i are [_{VP} [all t_i] being [_{AP} [*all t_i] noisy]]

A similar analysis is given to the French example in (21) ((14b) above), where the past participle has undergone overt head movement (see (14a) above):

(21) Les enfants_i ont [_{XP} [tous t_i] vu_j [_{VP} [*tous t_i] t_j ce film]]]
 the:M;PL child:M;PL have all:M;PL seen all:M;PL this movie
 ‘The children have all seen this movie’

Extending Bošković’s proposal to the conflicting facts of Japanese, Swedish, and, to a certain extent, Spanish is, however, more controversial. Regarding Japanese, Miyagawa and Arikawa (2007) show that ungrammatical sentences such as (16) above

⁷ Note that, from these quarters, *bona fide* cases of overt object movement such as scrambling or object shift must necessarily target a final position higher than Spec, AgrP or its minimalist equivalent Spec, ν P, which is against the prevailing view in the literature. (i) below illustrates the traditional analysis for Object Shift in Icelandic, while (ii) illustrates Bošković’s:

(i) Ég las [_{AGROP/VP} bækurnar_i [_{VP} ekki [_{VP} allar t_i]]]
 I read book.the:ACC;PL not all:ACC;PL
 ‘I did not read all the books’

(ii) Ég las bækurnar_j ekki [_{AGROP/VP} [allar t_j]_i [_{VP} t_i]]]
 I read book.the:ACC;PL not all:ACC;PL
 ‘I did not read all the books’

⁸ Bošković explicitly argues for a richer clausal structure than the one proposed in Chomsky (1995), thus allowing for the kind of split INFL defended in Pollock (1989), Belletti (1990) and others.

(repeated here as (22a)) contrast with almost identical examples that crucially include an adverb intervening between the subject and the object:

- (22) a. *Gakusei-ga sake-o san-nin nonda
 student-NOM sake-ACC three-CLF drank
 ‘Three students drank sake’
- b. Gakusei-ga sake-o *imamadeni* san-nin nonda
 student-NOM sake-ACC so.far three-CLF drank
 ‘Three students drank sake so far’

The difference between (22a) and (22b) is entirely unexpected in Bošković’s approach. There is no clear reason why attachment of an adverb could provide an additional position in the A-chain in (22b). A similar puzzle arises in the case of unergative structures, where ‘high’ (i.e. VP-external) but not ‘low’ (i.e. VP-internal) adverbs may intervene between the subject and the quantifier it has stranded (Ko, 2005; Miyagawa and Arikawa (2007)):⁹

- (23) a. Kodomo-ga *kinoo* san-nin kurasu-de waratta
 children-NOM yesterday three-CLF class-in laughed
 ‘Three children laughed yesterday in class’
- b. *Kodomo-ga *geragerato* san-nin waratta
 children-NOM loudly three-CLF laughed
 ‘Three children laughed loudly’

With respect to Swedish, Bošković’s analysis can straightforwardly account for (15) above, repeated here as (24). If, as generally claimed in the literature, finite verbs do not move overtly in Swedish embedded clauses, the only available “non-theta position” for acyclic adjunction of the quantifier is the specifier of the VP headed by the auxiliary itself:

- (24) Jag undrar varför studenterna_i inte [_{VP} alla t_i har [_{VP} [*alla t_i
 I wonder why student.the:PL not all:PL have all:PL
 läst boken]]]
 read book.the
 ‘I wonder why the students have not all read the book’

Bošković argues that parallel facts obtain in Swedish root clauses with more than one auxiliary (25a), which he takes to involve just one instance of head movement, namely that of the highest auxiliary to (I)-C (Swedish is a V2 language). However, his proposal accounts for cases such as (25b) only if the quantifier occupies the highest non-thematic specifier, namely that in the VP projected by *ha* ‘have’. That is, his proposal cannot explain why acyclic adjunction to the non-theta position in the VP headed by *kunnat* ‘been able’ is illicit, as Cirillo (2009) notes. Whatever the right

⁹ Miyagawa and Arikawa (2007) account for both (22) and (23) by resorting to an analysis combining Miyagawa’s (1989) proposal of floating quantifiers as elements adjacent to a VP-internal trace and parsing strategies.

analysis of the Swedish data may finally be, the obvious generalization is that quantifier stranding in complex verbal structures is possible only in the highest non-thematic position. That that position is non-thematic is correctly predicted by Bošković's proposal. What is completely unpredicted is that such a position must be the highest one.

- (25) a. De_i kan [_{VP} <alla> t_i ha [_{VP} ??<alla> t_i talat med Peter]]
 they may all:PL have all:PL talked to Peter
 ‘They may have all talked to Peter’
- b. Doktorerna_i skulle [_{VP} <alla> t_i ha [_{VP} *<alla> t_i
 doctor.the:PL will all:PL have all:PL
 kunnat [_{VP} *<alla> t_i undersöka patienten]]]
 been.able.to all:PL examine patients.the
 ‘All the doctors will have been able to examine the patients’

Finally, let us briefly consider the Spanish data in (13b) above, repeated here as (26a), which Bošković takes as support for his proposal. It seems that neither his grammatical judgment nor his account are entirely unproblematic. Ordóñez (2007) gives the exact parallel cases to (26a) in (26b) and (26c) below as acceptable, although he notes that some speakers judge them as deviant:

- (26) a. *Los estudiantes entenderán completamente *todos*
 the:M;PL student:M;PL will.understand completely all:M;PL
 ese problema
 that problem
 ‘The students will all understand that problem’
- b. Entonces trataban mis vecinos cuidadosamente *ambos*
 then treated my:M;PL neighbor:M;PL carefully both:M;PL
 a su hija
 to their daughter
 ‘Then both my neighbors treated their daughter carefully’
- c. Por no hablar los profesores pacientemente *todos*
 for not speaking the:M;PL teacher:M;PL patiently all:M;PL
 a sus respectivos estudiantes
 to their respective students
 ‘Because the teachers did not talk to all their respective students’

In addition, as pointed out in Valmala (2008), the well-formedness of examples such as (27a) below, unanimously accepted, casts serious doubts that (26a) is to be excluded on grounds that floating quantifiers cannot be in theta-positions. The fundamental issue is where exactly the neutral, non-focused, Q *todos* ‘all’ has moved to. A possible solution, illustrated in (27b), might be that the quantifier has undergone acyclic adjunction to its nominal associate in what Ordóñez (2007) labels SubjP, a

projection located between the landing site of V-Movement and that of the object (Spec, FP in Ordóñez's account).

- (27) a. Los estudiantes de física han conseguido *todos* beca
 the:M;PL student:M;PL of Physics have got all:M;PL grant
 b. Los estudiantes de física_i han conseguido [_{SubjP} todos t_i [_{FP} beca_j [_{VP} t_i t_j]]]
 'The students of Physics have all got grants'

This possibility is however discarded by Valmala (2008), who claims that FQ in Spanish is invariably discourse-driven. Since movement to Spec, SubjP is, according to Ordóñez, an instance of A-movement, floating quantifiers in Spanish should be banned on the SubjP position of (27b).

On the basis of the discussion so far, it may be concluded that the SA, as reformulated in Bošković (2004), solves some of the empirical puzzles that defied Sportiche's (1988) seminal analysis, but still leaves important sets of data unaccounted for, especially, and surprisingly, in instances of floating from Spec, VP. Finally, as with its predecessors, Bošković's (2004) analysis also leaves unanswered the question of the exact treatment of Kayne's (1975) 'L-tous', an issue which will be addressed next.

2.1.4. A note on 'L-tous'

As described in Kayne (1975), French 'L-tous' structures are characterized by three main properties: (i) the quantifier, which is obligatorily *tous*, precedes its associate, (see (28)); (ii) the associate is obligatorily a pronominal NP ((28a) vs (28b)); and (iii) a clausal boundary may intervene between the quantifier and its associate ((28a), (28c)), although it does not have to (28d). However, the intervening clausal boundary must be one that corresponds to either the complement of a Romance restructuring verb, as in (28a), or a subjunctive clause, as in (28c).

- (28) a. Elle a *tous* voulu *les* lire
 she has all:M;PL wanted them:M;PL to.read
 'She has wanted to read them all'
- b. * Elle a *tous* voulu lire *ces* livres
 she has all:M;PL wanted to.read this:M;PL book:M;PL
 'She has wanted to read all these books'
- c. Il faut *tous* qu' *ils* partent
 it is.necessary all:M;PL that they:M;PL leave
 'It is necessary that they all leave'
- d. J'ai promis de *tous* *les* lire
 I have promised to all:M;PL them:M;PL read
 'I have promised to read them all'

As noted by Sportiche (1988), 'L-tous' structures pose a 'locality' problem for both the anaphoric analysis of floating quantifiers (Jaeggli 1982; Belletti 1982; Kayne 1983; etc) and his own approach. According to the former, in which quantifiers are taken to be anaphors, all examples in (28) should be equally excluded since the associate fails to c-command the quantifier. In Sportiche's (and Bošković's 2004)

account of QF, stranding necessarily requires the associate to move at least a step higher than the quantifier. Sportiche's conclusion, largely adopted by other proponents of the SA, is simply to consider French 'L-*tous*' as a highly idiosyncratic phenomenon and thus different from 'true' QF. He observes that the construction is severely restricted, both intra-linguistically and cross-linguistically. Intra-linguistically, the phenomenon is attested with *tous* but not with *chacun* 'each', which may float in regular cases of QF. Cross-linguistically, Sportiche himself points out that the construction, excluded in the other Romance languages, seems however to be attested in Norwegian-Swedish and Japanese, although it is apparently quite infrequent. In spite of this, Sportiche's arguments are not very convincing. On the one hand, it is a well-known fact that intra-linguistically regular QF is restricted to only a small set of the quantifiers available in a language. In English, *all*, *each*, and *both* can float, but *every*, *some*, *several*, *a lot*, etc. cannot. On the other hand, cross-linguistic research has revealed that QF is less restrictive than previously thought. For instance, Pittner (1995) and Pafel (1996) have shown that the construction is attested in German with pronominal NPs, both subjects (29a) and objects (29b):

- (29) a. *Alle* haben <*sie*> <*&i>die Musiker> viel
 all:NOM;PL have they:NOM;PL the:NOM;PL musician:NOM;PL much
 Beifall bekommen
 applause:ACC; SG got
 'They / the musicians all got a big applause'
- b. *Alle* hat er <*sie*> <*&i>diese Akten>
 all:ACC;PL has he:NOM;SG them:ACC;PL this:ACC;PL file:ACC;PL
 bearbeitet
 worked.on
 'He has worked on them all / all these files'

The inability of the SA to cope with 'L-*tous*' structures has become one of the most frequent criticisms in the work of proponents of other approaches, most notably in Doetjes (1997). The alternative analysis she proposes will be discussed in the light of her overall proposal in the corresponding section.

2.2. Stranding by A- or A'-movement?

Although all the cases discussed so far involve stranding by A-movement, Sportiche's (1988) formulation of the SA does not, in principle, preclude the possibility of QF as the result of A'-movement of the associate. In fact, as Sportiche (1988) himself notes, French allows Q-stranding in appositive relatives (30a), in the general case, as well as in *wh*-questions (30b), once relevant pragmatic factors are controlled for.¹⁰ On the other hand, Sportiche claims that floating in a French restrictive relative clause is highly deviant (30c). Yet, Fitzpatrick (2006) shows that this is not the case once pragmatic factors are controlled, as in the case of *wh*-questions, as seen in (30d):

¹⁰ In the case of (30b), as Sportiche (1988) notes, the situation must be one in which children have been divided into two groups, one of which is such that all children in it have gone to the cinema.

- (30) a. Les livres, [que j'ai tous lu avant la classe], sont
 the:M;PL book:M;PL that I have all:M;PL read before the class are
 sur la table
 on the table
 'The books, all of which I read before the class, are on the table'
- b. Quels enfants sont tous allés au cinéma?
 which:M;PL child:M;PL are all:M;PL gone to cinema
 *'Which children have all gone to the cinema?'
- c. ?*Les livres [que j'ai tous acheté] sont sur la table
 the:M;PL book:M;PL that I have all:M;PL bought are on the table
 *'The books that I bought all are on the table'
- d. J'ai vendu les livres [que j'ai chacun lu au moins
 I have sold the:M;PL book:M;PL that I have each:M;SG read at least
 trois fois]
 three times
 'I sold each of the books that I have read at least three times'

English, however, presents quite a different picture. Q-floating is barred in all types of relative clauses ((31a) and (31b)) and in *wh*-questions as well (31c):

- (31) a. *The books, [which I all read before the class], are on the table
 b. *I sold the books [that I all read at least three times]
 c. *What did John buy all?

Further cross-linguistic research has shown that, while languages like Hebrew (32a) (Shlonsky 1991) align themselves with English in disallowing A'-stranding, German (Merchant 1996) and Dutch (Doetjes 1997) apparently permit it (32b), (32c):

- (32) a. *eize tapu? axalta ? et kul-o?
 which apple you.ate all-3SG;M
 'Which apple did you eat all of?'
- b. Was hast du alles gekauft?
 what:ACC;SG have you all:ACC;SG bought
 'What all did you buy?'
- c. Deze boeken heb ik allemaal gelezen
 this:N;PL book:N;PL have I all read
 'I read all these books'

As it stands, the fact that languages split concerning the availability of QF by A'-movement raises several questions. An important one, addressed in Bobaljik (2003), relates to the compatibility of the A'-movement data with the SA. In principle, the SA should be compatible with the French, German or Dutch data above. After all, Sportiche's (1988) grammatical examples of QF in French appositive and *wh*-structures

show precisely this point. What is then the exact reason behind the asymmetry between French, German, and Dutch, on the one hand, and English and Hebrew, on the other? Scholars like Déprez (1989), Shlonsky (1991), Bobaljik (2003), and Fitzpatrick (2006) have noted that, in the former group of languages, A'-movement appears to be preceded by intermediate A-movement. This is true of French, in which short A-movement is responsible for participle agreement (Kayne 1989), as well as in German and Dutch, languages that have scrambling (Vanden Wyngaerd 1989; Mahajan 1990). If this is correct, the quantifiers in the French, German, and Dutch examples above would have been stranded by A-movement, rather than by A'-movement. Overall, there appears to be a connection between A-movement and QF. For example, English and Hebrew, which do not license QF by A'-movement, permit to strand Q in instances of *wh*-movement of the subject, as observed by Fitzpatrick (2006):

(33) a. Which students have all left?

- b. ? eize kita ? avra ? et ha-mivxan kul-a?
 which class:F;SG passed ACC the-exam all-3SG:F
 'Which class all passed the exam?'

The connection between QF and A-movement finds additional support in the two sets of German data below, originally from Bobaljik (2003). (34a) shows that *wh*-movement of the nominal associate is, in itself, unable to license a quantifier in that clause. (34b), on the other hand, illustrates the impossibility of stranding a floating quantifier in the intermediate positions that cyclic A'-movement of its nominal associate targets:

- (34) a. Welche Würste hat der Peter (*alle)
 which:ACC;PL sausage:ACC;PL has the:NOM;SG Peter:NOM;SG all:ACC;PL
 bezweifelt ob der Hund gegessen hat?
 doubt whether the:NOM;SG dog:NOM;SG eaten has
 'Which sausages did Peter doubt whether the dog has eaten all (of)?'
- b. Welche Würste hat Peter gesagt (*alle)
 which:ACC;PL sausage:ACC;PL has Peter:NOM;SG said all:ACC;PL
 dass der Hund gegessen hat?
 that the:NOM;SG dog:NOM;SG eaten has
 'Which sausages did Peter say (*all) that the dog ate?'

However, that the connection between QF and A-movement is not as neat as the preceding paragraphs suggest is revealed by McCloskey's (2000) pioneering research on West Ulster Irish English (WUIE). In contrast to Standard English, where floating off a complement to V by either A- or A'-movement is strictly forbidden (35a), (35b), A'-, but crucially not A- movement can strand an object quantifier in WUIE (36a), (36b). Parallel facts obtain in the case of floating off a subject in Spec, VP (36c), (36d). Finally, WUIE permits the presence of floating quantifiers in any of the intermediate positions successive-cyclic A'-movement targets (36e):

- (35) a. *They were arrested *all* last night

b. **Who* was arrested *all* in Duke Street?

(36) a. **They* were arrested *all* last night

b. *Who* was arrested *all* in Duke Street?

c. **They* were throwing stones *all* in Paris

d. *Who* was throwing stones *all* in Paris?

e. *What* do you think <*all*> (that) he'll say <*all*> (that) we should buy <*all*>?

As McCloskey himself argues (as well as Bošković (2004) and Fitzpatrick (2006)), the only possible account of the WUIE facts is in terms of stranding by direct A'-movement. Otherwise, the contrast between (36a), (36c) and (36b), (36d) would be a mystery. Putting it differently, there is no reason why potential A-movement of the complement/subject could license a quantifier *only if* it were followed by A'-movement. And given the standard dichotomy between A- and A'-movement with respect to clause-boundness, the interpretation of the facts in (36e) is crystal-clear.

In sum: whatever the exact analysis of the WUIE may be,¹¹ it is unquestionable that, as Sportiche (1988) hypothesized, stranding of the quantifier should not be (and, in fact, is not) restricted to either A- or A'-movement. An explanation why languages choose one mechanism or the other is, of course, still needed.¹²

2.3. Island effects

Leaving aside a few exceptions, most studies devoted to QF pay little, if any, attention to island effects. The reasons are, probably, mainly empirical, given the diversity of both cross-linguistic and intra-linguistic data. However, island effects are, in themselves, essential in assessing the correctness of the SA: if QF is the result of movement of the NP stranding the quantifier, QF must be sensitive to islandhood.

¹¹ Bošković (2004) proposes a reformulation of McCloskey's (2000) analysis that makes the WUIE examples in (36) above fully compatible with his account of QF as acyclic adjunction.

¹² Several major aspects of the QF-debate are relevant as well for resumptive pronouns (RPs). RPs are a grammatical phenomenon with considerable cross-linguistic and intra-linguistic variation, just like QF is; the following example from Welsh illustrates it:

(i) y dyn y siaradasoch chwi ag ef
 the man COMP spoke you with him
 'the man that you spoke with'

The literature of RPs discusses whether the dependency between the RP and its host is the result of syntactic movement, and if so, what exactly the RP is vis à vis its host (a copy, an independent element, etc.). In parallel to earlier accounts of QF, Boeckx (2003) analyses RPs as stranded A'-pronouns, with the RP forming a constituent with its host in the First Merge. A stranded approach to RPs was explored in the early eighties by Rouveret (1994) as well. (See Rouveret (2011) for an overall view of the properties of RPs and for a review of the grammatical issues they pose).

Although, as they stand, neither Sportiche's nor Shlonsky's (1991) analyses are compatible with the absence of island effects in QF structures, studies such as Benmamoun (1999) or, more recently, Ott (2012) attempt to reconcile the SA with the apparent lack of sensitivity of some QF structures to islandhood. Ott (2012), for example, observes that, in spite of being opaque for sub-extraction (37a), dative complements (37b) as well as free datives (37c) can be split by QF in German. Importantly, German floated structures must be derived via (A')-movement, for they exhibit reconstruction effects (37d):

- (37) a. *Über wen hat der Verleger [NP einem Buch t_i]
 about whom has the:NOM;SG editor:NOM;SG a:DAT;SG book:DAT;SG
 keine Chance gegeben?
 no:ACC;SG chance:ACC;SG given
 *‘About whom did the editor give no chance to a book?’
- b. *Den Kindern* habe ich *allen* geholfen
 the:DAT;PL child:DAT;PL have I:NOM;SG all:DAT;PL helped
 ‘I helped all the children’
- c. *Den Freunden von Benni* hat Caro *beiden*
 the:DAT;PL friend:DAT;PL of Benni has Caro:NOM;SG both:DAT;PL
 einen Kuchen gebacken
 a:ACC;SG cake:ACC;SG baked
 ‘Caro baked a cake for both of Benni's friends’
- d. *Seinenⁱ besten Studenten* hat jederⁱ
 his:DAT;PL best:DAT;PL student:DAT;PL has every:NOM;SG
 Professor *beiden* t_i ein Buch gegeben
 professor:NOM;SG both:DAT;PL a:ACC;SG book:ACC;SG given
 ‘Every professor gave a book to both of his best students’

Ott proposes to treat German QF along the lines of his analysis of ‘Split Topicalization’ (ST), the main focus of his paper. Building on proposals by Moro (2000) and Chomsky (2013), he argues that both ST and QF structures are generated as {XP, YP} structures. Because {XP, YP} is an unlabelable structure, it must be asymmetrized at the phase level. Such a requirement, along with certain conditions on pragmatic well-formedness, is, according to Ott, what triggers movement of, in principle, either XP or YP. In the specific case of QF, he argues that asymmetry-breaking movement must invariably apply to the nominal associate, since it is [NP Q], and not [Q NP], the structure satisfying relevant pragmatic needs.¹³ This is, in turn,

¹³ In short, the topic (TOP), understood as Jacobs's (2001) conceptual frame, must precede the comment (REM). In this light, (38a) and (38b) in the main text would respectively correspond to (i) and (ii) below:

- (i) Was die Kinder angeht, Elisabet hat beide eingeladen
 ‘As for the children, Elisabet invited both’
 (ii) *Was beide angeht, Elisabet hat die Kinder eingeladen
 *‘As for both, Elisabet invited the children’

what would explain the contrast between (38a) and (38b):¹⁴

- (38) a. *Die Kinder* hat Elisabet *beide* eingeladen
 the:ACC;PL child:ACC;PL has Elisabet:NOM;SG both:ACC;PL invited
 ‘Elisabet invited both children’
- b. **Beide* hat Elisabet *die Kinder* eingeladen
 both:ACC;PL has Elisabet:NOM;SG the:ACC;PL child:ACC;PL invited
 ‘Elisabet invited both children’

Another case of unexpected compatibility between QF and islandhood is that reported in Fitzpatrick (2006), who attributes it to Madariaga (2005). According to these authors, the Russian floating quantifiers *mnogo* ‘a lot’ and *vse* ‘all’ differ in that the former is possible with objects (39a) but not with subjects (39b), while the latter is possible with both ((39c), (39d)):

- (39) a. *Knig* studenty kupili *mnogo*
 book:GEN;PL students bought a.lot.of
 ‘The students bought a lot of books’
- b. **Studentov* kupilo ètu knigu *mnogo*
 student:GEN;PL bought this book a.lot.of
 ‘A lot of students bought this book’
- c. *Studentov* učitelj' ljubjat *vsex*
 student:ACC;PL teacher loves all:ACC;PL
 ‘The teacher loves all the students’
- d. *Studenty* ljubat učitelj' *vse*
 student:NOM;PL love teacher all:NOM;PL
 ‘The students all love the teacher’

On the assumption that subjects are islands for sub-extraction in Russian, Fitzpatrick interprets the facts above as indicating that only one of the two quantifiers at hand, namely *mnogo*, is stranded by movement. His overall conclusion is that there must exist more than one mechanism to generate QF structures, cross-linguistically and, crucially, intra-linguistically as well.

In conclusion, against appearances, the absence of island effects in certain QF structures in some languages does not undermine *per se* the adequacy of the SA. Potential empirical problems aside, accounts such as Ott (2012) show that alternative

¹⁴ Note, however, that Ott's analysis fails in accounting for (i) below, namely the German equivalent to Kayne's (1975) ‘L-tous’ structure in French, which was previously shown to be possible with a pronominal associate in both languages:

- (i) *Alle* hat er <*sie*> <**diese Akten*> bearbeitet
 all:ACC;PL has he:NOM;SG them:ACC;PL this:ACC;PL file:ACC;PL worked.on
 ‘He has worked on them all / all these files’

analyses couched within the SA are possible, at least for German. In this respect, it must be noted that other stranding analyses such as Boškovič (2004) are, at first sight, perfectly compatible with grammatical floating off an island. This is as far as the quantifier goes, which, as in Sportiche's (1988) account, will adjoin to the maximal projection of its nominal associate acyclically.

2.4. Non-floated structures

One of the most frequent objections found in the literature against the SA is that not all quantifier dependencies can be derived by movement. This is particularly relevant for those in which the alleged underlying single (i.e. non-floated) constituent is impossible (Hoekstra et al. 1989; Doetjes 1992, 1997; Bobaljik 1995, 2003; Fitzpatrick 2006; Rooryck and Vanden Wyngaerd 2011; Ott 2012; etc.).

Bobaljik (1995) and Fitzpatrick (2006) note that quantifiers in English may iterate in floated constructions ((40a), (41a)), but not in non-floated ones ((40b), (41b)):

(40) 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

(41) a. *All* the students have *each* been asked to fill out the form in pencil

b. ??*Each* (of) *all* the students have been asked to fill out the form in pencil

There are also mismatches between floated and non-floated structures concerning both preposition insertion and number agreement, in French (42) and in English (43) (Sportiche 1988; Bobaljik 2003). However, in German only the mismatch in number is attested (44), and the definite article is obligatorily absent in the non-floated variant (Ott, 2012):

(42) a. Ces enfants ont *chacun* (*de) lu un livre différent
 this:M;PL child:M;PL have each:M,SG of read a book different
 'These children have each read a different book'

b. [*Chacun* *(de) ces enfants] a lu un livre différent
 each:M;SG of this:M;PL child:M;PL has read a book different
 'Each of these children has read a different book'

(43) a. These children have *each* (*of) read a different book

b. [*Each* *(of) these children] has read a different book

(44) a. Den übergewichtigen Mitarbeitern wurde *jedem*
 the:DAT;PL overweight:DAT;PL employee:DAT;PL was each:DAT;SG

eine Diät verschrieben
 a:NOM;SG diet:NOM;SG administered

'A diet was administered to each of the overweight employees'

- b. [*Jedem* (*dem) *überwichtigen* *Mitarbeiter*]
 each:DAT;SG the:DAT;SG overweight:DAT-SG employee:DAT-SG

wurde eine Diät verschrieben
 was a:NOM;SG diet:NOM;SG administered

‘A diet was administered to each of the overweight employees’

Finally, complex quantifying expressions such as *all/none of them*, *the both of them*, *all three (of them)*, etc. are restricted to floated positions in French (45), English (46), and German (47) (Bobaljik 2003, and references therein; Ott 2012):

- (45) a. Elles sont *toutes les trois* intelligentes
 they:F;PL are all:F;PL the:F;PL three intelligent
 ‘They are all the three intelligent’

- b. *[*Toutes les trois* elles] sont intelligentes
 all:F;PL the:F;PL three they:F;PL are intelligent
 *‘All three of them are intelligent’

- (46) a. We have *all three of us* completed the assignment on time

- b. *[*All three of us* we] completed the assignment on time

- (47) a. Die Bücher hat er *alle vier* gelesen
 the:ACC;PL book:ACC;PL has he:NOM;SG all:ACC;PL four read
 ‘He has read all the four books’

- b. *[*Alle vier* die Bücher] hat er gelesen
 all:ACC;PL four the:ACC;PL book:ACC;PL has he:NOM;SG read
 ‘He has read all the four books’

The difficulty of reconciling the sets of data above with the SA varies depending on the type of examples to be accounted for. For instance, Fitzpatrick (2006), following a suggestion by Fox (p.c.), suggests that the ungrammaticality of iterated quantifiers in non-floated structures ((40b), (41b)) could well be due to semantic requirements on the element selected by *all/each*, a trace but not a quantified NP. In the same vein, obligatory preposition insertion with non-floated *each/chacun* is perhaps to be attributed to independent morphological or phonological processes (Sportiche, 1988; Bobaljik 2003). However, as convincingly argued by Bobaljik (2003), cases such as the different agreement patterns in ((42)-(44)), or the impossibility of complex quantifying expressions to appear in pre-nominal position ((45)-(47)) are not easily accounted for under the SA. The most plausible conclusion is, then, that floated and non-floated structures are not the same in their underlying constituency.

Another area in which floated and non-floated constructions appear to differ is in their semantics, as argued in depth in Bobaljik (2003). The reader is referred to Bobaljik's excellent sections for a detailed discussion of an important number of differences in the possible readings of floated and non-floated constructions in several languages. As an illustration, consider (48), which shows that, while non-floated universal *all* may reconstruct under the modal, its floating counterpart is restricted to taking scope in its surface position (Williams 1982; Dowty and Brodie 1984; Déprez 1994):

- (48) a. All the contestants could have won all > could, could > all
 b. The contestants could have all won *all > could, could > all

In sum: a comparison between floated and non-floated structures reveals significant differences between the two, both with respect to underlying constituency and semantics. This is entirely unpredicted in the SA, which takes floated structures to be transformationally derived from their non-floated counterparts.

3. The ‘adverbial approach’

The preceding paragraphs have offered a cross-linguistic overview of QF. We focused on four aspects that are relevant for assessing the adequacy of the SA: (i) the distribution of floating quantifiers, (ii) the type of movement involved in stranding, (iii) the presence (or absence) of island effects, and (iv) the comparison between floated and non-floated structures. The SA is not completely without problems in any of these areas. However, (i) and (iv) have been shown to be particularly defiant. The former constitutes an obstacle to the SA because of the apparent ban on floating in low structural positions in several languages. Even highly articulated proposals such as Boškovič’s (2004) acyclic adjunction cannot completely account for it. Although the SA makes the right prediction for the latter insofar as the floated and the non-floated structure share at least one reading ((49a), (49b) below), they raise the question why they are identical in interpretation to standard cases of adverbial quantification (49c) (see Bobaljik (2003)). In other words, (49) suggests that similarity in meaning or quantificational properties may not necessarily entail a transformational relationship.

- (49) a. Horses will *all* eat sugar
 For every x, x a horse, x will eat sugar
 b. *All* horses will eat sugar
 For every x, x a horse, x will eat sugar
 c. Horses will *always* eat sugar
 For every x, x a horse, x will eat sugar

Finally, the SA does not accommodate ‘L-*tous*’.

The two areas commented above are SA’s main weaknesses, and constitute the basis for the ‘adverbial approach’ to QF (Dowty and Brody 1984; Doetjes 1992, 1997; Baltin 1995; Bobaljik 1995; Torrego 1996; Brisson 1998; among others). Disregarding differences in particular analyses, studies adopting this view basically contend that floating quantifiers are adjuncts attached to a lower inflectional domain with no structural relationship with the nominal they modify. The analysis of (50a) would not then be the stranding structure in (50b) but rather the adjunct structure in (50c):

- (50) a. The students have *all* read the books
 b. The students_i have [_{VP} [_{NP} all t_i] read the books]
 c. The students_i have [_{VP} all [_{VP} t_i read the books]]

One of the pieces of empirical evidence for the structure in (50c) is the similar distribution of floating quantifiers and certain adverbials (Bobaljik 1995; Brisson 1998). The following examples, taken from Fitzpatrick (2006), show that, as illustrated in (51a), floating quantifiers can occur exactly in those positions in which ‘high’ adverbs can appear, i.e. speaker-oriented (51b), subject-oriented (51c), and modal (51d):

- (51) a. The students <all> will <all> have <all> been <?*all> being <*all> reprimanded
- b. The students <allegedly> will <allegedly> have <?*allegedly> been <*allegedly> being <*allegedly> reprimanded
- c. The students <?*willingly> will <willingly> have <willingly> been <?*willingly> being <*allegedly> reprimanded
- d. The students <easily> will <easily> have <easily> been <?*easily> being <*easily> reprimanded

Further confirmation comes from contrasts like that in (52) (according to Fitzpatrick (2006)): the adverb *bravely* can be interpreted either as subject-oriented (‘it was brave of x to do y’) or as a manner adverb (‘in a brave manner’) if preceded by the quantifier *all*. But if *all* follows the adverb, only the subject-oriented reading obtains. As argued by Fitzpatrick, these facts are easily explained if floating quantifiers are attached at least as high as modal adverbs, i.e. adjoined to a projection higher than the lexical VP, which, in turn, is the site for the attachment of manner adverbs.

- (52) a. The gladiators *all bravely* fought the lions
 ‘It was brave of all the gladiators to fight the lions’
 [_{XP} all [_{XP} bravely [_{VP} fought the lions]]]
 ‘All the gladiators fought in a brave way’
 [_{XP} all [_{VP} bravely [_{VP} fought the lions]]]
- b. The gladiators *bravely all* fought the lions
 ‘It was brave of all the gladiators to fight the lions’
 [_{XP} bravely [_{XP} all [_{VP} fought the lions]]]

From this perspective, the ban on floating off low thematic positions (which served as the basis for the reformulation of the SA in Bošković (2004)) finds confirmation in both French and English: the position to which floating quantifiers must adjoin is higher than both the complement to V and the specifier of VP. This correctly rules out low attachment of *all* in (53). This also fits nicely with floating off an unergative subject in Japanese (23), repeated here as (54). As the reader may recall, this was possible if the floating numeral followed a ‘high’ (54a), but not a ‘low’ (54b) adverbial:

- (53) The students_i [were_j [_{VP} all t_j [_{VP} arrested *all t_i]]]
- (54) a. Kodomo-ga *kinoo* san-nin kurasu-de waratta
 children-NOM yesterday three-CLF class-in laughed
 ‘Three children laughed yesterday in class’
- b. *Kodomo-ga *geragerato* san-nin waratta

children-NOM loudly three-CLF laughed
 ‘Three children laughed loudly’

In contrast to the SA, the AA needs additional refinements to capture the movement component of QF. If the quantifier is just an adjoined element taking scope over a NP, why is it that the NP must move? Doetjes (1997) offers an answer to this question by developing what she calls the ‘Generalized *L-tous*’ analysis. Doetjes's basic claim is that floating quantifiers differ from bare ones in that only the latter are able to function as operators licensing an empty category. The reason she gives (following Cinque (1990)) has to do with the internal structure of Qs: bare quantifiers are simply Q [_{XP} Q], but floating quantifiers are more complex. Floating Qs contain a silent pronominal element representing the domain of quantification, i.e. [_{QP} Q [_{NP} pro]]. The empty category must thus find another suitable licenser, namely the displaced nominal associate.¹⁵ On these grounds, Doetjes's proposal is able to also account for Kayne's (1975) ‘*L-tous*’, which had proven resistant to all previous analyses. From Doetjes's new perspective, licit QF structures must meet only two requirements: (i) that the empty category they bind be licensed by a displaced constituent, and (ii) that the licenser following the floating quantifier be a pronominal, not a nominal NP (55b), (55c). According to Doetjes, (ii) is entirely expected under Chomsky's (1981) ‘Binding Theory’: since the floating quantifier, coindexed with the NP-trace, c-commands the NP, it triggers a Principle C violation in (55c). Principle B is, nevertheless, respected in (55b), as the quantifier is outside of the pronoun's binding domain. Note that, as Bobaljik (2003) points out, such an explanation has the additional advantage of shedding light on the question why, in a significant number of the languages studied, QF seems to be associated to A-movement: if the floating quantifier is a potential binder for the NP, A'-extraction across it will inevitably result in a strong crossover violation.¹⁶

- (55) a. Les enfants_i ont [_{QP} tous [_{NP} pro]]_i t_i mangé
 the:M;PL children:M;PL have all:M;PL eaten
 ‘The children have all eaten’
- b. Je veux [_{QP} tous [_{NP} pro]]_i qu' ils_i viennent t_i
 I want all:M;PL that they:M;PL come
 ‘I want them all to come’
- c. *Je veux [_{QP} tous [_{NP} pro]]_i que les enfants_i viennent t_i
 I want all:M;PL that the:M;PL children:M;PL come
 ‘I want the children to all come’

Despite these obvious merits, Doetjes's proposal cannot be extended to cross-linguistic sets of data she does not explicitly address. A case in point, discussed in Bobaljik (2003), is the German ungrammatical ‘*L-tous*’ structure in (56a), which, nevertheless, meets Doetjes's requirements on well-formed QF (the scrambled object is the alternative licenser of the trace bound by the quantifier while complying with

¹⁵ According to Doetjes, agreement between the floating quantifier and the displaced NP is just a reflex of the binding relation between the former and the trace of the latter.

¹⁶ In fact, this is one of the main arguments Fitzpatrick (2006) gives to defend an adverbial approach *à la* Doetjes in those languages (Standard English, French) which completely lack the A'-movement strategy of McCloskey's (2000) WUIE.

Principle B). Surprisingly, focus stress on the intervening subject makes the structure perfectly licit (56b), a fact which goes unnoticed in Bobaljik (2003).¹⁷

- (56) a. *Im Garten hat *alle*_i der Hans *sie*_i
 in.the garden has all:ACC;PL the:NOM;SG Hans:NOM;SG them:ACC;PL
 gestern *t*_i gegessen
 yesterday eaten
 ‘Hans ate them all yesterday in the garden’
- b. Im Garten hat *alle*_i der HANS *sie*_i
 in.the garden has all:ACC;PL the:NOM;SG Hans:NOM;SG them:ACC;PL
 gestern *t*_i gegessen
 yesterday eaten
 ‘It was Hans who ate them all yesterday in the garden’

These problems aside, it may be concluded that the AA as developed in Doetjes gives a relatively solid answer to the question why QF should be connected to movement if no stranding is involved. Doetjes thus offers a good alternative to Sportiche's (1988) adnominal adjunction structure [_{NP} Q [_{NP} *ec*]], where *ec* stands for an empty category resulting from movement. However, as stated elsewhere (fn. 3), *ec* for Sportiche is not restricted to *t* (57a). It also includes the non-phonologically realized elements *pro* (57b), *PRO* (57c), and *ec* (an empty category that forms a chain with a constituent other than *pro* and *PRO* but crucially base-generated in a c-commanding position (57d)):¹⁸

- (57) a. Les enfants_i ont [_{NP} tous [_{NP} *t*_i]] mangé
 the:M;PL child:M;PL have all:M;PL eaten
 ‘The children have all eaten’
- b. [_{NP} Tous [_{NP} *pro*]] ont décidé de venir
 all:M;PL have decided to come
 ‘All decided to come’
- c. Ils_i ont décidé de [_{NP} tous [_{NP} *PRO*_i]] partir
 they:M;PL have decided to all:M;PL leave
 ‘They have decided to all leave’
- d. Ces hommes_i avaient [_{NP} tous les trois [_{NP} *ec*_i]] connu
 this:M;PL man:M;PL had all:M;PL the:M;PL three known
 Greta Garbo
 Greta Garbo
 ‘These men have all three known Greta Garbo’

¹⁷ We thank Henk van Riemsdijk for calling our attention to this.

¹⁸ The main reason why Sportiche rejects a stranding analysis for this kind of example is the unavailability of the non-floated structure, that is *Tous les trois ces hommes avaient connu Greta Garbo.

Although Doetjes's proposal does not explicitly address the paradigm in (57), this has been the focus in other studies adopting the AA, such as Baltin (1995) and Torrego (1996). Despite relevant differences between them, both present compelling arguments from English and Spanish for the view that floating quantifiers need not form a single structural NP-chain with its nominal associate.

4. The 'hybrid approach'

The preceding section has shown that analyses couched within the AA seem to fare empirically well in two of the four areas in which the SA does not make the right predictions. That is, it captures the impossibility of floating off low thematic positions generally (English and French) or just in unergative constructions (Japanese), and the asymmetry between floated and non-floated structures. It has also been argued that the AA offers plausible solutions to issues such as the connection between A-movement and QF in a considerable number of languages, the unified account of 'R-' and 'L-tous' phenomena, and the existence of QF associated to empty categories other than NP-traces. It clearly fails, however, in two other areas unproblematic for Sportiche's (1988) formulation of the SA. One is Miyagawa's (1989) paradigm for Japanese in (10a), (10b), repeated here as (58), and, another, McCloskey's (2000) data from WUIE in (59), corresponding to (36) above:

(58) a. [Gasukei-ga]_i ano otoko-ni [t_i huta-ri] korosareta
 student-NOM that man-by two-CLF were-killed
 'Two students were killed by that man'

b. [Gasukei-ga]_i ofisu-ni [t_i huta-ri] kita
 student-NOM office-to two-CLF came
 'Two students came to the office'

(59) a. **They* were arrested *all* last night

b. *Who* was arrested *all* in Duke Street?

c. **They* were throwing stones *all* in Paris

d. *Who* was throwing stones *all* in Paris?

e. *What* do you think <*all*> (that) he'll say <*all*> (that) we should buy <*all*>?

If Miyagawa's (1989) interpretation of the Japanese facts is correct, the low position of the floating numeral is the complement to V. This is incompatible with the claim of the AA that floating quantifiers are adjoined to a projection (at least) as high as the VP. On the other hand, it seems to be extremely difficult to connect the WUIE data to a mechanism different from A'-movement.

Another problem is that of accounting for structures in which, as Shlonsky's (1991) version of the SA would predict, island effects are observed: if, as proponents of the AA argue, QF reduces to adjunction, there is no reason why floating off a subject (60b), but not off a complement (60a), should be disallowed in Russian (Madariaga's (2005) examples in (39a), (39b) above):

(60) a. *Knig studenty kupili mnogo*
 book:GEN;PL student:NOM;PL bought a.lot.of
 ‘The students bought a lot of books’

b. **Studentov kupilo ètu knigu mnogo*
 student:GEN;PL bought this book a.lot.of
 ‘A lot of students bought this book’

Fitzpatrick (2006) capitalizes on these data to defend the view that there are two mechanisms resulting in QF, both intra-linguistically and cross-linguistically. The first he proposes, attested in languages like French or Standard English, is an operation of adjunction of the kind defended in Doetjes (1997). The second, stranding by A'-movement, is available in WUIE, Japanese, Korean and Russian. One of his main arguments, partially developed for Japanese already in Yamashita (2001), is the asymmetry between floated and non-floated structures with respect to reconstruction effects: in the Japanese example in (61) below, the scrambled object reconstructs in its base-generation position only if it strands a quantifier (61b). Given that reconstruction effects have conventionally been taken as a hallmark of A'-movement, Fitzpatrick's conclusion seems to be warranted.

(61) a. [*Gakusei-o huta-ri*]_i [otogaiⁱ-no sensei]-ga *t_i sikatta*
 students-ACC two-CLF each.other-GEN teacher-NOM scolded
 ‘Each other's teacher scolded the two students’

b. [*Gakusei-o**]_i [otogai*ⁱ-no sensei]-ga *t_i huta-ri sikatta*
 students-ACC each.other-GEN teacher-NOM two-CLF scolded
 (Intended) ‘Each other's teacher scolded the two students’

Fitzpatrick's connection between QF and A'-movement cannot, however, be readily extended to other languages. A case in point is Finnish, where, as Holmberg and Nikanne (2002) show, floating quantifiers cannot be licensed by a constituent in Spec, CP (62a), which, in Fitzpatrick's system, would basically mean that Finnish floating quantifiers are of the adverbial type. However, they are possible with a licenser in the specifier of Holmberg and Nikanne's α P, a projection immediately below CP (62b). The problem for Fitzpatrick's system is that, as illustrated in (62c), Spec, α P must count as an A'-position, given that the anaphor undergoes reconstruction, which leaves unanswered the question why in (62b) movement of the NP across the adverbial quantifier, a potential binder, does not give rise to a strong crossover violation (see fn. 16). On the other hand, the empirical burden of the Finnish data against Fitzpatrick's analysis of Japanese may be of certain importance, if, as extensively argued in Miyagawa (2010), α P is also present in Japanese clause-structure.

(62) a. *Nämä kirjat* Graham Greene on (**kaikki*) kirjoittanut
 these books Graham Greene has all written
 ‘All these books Graham Greene has written’

b. *Ilmeisesti nämä kirjat* on (*kaikki*) kirjoittanut Graham Greene
 evidently these books has all written Graham Greene
 ‘Graham Greene has evidently written all these books’

- c. Ilmeisesti *itseä* äänesti vain Jussi
 apparently for-himself voted only Jussi
 ‘Apparently the only person who voted for him was Jussi himself’

But Fitzpatrick is neither the only nor the first scholar in defending an HA to QF. Previous studies such as Benmamoun's (1999) and Ko (2005) have respectively argued something similar for Arabic and Korean. Benmamoun focuses on the Moroccan Arabic quantifier *buħd* ‘alone’, which can be interpreted as quantifying over either a subject NP or a VP (63a) while carrying the clitic *-u* agreeing in gender and number with the subject, one of the crucial pieces of evidence for Shlonsky's (1991) stranding analysis. In the former reading, it may undergo Clitic-Left Dislocation along with the subject (63b), which, according to Benmamoun, supports its adnominal nature. However, when quantifying over the VP, it may appear conjoined with a PP adverb (63c), which in Benmamoun's view would strongly suggest that it is a VP-adjunct.

- (63) a. *l-wəld ža buħd-u*
 the-boy come[PST;3SG;M] alone-his
 ‘Only the boy came’
 ‘The boy came alone’
- b. *l-wəld buħd-u smə⁷-t bəlli ža*
 the-boy alone-his hear-PST;1SG that come[PST;3SG;M]
 ‘I heard that only the boy came’
- c. *ma-⁷raft-š waš ⁷omar ža*
 NEG-know-PST;1SING;NEG whether Omar come[PST;3SG;MASC]
- buħd-u wla m⁷a xu-h*
 alone-his or with brother-his
 ‘I don't know whether Omar came alone or with his brother’

An HA to QF is also necessary in Korean according to Ko (2005). Ko capitalizes on the Korean counterpart to Haig's (1980) and Kuroda's (1980) standard set of data in Japanese: floating off a complement across an intervening subject is licit (64a), but floating off a subject across an intervening complement is not (64b). The restriction, however, disappears if the floating numeral chosen belongs to the class of case-marked quantifiers (64c). Ko proposes an account combining Fox and Pesetsky's (2005) ‘Cyclic Linearization’ and the existence of two different mechanisms of QF in Korean, stranding, for non-case-marked numerals (64a), (64b), and adverbial adjunction for case-marked ones (64c). On Fox and Pesetsky's assumptions, the former but not the latter are subject to the linearization constraints Ko contends explain the ungrammaticality of (64b).

- (64) a. *Maykcwu-lul John-i sey-pyeng masiessta*
 beer-ACC John-NOM three-CLF_{BOTTLE} drank
 ‘John drank three bottles of beer’
- b. **Haksayng-tul-i maykcwu-lul sey-myeng masiessta*
 student-PL-NOM beer-ACC three-CLF drank
 ‘Three students drank beer’

- c. *Haksayng-tul-i* maykcwu-lul *sey-myeng-i* masiessta
 student-PL-NOM beer-ACC three-CLF-NOM drank
 ‘Three students drank beer’

Irrespective of the empirical adequacy of Fitzpatrick' (2006), Benmamoun's (1999) or Ko's (2005) analyses for accounting for the intra-linguistic and cross-linguistic sets of data on which they focus, all pose the fundamental question of the choice of one type of strategy or the other in QF structures. Fitzpatrick (2006) is the only one that attempts to provide a principled answer. In his view, this choice is dependent on the internal structure of the quantifier itself, which, in turn, derives from its semantics. In a nutshell, what Fitzpatrick argues is that, whereas A'-stranding is restricted to non-exhaustive quantifiers, adverbial adjunction is possible only for exhaustive ones. Further research will have to assess if Fitzpatrick's proposal is tenable beyond those languages and those data he studies.

5. Conclusion

After more than two decades of research since Sportiche's (1988) pioneer analysis, it seems undeniable that there is no proposal in the literature that can account for the variety of QF-patterns found cross-linguistically and intra-linguistically. The main empirical arguments for each of the most accepted approaches, the SA and the AA, cannot be easily accommodated by the other, and the solution offered by the HA has not been shown to be completely unproblematic either. Despite failure in providing an analysis that can cover all sets of data without exception, studies on one side or the other have proven exceptionally fruitful with respect to not only QF itself, but also, and most importantly, to more general issues such as the mechanisms behind anaphoricity, the potential existence of a clausal structure richer than that standardly assumed, or the right characterization of conventional movement types.

QF has served as an analytical tool in the development of the VP-structure, most prominently in the VP-split hypothesis (Koizumi 1995). With the VP-internal Subject Hypothesis in place, a traditional VP-structure could not accommodate hierarchical relations among arguments under binary branching (Larson 1988, Hale and Keyser 1993, Borer 1994, 2005, Pytkänen 2008, and others). Furthermore, the addition of a functional head 'v' has split "VP" into VP and vP, with the First Merge of the external argument outside the VP proper (Chomsky 1995, Hale and Keyser 1993, Kratzer 1996, Marantz 1997 and others), changing the VP-internal Subject Hypothesis into the vP-internal Subject Hypothesis. Irrespective of potential complications, QF covers a big spectrum of arguments, not just subjects. Conflicting approaches to QF may be helped by the emerging rich literature on these topics. In sum, QF will undoubtedly continue to be at the center of linguistic research in the near future.