Floating Quantifiers are Autonomous Phrases: A Movement Account

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Abstract

Q-float is a phenomenon in which a quantifier is separated from the noun it associates with (*The cookies were all eaten up*). The phenomenon has received two major analyses: stranding and adjunction. The stranding analysis argues that the associate moves leftward out of a complex constituent that contains both it and the floating quantifier. The adjunction analysis considers floating quantifiers to be adverbial VP adjuncts. This paper investigates Q-float in Arabic and shows that neither of the existing accounts perfectly captures the facts. Building on a recent analysis of German split topics (Ott 2015), the paper argues that a floating quantifier and its associate are merged in the same syntactic position as a set of autonomous NPs; the associate moves out of the set to allow the set to be labeled and integrated in the structure (e.g., Chomsky 2013). It will be shown that the account proposed captures many of the peculiarities of Q-float, among which are apparently two conflicting facts: the locality restrictions on floating quantifiers and, in many cases, the impossibility for the floating quantifier and the associate to have formed a continuous constituent at any stage of the derivation. The facts and analysis presented contribute to the debate on whether floating quantifiers mark the positions of lower copies of displaced NPs (NP traces in pre-minimalist terms).

Keywords: quantifier float, movement, labels, construct state, Arabic

1 Introduction

Quantifier float (Q-float) occurs when a quantifier is separated from its associate NP, as has been first observed by at least Postal (1974) and discussed by much later work (e.g., Kayne 1975, Fiengo and Lasnik 1976, Sportiche 1988, Shlonsky 1991, Bobaljik 1995, Doetjes 1997, Benmamoun 1999, McCloskey 2000, Bobaljik 2003, Bošković 2004, Fitzpatrick 2006, Spector 2009, Jenks 2013, Lacerda 2016, Zyman 2017, among others). The example in (1b) is representative:

(1) (Zyman 2017, 2, (1))

a. All the walruses are painting murals.

b. The walruses are all painting murals.

Different accounts were offered to explain the Q-float phenomenon. One account, *the movement/stranding account*, argues that Q-float results from a leftward movement of the associate NP out of a complex constituent that contains both it and the quantifier (Giusti 1990, Shlonsky 1991, Merchant 1996, Cinque 1999, McCloskey 2000, Zyman 2017, among others). Another account is the *adverbial/adjunct analysis* which simply treats FQs as adverbial elements that semantically modify the predicates they combine with, or that modify their associate NPs (Kayne 1975, Dowty and Brodie 1984, Miyagawa 1989, Baltin 1995, Bobaljik 1995, Torrego 1996, Brisson 1998, Benmamoun 1999, Reed 2010, and others). A more recent analysis, a *hybrid analysis* argues that in some languages both stranding and adverbial modification are available as Q-floating strategies (e.g., Fitzpatrick 2006).

This paper investigates Q-float in Modern Standard Arabic (and related languages like Hebrew), and presents empirical facts that argue in favor of a movement account. This account, however, does not involve stranding of a floating quantifier in the strict sense. Rather, the FQ and its associate are merged in the same syntactic position as a set of autonomous NPs, where a member of the set (the associate) moves to allow the set to be labeled and integrated into the structure (Ott 2015). This means that although the associate and the quantifier are in a movement dependency, they have not formed a continuous constituent at any stage of the derivation. I will show that the analysis captures many of the peculiarities of Q-float in natural languages in general and in Arabic specifically.

I begin by presenting the facts of Q-float in Arabic in section 2, many of which have not been documented before, as far as I know. In section 3, a brief critique of previous accounts will be presented, showing that they do not capture all the facts of Q-float in Arabic. In section 4, building on a recent account for split topics in German (Ott 2015), I propose a movement analysis that solves many of the puzzles of Q-float in Arabic. Section 5 is a note on the other languages. Section 6 is a conclusion.

2 Quantifier Float in Arabic: The Facts

This section presents a description of Q-float in Arabic. The description includes the nature of elements that may float, the distribution of these elements, the restrictions on their distribution, and case matching and phi agreement between floating elements and their associates. Unless indicated otherwise, the variety of Arabic discussed is Modern Standard Arabic. All the Arabic examples were confirmed with native speakers.

2.1 Which Elements May Float?

Languages differ in which quantifiers may participate in Q-float construction. In English, for instance, only universal quantifiers float (*all*, *both*, and *each*), while generalized quantifiers (e.g., *half*) or numerals may not:

(2) (Reed 2010, 1737, (1))

a. We are all becoming increasingly aware of climate change.

b. The protestors were both yelling/arrested/angry/lawyers.

c. The patients with food poisoning had each eaten at Joe's Diner.

(3) a. * Children were half playing in the backyard. (cf. *Half of the children were playing in the backyard.*)

b. * Children were three playing in the backyard. (cf. *Three children were playing in the backyard.*)

In contrast, a language like Japanese allows numerals to float (Miyagawa 1989):

(4) Gakusei ga kyoo 3-nin kita.
students NOM today 3-CL came.
'Three students came today. (Japanese)

As for Arabic, a range of elements may float. Among these elements are universal quantifiers, such as *kull*, *jamiiʕ*, and *kaafah* which are all equivalent to English *all*:[1]

(5) a. kull-u aT-Tullab-i qadamu waraqat-an baħthiya-tan.
all-NOM the-students-GEN submit.3MPL paper-ACC research-ACC
'All students submitted a research paper.'

b. aT-Tullab-u qadamu kull-u=hum waraqat-an baħthiya-tan.
the-students-NOM submit.3MPL all-NOM=3MPL paper-ACC research-ACC
'The students all submitted a research paper.'

(6) a. jamiiʕ-u al-muaTiniin sa-yusharikuun fi al-intikhabat.
all-NOM the-citizens.3MPL.GEN FUT-participate.3MPL in the-elections
'All citizens will participate in the elections.'

b. al-muaTinuun sa-yusharikuun fi al-intikhabat jamiiʕ-u=hum.
the-citizens.3MPL.NOM FUT-participate.3MPL in the-elections all-NOM=3MPL
'The citizens will all participate in the elections.'

(7) a. kaafat-u aT-Ttullab-i qaraʔ-u kitab-an.
all-NOM the.students-GEN read-3MPL book-ACC
'All the students read a book.'

b. aT-Tullab-u qaraʔ-u kitab-an kaafat-u=hum.
the-students-NOM read-3MPL book-ACC all-NOM=3MPL
'The students all read a book.'

[1] The following letters/symbols will be used in the Arabic examples: ħ = voiceless pharyngeal fricative; kh = voiceless uvular fricative; S= voiceless alveolar fricative; ʕ=voiced pharyngeal fricative; T= alveo-palatal stop; q = voiceless uvular stop; ʔ = glottal stop.

(8) a. kila ad-dawlatayni qarrara-ta ʔan tuʕlin-aa al-intikhabat.
both.NOM the-country.3F.DU.GEN decided-3F.DU to announce-3F.DU the-elections
'Both countries decided to announce the (beginning of) elections.'

b. ad-dawlatani qarrara-ta kila=huma ʔan tuʕlin-aa
the-country.3DU.NOM decided.3F.DU both.NOM=3F.DU to announce-3DU
al-intikhabat.
the-elections
'The countries both decided to announce (the beginning of) the elections.'

Additionally, generalized quantifiers like *baʕd* 'some' and *aħad* 'one' may float:

(9) a. baʕd-u al-musharikina fi musabaqat-i al-kitabat-i
some-NOM the-participants.3M.PL.GEN in competition-GEN the-writing-GEN
aTfal-un.
children-NOM
'Some of participants of the writing competition were children.'

b. al-musharikuna fi musabaqat-i al-kitabat-i
the-participants.3M.PL.NOM in competition-GEN the-writing-GEN
baʕdu=hum aTfal-un.
some-NOM=3M.PL children-NOM
'The participants of the writing competition, some of them were children.'

(10) a. aħad-u at-tamathiil-i suriqa min al-mutħaf-i.
one-NOM the-statues-GEN was.stolen from the-museum-GEN
'One of the statues was stolen from the museum.'

b. at-tamathiil-u suriqa aħad-u=ha min al-mutħaf-i.
the-statues-NOM was.stolen one-NOM=3F.SG from the-museum-GEN
'The statues, one of them was stolen from the museum.'

Other elements that may float are numerals, a fact that has not been documented before, as far as I know:

(11) a. ʔarbaʕat-u al-mudarissiin ʔalqau muhadarat-an.
four-NOM the-teacher.3M.PL.GEN gave.3MPL a.lecture-ACC
'Four teachers gave a lecture.'

b. al-mudarrisuun ʔalqau ʔarbaʕat-u=hum muhadarat-an.
the-teacher.3M.PL.NOM gave.3M.PL four-NOM=3M.PL a.lecture-ACC
'The teachers, four of them gave a lecture.'

(12) a. thalathat-u al-laʕibiin uSib-u fi-l-malʕab.
three-NOM the-player.M.PL.GEN were.injured.3M.PL in-the-field
'Three players were injured in the field.'

b. al-laʕibuun uSib-u thalathat-u=hum fi-l-malʕab.
the-player.M.PL.GEN were.injured.3M.PL three-NOM=3M.PL in-the-field
'The players, three of them were injured in the field.'

In addition, Arabic Q-float is not restricted to quantifiers and numerals. Construct state NPs, in which two NPs are annexed to each other, may be split into two NPs and one of them becomes an associate of the other:

(13) a. niSf-u al-jumhur-i ghadara al-masraħ-a qabla nihayat-i
half-NOM the-audience-GEN left.3M.SG the-theater-ACC before end-GEN
al-masraħiyat-i.
the-play-GEN
'Half of the audience left before the end of the play.'

b. al-jumhur-u ghadara niSf-u=hu al-masraħ-a qabla nihayat-i
the-audience-GEN left.3M.SG half-NOM=3M.PL the-theater-ACC before end-GEN
al-masraħiyat-i.
the-play-GEN
'The audience, half of them left before the end of the play.'

(14) a. yad-u Ali-in juriħat fi ħadith-in muʔsif-in.
hand-NOM ʕali-GEN injured.3F.SG.PASS at accident-GEN tragic-GEN
'Ali's hand was injured at a tragic accident.'

b. Ali-un juriħa fi ħadith-in muʔsif-in yad-u=hu (wa
ʕali-NOM injured.3F.SG.PASS at accident-GEN tragic-GEN hand-NOM=3M.SG (and
baʕd-u ʔjzaʔin ʔukhraa min jism-i=hi.
some-NOM parts-GEN other of body-GEN=3M.SG
'Ali was injured at a tragic accident, his hand and some other parts of his body.'[2]

(15) a. mujawharat-u Muna fuqid-at al-shahra al-madi.
jewelry-NOM Muna got.lost-3F.PL the-month the-last
'Muna's Jewelry was lost last month.'

[2]This sentence has another variant in which the verb agrees with 'hand'. In such case *Ali* occupies a topic position.

b. Muna fuqid-at mujawharat-u=ha al-shahra al-madi.
Muna got.lost-3F.PL jewelry-NOM=3F.SG the-month the-last
'Muna, her Jewelry was lost last month.'

It appears that what all the floating elements above share is that they hold a subset-superset, a part-whole, or a possessee-possessor relationship to the associate NP.

Thus, a range of elements exhibit floating behavior in Arabic: universal quantifiers, generalized quantifiers, numerals, and a class of nouns. *Q-float* is, thus, not the accurate term to describe the facts in Arabic because the phenomenon is not specific to quantifiers. I will continue to use this term throughout the paper for convenience, however.

2.2 Distribution of Floating Elements

Arabic FQs may appear where NPs appear (NP trace positions in pre-minimalist terms), such as the subject, direct object, indirect object, and prepositional complement positions. We have seen numerous examples of FQs occurring in the subject position above. Examples of the other positions follow:

(16) *Direct Object*

a. qaraʔa ʕali-un jamiiʕ-a al-kutub-i fi-S-Sayf-i.
read.3M.SG Ali-NOM all-ACC the-books-GEN in-the-summer-GEN
'Ali read all the books.'

b. qaraʔa ʕali-un al-kutub-a fi-S-Sayf-i jamiiʕ-a=ha.
read.3M.SG Ali-NOM the-books-ACC in-the-summer-GEN all-ACC=3F.PL
Ali read the books all in the summer.'

(17) *Indirect Object*

a. darrasa al-muʕalim-u jamiiʕ-a aT-Tullab-i al-qasiidat-a.
taught.3M.SG the-teacher-NOM all-ACC the-students-GEN the.poem-ACC
'The teacher taught the poem to all the students .'

b. darrasa al-muʕalim-u aT-Tullab-a al-qasiidat-a jamiiʕ-a=hum.
taught.3M.SG the-teacher-NOM the-students-ACC the.poem-ACC all-ACC=3M.PL
'The teacher taught the poem to the students, all of them.'

(18) *Prepositional Complement*

a. ʔSbaħa al-internet-tu mutaħ-an li-kull-i al-buyut-i fi ʕamman.
became.3M.SG the-internet-NOM available-ACC to-all-GEN the-houses-GEN in Amman
'The internet has become available to all the houses in Amman.'

b. ʔSbaħa al-internet-tu mutaħ-an li-l-buyut-i fi ʕamman kull-i=ha.
became.3M.SG the-internet-NOM available-ACC to-the-houses-GEN in Amman all-GEN=3F.PL
'The internet has become available to the houses in Amman, all of them.'

In addition, Arabic FQs appear in positions like the complement position of unaccusative and passive verbs (19) (Miyagawa 1989 shows that Japanese allows floating numerals in these positions, as well):[3]

(19) a. aT-Tullab-u waSalu kull-u-hum.
the-students-NOM arrive.3M.PL all-NOM=3M.PL
'All the students arrived.'

b. aT-Tullab-u uʕtuqilu kull-u-hum.
the-students-NOM arrest.PASS.3M.PL all-NOM-3M.PL
'All the students were arrested.'

c. Salma takrahu aT-Tullab-a kull-a-hum.
Salma hate.3F.SG the-students-ACC all-ACC-3M.PL
'Salma hates all the students.'

[3] One might wonder whether we really know that these quantifiers have been stranded in direct object position, or they could be higher (with the verb having raised). However, other examples show that FQs may appear in the same position even when the main verb cannot have moved (to T, assuming that in Arabic the highest verb must move to T to check its features). In (1), the auxiliary *kan* is assumed to occupy T, so it is impossible for the verb to have moved over the FQ:

1. aT-Tullab-u kan-u qad uʕtuqilu kull-u-hum.
the-students-NOM was-3M.PL PERF arrest.PASS.3M.PL all-NOM-3M.PL
'The students had been all arrested.'

In contrast, FQs are banned in these positions in some languages like English and French (Sportiche 1988, Authier 1991, Bobaljik 1995, McCloskey 2000, Bošković 2004, and others):

(20) (Bošković 2004, 682, (3))

a. * The students arrived all.

b. * The students were arrested all.

c. * Mary hates the students all.

Furthermore, Arabic FQs appear sentence finally. This is not possible in English and French which ban FQs in this position, and allow them only if preceded by PP adjuncts or secondary predicates (e.g., Fiengo and Lasnik 1976, Maling 1976, Bobaljik 1995):

(21) ʔali-un, Salem-un wa Said-un dakhalu al-maqha kull-u=hum.
Ali-NOM, Salem-NOM and Said-NOM enter.3M.PL the-café all-NOM=3MPL
'Ali, Salem, and Said all entered the café.'

(22) (Bobaljik 1995, 231,(32))

a. Larry, Sally and Darryl came into the café *all.

b. Larry, Sally and Darryl came into the café all [at the same time].

c. Larry, Sally and Darryl came into the café all [very tired].

Additionally, Arabic differs from English and French in that Arabic FQs may associate with elements in $\overline{\text{A}}$-positions (24–25).[4]

(23) *Which books did you all give away? (*all* associates with *which books*.)

(24) juzur-u al-muħiT-i al-aTlanT-i taʔathar-at kull-u=ha
islands-NOM the-ocean-GEN the-Atlantic-GEN was.affected.by-3F.PL all-NOM=3F.PL
mina al-iʕSar.
due.to the-tornado
'The Atlantic Ocean Islands, they were all affected by the tornado,'

[4]See McCloskey 2000 who shows that Ulster English allows FQs to associate with NPs in $\overline{\text{A}}$-positions.

(25) ʔayy-u al-aflami hadara=ha kull-a=ha?
which-NOM the-movies watched=3F.PL all-ACC=3F.PL
'*Which movies did he attend all?' (*all* associates with *which movies*.)

That Arabic FQs are not restricted in distribution and that they may associate with A and $\overline{\text{A}}$ positions make the phenomenon more like movement. As will be shown in section 4, these facts, among others, argue for there being a movement dependency between a FQ and its associate. This does not imply that a FQ and its associate form a continuous constituent at any stage of the derivation, however.

2.3 Phi Agreement and Case Matching

Arabic FQs agree with their associates in phi features. A FQ must agree with its associate in person number and gender. This agreement takes the form of a clitic appearing on the FQ, as can be seen in all of the examples above, like (5b), repeated below:

(26) aT-Tullab-u qadamu kull-u=hum waraqat-an baħthiya-tan.
the-students-NOM submit.3MPL all-NOM=3MPL paper-ACC research-ACC
'All students submitted a research paper.'

Note that the sentence is ungrammatical without the clitic:

(27) *kull-u=hum aT-Tullab-i qadamu waraqat-an baħthiya-tan.
all-NOM=3M.PL the-students-GEN submit.3MPL paper-ACC research-ACC

In addition, Arabic FQs must agree with their associate NPs in case (Shlonsky 1991, Benmamoun 1999). In (5b), *kull* and *T-Tullaab-u* have a matching case, namely NOMINATIVE; in (28a), both have ACCUSATIVE case; in (28b), both are assigned GENITIVE case. Compare these examples to those that do not involve Q-float like (5a) above. In those cases, the NP invariably gets GENITIVE case (examples 28a and 28b are adapted from Benmamoun 1999, 631, (25b), (25c)).

(28) a. raʔay-tu aT-Tullab-a albariħata kull-a=hum.
saw-1SG the-students-ACC yesterday all-ACC=3MPL
'I saw all the students yesterday.'

b. minaħ-u aT-Tullab-i ath-thalathat-i al-mutafawiqina
scholarships-NOM the-students-ACC the-three-GEN the-distinguished.3M.PL.GEN
kull-i-him uqifat.
all-GEN=3MPL were.suspended
'The scholarships of all the three distinguished students were suspended.'

2.4 Locality Restrictions

Baltin (1978), Kayne (1981), Bobaljik (2003), and others note that the dependency between a FQ and its associate is similar to the one that holds between an anaphor and its antecedent. First, the FQ must be in the local domain of its associate NP.

(29) a. *There (had) all hung on the mantelpiece Portraits by Picasso. (Baltin 1978, 26)

b. *My friends$_i$ think that I have all$_i$ left. (Kayne 1981, 196)

This is the case in Arabic. Sentence (30) is ungrammatical under the reading in which 'all' associates with 'students':

(30) *AT-Tullab-u iʕtaqad-u ʔanna al-muʕalimah lan tadaʕ-a
the-students-NOM thought-3M.PL that the-teacher.F.SG NEG put-IMPERF
wajib-an jadiid-an ilkitroniy-an kull-a=hum alʔarbiʕaʔ.
assignment-ACC new-ACC electronic-ACC all-NOM=3M.PL Wednesday
'*The students thought that the teacher will not post a new assignment online all on Wednesday.' (*all* associates with *students*)

Second, floating quantifiers must be c-commanded by their associates. Again, the same holds for Arabic FQs (Benmamoun 1999):

(31) *[A friend of [the students]] has all arrived.

Intended: 'A friend of all of the students has arrived.' (Fitzpatrick 2006, 69, (87))

(32) *[ism-u [al-kuttab-i]] kan kull-u-hum mafqud-an.
[name-NOM [the-authors-GEN]] was all-NOM-3M.PL missing-ACC
'*The name of the authors was all missing.'

Intended: 'The name of all of the authors was missing.'

Third, a FQ and its associate cannot be separated by a movement island. All the examples below are ungrammatical because the displaced NPs are associated with FQs that appear inside movement islands.

(33) *ʔayy-u ʔaflam-in saʔala ʕali-un limatha Salma ʔaħabat kull-a=ha?
which-NOM movies-GEN ask.3M.SG Ali-NOM why Salma liked.3F.SG all-NOM=3F.PL
'*Which movies did Ali Ask why Salma did not like all?' (*WH*-island constraint)

(34) *al-akhbar-a al-hamma-ta, ʕali-un Saddaqa iddiʕaʔ-a Salma ʔanna
the-news-ACC the-important-ACC, Ali-NOM believed.3M.SG claim-ACC Salma COMP
Samir sarraba kull-a=ha?
Samir leaked.3M.SG all-ACC=3F.PL
'*The important news, Ali believed Salma's claim that Samir leaked all?' (complex NP constraint)

(35) *ʔayy-u kutub-in katabat Salma risalata=ha qabla ʔan taqraʔ
which-NOM books-ACC wrote.3F.SG Salma PhD.dissertation before COMP read.3F.SG
kull-a=ha
all-ACC=3F.PL
'Which books did Salma write her Ph.D. dissertation before she read all?' (adjunct island constraint)

Benmamoun (1999), however, claims that FQs may appear inside movement islands as in (36) from Moroccan Arabic:

(36) hadu li-wlad$_i$ lli msh-at [qbil ma-y-ji-w kull-hum$_i$].
these the-children that leave.PAST-3FS before NEG-3-come-P all-them
'These are the children that she left before meeting them all.' (Benmamoun 1999, 628, (16)) (Moroccan Arabic)

I believe, nonetheless, that the FQ does not violate the island constraint here. It is more likely that the FQ associates with a null pronominal subject within the adjunct clause, which is in turn co-indexed with the NP, 'the children', in the higher clause. This is supported by the fact that a FQ associating with a subject does not require an overt subject (37a), but the one associating with an object does (37b).

(37) a. jaʔ-u ʔila al-ħafl-i kull-u-hum.
came-3M.PL to the-party-GEN all-NOM=3M.PL
'They all came to the party.'

b. *qabal-tu fi-l-ħafl-i kull-a=hum.
met-1SG in-the-party-GEN all-ACC=3M.PL

In order for a floating quantifier to associate with an NP in the object position, an overt NP is required, which can take the form of a pronominal clitic:

(38) qabal-tu=hum fi-l-ħafl-i kull-a=hum.
met-1SG=3M.PL in-the-party-GEN all-ACC=3M.PL
'I met them all at the party.'

In the same way, a FQ associating with an object may appear inside an island only when a clitic appears in the object position:

(39) *haʔulaʔi hum alʔawlad-u allathiin safara Sami qabla ʔan
these they the-boys-NOM that travel.3M.SG Sami before COMP
yara kull-a=hum
see.3M.SG=3M.PL all-ACC=3M.PL
*These are the boys whom Sami had traveled before he saw.

(40) haʔulaʔi hum alʔawlad-u allathiin safara Sami qabla ʔan
these they the-boys-NOM that travel.3M.SG Sami before COMP
yara=hum kull-a=hum
see.3M.SG=3M.PL all-ACC=3M.PL

There are two possible explanations of the contrast between (39) and (40). The first is that the clitic ameliorates the island violation (Aoun and Benmamoun 1998 refer to this as the *resumptive strategy*). The second is that the FQ associates with the pronominal clitic which is in turn co-indexed with the associate NP, meaning that there is no island violation. Either of these possibilities leads to the same conclusion: FQs cannot violate islands.

2.5 Interim Summary

A detailed description of Q-float in Arabic was presented in this section. It was shown that a range of elements may participate in Q-float, not just quantifiers, a fact that has not been documented before, as far as I know. This calls for a more general account, not one specific to quantifiers. Also, unlike FQs in languages like English and French, Arabic FQs may appear where NPs normally appear (thematic positions or NP-trace positions in traditional terms), and they may associate with A- and $\overline{\text{A}}$-positions. FQs are also constrained by locality restrictions as in many languages. As will be argued in section 4, these facts argue in favor of a movement dependency between the FQ and its associate.

3 Remarks on Previous Accounts

Before presenting my analysis of Q-float in Arabic, a few remarks about previous accounts are in order. Two accounts have been proposed in the literature: the movement/stranding analysis and the adverbial/adjunct analysis. Proponents of the stranding analysis claim that Q-float results from leftward movement of the associate NP away from the quantifier (Giusti 1990, Shlonsky 1991, Merchant 1996, Cinque 1999, McCloskey 2000, Zyman 2017, among others).[5] One major version of this analysis in the literature on Semitic languages like Arabic and Hebrew is Shlonsky (1991) in which it is proposed that Hebrew *kol* 'all' (and its Arabic equivalent) is a functional head that selects a DP complement. According to Shlonsky, building on Sportiche's (1988) movement analysis, Q-float is derived by moving an NP out of a QP, resulting in the quantifier being stranded, as illustrated in (42) for (41):

(41) Ha-yeladim medabrim sinit kul-am.
the-children speak Chinese all-3M.PL
'The children all speak Chinese.' (Shlonsky 1991, 170, (18a)) (Hebrew)

(42) (Shlonsky 1991, 169, (17); adapted)

[IP [DP ha-yeladim] . . . [QP [.DP] [Q [Q kul-am] [DP *t*]]]]

[5]Earlier analyses assumed a rightward movement of floating quantifier (e.g., Kayne 1975). I will not discuss this possibility here.

Here the quantifier *kol* floats as a result of a leftward movement of *ha-yeladim* 'the children' through the specifier of QP. *Ha-yeladim* and *kol* enter into spec-head agreement, which is manifested by the agreement clitic *-am*. (Note that in Shlonsky's analysis, specifiers, like VP-internal subjects, are projected to the right.)

The stranding analysis has received much criticism. First, it does not capture the cases in which FQs may not appear in NP trace positions (positions of lower copies of displaced NPs, to put it in Minimalist terms), as with passive and unaccusative verbs (e.g., 20). Second, it does not explain why in some languages FQs cannot be associated with $\overline{\text{A}}$-positions (e.g., 23). As has been shown in section 2.2, these two criticisms are inapplicable to Arabic because Arabic allows FQs to appear after passive and accusative verbs, and allows FQs to associate with NPs occupying $\overline{\text{A}}$-positions.

However, other facts argue strongly against a stranding analysis of Q-float. More particularly, in many cases, it is impossible for the associate and the FQ to have formed a continuous constituent at any stage of the derivation, as pointed out by many (e.g., Sportiche 1988, Bobaljik 2003). This is true for Arabic and for languages like English and French:

(43) (Bobaljik 2003, (32))

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

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

(44) (Doetjes 1997, 201)

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. (French)

(45) a. aT-Tullab-u dakhal-u alqaʕa-ta kull-un ħasaba ismihi.
the-students-NOM entered- the.hall each according.to his.name
'The students entered the hall each according to his name.'[6]

[6] In Arabic, the same lexical item, namely the word *kull* is used as a universal quantifier like *all* in English, and

b. *kull-un (min) aT-Tullab-u dakhal-u alqaʕa-ta ħasaba ismihi.
each (of) the-students-NOM entered- the.hall each according.to his.name
'Each of the students entered the hall according to his name.'

In each of the pairs above, the non-floating sentence requires a prepositions ('of') between the quantifier and the NP that follows it, a fact that is hard to explain under a stranding analysis.

Similarly, FQs may associate with a coordinate phrase. Non-floating versions are ungrammatical even with a preposition:

(46) a. Larry, Darryl and Darryl have all come into the café.

b. ?*All (of) Larry, Darryl and Darryl have come into the café.

(47) a. Sally, Sarah, wa Suzan ijtazna kull-u=hunna al-ikhtibar-a.
Sally, Sarah, and Suzan passed.3F.PL all-NOM=3F.PL the-test-ACC
'Sally, Sarah, and Suzan all passed the test.'

b. kull-u (*min) Sally, Sarah, wa Suzan ijtazna al-ikhtibar-a.
all-NOM (*of) Sally, Sarah, and Suzan passed.3F.PL the-test-ACC
'Sally, Sarah, and Suzan all passed the test.'

Moreover, a FQ may associate with a quantified NP, but a non-floating version is unavailable for this case:

(48) 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.

(49) a. baʕd-u aT-Tullab-i ghab-u kull-u=hum ʕan
some-NOM the-students-GEN be.absent.PST-3M.PL all-NOM=3M.PL from
al-imtiħan-i.
the-exam-GEN
'Some students were all absent from the exam.'

b. *kull-u baʕd-i aT-Tullab-i ghab-u ʕan alimtiħan.
all-NOM=3M.PL some-GEN the-students-GEN be.absent.PST-3M.PL from the-exam

distributive quantifier like *each*.

An additional problem for the stranding analysis is that Q-float occurs within the nominal domain in Arabic. In particular, in construct state constructions, a floating quantifier may associate with a nominal within the construct itself. Below are some examples:

(50) qarar-u-hum kull-u-hum
decision-NOM-3M.PL all-NOM=3M.PL
'the decision of all of them'

(51) ħal-u=hum kull-u=hum
situation-NOM=3M.PL all-NOM=3M.PL
'the situation of all of them' '

(52) sharaf-u=hum kull-u=hum
honor-NOM=3M.PL all-NOM=3M.PL
'the honor of all of them'

(53) muʕtaqad-u=hunna ʕamat-u=hunaa
belief=NOM=3F.PL all-NOM=3F.PL
'the belief of all of them'

Here the FQ associates with a preceding pronominal possessor. It is not clear how a movement analysis would explain the pattern here.

All of the above facts lead to the conclusion that the stranding analysis does not explain all cases of Q-float. An associate does not move out of a constituent, stranding the quantifier. However, a number of facts still argue that there is a movement dependency between a FQ and its associate: a FQ may associate with A- or $\overline{\text{A}}$-positions (24-25) and is sensitive to islands (33-35). In addition, a FQ shows reconstruction effects for binding conditions:

(54) ishaʕat-in ʕan *-hu$_i$/nafsih$_i$ ʕali-un$_i$ ʔankara=ha kull-a=ha.
rumors-ACC about *him$_i$/himself$_i$ Ali$_i$-NOM denied.3F.PL=3F.PL all-ACC=3F.PL.
'Rumors about himself$_i$, Ali$_i$ has all denied.' (Binding Condition B)

(55) *kutub-an ʕan al-raʔiis$_i$ lam yaqraʔ=ha huwa kull-a=ha.
books-ACC about the-president NEG read.3M.PL=3F.PL he$_i$ all-ACC=3F.PL
'*Books about the president$_i$, he$_i$ did not read all.' (Binding Condition C)

It therefore seems that Q-float cannot result from movement of the associate out a continuous constituent that includes it and the quantifier. It rather appears that the associate moves out of a projection that dominates both it and the quantifier. I will present an analysis that reconciles these apparently conflicting facts in section 4.

The adverbial analysis, on the other hand, was proposed as an alternative to the movement analysis. Proponents of the adverbial analysis proposed that FQs are adverbial elements that semantically modify the predicates they combine with, or in some versions of the analysis, that modify their associate NPs (Kayne 1975, Dowty and Brodie 1984, Miyagawa 1989, Baltin 1995, Bobaljik 1995, Torrego 1996, Brisson 1998, Benmamoun 1999, among others). The majority of the arguments used to argue for the adverbial analysis were the same arguments that rendered the movement analysis problematic: FQs appear in positions that are not known to be thematic positions (NP trace positions), and FQs cannot appear in the object position of some verbs (e.g., passives) which are known to be thematic positions. As shown in section 2.2, these criticisms were mainly based on facts from English and French, and are not applicable to Arabic as supported by empirical evidence.

A third analysis that has been recently proposed is a hybrid analysis (e.g., Fitzpatrick 2006). This analysis argues that in some languages both stranding and adverbial modification are available as Q-floating strategies. This analysis would explain the cases in which movement is impossible, and still would account for the movement-like properties of Q-float, like the fact that Arabic FQs may be associated with both A and $\overline{\text{A}}$ positions. However, I do not adopt this analysis here because I believe that a uniform analysis of the facts would be more parsimonious than two.

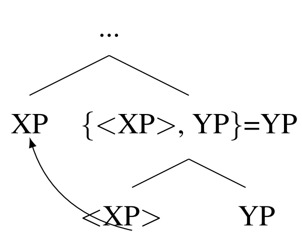
The conclusion that I reach, then, is that existing accounts of Q-float do not explain the Arabic facts perfectly. The distribution and the nature of the elements that float indicate that FQs cannot have formed continuous constituents with their associates at any stage of the derivations, nor are they projected as VP adverbials. More importantly, though, is that previous accounts, whether hybrid or not, are designed to account for cases of *quantifier* float. We have seen that the pattern of floating in Arabic can be seen with a range of elements, and not necessarily with quantifiers, which calls for a general account.

4 Analysis

In the previous section, I concluded that a FQ and its associate cannot form a continuous NP from which the associate has moved. At the same time, I presented evidence that there is a movement dependency between the quantifier and its associate. In this section, following a recent proposal by Ott (2015) for German split-topics, I will propose that a FQ and its associate are merged in the same syntactic position as a set of autonomous NPs, and that the associate moves out of this set.

Before presenting the analysis, two assumptions should be spelled out. First, I assume that the FQ and its associate hold a semantic relation of a predicate and argument (Ott 2015) respectively. Second, following Chomsky (2004, 2008, 2007, 2013), I assume that the operation *merge* combines two syntactic objects into an unordered set (assuming that linear order is computed in the post-syntax). This set must be labeled in order for the constructed unit to enter into thematic relations with a selecting element via external merge. According to Chomsky, the label of the set is identified via a simple algorithm which identifies the head through a specific feature of that head. To put it simply, the label of {A, B} is A if A is a lexical item and B is an XP. A set that results from merging an XP with a YP is a symmetric set or a *locally unstable* combination for which no lexical item can be identified as a head (Moro 2000, Chomsky 2013, Ott 2015). For the derivation to converge, it is crucial for the combination to be labeled. One solution is for one of the members of the set to move out of the set via internal merge (Moro 2000, Chomsky 2013, Ott 2015). This makes only one phrase properly contained within the set, and consequently be the label of the set:

(56)

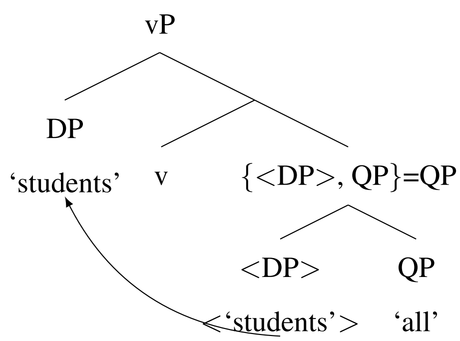


Turning to the case of Q-float in Arabic, consider the example in (5b), reproduced below:

(57) aT-Tullab-u qadamu kull-u=hum waraqat-an baħthiya-tan.
the-students-NOM submit.3MPL all-NOM=3MPL paper-ACC research-ACC
”The students all submitted a research paper.”

The labels of ‘students’ and ‘all’ are DP and QP, respectively. The quantifier ‘all’ semantically takes ‘students’ as an argument. The quantifier and its associate combine into a set, {DP, QP}. Because the set is symmetric, the labeling algorithm cannot identify a label for the set. Without a label, the set may not enter into thematic relations, and the derivation will crash consequently. One way to break the symmetry is for one of the members of the set to move, which I assume will be the argument DP (‘students’). The label of the set will then be the label of the phrase that is properly contained in the set which is the label of the quantifier ‘all’ (QP). Assuming that derivations proceed in phases, the moved element moves via the edge of vP phase, where it may undergo further movements, as illustrated below:

(58)



Note that case matching between the quantifier and the associate follows under the analysis presented. Any case checking head checks its features with all members of the set, which guarantees that each member is marked with the same case (Ott 2015). Phi agreement also follows if the displaced member agrees with the quantifier, either prior to movement or after it.

Moreover, unlike previous analyses, the current analysis has the advantage of accounting for floating of elements that are not quantifiers. In (59), the floating element, ‘jewelry’, is a DP rather than a QP, but it semantically selects the associate, *Muna*, as an argument. The associate moves out of the set of {DP, DP} and allows the set to be labeled as DP. Case matching and agreement between the associate and the floating element occur via the same mechanism explained above.

(59) Muna fuqid-at mujawharat-u=ha al-shahra al-madi.
Muna got.lost-3F.PL.PASS jewelry-NOM=3F.SG the-month the-last
'Muna, her Jewelry was lost last month.'

The analysis also explains the impossibility for examples like (47a) to have a non-floating version:

(60) Sally, Sarah, wa Suzan ijtazna kull-u=hunna al-ikhtibar-a.
Sally, Sarah, and Suzan passed.3F.PL all-NOM=3F.PL the-test-ACC
'Sally, Sarah, and Suzan all passed the test.'

This sentence is derived by merging the coordinate and the quantifier in the same position as a set of {&P, QP} (I follow Collins 1988, Johannessen 1998, and others in assuming that coordinates have the label of &P. But see e.g. Zhang 2010 and Al Khalaf 2015 for different proposals). The coordinate moves out of the set and allows the set to be labeled as QP. Consider the non-floating version in (47b) again, on the other hand:

(61) kull-u (*min) Sally, Sarah, wa Suzan ijtazna al-ikhtibara.
all-NOM (*of) Sally, Sarah, and Suzan passed.3F.PL the-test-ACC
'Sally, Sarah, and Suzan all passed the test.'

The ungrammaticality of the sentence (without the preposition) can be explained as follows. The coordinate phrase and the quantifier are merged in the same syntactic position as a symmetric set. Neither of the members of the set moves, and the combination fails to be labeled, as a result. This causes the derivation to crash because the combination fails to enter into a thematic relation with a selecting element. Note, however, that the sentence becomes grammatical with *of*. I suggest that this is due to the fact that *all of &P* is merged as a complex NP or as an asymmetric set of {Q, PP}. This clearly does not pose any issues to the labeling algorithm.

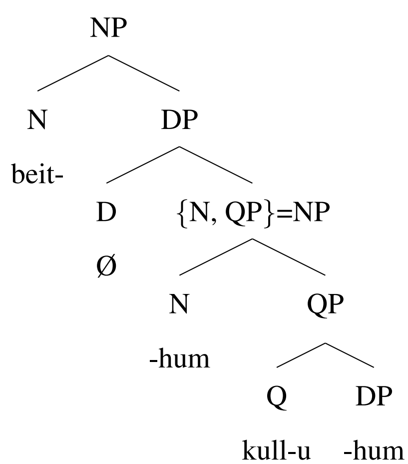
Moreover, the analysis captures island sensitivity of FQs. The associate moves from a projection that dominates both it and the floating element. Thus, movement effects are predicted. It is also predicated that FQs associate with $\overline{\text{A}}$-positions as well as A-positions.

Two remaining issues should be addressed before concluding the section. The first is Q-float within the nominal domain as in the example below (also examples 50–53):

(62) beit-u=hum kull-u=hum
home-NOM=3M.PL all-NOM=3M.PL
'the house of all of them'

This phrase is a construct state in which two nominal phrases are annexed to each other. The phrase *-hum kull-u-hum* is itself a construct inside the bigger construct *beit=hum kull-u=hum*. I follow Shlonsky (2004) in considering nominal construct states to have the structure of an NP in which an N selects a DP/QP as a complement. In (62), the quantifier heads a QP, takes the pronominal *-hum* as a complement and associates with a preceding pronominal. I propose that QP and the possessor are combined into a set as a complement of D. The resulting set is an asymmetric set of {N, QP} for which the labeling algorithm assigns NP as a label, as illustrated below:

(63)



As can be seen, no movement occured within the construct because the set created by combining the quantifier and its associate is asymmetric and could therefore be labeled.

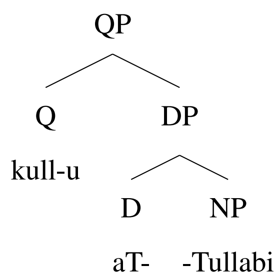
The second issue is how the current analysis would accommodate the sentences in which no floating has occurred, namely in which the associate follows the quantifier:

(64) kull-u aT-Tullab-i qadamu waraqat-an baħthiya-tan.
all-NOM the-students-GEN submit.3MPL paper-ACC research-ACC

‘All students submitted a research paper.’

I suggest that in these cases, the quantifier and the noun that follows it are not merged in the same position as a symmetric set. Rather, they form a complex phrase (i.e., construct state) in which the quantifier selects the noun as a complement. In (5a), ‘all students’ is merged as an symmetric set of $\{Q, DP\}$. Again, I adopt the structure proposed by Shlonsky (2004) for construct states headed by a Q, as illustrated below (details left out):

(65)



The case mismatch between the quantifier and the NP follows from the fact that the quantifier checks case with an outside case probe, being the head of the projection, while the NP checks case within the construct. The mechanism through which case is checked inside the construct is not crucial, but I assume that the NP is marked with GENITIVE case, either by checking case features with D or by default (Pesetsky 2012, Kagan 2012, among others).

To summarize, following a recent analysis of German split topics, I proposed that Arabic Q-float involves merger of a symmetric set of two autonomous NPs. In order for the set to be labeled, it should be asymmetrized via movement of the associate out of the set. The analysis explains many of the peculiarities of Q-float like the two conflicting facts of island sensitivity and the impossibility of stranding in some cases.

5 A Note on Other Languages

The analysis presented predicts that Arabic FQs should appear only in thematic positions or where NPs are externally merged. As was shown in section 2.2, Arabic FQs appear in positions that are known to be NP trace positions, including the complement position of passives and unaccusatives where FQs are banned in other languages.

One set of cases that seems to deviate from this generalization is those in which FQs appear sentence-finally as in (21) above:

(66) ʔali, Salem wa Said dakhalu al-maqha kull-u=hum.
Ali, Salem and Said enter.3M.PL the-café all-NOM=3MPL
'Ali, Salem, and Said all entered the café.'

English FQs, in contrast, are banned in these positions, and are allowed only if preceded by a PP or a secondary predicate:

(67) Larry, Sally and Darryl came into the café *all.

(68) Larry, Sally and Darryl came into the café all [at the same time].

(69) Larry, Sally and Darryl came into the café all [very tired].

I suggest that the contrast between English and Arabic is due to the fact that in Arabic word order is freer than the word order in English. For instance, in Arabic, the subject may precede the verb or follow it, and may even be separated from the verb by VP adjuncts when it follows the verb. This fact explains the distribution of FQs as seen above, and illustrated further below:

(70) a. dakhala ʔila al-maqha kull-u aT-Tullab-i.
came.into.3M.SG to the-café all-NOM the-students-GEN
'All the students came into the café.'

b. aT-Tullab-u dakhal-u ʔila al-maqha kull-u=hum.
the-students-NOM came.into-3M.PL to the-café all-NOM=3M.PL
'The students all came into the café.'

(71) a. aT-Tullab-u dakhal-u ʔila al-maqha kull-u-hum fi thati alwaqti.
the-students-NOM came.into-3M.PL to the-café all-MOM=3M.PL at same time
'The students came into the café all at the same time.'

b. dakhala ʔila al-maqha kull-u aT-Tullab-i fi thati alwaqti.
came.into.3M.SG to the-café all-NOM the-students-GEN at same time
'All the students came into the café at the same time.'

This difference between Arabic on the one hand and English and French on the other requires a more thorough investigation, however, which I leave to future work.

6 Conclusion

In this paper, I presented a detailed description of Q-float in Arabic. The facts argue for a movement dependency between a FQ and its associate, but also show that it is impossible for them to have formed a continuous constituent at any stage of the derivation. To account for these two conflicting facts, following a recent analysis of split topics in German, I proposed that a FQ and its associate are merged as a symmetric set of independent phrases, and that the associate moves out of the set to allow the set to be labeled. A major result of this study is that the distribution of FQs in Arabic serves as a powerful diagnostic of the distribution of lower copies of displaced NPs (NP trace positions in traditional terms).

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