# Floating and Non-floating Quantifiers in Hijazi Arabic: an HPSG Analysis

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# Abstract

This thesis concerns the description and analysis of floating and non-floating quantifiers in Hijazi Arabic (HA) within the framework of Head-Driven Phrase Structure Grammar (HPSG). This work is a contribution to the long-standing debate on the relation between floating and non-floating quantifiers. It investigates the properties of Hijazi Arabic floating quantifiers to be able to determine whether they belong to the nominal or the verbal domain, and to provide an answer, or a close approximation, to the question that keeps being asked in the literature with respect to how floating quantifiers are generated.

This work focuses on quantifiers in HA, and attempts to provide a unified account that takes into consideration, and tries to link and unify, the following properties:

- Quantifiers have three forms which are parallel to that of ordinary nominal forms: Simple, construct state, and free states. For this reason, I pursue the claim that quantifiers are categorically Nouns, and not a functional category Determiner (D) or Quantifier (Q). They differ from 'ordinary nouns' in terms of their agreement behaviours and semantic properties.

- Definiteness in HA is a head feature and is associated with no lexical category, and for that we might claim that HA lacks the category Determiner (D).

- Contrary to the analysis provided in some transformational approaches, floating and non-floating quantifiers in HA cannot be related to their nominal associate by syntactic transformation. Floating quantifiers are here analysed as adjuncts that can alternate between being NP modifiers or VP modifiers, but which are nevertheless always related to an associated noun, semantically, and display the need to be anaphorically-bound to it.

I propose that non-floating quantifiers take the same distribution as that of ordinary nouns, which I take to imply that nouns, and non-floating quantifiers are actually two instances of the same type. By adopting a lexical hypothesis that makes use of lexical rules, I account for their definiteness agreement and definiteness inheritance in the framework of HPSG. In contrast, I demonstrate that floating behaviours display a series of puzzles that can be resolved, or better analysed, on the basis of their treatment as NP or VP adjuncts, involving a MOD feature. The latter can only ever be subject-oriented, yet can linearly come in between complements, and still modify the V, due to my proposal of a flat VP phrase structure. To account for the syntax and semantics of the floating quantifier with the NP, the lexical information associated with the quantifier in the lexical entry encodes the syntactic and semantic properties that concern its distribution.

# Dedication

<div dir="rtl">

إلى ذوي الفضل.. أمي و أبي

</div>

# Acknowledgements

It is unfortunate that I left writing the acknowledgement to this dissertation to the end of the process. Due to the stress of completing the work and my tired mind, I can only hope that no one who is deserving of my gratitude is left out.

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# List of Transcription symbols used

# for HA

| HA | | IPA equivalent |
|---|:---:|:---:|
| ʔ | glottal stop plosive | ʔ |
| b | voiced bilabial stop | b |
| t | voiceless dental stop | t |
| θ | voiceless inter-dental fricative | θ |
| j | voiced palatalized affricate | ʤ |
| ḥ | voiceless pharyngeal fricative | ħ |
| x | voiceless uvular fricative | χ |
| d | voiced dental stop | d |
| ð | voiced inter-dental fricative | ð |
| r | dental trill | r |
| z | voiced dental fricative | z |
| s | voiceless dental fricative | s |
| š | voiceless palatal fricative | ʃ |
| ṣ | voiceless pharyngealized dental fricative | sˤ |
| ḍ | voiced pharyngealized dental stop | dˤ |
| ṭ | voiceless pharyngealized dental stop | tˤ |
| ẓ | voiced pharyngealized inter-dental fricative | ðˤ |
| ʕ | voiced pharyngeal fricative | ʕ |
| ɣ | voiced uvular fricative | ʁ |
| f | voiced labio-dental fricative | f |
| g | voiced velar plosive | g |
| k | voiceless velar stop | q |
| l | lateral dental | l |
| m | bilabial nasal | m |
| n | dental nasal | n |
| h | voiceless glottal fricative | h |
| w | voiced bilabial glide | w |
| y | voiced palatal glide | j |

Table 1: Consonants in HA

| HA | | IPA equivalent |
|---|---|---|
| a | short low central unrounded vowel | a |
| i | short high front unrounded vowel | i |
| u | short high back rounded vowel | u |
| e | short mid front unrounded vowel | e |
| o | short mid back rounded vowel | o |
| ā | long low central unrounded vowel | a: |
| ī | long high front unrounded vowel | i: |
| ū | long high back rounded vowel | u: |
| ē | long mid front unrounded vowel | e: |
| ō | long mid back rounded vowel | o: |
| ey | mid front to high front unrounded diphthong | ei |
| aw | low unrounded to high back rounded diphthong | au |
| ai | low unrounded to high front unrounded diphthong | ai |

Table 2: Vowels and Diphthongs in HA

# List of Abbreviations

| | | | |
|---|---|---|---|
| 1 | first person | 2 | second person |
| 3 | third person | ⊕ | list addition |
| ∃ | existential quantifier | ∀ | universal quantifier |
| ¬ | negative operator | ACC | accusative |
| ACT.PTCP | active participle | ADJ | adjunct |
| AP | adjective phrase | ADV | adverb |
| ARG-ST | ARGUMENT STRUCTURE | AVM | attribute-value matrices |
| BCKGGRD | BACKGROUND | CAT | CATEGORY |
| CLD | clitic left dislocation | COMPS | COMPLEMENTS |
| C | complementiser | CONJ | conjunction |
| CONT | CONTENT | COP | copula |
| CP | complementiser phrase | DEF | definite |
| DLR | Definite Lexical Rule | DU | dual |
| EMPH | emphatic | F | feminine |
| FQ | floating quantifier | GF | grammatical function |
| GEN | genitive | GEND | gender |

| | | | |
|---|---|---|---|
| HA | Hijazi Arabic | INDEF | indefinite |
| IP | inflectional phrase | IMPV | imperfective |
| LFG | lexical functional grammar | LF | logical form |
| M | masculine | MOD | MODIFIER |
| MSA | Modern Standard Arabic | NEG | negative marker |
| NOM | nominative | NP | noun phrase |
| NUCL | NUCLEUS | PFV | perfective |
| PL | plural | POL | polarity |
| PP | prepositional phrase | PRED | predicate |
| QUANTS | QUANTIFIER | QP | quantifier phrase |
| REFL | reflexive | RESTR | RESTRICTIONS |
| SN | sentential negation | SG | singular |
| SUBJ | SUBJECT | SPEC | specifier |

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# Introduction

## 1.1 Scope and Purpose

It is widely understood that quantifier floating denotes a phenomenon characterized by a mismatch between the syntax and the semantics of the quantifier (e.g. Kayne (1975); Sportiche (1988); Shlonsky (1991); Bobaljik (1995), among others). Thus, in the HA example in (1a), the quantifier is construed as a syntactic part of the subject NP in its usual position, while in (1b) it is thought of as being syntactically disjoint from the NP, whose content is its semantic restriction.

(1) a. kull ṭ-ṭullāb       ḥaḍar-u         l-ʔijtimāʕ
       all   DEF-student.PLM attend.PFV.3-PL DEF-meeting
       All of the students attended the meeting.      Non-floated quantifier

    b. ṭ-ṭullāb        ḥaḍar-u          kulla-hum       l-ʔijtimāʕ
       DEF-student.PLM attend.PFV.3-PL all-3PLM.GEN DEF-meeting
       The students all attended the meeting.       Floated quantifier

Due to the parallelism between the two sentences in (1), and the semantic relationship between the quantifier and the NP to which it is bound, this phenomenon has been viewed as one that gives evidence in favour of movement,

in transformational accounts (e.g. Kayne (1975); Sportiche (1988); Shlonsky
(1991)). This account, however, is not without its pitfalls, as has been noted
in Dowty and Brodie (1984) for English, and Benmamoun (1999) for Arabic.

This thesis is concerned with both a descriptive account and an analysis of
floating and non-floating quantifiers in Hijazi Arabic (HA) within the frame-
work of Head-Driven Phrase Structure Grammar (HPSG). The description
involves a discussion of the syntax of quantifiers and their distribution, and
will also delve into considerations that pertain to the semantics, when nec-
essary. The focus of this study will nevertheless be considerations related to
the syntax (and morphology) of quantifiers and floating quantifiers, and other
floating constructions in HA. It will also engage in a discussion of the similar
constructions that have hitherto escaped researchers' attention, such as float-
ing numerals and floating emphatic reflexives. The description will provide
itself as the background for the HPSG analysis which I propose for HA non-
floating quantifier (FQ) and FQ data. To the best of my knowledge, there is
no comprehensive study on the syntax of HA quantifier constructions in any
framework.[1] This is a gap which the current study aims to remedy.

Providing a description and analysis of HA quantifiers within HPSG will pri-
marily address the gap in the literature on HA, and will be the first study
in HA on the subject matter; it will secondly add to the already large ar-
ray of crosslinguistic literature specifically concerned with being better able
to address questions that have to do with relations between FQs and non-FQ
counterparts, particularly with respect to their distinct syntactic structures,
as framed within the framework of HPSG. This work on HA will thus help also
position and characterise the HA facts in the realm of crosslinguistic quantifier

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[1]Work on MSA and Moroccan Arabic has however been considered, as we will see in
Chapter 4.

behaviours.

## 1.2  The language and its morphosyntactic facts

This section introduces some general aspects of clause structure in Hijazi Arabic, which itself serves as an introduction to subsequent chapters. Prior to doing that, I briefly discuss HA as the language of study.

Arabic is a Semitic language that belongs to the Afroasiatic language family. It is the official language of all the members of the Arab League, from North Africa to the Arabian Gulf, including Saudi Arabia. Classical Arabic is the language of Quran and other classical literature, and Modern Standard Arabic (MSA), which is widely used in written Arabic media. These varieties of Arabic are in a diglossic relation with the dialects, however, I will not be concerned with these here. I will however be noting some distinctions as they occur, between the dialect under study here, and MSA. The informal dialects are used in everyday interactions in spoken conversation. In Saudi Arabia, there are five main dialects: Hijazi in the Western Province, Najdi in the Central Province, Gulf in the Eastern Province, and Southern, and Northern, in the Southern and the Northern Provinces, respectively (See Figure 1.1). The dialects differ considerably between, and even within, national boundaries.

Hijazi Arabic is a variety of Arabic that is spoken in the western region of Saudi Arabia. Although it is considered to be one of the major dialects spoken in Saudi Arabic, it is observed that it has not received as much attention, when compared to other dialects such as Najdi Arabic. This dialect is further divided into two sub-dialects: urban Hijazi Arabic and bedouin Hijazi Arabic. Bedouin HA is spoken by those who live in the villages whereas urban HA is spoken in the cities of Makkah, Madinah, Jeddah and Taif, in the Western province. The thesis is concerned with Urban Hijazi Arabic spoken
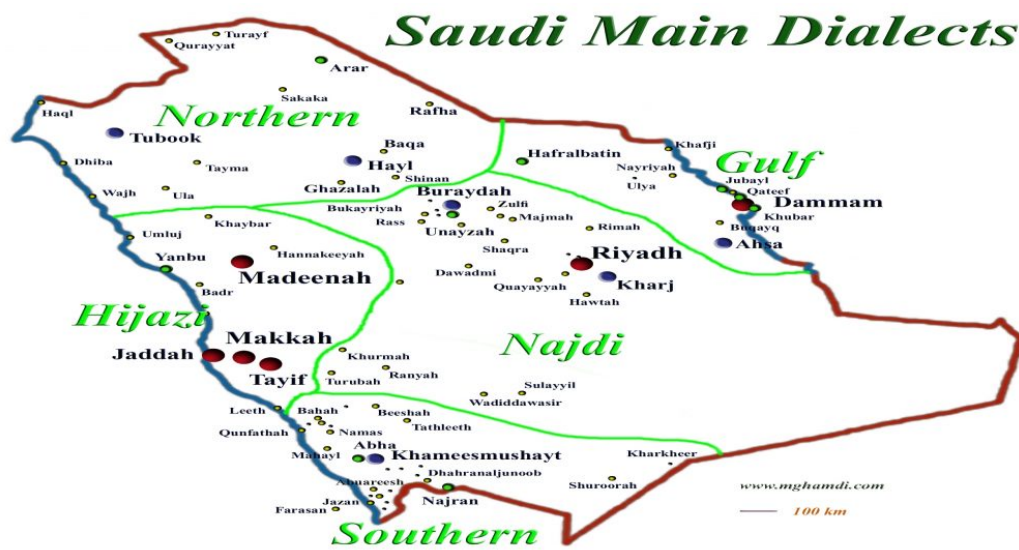
Figure 1.1: The main dialects of Saudi Arabia

in Jeddah, which I will be referring to as HA throughout. The researcher is a native speaker of the variety, and will serve as the primary informant for all the data set provided, which has been subject to consultation with other native speakers when in cases of doubt.

In what follows, in each sub-section I consider a key feature that characterises and defines the HA morphosyntax and its clausal structure. This will all provide itself as useful ground to then move on to consider the descriptive investigation of floating and non-floating quantifiers in HA. What I consider here includes word order, subject - verb agreement, verbal morphology, pronominal forms, distinct sentence types, and the expression of negation.

### 1.2.1   Word order

The syntactic position of the subject determines the type of word order in Arabic. If the subject precedes the verb, it gives an SVO order. By contrast, if the subject follows the verb, it gives a VSO one. SVO and VSO, as shown in (2) are the basic, or canonical word orders in verbal sentences in HA. There may be other word orders. However, I will omit them from consideration here as these

orders are not neutral, in the sense that they convey some sort of distinctive discourse meaning (e.g. topicalisation, contrastive emphasis, etc.), which are themselves issues which I largely omit from a consideration of quantifier and floating constructions in HA.

(2)  a.  badr   šāf          sāra
         Bader  see.PFV.3SGM  Sara

         Bader saw Sara.                                              (SVO)

     b.  šāf          badr   sāra
         see.PFV.3SGM  Bader  Sara

         Bader saw Sara.                                              (VSO)

A SVO word order is only possible if the subject is DEFINITE, be it semantically, as in the case of a proper noun, or morphologically, as is the case with NPs marked with *l-*. The ungrammaticality of (3) thus comes about due to the INDEFINITENESS of the subject. It is still however possible for an indefinite NP to appear in a pre-verbal position. If it is so, however, it must be made more specific, as in (4). In (4b), we observe that quantification over an indefinite N qualifies an NP as being more definite, or specific enough such that the construct is allowed to appear preverbally.

(3)  *walad   šāf          sāra
      boy.SGM  see.PFV.3SGM  Sara

      A boy saw Sara.

(4)  a.  walad    ṭawīl     šāf          sāra
         boy.SGM  tall.SGM  see.PFV.3SGM  Sara

         A tall boy saw Sara.

     b.  kull    walad    axað          hadiyyah
         every  boy.SGM  take.PFV.3SGM  gift

         Every boy received a gift.

Arabic exhibits a phenomenon known as pro-drop, where the subject does not have to be overt, whereby the subject in these contexts is solely indicated by the inflection on the verb, as shown in (5). This can thus result in structures merely involving a verb-form (5a). If an object NP is present, along with just the verb, then a VO structure is observed (5b).

(5)  a. sāfar
        travel.PFV.3SGM
        He traveled.

     b. šāf          sāra
        see.PFV.3SGM Sara
        He saw Sara.

### 1.2.2   Subject-verb agreement

The verb in HA shows full agreement in PERSON, NUMBER and GENDER with a subject in both SVO and VSO orders, as seen in (6a)-(6b). Partial agreement with the subject, which would involve a pattern that only displays agreement in PERSON and GENDER, but not in NUMBER, is ungrammatical in HA, as illustrated through the ungrammaticality of (6c).

(6)  a. l-awlād       gābal-u      sāra
        DEF-boy.PLM meet.PFV.3-PL Sara
        The boys met Sara.                                              (SVO)

     b. gābal-u       l-awlād      sāra
        meet.PFV.3-PL DEF-boy.PLM Sara
        The boys met Sara.                                              (VSO)

     c. *gābal        l-awlād      sāra
        meet.PFV.3SGM DEF-boy.PLM Sara
        The boys met Sara.                                              (VSO)

This behaviour is in contrast with the facts as they obtain in MSA, which shows an asymmetry of agreement in the distinct SVO and VSO orders. The

verb exhibits full agreement with the subject in an SV order, as in (7a), hence partial agreement is ruled out, as in (7b), whereas it displays partial agreement in VS order, where the verb agrees in PERSON and GENDER, but not in NUMBER, such that a singular inflected form appears, despite the subject being plural, as in (7c). If the verb were to display full agreement, the sentence would be ill-formed as in (7d).

(7)  a.  l-muʕallim-ūn       akal-ū
         DEF-teacher.PLM-NOM eat.PFV.3-PLM
         The teachers ate.                    MSA: Aoun et al. (2009)

     b.  *l-muʕallim-ūn      akal
         DEF-teacher.PLM.NOM eat.PFV.3SGM
         The teachers ate.                    MSA: Aoun et al. (2009)

     c.  akal          l-muʕallim-ūn
         eat.PFV.3SGM  DEF-teacher-PLM.NOM
         The teachers ate.                    MSA: Aoun et al. (2009)

     d.  *akal-ū       l-muʕallim-ūn
         eat.PFV.3-PLM DEF-teacher-PLM.NOM
         Intended: The teachers ate.          MSA: Aoun et al. (2009)

### 1.2.3   Verbal inflection and pronominal forms

Arabic is well known for its rich morphology. In HA, nouns inflect for NUMBER and GENDER, and are also marked for DEFINITENESS, as illustrated through:[2]

(8)  a.  aṭfāl       ḥilw-īn
         child.PLM beautiful-PLM
         beautiful children

     b.  ṭifl-ah    ḥilw-ah
         child-SGF beautiful-SGF
         a beautiful girl

---

[2]Nouns will be discussed in detail in the next chapter.

    c. l-kitāb     l-jadīd
       DEF-book DEF-new
       the new book

Verbs in HA inflect for two morphological Moods: the Indicative and the Imperative. The Indicative Mood involves two morphological aspectual forms: perfective and imperfective. Throughout this study the glossing PFV and IMPV will be used to refer to perfective and imperfective verbs, respectively. Table (1.1) illustrates the perfective and imperfective paradigmatic verb-forms, represented through the paradigm of the verb *katab* 'write'. Table (1.2) provides the imperative verb-form counterparts associated with the same verb. I choose to refer to the inflectional forms on the verb expressing the subject, as NOM forms, which I here use merely as a label.

|        | Perfective form | Imperfective form |
|--------|-----------------|-------------------|
| 1.SG   | katab-**t**     | **a**-ktub        |
| 1.PL   | katab-**na**    | **na**-ktub       |
| 2.SGM  | katab-**t**     | **tu**-ktub       |
| 2.SGF  | katab-**ti**    | **tu**-ktub-**i** |
| 2.PL   | katab-**tu**    | **tu**-ktub-**u** |
| 3.SGM  | katab           | **yu**-ktub       |
| 3.SGF  | katab-**at**    | **tu**-ktub       |
| 3.PL   | katab**u**      | **yu**-ktub-**u** |

Table 1.1: The HA paradigm of *katab* 'write' and the NOM inflection expressing the subject

| Morphosyntactic form | Imperative form |
|----------------------|-----------------|
| 2.SGM                | a-ktub          |
| 2.SGF                | a-ktub-**i**    |
| 2.PL                 | a-ktub-**u**    |

Table 1.2: The HA paradigm of imperative forms of *katab* 'write'

As observed through the inflectional system represented in Table 1, HA displays no GENDER in the plurals. As a consequence, therefore, the verb in (9) takes the same form, irrespective whether the subject is MASCULINE or FEMININE.

(9)  a.  l-banāt        sāfar-u
         DEF-girl.PLF travel.PFV.3-PL

         The girls have traveled.


     b.  l-awlād        sāfar-u
         DEF-boy.PLM travel.PFV.3-PL

         The boys have traveled.


Non-human plural nouns trigger feminine singular agreement on verbs and adjectives.


(10)  l-kutub        l-jadīd-ah     ḍāʕ-at
      DEF-book.PLM DEF-new-SGF lose.PFV-3SGF

      The new books have been lost.


HA nouns, like other Arabic dialects, no longer inflect for case. It is only the pronominal system that still maintains a trace of this system. In Table 3 and Table 4, I provide the list of HA personal pronouns. In Table (1.3) I display independent pronouns that function as subjects, while in Table (1.4) I demonstrate the ACC and GEN bound pronominal forms, which attach to Vs, and Ns and Ps, respectively, and as can be observed, only display a distinct form in the 1SG cell of the paradigm. The form *-ni* expresses the 1SG.ACC, while *-i* expresses the 1SG.GEN form.

| Independent pronouns | |
| --- | --- |
| 1.SG 'I' | ana |
| 1.PL 'we' | iḥna |
| 2.SGM 'you' | inta |
| 2.SGF 'you' | inti |
| 2.PL 'you' | intu |
| 3.SGM 'he' | huwwa |
| 3.SGF 'she' | hiyya |
| 3.PL 'they' | humma |

Table 1.3: The HA paradigm of independent subject pronouns

|        | ACC          | GEN           |
|--------|--------------|---------------|
| 1.SG   | -ni 'me'     | -i 'my'       |
| 1.PL   | -na 'us'     | -na 'our'     |
| 2.SGM  | -ak 'you'    | -ak 'your'    |
| 2.SGF  | -ik 'you'    | -ik 'your'    |
| 2.PL   | -kum 'you'   | -kum 'your'   |
| 3.SGM  | -uh 'him'    | -uh 'his'     |
| 3.SGF  | -ha 'her'    | -ha 'her'     |
| 3.PL   | -hum 'them'  | -hum 'their'  |

Table 1.4: The HA paradigm of ACC and GEN bound pronouns

### 1.2.4   Verbless sentences

It is well known that Arabic allows for sentences without requiring a verb. Such sentences, which involve non-verbal predicates, have been referred to as nominal, copular or verbless sentences (Fassi Fehri (1993); Plunkett (1993); Shlonsky (2002); Benmamoun (2008); and Aoun et al. (2009)). Such sentence types in the PRESENT TENSE may include only a subject and a non-verbal predicate.

One of the common features of all affirmative verbless sentences is that they have to express an overt subject. Therefore, while an overt NP expressing the subject is optional in a verbal sentence, where it is the NOM inflection that functions as the subject, as in (11a), this is not a possibility in verbless sentences, where there is no verb present to carry such an inflection that could be indicative of the subject. For this reason, the subject pronoun *howa* 'he' in (11b), is obligatory.

(11)  a. (huwwa) šāf            sāra
         he        see.PFV.3SGM Sara

         He saw Sara.                                                    (verbal)


      b. huwwa fi  l-maktab
         he       in DEF-office

         He is in the office.                                           (verbless)

There are two important sub-types of verbless sentences: predicational vs. equational. A predicational sentence consists of a definite subject followed by an indefinite predicate. This predicate can be an indefinite NP (12a), indefinite AP (12b), or a PP (12c). In such structures no overt copula is allowed in PRESENT TENSE contexts.

(12) a. badr  ṭifil
       Bader child.SGM
       Bader is a child.

    b. badr  šāṭir
       Bader excellent.SGM
       Bader is excellent.

    c. badr  fi  l-bēt
       Bader in  DEF-house
       Bader is at home.

The indefinite predicate in such verbless sentences can be an active or passive participle form, which I here consider to be distinct from their verbal form counterparts, since the morphosyntactic behaviour they display parallels that of adjectives. Like adjectives, these forms inflect for NUMBER and GENDER, and agree with the subject, as in the predicational contexts in (13).

(13) a. badr  rāyḥ
       Bader go.ACT.PTCP.SGM
       Bader is going.                                    (active participle)

    b. badr  mi-tʕawwir
       Bader PASS.PTCP-injure.SGM
       Bader is injured.                                 (passive participle)

The other verbless sentence type involves an equational/equal status between the subject and the predicate. The subject as well as the predicate are definite NPs in an equational structure (Eid, 1991). Equational sentences in HA show a systematic pattern that includes two definite NPs that are usually

separated by what formally appears to be a subject pronoun, but which is considered to be a pronominal copula (Eid, 1983). While the subject may be of any PERSON, the pronominal copula is constrained to always appear in the 3rd PERSON, which then agrees in GENDER and NUMBER with the subject. The pronominal copula is optional in equational sentences.

(14) badr   (huwwa)   l-mudīr
     Bader  COP.3SGM  DEF-head.SGM
     Bader is the head.

### 1.2.5   Negation system in HA

This section considers the expression of sentential and constituent negation in HA. Sentential negation is expressed through the particles *mā* or *lā*. *mā* is able to negate finite verbal predicates that are either perfective (15a) or imperfective (15b), and it must be strictly left-adjacent to these forms.

(15)  a. badr   mā   gābal          sāra
         Bader  NEG  meet.PFV.3SGM  Sara
         Bader did not meet Sara.

      b. badr   mā   y-gābil          sāra
         Bader  NEG  3-meet.IMPV.SGM  Sara
         Bader does not meet Sara.

*lā* on the other hand expresses a PROHIBITIVE reading, and is mainly used to negate the verb in an imperative meaning, yet where morphologically, the verbal form used is the imperfective.

(16) lā    t-gābil           sāra
     NEG   2SGM-meet.IMPV   Sara
     Don't meet Sara.

*mū* is on the other hand the particle that is used to negate predicational and equational sentences involving a wide range of non-verbal predicates, such

as the PP predicate in the verbless sentence in (17). In the absence of a verbal predicate, the PP is predicative, and hence *mū* functions as a sentential negator.

(17) badr  mū  fi  l-bēt
     Bader NEG in DEF-house
     Bader is not at home.

The second major type of negation, constituent negation (CN), formally involves the same negative marker *mū*, which takes scope over one specific constituent within a clause, rather than over the whole clause, as is, on the other hand, the case with sentential negation. In (18), *mū* precedes, and takes scope over the adjunct *ams* 'yesterday', which is what is negated.

(18) mū  ams      gābal-t      sāra
     NEG yesterday meet.PFV-1SG Sara
     It is not yesterday that I met Sara.

With that overview of what constitutes the main morphosyntactic aspects of the grammar of HA, in the next section I provide a preliminary background to HPSG, which is then followed by a worked out HPSG analysis of HA basic syntactic structures.

## 1.3 HPSG Prelimaries

Head-driven Phrase Structure Grammar (HPSG) (Sag and Pollard (1987); Pollard and Sag (1994)) is characterised as a mono-stratal, and therefore, non-derivational grammatical framework. It deals entirely with multiple levels of syntactic representations and transformations that mediate among them. It is called 'head-driven' as a result of the fact that heads contain information regarding the non-heads with which they combine. I first provide an overview of the Classical version of the theoretical assumptions that characterise the framework. In doing so, important concepts and notations as used in the general framework will be introduced.

$$
\begin{bmatrix}
\textit{word} \\
\text{PHONOLOGY} \quad \textit{phonology} \\[4pt]
\text{SYNSEM} \quad
\begin{bmatrix}
\textit{synsem} \\
\text{LOC} \quad
\begin{bmatrix}
\textit{loc} \\
\text{CAT} \quad
\begin{bmatrix}
\textit{cat} \\
\text{HEAD} \quad \textit{part-of-speech} \\
\text{SUBJ} \quad \langle\,\rangle \\
\text{COMPS} \quad \langle\,\rangle
\end{bmatrix} \\
\text{CONT} \quad \textit{content} \\
\text{CONX} \quad \textit{context}
\end{bmatrix} \\
\text{NONLOCAL} \quad \textit{nonlocal}
\end{bmatrix}
\end{bmatrix}
$$
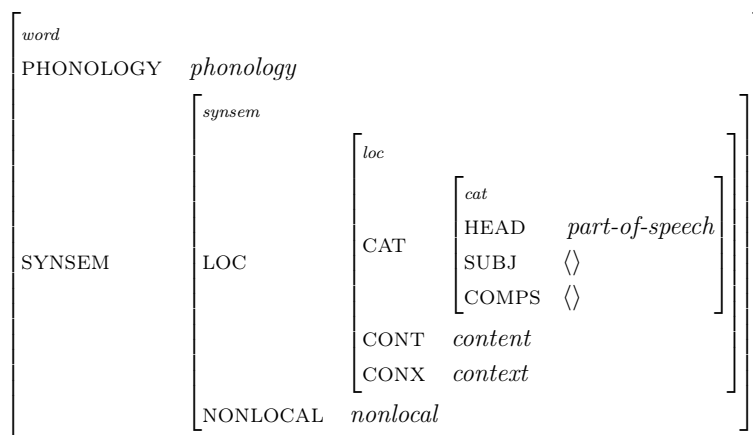
Figure 1.2

### 1.3.1   Signs and types

In HPSG, linguistic expressions, words or phrases are assumed to consist of feature structures of type *sign*, which is represented as a complex of phonological, syntactic, and semantic information within typed feature structures. Figure (1.2) illustrates the feature structure of *sign*.

The value of the feature PHONOLOGY (PHON) is of type *list* (phonstring), which provides the phonological information of the sign. The value of SYNTAX-SEMANTICS (SYNSEM) is a feature structure that specifies the syntactic and semantic information associated with the *sign*. The synsem value contains the features LOCAL and NONLOCAL. The NONLOCAL information includes information about unbounded dependency phenomena, such as argument extraction and relativization. The information carried by the feature LOCAL is divided into CAT(EGORY), CONT(ENT), and CONTEXT features. The feature CAT is further divided into the HEAD, SUBJ and COMPS features. HEAD refers to the categorical status of the *sign*, i.e. whether it is a verb, noun, adjective, etc. The HEAD also contains information about the nonheads with which it combines. This information is specified in valence features, whose value is a list of *synsem* objects. Valence features contain the SUBJ feature, which indicates what kind of subject the head takes, and the COMPS feature, which indicates what kind of complements the head takes. The seman-

$$sign$$

$$word \qquad phrase$$
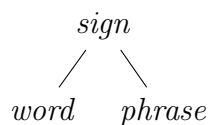
Figure 1.3: Classification of *sign*

$$phrase \rightarrow \left[ \text{COMPS} \quad \langle \rangle \right]$$
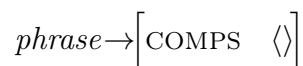
Figure 1.4

tic properties of a sign are represented under SYNSEM‖LOC‖CONT(ENT). Context-dependent linguistic information is represented as a value of CON-TEXT. Sag (1997) and Ginzburg and Sag (2000) assume that the grammars of natural languages are part of a rich network of constructions with associated constraints. The type *sign* contains the immediate *word* and *phrase* sub-types (Figure 1.3).

The feature structure of the type *word* can be described by its associated lexical entries. Phrases of various kinds are described by a feature structure of the type *phrase*. Phrases are subject to the constraint illustrated through Figure 1.4, where it is stated that phrases have an empty COMPS list.

The sub-type *phrase* is classified into sub-types such as: *head-complement-phrase (hd-comp-ph), head-subject-phrase (hd-subj-ph), head-specifier-phrase (hd-spr-ph)*, and *head-adjunct-phrase (hd-adj-ph)*.[3] The partial phrasal type hierarchy is given in Figure (1.5).

All sub-types of the *hd-ph* are subject to the Head Feature Principle, which is stated as follows:

**Head Feature Principle:** The HEAD value of any headed phrase is structure-shared with the HEAD value of the head daughter. (Pollard and Sag, 1994, p. 34)

The principle requires, by default, to identify the SYNSEM of the mother

---

[3]For more detailed discussion about sub-types, see Pollard and Sag (1994). Only relevant sub-types are introduced here.

$$phrase$$

$$\mid$$

$$hd\text{-}ph$$

hd-filler-ph     hd-adj-ph     hd-comp-ph     hd-subj-ph
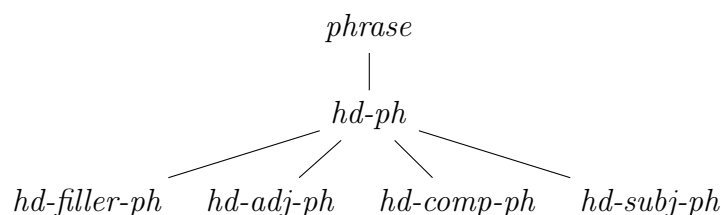
Figure 1.5: A partial classification of *phrase*

of a headed phrase with that of its head daughter.

Another such constraint is the Valence Principle.

**Valence Principle:** In a headed phrase, for each valence feature F, the F
value of the headed daughter is the concatenation of the phrase's F
value with the list of SYNSEM values of the F-DTRS value.     (Pollard
and Sag, 1994, p. 348)

The Valence Principle states that in a given phrase the head daughter's valence
features specify an element that is identified with the appropriate non-head sis-
ter of the head daughter. F can be one of either: SUBJ, COMPS, or SPR.

HPSG assumptions have proposed a new way of working with some traditional
grammar notions such as 'lexical entry' and 'phrase structure rule'. Lexical
entries are themselves understood as descriptions of feature structures of the
type *word*, which are represented through the use of Attribute-Value Matrices
(AVMs). The lexical entry provided in Figure (1.6) is that of the simple tran-
sitive verb *see*, which however is only partial, containing only the information
that will be relevant to what will be discussed in this thesis.

The lexical entry presented in Figure (1.6) specifies that the finite verb
'see' takes a subject NP and a complement NP. The valence information, as
noted above, is encoded as values for the features SUBJ and COMPS. The
*[fin]* specification is an abbreviation for [VFORM *fin*], which indicates that
the verb is finite.

$$
\begin{bmatrix}
\text{PHON} & \textit{see} \\
& \\
\text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{verb[fin]} \\ \text{SUBJ} & \left\langle \text{NP} \right\rangle \\ \text{COMPS} & \left\langle \text{NP} \right\rangle \end{bmatrix}
\end{bmatrix}
$$

Figure 1.6: Partial lexical entry for the verb 'see'

$$
\textit{hd-comp-ph} \rightarrow \begin{bmatrix}
\text{HD-DTR} & \begin{bmatrix} \textit{word} \\ \text{COMPS} & \left\langle \boxed{1},\dots,\boxed{n} \right\rangle \end{bmatrix} \\
\text{NH-DTRS} & \left\langle [\text{SS } \boxed{1}],\dots [\text{SS } \boxed{n}] \right\rangle
\end{bmatrix}
$$

Figure 1.7: *hd-comp* schema

In the conception of grammar adopted in this study, feature structure rules (or immediate dominance schemata) are understood as partial descriptions of feature structures of type *phrase* (Sag (1997); Ginzburg and Sag (2001)). Therefore, lexical entries and feature rules work together in helping construct a delimitation of the grammar. The lexical entries specify a set of words; while the feature rules specify a set of phrases. In this section I will introduce three of such classic schemata, which are particularly relevant to the discussion in the present work, given that these essentially form the basis of the argument-list of a given word, and the subject-verb agreement. Further schemata will be added later, as needed, throughout this study. Here and elsewhere, I use 'defaults' in the sense of Ginzburg and Sag (2000).

One sub-type of *hd-ph* is *hd-comp-ph*. This is subject to the constraint in Figure (1.7).

What we have in this schema is primarily that a head daughter is referred to by the HEAD-DAUGHTER (H-DTR) feature. The non-head daughters of a phrase are represented as the value of the NONHEAD-DAUGHTERS (NH-

$$hd\text{-}subj\text{-}ph \rightarrow \begin{bmatrix} \text{SUBJ} & \langle\rangle \\ \text{HD-DTR} & \begin{bmatrix} phrase \\ \text{SUBJ} & \langle\boxed{1}\rangle \end{bmatrix} \\ \text{NH-DTR} & \langle[\text{SS } \boxed{1}]\rangle \end{bmatrix}$$

Figure 1.8: *hd-subj* schema

$$hd\text{-}adj\text{-}ph \rightarrow \begin{bmatrix} \text{HD-DTR} & [\text{SS} & \boxed{1}] \\ \text{NH-DTRS} & \langle[\text{MOD} & \boxed{1}]\rangle \end{bmatrix}$$

Figure 1.9: *hd-adj* schema

DTRS) feature. Figure (1.7) indicates that a head-complement phrase has a head daughter which is a word and non-head daughters whose SYNSEM values are identical to the synsem objects that form the COMPS list of the head. The 'tags' are there to represent visually that the same object appears in more than one position in the representation.

Head-subject phrases, on the other hand, are subject to the constraint in Figure (1.8). This requires a phrase to be SUBJ <> (subject empty). It also requires the phrase to have a head daughter which is a phrase and a non-head daughter whose SYNSEM value is the same as the *synsem* value in the SUBJ list of the head.

Head-adjunct phrases which are responsible for concord are subject to the constraint in Figure (1.9). This requires a head-modifier phrase to have a head-daughter and a non-head daughter, and the MOD value of the latter is meant to be identical to the SYNSEM value of the former.

The schemata which I have introduced here will be used in the next section to provide a similar analysis of a basic HA structure.

### 1.3.2 Basic semantic assumptions in HPSG

So far, the discussion has been limited to syntactic considerations. As syntax and semantics are intimately associated in certain areas in a way that makes it impossible to discuss the syntax without semantics, this section will look at semantic considerations. However, core properties will be outlined.

Semantic information is also represented through feature structures. This information is organized into a sortal system. It is the attribute CONTENT, together with the CONTEXT, which bears the semantic information.

$$
\begin{bmatrix}
\text{PHON} \\
\\
\text{SYNSEM} \mid \text{LOC} \quad
\begin{bmatrix}
\text{CATEGORY} \\
\text{CONTENT} \\
\text{CONTEXT}
\end{bmatrix}
\end{bmatrix}
$$

Content has three subsorts which are used to define the semantics for different classes of syntactic objects: *parameterised-state-of-affairs* (*psoa*), *nominal-object* and *quantifier*. A *psoa* is the value of the sentence's CONTENT features. *Nominal-object* is the value of nouns and nominal projections, and *quantifier* is the value of determiners. A *psoa* has the attributes QUANTS and NUCLEUS. The former takes as its value a list of quantifiers and the latter takes as its value a *quantifier-free-parameterised-state-of-affairs* (qfpsoa), which is the type of all basic semantic relations.

$$
\begin{bmatrix}
psoa \\
\\
\text{QUANTS} \quad list(quantifier) \\
\\
\text{NUCLEUS} \quad relation
\end{bmatrix}
$$

The CONTENT value for the verb *love* is presented as follows, where the relation provides information about the semantic roles of the arguments. QUANTS takes an empty list as its value, since this is an unquantified expression.

$$\begin{bmatrix} psoa \\ \text{QUANTS} & \langle\rangle \\ \text{NUCLEUS} & \begin{bmatrix} love\text{-}rel \\ \text{LOVER} & index \\ \text{LOVED} & index \end{bmatrix} \end{bmatrix}$$

Nominal objects have the subsorts *non-pronoun (npro)* and *pronoun (pro)*. The latter has two subsorts: *personal-pronoun (ppro)* and *anaphor (ana)*. They additionally have the following attributes:

$$\begin{bmatrix} nom\text{-}obj \\ \text{INDEX} & index \\ \text{RESTRICTION} & set(psoa) \end{bmatrix}$$

The value of INDEX is a structure of sort *index* which is further divided into the subsorts *referential*, *there*, and *it*. Indices have the agreement features PERSON, NUMBER, and GENDER. The following illustrates these ideas with the CONTENT value of a common noun, such as 'book'.

$$\begin{bmatrix} nom\text{-}obj \\ \text{INDEX} & \boxed{1} \begin{bmatrix} \text{PERSON} & 3 \\ \text{NUMBER} & sing \\ \text{GENDER} & neut \end{bmatrix} \\ \text{RESTRICTION} & \left\{ \begin{bmatrix} \text{QUANTS} & \langle\rangle \\ \text{NUCLEUS} & \begin{bmatrix} book\text{-}rel \\ \text{INSTANCE} & \boxed{1} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix}$$

We now turn briefly to verbs. Verbs such as *loves* might have the following structure, which includes syntax and semantics (ignoring phonology and simplifying somewhat).

$$
\begin{bmatrix}
\text{CAT} & \begin{bmatrix}
\text{HEAD} & verb \\
\text{SUBJ} & \left\langle \boxed{1}\text{NP}[\text{NOM}]_{i[3rd,sing]} \right\rangle \\
\text{COMPS} & \left\langle \boxed{2}\text{NP}[\text{ACC}]_{j} \right\rangle \\
\text{ARG-STR} & \left\langle \boxed{1}, \boxed{2} \right\rangle
\end{bmatrix} \\
\text{CONTENT} & \begin{bmatrix}
\text{QUANTS} & \langle \rangle \\
\text{NUCL} & \begin{bmatrix}
love\text{-}rel \\
\text{LOVER} & i \\
\text{LOVED} & j
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

Notice that the index values of the subject and complement are structure-shared with the values of the argument role of the verb's CONTENT, expressing the fact that the index of the subject is the value of the LOVER role, and the index of the complement, the value of the LOVED role. In this way, lexical signs link up whatever syntactic and semantic contributions are made by their arguments.

### 1.3.2.1 Quantification

Quantification is an important aspect of meaning. Ambiguities arise when there are two quantifiers in a sentence, which must be accounted for in HPSG. For example, (19a) has two interpretations, given in (19b) and (19c).

(19)  a. Every student knows a poem.

   b. Every student knows some poem or other.

   c. There is a certain poem that every student knows.

It is not difficult to account for the two interpretations in HPSG. Pollard and Sag propose that a quantifier is an object with the attributes DET and RESTRICTION. The latter takes as its value a *non-pronominal* (a subsort of *nominal-object*, and abbreviated as *npro*) with a non-empty restriction value.

Within this concept, the interpretation of *every student* and *a poem* can be represented as follows:

$$
\begin{bmatrix}
\text{DET} & forall \\[2ex]
\text{RESTR-IND} & \begin{bmatrix}
\text{INDEX} & \boxed{1} \\[2ex]
\text{RESTR} & \left\{ \begin{bmatrix} \text{RELN} & student \\ \text{INSTANCE} & \boxed{1} \end{bmatrix} \right\}
\end{bmatrix}
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{DET} & exists \\[2ex]
\text{RESTR-IND} & \begin{bmatrix}
\text{INDEX} & \boxed{2} \\[2ex]
\text{RESTR} & \left\{ \begin{bmatrix} \text{RELN} & poem \\ \text{INSTANCE} & \boxed{2} \end{bmatrix} \right\}
\end{bmatrix}
\end{bmatrix}
$$

The attribute QUANTS in a *psoa* takes the value list of the quantifiers in order of scope. Thus, the two interpretations in (19a) can be represented as follows:

$$
\begin{bmatrix}
\text{QUANTS} & \left\langle \boxed{3},\ \boxed{4} \right\rangle \\[2ex]
\text{NUCLEUS} & \begin{bmatrix}
\text{RELN} & know \\
\text{KNOWER} & \boxed{1} \\
\text{KNOWN} & \boxed{2}
\end{bmatrix}
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{QUANTS} & \left\langle \boxed{4},\ \boxed{3} \right\rangle \\[2ex]
\text{NUCLEUS} & \begin{bmatrix}
\text{RELN} & know \\
\text{KNOWER} & \boxed{1} \\
\text{KNOWN} & \boxed{2}
\end{bmatrix}
\end{bmatrix}
$$

Here we see that we have two CONTENT values for (19a), where $\boxed{3}$ is the CONTENT value of the determiner *every*, and $\boxed{4}$ is the CONTENT value of the determiner *a*. $\boxed{1}$ and $\boxed{2}$ are the values of semantic roles in *relations*.

To associate sentences with CONTENT values like (19b) and (19c), the mechanism of Cooper's storage (Cooper (1975); Cooper (2013)) is built into

HPSG. This allows a quantified NP to be integrated into the interpretation
of the sentence that contains it at a higher point in the structure. Pollard
and Sag propose that signs have a QSTORE attribute, whose value is a set
of quantifiers, and that all quantifiers start out in QSTORE by lexical defini-
tion. Thus, the phrase *every student* has the CONTENT and the QSTORE
as follows:

$$
\begin{bmatrix}
\text{CONTENT} & \boxed{2} \\
\text{QSTORE} & \left\{ \begin{bmatrix}
\text{DET} & \textit{forall} \\
\text{RESTR-IND} & \boxed{2}\begin{bmatrix}
\text{INDEX} & \boxed{1} \\
\text{RESTR} & \left\{ \begin{bmatrix}
\text{RELN} & \textit{student} \\
\text{INSTANCE} & \boxed{1}
\end{bmatrix} \right\}
\end{bmatrix}
\end{bmatrix} \right\}
\end{bmatrix}
$$
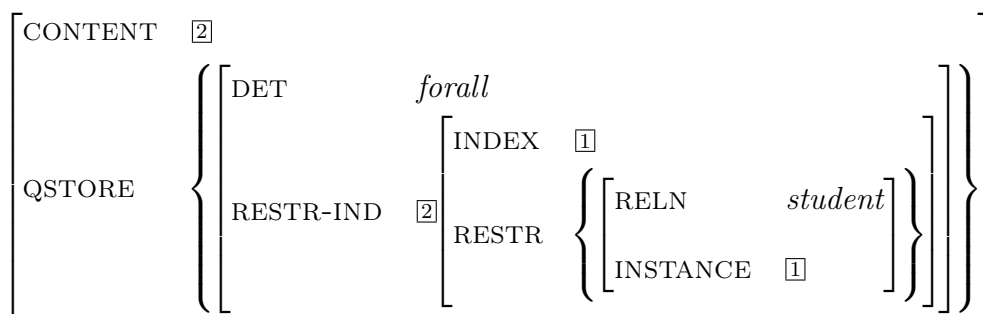
They propose the additional attribute: RETRIEVED, whose value is like
that of QUANTS, represented as a set of quantifiers. To use the various
attributes, the CONTENT Principle requires the NUCLEUS of the semantic
head and the mother to be identical, where the semantic head is of sort *psoa*.

**Content Principle:** In a headed phrase, (Case 1) if the semantic head's
CONTENT value is of sort *psoa* then its NUCLEUS is token-identical
to the NUCLEUS of the mother. (Case 2) otherwise, the CONTENT
value of the semantic head is token-identical to the CONTENT value of
the mother.                                  (Pollard and Sag, 1994, p. 322)

To ensure the correct relations between RETRIEVED and QSTORE, Pol-
lard and Sag propose the Quantifier Inheritance Principle.

**Quantifier Inheritance Principle:** In a headed phrase, the RETRIEVED
value is a list whose set of elements forms a subset of the union of the
QSTOREs of the daughters, and is non-empty only if the CONTENT
of the semantic head is of sort *psoa*; and the QSTORE value is the

$$
S
$$

$$
\begin{bmatrix}
\text{QUANTS} & \langle \boxed{4}, \boxed{5} \rangle \\
\text{NUCLEUS} & \boxed{3} \\
\text{RETRIEVED} & \langle \boxed{4}, \boxed{5} \rangle
\end{bmatrix}
$$

NP$_1$                                    VP

$$
\begin{bmatrix} \text{QSTORE} & \{\boxed{4}\} \end{bmatrix}
\qquad
\begin{bmatrix}
\text{QUANTS} & \langle \rangle \\
\text{NUCLEUS} & \boxed{3} \\
\text{QSTORE} & \{\boxed{5}\}
\end{bmatrix}
$$

V                                    NP$_2$

$$
\begin{bmatrix}
\text{QUANTS} & \langle \rangle \\
\text{NUCLEUS} & \boxed{3}
\end{bmatrix}
\qquad
\begin{bmatrix} \text{QSTORE} & \{\boxed{5}\} \end{bmatrix}
$$

every student     knows                     a poem
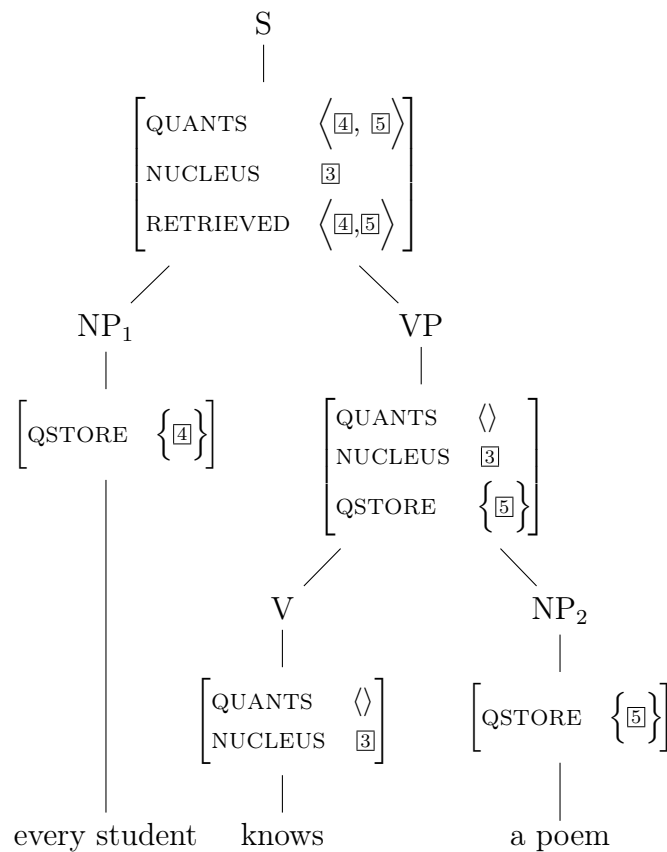
Figure 1.10: Every student knows a poem.

relative complement of the RETRIEVED value.        (Pollard and Sag,
1994, p. 322-323)

This requires a phrase's QSTORE to be the set union of the QSTOREs of
all daughters, minus any quantifiers in the phrase's RETRIEVED list. Finally,
to ensure the correct relation between QUANTS and RETRIEVED, the Scope
Principle is defined as follows:

**Scope Principle:** In a headed phrase whose semantic head is of sort *psoa*,
the QUANTS value is the concatenation of the RETRIEVED value
with the QUANTS value of the semantic head. (Pollard and Sag, 1994)

We can illustrate all of these principles in Figure (1.10).

In Figure (1.10), the subject and the object give rise to a quantifier in
storage. The S RETRIEVED value is a list whose set of elements is identical

to the union of the QSTOREs of its daughters. Hence, its QSTORE is empty
by the Quantifier Inheritance Principle. The QUANTS value of the VP is the
empty list. As a result, the QUANTS value of S is identical to the retrieved
value by the Scope Principle. Figure (1.10) provides a representation of when
the sentence has the interpretation in (19b). If the quantifiers were retrieved
from storage in the opposite order, the RETRIEVED and the QUANTS of S
would have the following representation:

$$
\begin{bmatrix}
\text{QUANTS} & \left\langle \boxed{5}, \boxed{4} \right\rangle \\
\text{NUCLEUS} & \boxed{3} \\
\text{RETRIEVED} & \left\langle \boxed{5}, \boxed{4} \right\rangle
\end{bmatrix}
$$

The purpose for this is to represent the quantifiers that have been retrieved
from storage, along with a representation of their order in the list, which then
corresponds to their scope; quantifiers on the left scope over those to their right.

With this, I have outlined the basic approach to semantics that is taken in
HPSG. As we will see, the semantic analysis of HPSG is of considerable impor-
tance in connection with floating and non-floating quantifiers in HA (chapter
3 and 5).

### 1.3.3   An HPSG analysis for basic HA structures

The literature supports an analysis whereby the pre-verbal subject, marked
as NOMINATIVE in MSA, is really a topic that is then associated with a null
pro(noun) which is then what functions as a subject (Ouhalla (1991); Plun-
kett (1993)). For HA, I here assume that it is possible to treat subject-initial
clauses in HA just as they are, i.e. as taking subject NPs, just as they do
in English, and where SVO clauses are treated as instances of the *hd-subj-ph*.
This is how Fassi Fehri (1993) (with some restrictions) and Mohammad (2000)
analyse the preverbal NOMINATIVE NP, i.e. as a subject, just like the post-

verbal one. One of their arguments is the fact that indefinite NPs can appear in preverbal position, at least if further specified. For that reason, they are argued to never take the status of a topic.[4]

To represent how the schemata work, I will consider the simple sentence in (20).

(20)  badr    gābal          sāra
      Bader  meet.PFV.3SGM  Sara
      Bader met Sara.

The phrase types and constraints that we have just outlined will together yield the following structure in Figure (1.11).

Let us now examine what the structure in Figure (1.11) represents. The lexical head *gābal* 'met' requires a NP subject and a NP complement. The lower VP *gābal sāra* 'met Sara' has two daughters: the lexical head *gābal* 'met' as a head daughter, and the complement NP *sāra* as a non-head daughter. The non-head daughter has its SYNSEM value (indicated by the tag ③) identical to the element on the COMPS list of the head daughter, as required by the constraint on head-complement phrases (Figure 1.7). Due to the Valence Principle, the COMPS list of the mother VP is empty. This is in accordance with constraint on phrases (Figure 1.4). The HEAD value (indicated by the tag ①) of the VP is identical to that of the head daughter *gābal* 'met'. This is due to the Head Feature Principle. The single element on the SUBJ list of the mother VP (indicated by ②) is identical to that of the head daughter VP; this is ensured by the Valence Principle. The Head Feature Principle again requires the structure-sharing of the HEAD value of the mother VP with that of the head daughter. The top node has two daughters: the head daughter is the VP just considered, and the non-head daughter *Bader*, which is the subject of the

---

[4]The issue is not the main focus of the thesis. For discussions on a topic analysis in HPSG, the reader can refer to Alotaibi (2015).

$$
\text{S}
$$

$$
\begin{bmatrix}
\textit{hd-subj-ph} \\
\text{HEAD} & \boxed{2}\,verb \\
\text{SUBJ} & \langle\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix}
$$

VP

$\boxed{2}$ NP

$$
\begin{bmatrix}
\textit{hd-comp-ph} \\
\text{HEAD} & \boxed{1} \\
\text{SUBJ} & \langle\boxed{2}\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix}
$$

$\boxed{1}$ V

$$
\begin{bmatrix}
\textit{word} \\
\text{HEAD} & \boxed{1}\ verb \\
\text{SUBJ} & \langle\boxed{2}\rangle \\
\text{COMPS} & \langle\boxed{3}\rangle
\end{bmatrix}
$$

$\boxed{3}$ NP

badr            gābal                     sāra
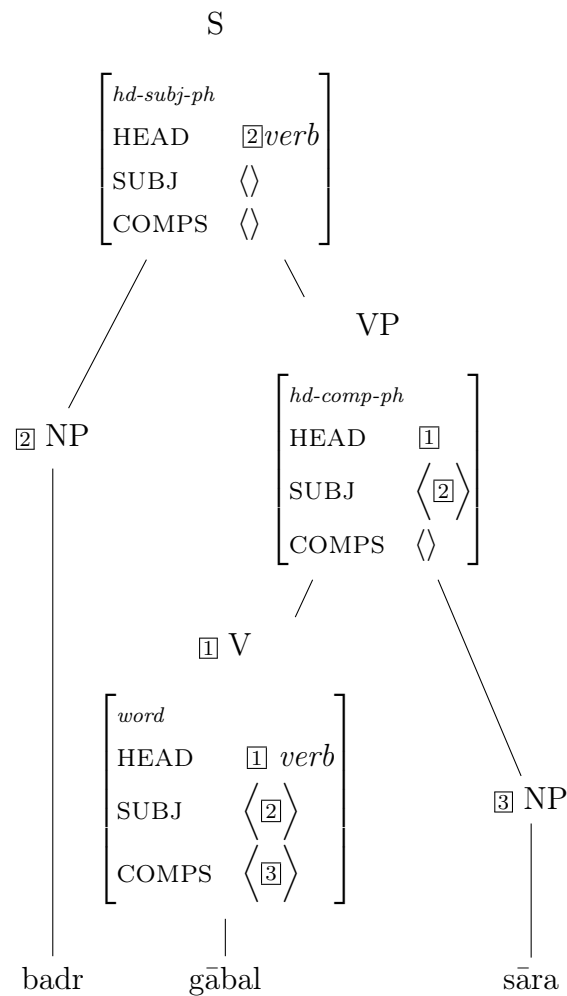
Figure 1.11: *Bader met Sara*

sentence. As stated in the constraint on *head-subj-ph*, the SYNSEM value (indicated by $\boxed{2}$) of the subject NP is identical to the single element on the SUBJ list of the head daughter. The SUBJ list of the mother node is now empty, in agreement with the Valence Principle. The identity of the mother's HEAD value with that of the head daughter is again due to the Head Feature Principle.

When it comes to the account of VSO structures, two approaches for verb-initial clauses have been suggested in the HPSG literature. The first deals with post-verbal subjects as an extra complement. This simply requires the type *hd-comp-ph* (Sag et al. (1999, pp. 308-311); Sag et al. (2003, pp. 409-

$$
\textit{hd-subj-comp-ph} \rightarrow \begin{bmatrix} \text{HD-DTR} & \boxed{1} \\ \\ \text{DTRS} & \left\langle \boxed{1} \begin{bmatrix} \textit{word} \\ \text{SUBJ} & \left\langle \boxed{2} \right\rangle \\ \text{COMPS} & \left\langle \boxed{3}, \dots \boxed{n} \right\rangle \end{bmatrix}, [\text{SS}\boxed{2}], [\text{SS}\boxed{3}], \dots [\text{SS}\boxed{n}] \right\rangle \end{bmatrix}
$$
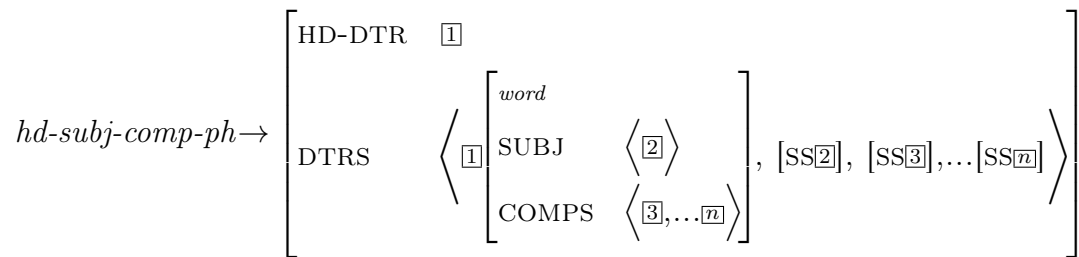
Figure 1.12: *hd-subj-comp* schema

414); Sag et al. (1999, pp. 409-414)).

The second approach, on the other hand, does not treat post-verbal subjects as a complement, but rather as a sister of the complements. This treatment calls for a special phrase type *hd-subj-comp-ph* (head-subject-complement phrase), and has been suggested in Pollard and Sag (1994); Ginzburg and Sag (2000); Kim and Sells (2008) for English auxiliary inversion phrases. *head-subj-comp* phrases are subject to the constraint in Figure (1.12).

This constraint states that a *head-subject-complement* phrase consists of a head daughter whose value is a word, and non-head daughters whose SYNSEM values are identical to the SYNSEM values on the SUBJ list and the COMPS list of the head daughter. Borsley (1995) argues that this is the best treatment for (Syrian) Arabic. The evidence he provides comes from the fact that verbal objects, prepositional objects and possessors can be realised in Arabic as clitics. Based on this, they should be realisations of the first member of the COMPS list, which entails that the post-verbal nominative NP cannot be in that position. Accordingly, the post-verbal nominative NP can only be a realisation of the SUBJ feature.

Within such an analysis, i.e. that the subject is a sister of the complement, verb-initial clauses, like the following in (21) would have a structure like the one in Figure (1.13).

S

$$\begin{bmatrix} \textit{hd-subj-comp-ph} \\ \text{HEAD} \quad \boxed{1}\textit{verb} \\ \text{SUBJ} \quad \langle\rangle \\ \text{COMPS} \quad \langle\rangle \end{bmatrix}$$

$\boxed{1}$ V

$$\begin{bmatrix} \textit{word} \\ \text{HEAD} \quad \boxed{1} \\ \text{SUBJ} \quad \langle\boxed{2}\rangle \\ \text{COMPS} \quad \langle\boxed{3}\rangle \end{bmatrix}$$

$\boxed{2}$ NP $\quad$ $\boxed{3}$ NP
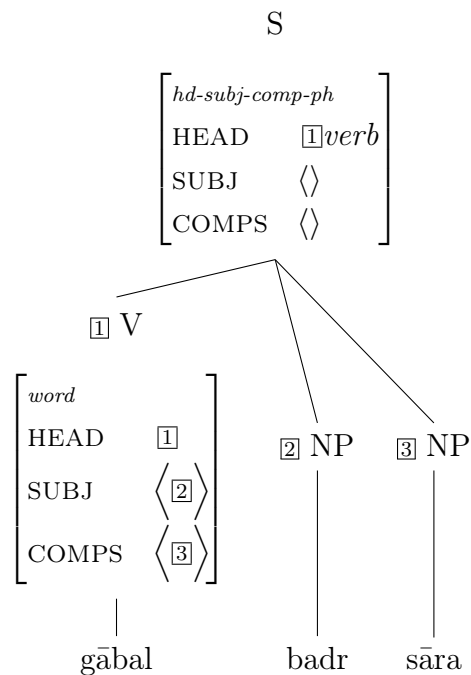
gābal $\qquad$ badr $\quad$ sāra

Figure 1.13: *Bader met Sara*

(21) gābal          badr   sāra
     meet.PFV.3SGM Bader Sara
     Bader met Sara.

With this I conclude the overview of the prerequisites for understanding how syntactic analyses are done in HPSG.

## 1.4   Overview of quantifiers

The status of quantifiers has been a central issue in the study of quantification in natural languages for the past decade, and their behaviours have been the topic of intense study, which has commenced with Aristotle, who was the first who reflected on the logical and philosophical implications of various types of quantification. Debates in the contemporary study of semantics still exist, and specifically are concerned with what constitute the different properties of linguistic quantifiers. Research from the domains of syntax, semantics, philosophy, psychology, and computational linguistics have all influenced the study of quantification through time.

The debate at the centre of a large portion of syntactic accounts concentrates around the determination of the behaviours of such a class. Jespersen (1933) provides a description of English grammatical categories which is however absent of the term *quantifier*. The issue is circumvented through the discussion only of indefinite numerals and totality. Quirk et al. (1985) establishes a more detailed syntactic description of the nominal co-occurrence of quantifiers and other different types of quantification. However, his work offers little in terms of semantic descriptions. Keenan and Stavi (1986) discuss the semantics of quantifiers such as *some, few, most* in their description of determiners in natural language.

A primary question for quantificational theory is how quantifiers should be classified. This question has been a recurrent controversial factor in many syntactic analyses, as syntactic categories classify quantifiers on the basis of some part of speech, which in turn impacts their analysis directly. Researchers usually classify quantifiers as determiners (Keenan and Stavi (1986); Keenan (1996)). On the other hand, some formal semantic accounts consider English determiners such as *the* and *a* within their analyses of quantifiers, e.g. Montague (1973). Jespersen (1933) categorization of quantifiers is such that it equates them to indefinite pronouns. In his later work, Jespersen (1969) proposes that there are adjectival forms of quantification, resulting in a big change in stance, where he essentially considers quantifiers to be members of the adjective class. Higginbotham (1995) follows suit, and classifies some quantifiers that form the sub-set of mass and count quantifiers to be functioning as adjectives. Jackendoff (1968); Jackendoff (1972) describes quantifiers as belonging to the categories of determiners and nouns. Other classifications includes the treatment of quantifiers as adjectives, adverbs, determiners, nouns,

or pronouns.  A pure syntactic component is not enough without a semantic meaning to understand the syntactic structure.  For this reason, research in the last four decades has started to shift to less strict syntactic roots, recognizing that independent syntactic cases are not strong enough to account for the semantic behavior of all quantifiers (Partee, 1970).

Although I cannot do justice to the interesting semantics of the floating and non-floating quantifiers here, I sketch an analysis which relies on the co-indexation of the quantifier and the NP, with some semantic mechanism such as 'storage' and 'retrieval' of the quantifier meaning.

## 1.5    Outline of the thesis

In Chapter 2 I provide a description of the NP and its modifiers.  It highlights the interesting properties that pertain to quantifiers, and will show that they share properties that are similar to those of nouns.  Quantifiers, similar to nouns, are then shown to be able to host a definite article, and pronominal enclitics, and can be in three forms: simple, construct state, and free state. What will be considered further in this chapter, is the semantic issue related with distributivity, and what interpretations arise, along with the interaction of the quantifier *kull* with negation.  Chapter 3 then suggests a foundation of how nouns, the main wider features of NPs, such as definiteness, adjectival modification, and modification via relative clauses, the annexing of possessive complements, and particularly quantifiers, within the HA system, may be analysed in HPSG. I will additionally show that there is no theory-independent reason to believe that quantifiers in HA are anything other than NPs.  Once they are treated as nouns, we can straightforwardly account for their similar behaviours.  An account of quantifiers concerned with some aspects of their semantic issues will also be presented.  Another central assumption to be made

in this chapter is that the definite article is an affix, rather than a determiner or a clitic. In Chapter 4 I start by first looking at FQs cross-linguistically. This I then follow with a review of the major approaches of the treatment of FQs as addressed in the literature. On the whole it will be shown how the different approaches that have been proposed, each have their own shortcomings. The same is true of the accounts provided for the Arabic facts more broadly. The core of this chapter is aimed at surveying the distribution, constraints, and the syntax and semantics associated with structures involving floating quantifiers in HA. It will also address floating constructions that have hitherto escaped the attention of previous researchers. These include reference to the behaviours of emphatic numerals, and emphatic reflexives. Working within the framework of HPSG, in Chapter 5 I demonstrate that, aside from the pre-nominal occurrences of quantifiers more broadly, floating quantifiers can be classified into two types of structures, depending on the distributional syntactic properties they manifest, and essentially function as: post-nominal vs. adverbial modification. The post-nominal instances modify a preceding NP, while the adverbial ones modify the verb just as other adverbs do, but are semantically linked to the subject, as required from the syntactic and semantic properties encoded in these items' lexical entries. Other floating constructions (emphatic reflexives) are also analysed and provided with parallel treatments. Finally, Chapter 6 contains a summary of the dissertation, highlighting the major contributions, as well as some gaps which will not be addressed in this study, and use these to further illuminate what directions can be taken for future extensions to this work.

# HA Noun Phrases

## 2.1 Introduction

This chapter provides a description of noun phrase forms in HA. It discusses the simple, construct state, and free state forms. It focuses mostly on HA, which diverges significantly in some aspects from MSA or other Arabic dialects. Such variations will be noted when relevant. The chapter is divided into four main sections: Section 2 focuses on noun phrase forms, which will include a discussion on definiteness and its realization in HA; Section 3 discusses noun phrase modifiers in HA; Section 4 accounts for the properties of quantified noun phrases and how they are both similar and different from nouns. Section 5 then concentrates on describing the universal quantifier *kull* 'all' by investigating its syntactic and semantic properties.

Before starting our discussion on nouns and noun phrases in HA, I here start with a discussion on the expression of the DEFINITENESS feature in Arabic. Nouns in both MSA and HA can be definite or indefinite. Indefinite nouns are simply unmarked bare forms in HA (1a). In MSA, on the other hand, indefinite nouns are marked with the suffix -*n* (a process referred to as *nunation*) (1b).[1]

---

[1]See Holes (1995); Kremers (2003); Ryding (2005) for their view of the suffix -*n* as an indefinite marker. An alternative analysis is provided by Fassi Fehri (1993), who claims that

(1)  a.  walad
         walad.SGM
         a boy                                                                HA

     b.  walad-u-n
         boy.SGM-NOM-INDEF
         a boy                                                               MSA

Definite nouns in HA and MSA exhibit a definite article *l*-, which is merely prefixed onto the bare noun form, and corresponds to 'the' in English.[2]

(2)  a.  l-walad
         DEF-boy.SGM
         the boy                                                              HA

     b.  l-walad-u
         DEF-boy.SGM-NOM
         the boy                                                             MSA

The definite article and the noun onto which it attaches form one prosodic word. The definite article's articulation depends upon the nature of the phonology of the first phon of the nominal (or adjectival) word-form. Consonants in Arabic are divided into *lunar* and *solar* sounds. When preceding a lunar consonant, the article's pronunciation is *l*. When preceding solar consonants, assimilation occurs between the article and the first coronal consonant, such that the doubling of the noun's initial consonant takes place (Alfozan (1989); Al-Nassir (1993); Ryding (2005); Alhawary (2011)). Therefore, when the definite article is followed by a word-form beginning with a coronal consonant {/t/,/ṭ/,/d/,/ð/, /θ/,/ḍ/,/s/,/š/,/z/,/ṣ/,/ẓ/}, the definite article *l* is assimilated to it. On the other hand, if it is followed by other consonants such as /b/, /f/, /m/, or /k/, no such assimilation takes place. Table 2.1 provides some examples of assimilated and non-assimilated definite article forms from Hijazi Arabic.

-------------------------------------------------------------

the suffix does not mark indefiniteness.

[2]The definite article *l*- can be pronounced as *il*- in HA. This difference is purely phonological.

| Non-coronal initial consonant | | Coronal initial consonant | |
|---|---|---|---|
| l-qamar | the moon | š-šams | the sun |
| l-walad | the boy | s-safar | the journey |
| l-kitāb | the book | n-nahar | the river |
| l-ʔism | the name | d-drāma | the drama |

Table 2.1: Non-coronal and Coronal Consonants in HA

## 2.2 Noun Phrase forms

### 2.2.1 Simple NPs

Simple NPs can optionally take complements such as PPs, as well as clauses.[3] Starting with indefinite nouns, such nouns can take either PP complements as in (3a), or a clausal complement as in (3b).

(3) a. gar-ēt          kitāb       ʕan   l-ḥubb
       read.PFV-1SG book.SGM about DEF-love

   I read a book about love.


   b. fīh    furṣah in-na         n-fūz         l-yōm
      there chance that-1PL.ACC 1PL-win.IMPV DEF-today

   There is a chance that we win today.


Definite nouns can take PP or clausal complements in a similar way.

(4) a. gar-ēt          l-magāl              ʕan   l-gaḍiyyah
       read.PFV-1SG DEF-article.SGM about DEF-case

   I read the article about the case.


   b. ḥabb-ēt          l-fikrah         in-na              ni-jtamiʕ
      like.PFV-1SG DEF-idea.SGF COMP-1PL.ACC 1PL-meet.REFL.IMPV

   I like the idea that we meet.

---

[3]HA clausal complements of nouns have not been discussed in the literature. There is a discussion about this structure in English (e.g. *the fact that it is raining*). A number of authors have recently advanced the claim that noun complement clauses are actually relative clauses in disguise (Kayne (2008); Kayne (2010); Arsenijević (2009), and Haegeman (2012); among others).

### 2.2.2   Construct state forms

The construct state (CS) has been thoroughly investigated with respect
to the fact that they express a relation between a possessor and a possessed
item (Borer (1988); Benmamoun (2000a); Fassi Fehri (1993); Ritter (1991);
Siloni (1991); Siloni (1997), among many others). The structure involves the
juxtaposing of two nouns/nominal forms. The order of the constituents that
form the construction is always possessed - possessor. Consider the following,
where the first expression inside such a structure is referred to as the *construct
head*, which requires to combine with another noun. Together, these form a
full NP.

(5) kitāb l-walad
    book DEF-boy.SGM
    the boy's book

The CS has also been called the genitive construction in MSA, due to the
invariable genitive case the noun expressing the possessor receives, as indicated
in (6).

(6) kitāb-u     l-walad-i
    book-NOM DEF-boy.SGM-GEN
    the boy's book                                                                MSA

Internal to the construct state construction, the construct head is a morpho-
logically 'bare' noun (Mohammad (1988); Mohammad (1999); Ouhalla (1991);
Fassi Fehri (1993); Shlonsky (2004), among others), i.e. it lacks any definite-
ness marking (7).

(7) *l-kitāb        l-walad
    DEF-book.SGM DEF-boy.SGM
    the boy's book

However, the possessor can be itself either definite (8a), by attaching the
definite article, or indefinite (12). The whole construct then 'inherits' the

(in)definiteness of the possessor (Danon (2006); Siloni (2001); Fassi Fehri (1993, 1999); Kremers (2003), among others).[4]

(8)  a. kitāb l-walad
         book DEF-boy
         the boy's book

     b. kitāb walad
        book boy
        a boy's book

Singular feminine nouns that function as construct heads are required to undergo a morphophonological change. Their *-ah* ending, as in: *zamīlah* 'friend.SGF' results in an addition of *-t* onto the final *a* of the stem, resulting in the construct form *zamīlat*, as in (9). This morphophonological addition is referred to as *tāʔ marbūṭah* in Arabic.

(9)  zamīlat      l-bint
     friend.SGF DEF-girl.SGF
     the girl's friend

In MSA, what morphophonological processes affect the construct head, apart from *tāʔ marbūṭah*, is the deletion of the final [n] of plural and dual suffixes, in e.g. *muʕallimūn* 'teacher-PLM'.

(10)  a. muʕallim-ū-n > muʕallim-ū   t-tārīx-i
          teacher-PLM  > teacher.PLM DEF-histroy.SGM-GEN
          the history teachers

      b. wālid-ān   > wālid-ā    ṭ-ṭālib-i
         parent-DU > parent-DU DEF-student.SGM-GEN
         the student's parents                                    MSA

---

[4]Some linguists (see Borer (1999); Shlonsky (2004); Alshara'i (2014); Alanbari (1997); Coene et al. (2003); Dobrovie-Sorin (2000); Sichel (2002); Sichel (2003), among many others) argue that there is no (in)definiteness spread in CSs, such that the head N in CS is always understood as being indefinite.

Adjectives modifying either the construct head, or the inner NP, (or both), must follow the construct state as a whole, i.e. both the two nominals.

(11)  a. kitāb        l-bint        l-jadīd
          book.SGM   DEF-girl.SGF   DEF-new.SGM

          the girl's new book

      b. kitāb        l-bint        š-šaṭr-ah
          book.SGM   DEF-girl.SGF   DEF-excellent-SGF

          the excellent girl's book

      c. *kitāb       l-jadīd       l-bint
          book.SGM   DEF-new.SGM   DEF-girl.SGF

          the boy's new book

Through the data in (11), we can observe two things:

1. The adjective follows the whole structure, and hence the ungramaticality of (11c), where the modifier comes in between the two nouns.

2. As a result of the definiteness of the whole construction, which comes about from the fact that the possessor noun (i.e. the complement) is definite, the attributive adjective in (11a), which modifies the construct head, agrees in definiteness.[5]

There are as expected, instances where ambiguity arises, given that the agreement features of the possessor and possessee happen to be the same. This is the use in (12), for instance, where both *kitāb* 'book' and *naḥu* 'syntax' are SGM.

(12) kitāb        n-naḥu        l-jadīd
      book.SGM   DEF-syntax.SGM   DEF-new.SGM

      the new book about syntax / the book about new syntax

---

[5]Noun-adjective agreement will be discussed in Section 4.2.

Apart from instances involving noun + noun CS formations, the construct state noun, i.e the possessed item, can host a possessive pronominal clitic as in (13). When this is the case, the CS is always understood as being definite. Evidence for this is once again the agreement in DEFINITENESS on the attributive adjective modifying the construct head, as in (13c).

(13)  a.  kitāb-uh
          book-3SGM.GEN
          his book

      b.  walad-hum
          boy-3PL.GEN
          their boy

      c.  walad-hum    l-kabīr
          boy-3PL.GEN  DEF-old.SGM
          their old boy

In what follows I discuss the main semantic relations that arise out of CS formations in HA.

### 2.2.2.1   Possessive relations

Primarily, the construct state construction expresses a wide range of possessive and partitive relationships. These include location (14a), part-whole relationships (14b), or quantificational ones (14c).

(14)  a.  ṭaraf       l-jabal
          edge.SGM  DEF-mountain.SGM
          the mountain's edge

      b.  yadd l-walad
          hand DEF-boy
          the boy's hand

      c.  šillat      l-ban-āt
          group.SGF DEF-girl-PLF
          the group of the girls

There are other examples in which the construct state construction is utilised but where the reading expressed is one that goes beyond a possessive reading. (15), for example, can express a range of relations. The noun phrase can describe a picture of the girl, or a picture taken by the girl. These readings are in addition to the possessive interpretation that comes about, where the picture is owned by the girl. Each relation is determined by the context. For more discussion about such sort of relations, and others derived out of possessive structures, see Eksell Harning (1980); Brustad (2000, pp. 70-88), and Holes (2004, pp. 208-210).

(15)  ṣūrat          l-bint
      picture.SGF DEF-girl
      the girl's picture

### 2.2.2.2   Verbal nouns

Just like ordinary nouns within a construct state, a verbal noun (referred to as *maṣdar* in Arabic, which is similar to *gerunds* in English) can form a construct state. Verbal nouns are nouns formed from verbs to express a process (or event), or a result (Fassi Fehri (1993)). There are different types of verbal noun forms (and hence associated restrictions, which come about due to their derivation out of distinct verbal forms with their own idiosyncratic restrictions). However, they will not be discussed here (see Fassi Fehri (1993) and Kremers (2003)). I here simply point out the key CS formation when verbal nouns are involved.[6] If we consider the data in (16), what we have is the verbal noun *kitābah* 'writing' derived from the transitive verb *katab* 'write', which subcategorises for external and internal arguments. Either of these arguments is able to function as the verbal noun's complement, in a CS, when the verb noun functions as the construct head. In (16a), the verbal noun's complement is its external argument, whereas in (16b), it is the internal argument.

---

[6]See Grenat (1996) for an extensive discussion about verbal noun types and forms.

(16) a. kitābat     l-walad
       writing.SGF DEF-boy.SGM
       the boy's writing

     b. kitābat     l-wājib
       writing.SGF DEF-homework.SGM
       the assignment's writing

The verbal noun *kitābat* 'writing' can have both of its arguments expressed, but they are subject to an ordering restriction. The first of the arguments closest to the verbal noun is the least oblique. With this one argument, the verbal noun forms a CS. The second argument, which is the internal argument, is then expressed within a PP headed by *li*. The relation of the verbal noun with both its arguments is illustrated in (17a). Note however that the verbal noun only forms a CS construction with the adjacent noun, which is the least oblique, i.e. only with one of its arguments. When the PP argument precedes the NP one, the sentence becomes ungrammatical as in (17b).

(17) a. kitābat     l-walad     li-l-wajib
       writing.SGF DEF-boy.SGM for-DEF-homework.SGM
       the boy's writing of the homework

     b. *kitābat     li-l-wajib     l-walad
       writing.SGF for-DEF-homework.SGM DEF-boy.SGM
       the boy's writing of the homework

The verbal noun can be modified by an adjective or an adverb. When modified by an adjective, this comes in between the external and internal argument, as in (18a). This is the expected adjectival position, given that the verbal noun along with its external argument form a CS. When modified by an adverb, typically expressed as a PP, this has to follow both arguments, as in (18b).

(18) a. kitābat     l-walad     s-sarīʕah     li-l-wājib
       writing.SGF DEF-boy.SGM DEF-fast.SGF for-DEF-homework.SGM
       the boy's fast writing of the homework

b. kitābat       l-walad        li-l-wajib              b-surʕah
   writing.SGF DEF-boy.SGM for-DEF-homework.SGM with-speed.SGF
   the boy's writing of the assignment quickly

## 2.2.3   Free state forms

It is not just CS constructions that can express possessive relations. There is also a free state form counterpart. The free state can be understood as an alternative way with which to express possession. However, free states express only a sub-set of the relations that are expressed by construct state nouns and their inner NP. Free state forms consist of a noun followed by a prepositional phrase (Bardeas (2009); Alhawary (2011)). The structure, taken together can express possession (19a), identification (19b), or action-agent relations (19c).[7]

(19)  a. l-kitāb          ḥagg l-bint
         DEF-book.SGM of    DEF-girl.SGF
         the book of the boy

      b. l-kitāb          ḥagg t-tārīx
         DEF-book.SGM of    DEF-history.SGM
         the book of the history

      c. l-kitāb          ḥagg l-walad
         DEF-book.SGM of    DEF-boy.SGM
         the book of the boy

It is the semantic relation that is derived out of such PP complements of the noun headed by *ḥagg*, that distinguishes such structures from simple

---

[7]In fact, *ḥagg* (and its counterparts (e.g. *tabaʕ*) in other dialects of Arabic), has been viewed as being either a preposition (Bardeas, 2009), or an adjective-like particle (Hoyt, 2008). The word also takes a lexical meaning of 'truth' (i a), or 'property' (i b):

(i)   a. gul-t          l-ḥagg
         say.PFV-1SG DEF-truth
         I said the truth.

      b. axað-t          ḥagg-uh
         take.PFV-1SG property-3SGM.GEN
         I took what is his.

nouns plus their PP complement. Another difference between free state and CS forms has to do with adjectival modification. In construct state forms, the adjective modifying the head noun cannot immediately follow it. Rather, it has to follow the inner NP, given that together they form a unit. In contrast, the adjective modifying the head noun in free state forms immediately follows it. In a similar manner, an adjective modifying the inner NP, must follow it. Therefore, in (20) we observe that, the adjective *l-jadīd* 'the new' immediately follows the head noun *l-kitāb* 'the book', while the adjective að-ðaki 'the smart' follows the NP *l-walad* 'the boy' inside the PP.

(20) l-kitāb      l-jadīd      ḥagg l-walad      ð-ðaki
     DEF-book.SGM DEF-new.SGM of   DEF-boy.SGM DEF-smart.SGM
     the new book of the smart boy

Nouns in the free state do not undergo phonological changes, unlike what was mentioned to be the case with CSs. However, what morphological changes do take place, involve changes right on the item *hagg* in the construction. Feminine nouns such as *šanṭah* 'bag' ending in an *-h* will not result in the addition of a *-t*.

(21) šanṭah   ḥaggat l-walad
     bag.SGF of.SGF DEF-boy.SGM
     a bag of the boy

The MSA counterpart for HA free states is introduced by the preposition *li* 'for'. This preposition is only able to express possession, and no other semantic relations, unlike in HA. Additionally, unlike in HA (and also distinct from the construct head noun in the CS), the head noun in a free state structure must be indefinite; i.e. overtly taking the indefinite marker *-n*. The NP internal to the PP can in MSA be either definite or indefinite.

(22) a. kitāb-u-n         li-walad-i-n
        book.SGM-NOM-INDEF for-boy.SGM-GEN-INDEF
        a book for a boy

b. kitāb-u-n              li-l-walad-i
   book.SGM-NOM-INDEF for-DEF-boy.SGM.GEN
   a book for the boy                                          MSA

The presence of a definite-marked head noun within a free state construction expressing a possessive relation or any other, using the preposition *li*, results in ungrammaticality, as in (23).[8]

(23) *l-kitāb-u              li-l-walad-i
     DEF-book.SGM-NOM for-DEF-boy.SGM-GEN
     the book for the boy                                      MSA

## 2.3   NP modification

This section describes the properties of modification in nominal phrases in HA, starting with considerations related with demonstratives, adjectives, relative clauses, and numerals. Most of these elements can occur post-nominally and pre-nominally (Fassi Fehri (1999); Bardeas (2009)). However, differences arise, depending on whether these elements are used pre-, or post-nominally. I address each of these different modificational elements in separate sections.

### 2.3.1   Demonstratives

The traditional Arab grammarians classify demonstratives within the word class of nouns, under the title *asmāʔ l-ʔišarah* 'reference nouns'. There are two types of demonstratives: proximal and distal, which refer to either temporal, or locative distance (Brustad, 2000).[9] The common forms are summarised in Table 2.2.

HA demonstratives can occur either pre-nominally, or post-nominally. They agree in NUMBER, GENDER, and PERSON with the noun they occur with. The noun that follows or precedes them must be definite:

---

[8]Note that on a sentential reading, rather than an NP reading, the sentence would be grammatical, and would mean: *The book is for the boy.*

[9]There is another set of demonstratives in HA. These are referred to as locative adverbs, whose meaning varies on the basis of proximity, stated as 'near' and 'distal' reference: e.g. *hina* 'here', and *hināk* 'there'.

| Features | Proximal | Distal |
|----------|----------|--------|
| M.SG | hāða | haðāk |
| F.SG | hāði | haðīk |
| PL | haðōl | haðolīk |

Table 2.2: Demonstratives in HA

(24)  a. hāða      l-walad
         this.3SGM DEF-boy.SGM
         this boy

      b. l-walad       hāða
         DEF-boy.SGM this.3SGM
         this boy

      c. hāði      l-bint
         this.3SGF DEF-girl.SGF
         this girl

      d. l-bint       hāði
         DEF-girl.SGF this.3SGF
         this girl

If the NP appears without the definite article, the resulting structure will be ungrammatical under a reading where the structures are understood as NPs.[10]

(25)  a. *hāða     walad
         this.3SGM boy.SGM
         this boy

---

[10]If the head noun is indefinite, a predication reading results, and hence the demonstrative is not understood as forming part of a NP.

   i  hāða      walad
      this.3SGM boy.SGM
      This is a boy.

A parallel predication reading is obligatory with definite construct state.

   ii hāða      axu          l-bint
      this.3SGM brother.SGM DEF-girl
      This is the girl's brother.

   b. *walad    hāða
     boy.SGM this.3SGM
     this boy

Distal demonstratives must also represent the attributes of the definite noun with which they agree in NUMBER, GENDER, and PERSON as in (26).

(26)  a. l-walad      haðāk
       DEF-boy.SGM that.3SGM
       that boy

     b. haðāk      l-walad
       that.3SGM DEF-boy.SGM
       that boy

     c. (haðolīk)  l-awlād     (haðolīk)
       that.3PLM DEF-boy.PLM that.3PLM
       those boys

There are two views available in the literature with respect to the syntax of pre- vs. post-nominal demonstratives in Arabic. Kremers (2003) and Shlonsky (2004) argue that pre-nominal demonstratives are heads of a demonstrative projection (Dem), whereas post-nominal demonstratives are modifiers similar to adjectives. The two views differ in the details as to where demonstratives are positioned in the carthographic structures.

## 2.3.2   Adjectives

Attributive adjectives in HA usually appear after the noun they modify, agreeing with it in GENDER, NUMBER, and DEFINITENESS.

(27)  a. bint     ðakīyy-ah
       girl.SGF clever-SGF
       a clever girl

     b. l-walad      ð-ðaki
       DEF-boy.SGM DEF-clever.SGM
       the clever boy

     c.  l-awlād       l-ʔaðkiya
        DEF-boy.PLM DEF-clever.PLM
        the clever boys

A different agreement pattern results when the noun is inanimate and plural. Such nouns trigger feminine singular agreement on adjectives.

(28)  l-kutub       l-gadīmah
       DEF-book.PL DEF-old.PLF
       the old books

Attributive adjectives can modify either the head (29a) in a construct state form or the complement (29b).

(29)  a.  axu         l-bint   ð-ðaki
         brother.SGM DEF-girl DEF-clever.SGM
         the clever brother of the girl

      b.  axu         l-bint   ð-ðakiyy-ah
         brother.SGM DEF-girl DEF-clever-SGF
         the brother of the clever girl

Free state forms can have either the head or the complement modified by attributive adjectives, as in (30).

(30)  š-šanṭah    s-sōd-a      ḥagg-at l-walad     ṭ-ṭawīl
      DEF-bag.SGF DEF-black-SGF of-SGF   DEF-boy.SGM DEF-tall.SGM
      the black bag of the tall boy

Adjectives in HA can also appear in a construct state when associated with a following noun. As expected from the behaviour of CS formations, so far, the following noun must be definite. The adjective is however indefinite, i.e. unmarked. The construction has been discussed for Hebrew by Siloni (2002); Hazout (2000); and Kim (2001), and Fassi Fehri (1999) and Bardeas (2009) for MSA. HA resembles the Hebrew structure rather closely, and involves the basic structure in (31).

(31) galīl        l-adab
     less.SGM  DEF-behaviour.SGM
     disrespectful

Note that the CS formation in (31), involving an Adj+Def N, forms a structure that itself expresses an adjectival form. This adjectival form, by virtue of its morphosyntactic formation within a CS that involves a definite inner N, is inherently definite. This can be tested for by using this very adjective, attributively. Just as in (27) we observed agreement in DEFINITENESS between the noun and the attributive adjective, the CS adjective can attributively modify a definite noun, as in (32a). In (32b), where the construct state adjective is inherently indefinite, this is able to modify an indefinite noun.

(32) a. l-walad        galīl      l-adab
        DEF-boy.SGM  less.SGM  DEF-behaviour.SGM
        the disrespectful boy

     b. walad       galīl      adab
        boy.SGM  less.SGM  behaviour.SGM
        a disrespectful boy                                                 HA

Unlike in HA, the MSA adjectival construct state form counterparts obligatorily requires a definite inner NPs.[11] This structure can still however modify an indefinite NP, as in (33). (33b) substitutes the CS formation with a structure involving a DEF Adj + DEF N.

(33) a. rajul-u-n                  ʕazīm-u            l-ḥazz-i
        man.SGM-NOM-INDEF  great.SGM-NOM  DEF-fortune.SGM-GEN
        a man who is very lucky

---

[11]My intuition with respect to the MSA data in (33) is such that the inner NP can be indefinite if it attaches the indefinite marker, as illustrated through (i) below.

  i walad-u-n                 jamīl-u               xuluq-i-n
    boy.SGM-NOM-INDEF  beautiful.SGM-NOM  manner.SGM-GEN-INDEF
    a boy with a good manner

    b. r-rajul-u         l-ʕaz̄īm-u        l-ḥazz-i
       DEF-man.SGM-NOM DEF-great.SGM-NOM DEF-fortune.SGM-GEN

       the man who is very lucky        MSA: (Kremers, 2005)

While *attributive adjectives* and *adjectival construct state* are categorically adjectives, they can in HA substitute nouns, and occupy their position. Both the attributive adjective and adjectival CS in (34a) and (34b), can respectively stand instead of nouns.[12]

(34)  a. šuf-t       l-ḥilw-ah
        see.PFV-1SG DEF-beautiful-SGF

       I saw the beautiful (female).

    b. šuf-t       galīl-at  l-adab
        see.PFV-1SG less-SGF DEF-behaviour.SGM

       I saw the disrespectful (female).

### 2.3.3  Numerals

HA has two types of numerals: ordinals and cardinals. The two types behave in a different way, when in combination with nominals. Both ordinals and cardinals may appear pre-nominally and post-nominally.

#### 2.3.3.1  Ordinals

When ordinals precede nouns, they are usually in the masculine form, and can form a construct state with the following noun, irrespective of whether the following noun is masculine or feminine, or plural.

(35)  a. awwal    walad
        first.SGM boy.SGM

       the first boy

---

[12]There can be an alternative analysis where what we have in such contexts are instances of elliptical constructions involving a phonologically empty noun.

    b. awwal    ban-āt
       first.SGM girl-PLF
       the first girls

Post-nominal ordinals in HA behave in a similar way to adjectives. They show agreement with the preceding noun, for NUMBER, GENDER, and DEFINITE-NESS.

(36)  a. l-walad      θ-θāni
       DEF-boy.SGM DEF-second.SGM
       the second boy

     b. l-bint       θ-θān-yah
       DEF-girl.SGF DEF-second-SGF
       the second girl

Ordinals can stand alone and be marked with the definite article and behave more like nominals, just as we have seen in (34a). Consider the following examples where the ordinals seem to be functioning/fulfilling the role of an argument:

(37)  a. θ-θāni         ʔistalam       hadiyyah
       DEF-second.SGM receive.PFV.3SGM gift
       The second (male) received a gift.

     b. θ-θān-yah      ʔistalam-at     hadiyyah
       DEF-second-SGF receive.PFV-3SGF gift
       The second (female) received a gift.

### 2.3.3.2 Cardinals

Cardinals are of two types in HA. These can be either simple, or compound numerals. I here restrict the discussion wholly to numerals from 'three' to 'ten'.[13] Cardinals can appear pre-nominally when the noun is indefinite (38), or post-nominally when the noun is definite (39).

---

[13]HA cardinals have a complex system as they do not form part of a uniform category. *Two* is treated differently from other numerals, as when it appears post-nominally, it expresses the meaning of 'other'.

(38)  a.  θlāθ        awlād
           three.SGM boy.PLM

           three boys


       b.  θlāθ-at    ban-āt
           three-SGF girl-PLF

           three girls



(39)  a.  l-awlād       θ-θalāθah
           DEF-boy.PLM DEF-three.SGF

           the three boys


       b.  l-ban-āt     θ-θalāθ-ah
           DEF-girl-PLF DEF-three-SGF

           the three girls


Cardinals from *three* to *ten* have reverse agreement with the nouns known as polarity (Badawi et al. (2015); Ryding (2005)). According to this rule of polarity, a feminine counted noun can agree with a cardinal in masculine GENDER, and vice versa. This is applicable with all number types they are part of, that is individual numbers and compound numbers. Consider (40) from HA, where the cardinals appear pre-nominally. In (40a), the cardinal *θalāθ* 'three' is feminine and shows reverse gender agreement with the count noun. (40b) involves the opposite behaviour; a masculine cardinal number in the context of a feminine count noun.

---

   i  l-awlād      θ-θān-ēn
      DEF-boy.PLM DEF-other-PLM

      the other boys

Instead, the dual form of the noun has to be used, in order to express the quantity of 'two'.

   ii  l-wlad-īn
      DEF-boy-DU

      the two boys

Compound and complex 'coordinate' numerals also take a different treatment. Such constructions need an in-depth examination in themselves. For this reason, I will leave these for further research.

(40)   a.   θalāθ-at      awlād
             three-SGF   boy.PLM

             three boys


       b.   θalāθ          ban-āt
             three.SGM   girl-PLF

             three girls


If they appear post-nominally, such cardinal numerals behave as nominal modifiers and agree with the preceding noun in definiteness, yet the rest of the feature values for NUMBER and GENDER remain mismatched.


(41)   l-awlād            θ-θalāθ-ah
       DEF-boy.PLM   DEF-three-SGF

       the three boys


Post-nominally, the cardinal numeral can attach a clitic pronoun forming a CS. The pronoun corefers with the preceding noun, and hence triggers agreement in PERSON, GENDER and NUMBER. The meaning that results is now not merely 'the three boys', but: 'the boys, the three of them'.


(42)   l-awlād            θalāθ-at-hum
       DEF-boy.PLM   three-SGF-3PLM.GEN

       the boys, three of them


Cardinals can stand on their own, and substitute nominals. This we have seen to be the case with ordinal numeral counterparts, as well as demonstratives and adjectives.


(43)   θ-θalāθah          safar-u
       DEF-three.SGM   travel.PFV.3-PL

       The three have traveled.

## 2.3.4 Relative clauses

Arabic has two main types of relative clauses.[14] With a definite antecedent, a relative clause is introduced by the complementizer *illi*, followed by the rest of the clause as illustrated in (44).[15]

(44) l-walad   illi     jā
     DEF-boy  COMP come.PFV.3SGM
     the boy that came

With an indefinite antecedent, the complementizer *illi* is not present, and in this case, we have a 'bare' clause.[16]

(45) walad  jā
     boy    come.PFV.3SGM
     A boy that came

*illi* can also introduce free relative clauses. Such free relatives, as in (46), take a nominal functional, and can indeed also substitute a NP. Free relatives lack an antecedent, and for this reason are referred to as *headless* relative clauses.[17]

(46) gābal-t     illi    jā
     meet.PFV-1SG COMP come.PFV.3SGM
     I met the one who came.

To recapitulate, I have in this section given an overview of the ways in which nominals can be modified. I have discussed demonstratives, adjectives, numerals, and relative clauses which occur in various positions to form a modifier-head relation. These structures can precede or follow the noun. In other words, they are dependents, since they are governed by the noun.

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[14]For more information about relative clauses in Arabic, see Alqurashi (2012).

[15]Aoun et al. (2009) assume that *allaði* in MSA, which is the counterpart of *illi* in HA, is a complementizer. In MSA, this complementizer is inflected for GENDER and NUMBER. This is not the case with HA *illi*.

[16]Note that (45) cannot ever mean: *The boy came*, as, as illustrated in Section 2.1 in Chapter 1, HA does not allow SVO clauses to be introduced by indefinite subjects.

[17]See Sadler and Camilleri (2018) for a discussion of FRCs introduced by the complementiser *(il)li* in Arabic.

## 2.4   HA Quantifiers

Quantifiers are another set of items that interact with nominals but in a different way from usual modifiers. This section highlights the main properties of quantifiers in HA. I primarily intend to describe the distribution of quantifiers in this chapter. While they interact with nouns in building the noun phrase, very often in very much the same way as nouns as the first element of a construct state does, displaying similar syntactic properties to ordinary nouns, it can be argued that quantifiers are nominals, and by contrast, are not determiners that somehow form a QP that then takes the NP as its dependent. Moreover, this section will also aim to capture the semantic status of the quantifiers, which sets the stage for a later discussion in another chapter. Having said this, it will be shown that while agreement on the predicate is mainly controlled by the head of the construct, we will see that this is usually not the case, when *kull* seemingly functions as the head of the morphological construct, taking a noun as its complement. This in turn suggests, as we will see, that it is not the head of the structure.

Arabic quantifiers can be used in three possible patterns:

1. They can stand alone in the nominal phrase;

2. They can occur pre-nominally;

3. or post-nominally.

When quantifiers occur on their own, they must be marked with the definite article (prefix *l-*), as in (**??**), meeting the minimum requirement of what being able to function as a NP entails.

We here start by exemplifying quantification with *kull* 'all'.

(47) l-kull    jā            l-ḥaflah
     DEF-all come.PFV.3SGM DEF-party

All came to the party.

The omission of the definite article results in ungrammaticality, as shown in (48).

(48)  *kull jā              l-ḥaflah.
      all   come.PFV.3SGM DEF-party
      All have came to the party.

This is not the same as in MSA, and other Arabic beduin dialects, such as Najdi Arabic. In such varieties, the -*n* marker is available, and can attach onto *kull* (Brustad 2000). Consider the following examples from MSA (49a) and Najdi (49b).

(49)  a.  kull-u-n           ʔanhā               ʔaʕmāla-hu
          all-NOM-INDEF finish.PFV.3SGM work-3SGM.GEN
          Everyone finished their work.                                   MSA

      b.  kill-in     jā              l-ḥaflah
          all-INDEF come.PFV.3SGM DEF-party
          Everyone has came to the party.                          Najdi Arabic

Another structure of quantifiers which is more generally used in HA is their formation of a CS. The structure is different from that of simple quantifiers (on both syntactic and semantic grounds). A construct state construction is typically one that involves construct head nouns. Here it consists of two elements, but where this time the head noun is the quantifier, which must be bare (no marker). The CS head is then followed by another noun, which can be either definite (50a) or indefinite (50b). While we here have a structure that morphologically and syntactically parallels that of CSs involving nouns, the function is here not the same, as we will see. Starting with, for example, we do not have the wide range of head and argument relationships which we have seen with the normal construct state nouns, and neither do we have a possessive relation. For this reason, therefore, sameness in the morphosyntax

of the construct does not imply the same sort of relation(s) we have observed
when we had N + N combinations.

(50)   a.   kull   l-awlād        sāfar-u
            all    DEF-boy.PLM travel.PFV.3-PL
            All of the boys traveled.


       b.   kull   walad   sāfar         maʕ   ahl-uh
            all    boy     travel.PFV.3SGM with family-3SGM.GEN
            Every boy traveled with his family.

Pre-nominal quantifiers cannot be separated from their NPs, as illustrated in
the ungrammaticality of (51). This is once again expected from the fact that
a bare quantifier preceding a NP forms a construct state construction.

(51)   *kull   sāfar-u          l-awlād
        all    travel.PFV.3-PL DEF-boy.PLM
        The boys all have traveled.

Adjective modifiers must follow the whole structure, and depending on the
definiteness of the whole construction, which itself depends on the definiteness
of the inner complement noun, the adjective displays agreement in (IN)DEF
with the inner noun, accordingly.

(52)   a.   kull   l-awlād        š-šāṭr-īn
            all    DEF-boy.PLM DEF-excellent-PLM
            all of the good boys


       b.   kull   walad   šāṭir

            every boy.SGM excellent.SGM

            every good boy

The absence of DEFINITENESS agreement results in ungrammaticality, as in
(53).[18]

---

[18](53a) would be grammatical, if the reading of 'excellent' is predicative, rather than
attributive.

(53)  a.  *kull l-awlād      šāṭr-īn
          all    DEF-boy.PLM excellent-PLM

          all of the good boys


      b.  *kull walad š-šāṭir

          every boy.SGM DEF-excellent.SGM

          every good boy


The construct state involving the quantifier along with the inner noun can
appear in any argument position; as a subject like what we have seen in (50a),
object (54a), or an object of a P (54b) as illustrated below.


(54)  a.  šuf-t         kull l-ban-āt
          see.PFV-1SG all   DEF-girl-PLF

          I saw all of the girls.


      b.  t-kallam-t          maʕ kull l-ban-āt
          RECIP-talk.PFV-1SG with all   DEF-girl-PLF

          I talked with all of the girls.


In MSA, the quantifier can carry NOMINATIVE, ACCUSATIVE, or GENITIVE
case, as shown in (55), and like nouns functioning as construct heads, quanti-
fiers invariably assign GENITIVE case to the inner noun (Benmamoun, 1999).


(55)  a.  kull-u      ṭ-ṭullāb-i          jāʔ-ū
          all-NOM DEF-student.PLM-GEN come.PFV.3-PL

          All of the students came.


      b.  raʔay-tu       kull-a  ṭ-ṭullāb-i
          see.PFV-1SG all-ACC DEF-student.PLM-GEN

          I saw all of the students.


      c.  kitāb-u      kull-i  ṭ-ṭullāb-i
          book-NOM all-GEN DEF-student.PLM-GEN

          all of the students' book                                    MSA

| Quantifiers | Nouns |
|---|---|
| kulla-na 'all of us' | awlād-na 'our boys' |
| kulla-kum 'all of you' | awlād-kum 'your boys' |
| kulla-hum 'all of them' | awlād-hum 'their boys' |

Table 2.3: The formation of CS with *kull* and parallels of NP CS formations

Quantifiers can host the same set of pronominal clitics as nouns. This is illustrated through Table (2.3) for the HA data set.[19]

An examplification of this is (56).[20]

(56)  kulla-hum        sāfar-u
      all-3PLM.GEN travel.PFV.3-PL
      All of them have traveled.

The quantifier can appear post-nominally. When it does, it must itself be in a CS form involving a pronominal form, as just illustrated above. The pronominal form internal to this morphological construct must corefer with, and display agreement in PERSON, NUMBER, and GENDER with the binding noun, as illustrated in (57). An in-depth discussion of *kull*+prn will follow in Chapter 4.

(57)  l-awlād          kulla-hum    safar-u
      DEF-boy.PLM all-3PL.GEN travel.PFV.3-PL
      The boys all have traveled.

Below we consider the different syntactic structures in which quantifiers can appear. I here choose to mainly represent such data through the use of *kull*. At times, however, I do make reference to other quantifiers.

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[19]Although the formation morphologically looks like a CS, functionally it is not, as we will argue in Chapter 5. Through the HPSG analysis to be provided, I will have a means of still treating it as the head, rather than as a specifier or a D/Q, yet will at the same time, still be able to capture the agreement facts.

[20]In (56) what we have is a case of a morphological CS-formation of the quantifier that takes on a subject position, as it seems to be *substituting* the subject NP. However, I will argue that we cannot treat this as a subject. We will see in Chapter 4 that this occurrence of *kull*+prn will not be analysed as a grammatical function, i.e. subject, in this case, but as a modifier.

## 2.4.1 Simple Quantifiers

Simple quantifiers can attach a definite article and appear in all argument positions in which nouns can appear, i.e subject, object, and object of preposition.

(58) a. l-kull    jā           l-ḥaflah
DEF-all come.PFV.3SGM DEF-party
All have came to the party.                                          (SUBJ)

   b. gābal-t        l-kull
meet.PFV-1SG DEF-all
I met all.                                                            (OBJ)

   c. t-kallam-t        maʕ l-kull
RECIP-talk.PFV-1SG with DEF-all
I talked with all.                                                  (OBJ of P)

The quantifier *baʕḍ* can also stand on its own.

(59) l-baʕḍ     jā           l-ḥaflah
DEF-some come.PFV.3SGM DEF-party
Some have came to the party.                                          (SUBJ)

The above behavior is similar to what one finds in English, were quantifiers such as *all*, *both*, and *half* can be used on their own as arguments in a structure (Quirk et al., 1985).

(60) All were happy.

In MSA, the quantifier *kull* can also stand on its own. Once again, when it does so, it bears NOMINATIVE, ACCUSATIVE, or GENITIVE case, accordingly, depending on the argument position it is in.

(61) a. l-kull-u      raḥal
DEF-all-NOM leave.PFV.3SGM
All left.                                                            (SUBJ)

b. šāhad-tu       l-kull-a        hunāk
   see.PFV-1SG  DEF-all-ACC  there
   I saw all there.                                                  (OBJ)

c. ta-ḥaddaθ-tu        maʕa  l-kull-i     bi-šaʔni-hi
   RECIP-talk.PFV-1SG  with   DEF-all-GEN  with-matter-3SGM.GEN
   I talked with all about him.                                    (OBJ of P)

The quantifiers *baʕḍ* 'some' and *jamīʕ* 'all' can also stand on their own in MSA:

(62) a. l-baʕḍ-u          raḥal
        DEF-some-NOM  leave.PFV.3SGM
        Some left.

    b. l-jamīʕ-u         raḥal
        DEF-all-NOM  leave.PFV.3SGM
        All left.

A difference between *kull* vs other quantifiers in MSA is that while the former can take the *-n* marker, other quantifiers cannot, hence the distinct behaviours in (63), where *-n* marked *kull* can appear pre-verbally, but not the *-n* marked *baʕḍ*.

(63) a. kull-u-n             ʔanhā                ʔaʕmāla-hu
        every-NOM-INDEF  finish.PFV.3SGM  work-3SGM.GEN
        Everyone finished their work.

    b. *baʕḍ-u-n           ʔanhā                aʕmāla-hu
        some-NOM-INDEF  finish.PFV.3SGM  work-3SGM.GEN
        Some have finished their work.                              MSA

Examples involving quantifiers in such form can only be used with reference to [+Human] nouns. This use is exclusive to human referents and cannot be used to refer to inanimate items or non-humans. When faced with a sentence containing the quantifier *kull*, two agreement options become available on the predicate. These reveal a number of puzzles that need to be reviewed in what

follows.

It is assumed in traditional Arabic grammar textbooks that Arabic quanti-
fiers are invariantly masculine singular (Parkinson (1975)). This assumption
comes from the fact that masculine singular quantifiers are morphologically
like nouns, in the sense that both the masculine value, as well as the singular
value are unmarked, i.e such values have no special affixes that mark them as
such. Evidence that they must be at least masculine comes from the inability
to have 3SGF agreement on the verb-form, as shown in (64).

(64)  *l-kull  jā-t             l-ḥaflah
       DEF-all come.PFV-3SGF DEF-party
       All have came to the party.

This is in contrast with their ability to trigger alternate 3SGM and 3PL
agreement on the verb, as in (65), depending on what reading is being expressed
by *kull*, as will be exemplified in more detail below.

(65)  a.  l-kull  jā             l-ḥaflah
          DEF-all come.PFV.3SGM DEF-party
          Everyone has came to the party.

      b.  l-kull  ju             l-ḥaflah
          DEF-all come.PFV.3-PL DEF-party
          All have came to the party.

The fact that we can have plural marking on the predicate, as in (65b) leads
us to question how is it the case that the quantifier triggers plural agreement
on the predicate, especially in the light of what traditional grammar has to
say with respect to *kull*. Note that this alternate 3SGM/3PL agreement on the
verb is not only triggered in the case of the quantifier *kull*. Collective nouns
seem to behave like simple quantifiers, allowing the trigger of either singular
or plural agreement on the predicate, even if at the morphological level, they

are singular nouns (see Fassi Fehri (2012); Fassi Fehri (2018); Mathieu (2012); Mathieu (2014), for more details).[21]  Collective nouns in HA include *grōp* 'group', *farīg* 'team', *jīl* 'generation', etc., which can all trigger either singular or plural agreement on verb (66).

(66)  a.  l-grōp      jā
          DEF-group come.PFV.3SGM
          The group came.


      b.  l-grōp   ju
          DEF-all come.PFV.3-PL
          The group came.

Below we consider the distinct semantics that could be playing a role in the determination of the different agreement patterns.

### 2.4.1.1   The semantics of *kull*

There appears to be a semantic difference within sentences that involve a predicate that is singular or plural, as in the contrast in (65).  Here I shall attempt to find an explanation that can translate into a difference observed in the grammar.  *kull* in simple constructions need not express a quantifier function, but can be used simply to designate a group.  Perhaps the most obvious different treatment from this is when the quantifier triggers singular agreement on the predicate.  This is generally a fact that reflects the underlying distributive meaning of the sentence.  In (65a), a distributive reading obtains if each person came to the party.  However, the availability of a distributive interpretation disappears when the predicate is plural, as in (65b), where a collective interpretation is present instead.  This distribution may be easier to comprehend and make sense of, when an indefinite object is involved, as in (67), where a collective reading results, when plural agreement is present in

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[21]Jackendoff (1968) too argues that English quantifiers share many syntactic and semantic properties with commitative nouns such as *group*, *herd*, etc.

(67b). Here we essentially get a non-distributive reading, whereby there is a single/unique prize that is won by all.

(67)  a.  l-kull     axað          jāyzah
          DEF-all receive.PFV.3SGM prize
          Everyone has received a prize.


      b.  l-kull     axað-u        jāyzah
          DEF-all receive.PFV.3-PL prize
          All have received a prize.

It seems reasonable to question whether the quantifier *kull* should be translated as English 'all' or 'every'. A defining difference between the two readings can be explained through the following contrast in (68), which essentially parallels what we had in (67).

(68)  a.  l-kull     šāl           ʕalam s-suʕūdiyyah
          DEF-all carry.PFV.3SGM flag    DEF-Saudia
          All (people) have carried Saudi Arabia's flag.


      b.  l-kull     šāl-u         ʕalam s-suʕūdiyyah
          DEF-all carry.PFV.3-PL flag    DEF-Saudia
          All (people) have carried Saudi Arabia's flag.

In (68a), the predicate is understood as applying to each individual member, and can be paraphrased as: *Each one carried a (single individual) flag.* In (68b), on the other hand, the sentence structure appears to be viewing the subject as a collective group. The reading refers to an event in which all (people) have participated in the carrying of a single flag. Further evidence for the collective reading of *al-kull* can be found by considering collective predicates. Such predicates are often understood in opposition to distributivity. It often applies to a plural entity as a whole, as opposed to its application to the individuals that form this entity. The singular form is ungrammatical with collective predicates such as *gather*, which require a collective noun. The fact that we can only have the presence of *al-kull* in the context of the plural form

of the verb, further enhances the availability of the collective reading with
respect to *al-kull*.

(69)  a.  *l-kull   ti-jammaʕ
          DEF-all  REFL-gather.PFV.3SGM
          Each (one) gathered.

     b.  l-kull   ti-jammaʕ-u
          DEF-all  REFL-gather.PFV.3-PL
          All gathered.

Fassi Fehri (2018) states that *kull* in MSA expresses the meaning of 'each'
if it combines with the indefinite marker *-n*, or in the partitive structure where
it combines with a PP:

(70)  a.  kull-u-n           min-nā
          each-NOM-INDEF  from-1PL.GEN
          each of us

     b.  kull-u-n           mina n-nuzalāʔ-i
          each-NOM-INDEF  from  DEF-inhabitant.PLM-GEN
          each of the inhabitants                                            MSA

In these constructions, the PP complement must be a definite noun. Fassi Fehri
(2018) assumes that the interpretation of 'each' can only be found in these
constructions, and only there does it enforce a distributive reading.

### 2.4.1.2   Generic interpretation

Another difference between *al-kull* in relation to a singular or plural pred-
icate is that the plural predicate may not be semantically coherent in generic
sentences. Generic sentences in Arabic can only be expressed with the definite
marker prefixed onto the noun. Consider:

(71)  a.  l-kilāb         ti-nbaḥ
          DEF-dog.PLM  3SGF-bark.IMPV
          Dogs barks.

    b. *kilāb   ti-nbaḥ
       dog-PLF 3SGF-bark.IMPV
       Dogs barks.

As shown in (71), Arabic nouns must be definite marked in order to express a generic interpretation. By the same parallel, it thus becomes understandable why a generic reading with *kull* must therefore also involve the presence of the definite article, i.e. *al-kull*. However, beyond a definite reading, *al-kull* in such a context is more likely to associate with a distributive reading, as shown from the fact that singular agreement is more likely on the predicate, rather than a plural form.

(72)  a. l-kull   Ɛind-u      Ɛyūn
       DEF-all have.3SGM.GEN eye.PLF
       Everyone has eyes.

     b. ?l-kull  Ɛinda-hum     Ɛyūn
       DEF-all have.3PLM.GEN eye.PLF
       All have eyes.

Observe once again that the interpretational reference in all of the examples is primarily [+Human]. Furthermore, we see that the discourse context is an important source from where to get to the quantifier meaning. It seems that *kull* in simple constructions includes reference to a [+Human], which may in turn be understood as either referring to an individual or to a collection.

## 2.4.2 Construct State Quantifiers

We here discuss the other syntactic context where *kull* and other quantifiers can appear. Quantified construct state constructions are the morphosyntactic structures in which quantifiers occur most frequently, in HA. A typical example is given in (73).

(73) kull l-awlād    sāfar-u
     all   DEF-boy.PLM travel.PFV.3-PL
     All of the boys traveled.

Within the HA quantified construct state, the verb agrees in NUMBER and
GENDER with the complement noun, and not with the head quantifier. This
is yet another key difference from what we have seen with nominal CSs, where
the verb agrees with the head noun in GENDER and NUMBER. Contrast the
following in (74) and in (75).

(74)  a.  axwān          l-walad        sāfar-u
          brother.PLM  DEF-boy.SGM  travel.PFV.3-PL
          The boy's brothers have traveled.

      b.  kull l-awlād        sāfar-u
          all   DEF-boy.PLM  travel.PFV.3-PL
          All the boys have traveled.

(75)  a.  bint        l-mudīr        jā-t
          girl.SGF  DEF-head.SGM  come.PFV-3SGF
          The head's daughter came.

      b.  kull  bint      tu-ḥubb       l-mēkab
          every girl.SGF  3SGF-love.IMPV  DEF-makeup
          Every girl loves make up.

Other quantifiers such as *baʕḍ* 'some', *aɣlab* 'most', and *akθar* 'most' can
also be found to be used in such constructions, as illustrated below in (76).[22]

(76)  a.  baʕḍ l-awlād        sāfar-u
          some DEF-boy.PLM  travel.PFV.3-PL
          Some of the boys traveled.

---

[22]*baʕḍ* can be used as a reciprocal to mean 'each other' or 'together'.

 (i)  a.  l-awlād         yu-ḥobb-u       baʕaḍ
          DEF-boy.PLM  3-love.IMPV-PL  each other
          The boys love each other.

      b.  l-awlād         yi-lʕab-u        maʕ baʕaḍ
          DEF-boy.PLM  3-play.IMPV-PL  with each other
          The boys play together.

    b.  aɣlab l-awlād      sāfar-u
       most  DEF-boy.PLM travel.PFV.3-PL
       Most of the boys traveled.

    c.  akθar l-awlād      sāfar-u
       most  DEF-boy.PLM travel.PFV.3-PL
       Most of the boys traveled.

The quantifiers *akθar* 'most' and *aɣlab* 'most' are superlatives, and can be used to express the meaning of 'most', and can be combined with both singular and plural definite nouns. Hallman (2016) points out similarities in the interpretation and distribution of these superlative quantifier forms with the quantifier *kull*. He extends the treatment of the English quantifier 'most' along the lines of e.g. Gawron (1995); Hackl (2009); Teodorescu (2009). Such treatment entails a claim that *most students* describes a plurality of students more numerous than any other plurality of students. Hallman (2016) claims that in Arabic, *kull* 'every/all' and *akθar* 'most' are superlatives but differ as to whether the pluralities they compare with in cardinality, are allowed to overlap or not. The possibility of overlap in the comparison of cardinality is what gives *kull* its universal character. He claims that quality and quantity superlatives both contain the superlative morpheme *ʔaCCaC*, while *kull* denotes a variation on the meaning of *ʔaCCaC*, which is what gives it its universal force.[23] Hallman's appealing semantic analysis is certainly worth exploring, but is beyond the scope of the thesis, which I mainly restrict to the morphosyntax of *kull*.

What is clear here is that the constructions are morphosyntactically CS formations, and through which structures, the quantifier enables a partitive relation between the quantifier and the morphosyntactic complement noun.

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[23]Hallman (2016) also proposes that *all* and *most* in English are both superlative forms, and differ only with respect to what they consider to be a distinct sub-part of the plural individual that their nominal complement denotes.

The quantifier *kull* is a special quantifier as the interpretations of this quantifier when in combination with an inner noun (definite or indefinite, mass or count) in a CS associates *kull* with a different meaning. When *kull* in such CS constructions combines with plural nouns, as in (73), repeated below as (77), it can be translated as 'all'. In contrast, *kull* can combine with a singular, indefinite noun, and in that way it has the meaning of 'every' (Ryding, 2005), as in (78).

(77)  kull  l-awlād
      all   DEF-boy.PLM
      All of the boys

(78)  a. kull   walad
         every  boy
         every boy

      b. kull   yōm
         every  day
         every day

In combination with a definite singular noun, unlike the plural in (77) above, *kull* then takes the meaning of 'whole'.

(79)  a. kull    l-ʕālam
         whole   DEF-world
         the whole world

      b. kull    l-yōm
         whole   DEF-day
         the whole day

When *kull* combines with a definite noun this can be either an uncountable or countable noun. This implies that *kull* therefore has a wider interpretational

distribution with such definite nouns, than when in combination with indefinite nouns restricted to individuals.

*kull* can be also found in an adverbial position, as illustrated in (80), where *kull* in relation to *yōm* 'day', denotes a time span, and for this reason, this functions as a modifier to the predicate.

(80) ʔa-gra         bi-l-maktabah kull   yōm
     1SG-read.IMPV in-DEF-library every day
     I read at the library every day.

Parallel behaviour can be observed with *baʕḍ*.

(81) ʔa-gra         bi-l-maktabah baʕḍ l-marrāt
     1SG-read.IMPV in-DEF-library some DEF-time-PLF
     I read in the library some times.

A difference between MSA and HA is the fact that MSA also involves paradgimatic forms that express a totality of two, through the availability of the dual forms *kilā* 'all.DU.M' and *kiltā* 'all.DU.F' as in (82). Such forms are however not found in HA. These forms in MSA mean 'both'. A constraint that emerges with respect to their function is the fact that they must be followed by a definite dual noun, which is what additionally bolsters their interpretation of a DUAL NUMBER value.[24]

(82) a. kilā        ṭ-ṭālib-ayni
        both.DU.M DEF-student.M-DU.GEN
        both of the (male) students

     b. kiltā       ṭ-ṭālib-at-ayni
        both.DU.F DEF-student-F-DU.GEN
        both of the (feminine) students                                    MSA

---

[24]We have seen this same DEF restriction in the context of adjectival constructs in Section 3.2.

**2.4.2.1    A closer look at *kull***

We have seen that the quantifier *kull* can be used in contexts meaning
'every', 'whole' and 'all', and can be distributive and collective, depending on
the context, or on the morphosyntactic features of the complement it combines
with. In predicative positions, the cannot stand on its own, and requires a
complement.

(83)  a.  *l-awlād        kull
          DEF-boy.PLM all
          *the boys are all


      b.  l-awlād        kulla-hum       ašgiya
          DEF-boy.PLM all-3PLM.GEN naughty.PLM
          The boys are all naughty.


*kull* is able to express the meaning of 'each' in combination with an indef-
inite noun in a CS that is then followed by a PP. Such a reading comes about
in (84).[25]

(84)  kull  walad      min  l-awlād
      each boy.SGM from DEF-boy.PLM
      each boy of the boys


The three CS structures in which *kull* can be found, i.e. *kull* + Def N; *kull*
+ Indef N; and *kull* + Indef N + PP, express different readings: 'each', 'every',
and 'all'. To disambiguate between these readings, Fassi Fehri considers these
different structures when modified by the adjective 'different', given how this
adjective is an unambiguous marker of a true *distributed share* status. As illus-
trated through both (85) for HA, and (86) for MSA, only quantifiers that mean
'every' and 'each' can have a distributive reading, hence the incompatibility of
the *kull* + Def N structure with the adjective 'different'.

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[25]This is not the equivalent of the construction in which the quantifier is in a free state,
as we will see in the analysis in Section 3.4.4 as I am assuming that the PP is a complement
of 'boy'. This means that the PP is in fact internal to the inner NP that forms a CS with
*kull*.

(85)  a.  gara                kull   walad  kitāb        γēr
          read.PFV.3SGM every  boy    book.SGM different.SGM
          Every boy read a different book.                       *kull* + Indef N

      b.  gara                kull  walad  min  l-awlād        kitāb
          read.PFV.3SGM each  boy    from  DEF-boy.PLM book.SGM
          γēr
          different.SGM
          Each boy of the boys read a different book.     *kull* + Indef N + PP

      c.  *gara-u            kull  l-awlād       kitāb      γēr
          read.PFV.3-PL  all    DEF-boy.PLM book.SGM different.SGM
          *All of the boys read a different book.              **kull* + Def N

(86)  a.  qaraʔa            kull-u       ṭālib-in           kitāb-a-n
          read.PFV.3SGM every-NOM student.SGM-GEN book-ACC-INDEF
          muxtalif-a-n
          different.SGM-ACC-INDEF
          Every student read a different book.                  *kull* + Indef N

      b.  qaraʔa            kull-u-n    kitāb-a-n
          read.PFV.3SGM each-NOM  book.SGM-ACC-INDEF
          muxtalif-a-n
          different.SGM-ACC-INDEF
          Each read a different book.                              *kull* - Indef

      c.  *qaraʔa            kull-u     ṭ-ṭullāb-i
          read.PFV.3SGM all-NOM  DEF-student.PLM-GEN
          kitāb-an                muxtalif-a-n
          book.SGM-ACC-INDEF different.SGM-ACC-INDEF
          *All of the students read a different book.     **kull* + Def N - MSA:

          (Fassi Fehri, 2018)

Fassi Fehri (2018) states that the difference between the meanings of 'each' and 'every' is that 'every' is a weak distributive universal quantifier, and can be used in generic contexts, whereas 'each' can serve as a strong distributer.

(87)  a.  kull-u        kalb-i-n              la-hu            ðayl-u-n
          every-NOM dog.SGM-GEN-INDEF to-3SGM.GEN tail-NOM-INDEF
          Every dog has a tail.

   b.  kull-u-n          mina l-kilāb-i          la-hu
      each-NOM-INDEF of    DEF-dog.PLM-GEN to-3SGM.GEN
      ðayl-u-n
      tail-NOM-INDEF
      Each of the dogs has a tail.    non-generic only - MSA: (Fassi Fehri,
      2018))

*kull* meaning 'every' in (87a) can make room for a generic use, as it is a claim about dogs in general, whereas in (87b), *kull* 'each' is about specific dogs that may have been previously mentioned in the discourse. However, both 'each' and 'every' are distributive, in contrast with 'all', as in (86c).

### 2.4.2.2   Clitic pronouns vs. nouns as complements

Internal to the construct state construction, we can have the quantifier followed by a pronominal clitic, rather than a NP, as illustrated through (88)

(88)  a.  kulla-hum
        all-3PL.GEN
        all of them

     b.  baʕḍa-hum
        some-3PL.GEN
        some of them

These constructions are similar to ordinary NPs and can serve as arguments in the sentence. However, we will see that quantifier *kull* is different from other quantifiers, with respect to two important points:

1. The agreement triggered on the verb;

2. and the constraint observed in its ability to serve as an argument.

When it comes to agreement, we observe that the verb fully agrees with the morphological complement of *kull*, as illustrated through (89), independent of the SVO or VSO order of the constituents. We have also seen this to be the case when the inner N of the CS formed with *kull* is a NP.

(89)  a.  kulla-hum      sāfar-u
          all-3PL.GEN travel.PFV.3-PL

          All of them have traveled.


      b.  sāfar-u         kulla-hum
          travel.PFV.3-PL all-3PL.GEN

          All of them have traveled.


Ungrammaticality results when the verb takes a singular form, i.e. when agreement is with *kull*, instead of agreement with the morphological complement of *kull*.


(90)  *sāfar          kulla-hum
       travel.PFV.3SGM all-3PL.GEN

       All of them have traveled.


Other quantifiers, on the other hand, display distinct behaviours, when compared with what goes on with *kull*. While primarily they show distinct behaviours depending on whether a NP or a pronoun is involved in the formation of the CS, such quantifiers still display a behaviour that is different from that of *kull*. A quantifier like *baʕḍ* can optionally itself agree with the verb, as shown through the 3PL ∼ 3SGM agreement alternation on the verb in (91) irrespective of the linear order, as illustrated in (92). The difference in the contrasts in (91) and (92) is that *baʕḍ* in the context of a verb agreeing with the PL complement refers to a specific 'some of them', while, when it appears with a singular verb, it is able to refer to a nonspecific 'someone'.


(91)  a.  baʕḍa-hum       sāfar-u
          some-3PL.GEN travel.PFV.3-PL

          Some of them have traveled.


      b.  baʕḍa-hum       sāfar
          some-3PL.GEN travel.PFV.3SGM

          Some of them have traveled.

(92)   a.   sāfar-u              baʕḍa-hum
            travel.PFV.3-PL some-3PL.GEN

            Some of them have traveled.


       b.   sāfar               baʕḍa-hum
            travel.PFV.3SGM some-3PL.GEN

            Some of them have traveled.


It should be mentioned that the agreement optionality is available only when
the pronoun is referring to a [+Human] entity. This phenomenon of having a
wider range of agreement patterns in certain environments has been noted in
other languages as well, such as Russian, Serbo-Croatian, and Basque (Danon
2012). However, the alternation we can see in HA occurs only when the comple-
ment is a pronominal form referring to a [+Human] entity. Non-human nouns,
as illustrated in Section 2.3 in Chapter 1, have a different system of agreement,
where they on the other hand always trigger feminine singular agreement on
the verb.


The ability of *kull*+prn to serve as an argument is another different point
that characterises *kull* distinctly from other quantifiers, at least when forming
a morphological construct state. It is unclear if in a structure such as (93a),
*kull*+prn can be said to function as the subject. What is clear, however, is
that it cannot serve as an object or as the object of a preposition. This is in
contrast to what is allowed with *baʕḍ*, as illustrated through data such as (94).


(93)   a.   sāfar-u              kulla-hum
            travel.PFV.3-PL all-3PL.GEN

            All of them have traveled.


       b.   *šuf-t               kulla-hum
            meet.PFV-1SG all-3PL.GEN

            I met all of them.

   c. \*t-kallam-t       maʕ kulla-hum
      REFL-talk.PFV-1SG with all-3PL.GEN
      I talked with all of them.

All other quantifiers, on the other hand, can occur in subject functions, object, or object of prepositions. Consider the following, represented through the quantifier *baʕḍ*.

(94)  a. sāfar-u      bʕḍa-hum
       travel.PFV.3-PL all-3PLM.GEN
       Some of them have traveled.

     b. šuf-t       baʕḍa-hum
       meet.PFV-1SG some-3SGM.GEN
       I met some of them.

     c. t-kallam-t      maʕ baʕḍa-hum
       REFL-talk.PFV-1SG with some-3SGM.GEN
       I talked with some of them.

In Chapter 4, it will become clearer that what could be preventing the 3SGM agreement option on the verb in contexts involving *kull*+prn, as illustrated in (90), along with the seeming restriction to a subject position in (93a), is because *kull*+prn is not itself the subject of the construction. Rather, as I will argue in Chapter 4, *kullahum* in such as subject position functions as a modifier of a *pro* subject, and it is that *pro* subject, which is expressed via the 3PL inflection on the verb, which is that which functions as the subject.

### 2.4.2.3   Relative clause as a complement

In HA, quantifiers can be followed by a free relative clause, and together, form a construct state. Consider the following constructions:

(95)  a. kull [illi    gābal-ta-hum]
       all  COMP meet.PFV-1SG-3PL.GEN
       all of whom I met / all of the ones that I met

    b. baʕḍ [illi    gabal-ta-hum]
        some COMP meet.PFV-1SG-3PL.GEN
        some of whom I met / some of the ones that I met

Instances such as (95) are frequent with the quantifiers. In this context, the relative clause functions as the inner NP with which the quantifier is able to build a CS. Note that although not given much prominence in the descriptions, this sort of construction is not only used with quantifiers, but can similarly be found with nouns. Although a CP, it is able to substitute a NP, and therefore able to form a CS.

(96) axo    illi    gābal-ta-ha
     brother COMP meet.PFV-1SG-3SGF.GEN
     the brother of whom I met / the brother of the one that I met

*kull*, but not other quantifiers, can be also used with the relative marker *mā*, which introduces a free relative clause. Once again, it is a CS formation that results. However, the difference is such that this particular structure renders an adverbial FRC meaning 'whenever'.

(97) kull mā    sāfar-t,        it-ʕallam-t
     all  COMP travel.PFV-3SGF, REFL-learn.PFV-1SG
     Whenever I traveled, I learned

## 2.4.3   Partitive Quantifiers

Similar to nouns in a free state form quantifiers can also occur in a construction involving the preposition *min* 'from' + Def NP, thus assigning a set from which the quantifier can select. Quantifiers such as *baʕḍ* 'some', *kaθīr* 'many' and *galīl* 'few' can be used in such constructions, where they form a partitive relation with their PP complement. Recall from Section 4.2 that *kull* cannot participate in this exact same structure. Possibly this is because of the different semantics attributed to *kull*, where the universal quantifier can either be understood in the totality of the noun it is referring to, or to its individual

distribution.

In such structures, the verb always agrees with the PERSON, NUMBER, and GENDER of the Def NP internal to the PP (98).

(98) a. kaθīr min l-awlād sāfar-u
     many of DEF-boy.PLM travel.PFV.3-PL
     Many of the boys have traveled.

    b. galīl min l-awlād sāfar-u
     few of DEF-boy.PLM travel.PFV.3-PL
     Few of the boys have traveled.

    c. baʕḍ min l-awlād
     some from DEF-boy.PLM
     some of the boys

When partitive quantifiers appear post-nominally, they function very much like attributive adjectives, in relation to the noun (99).

(99) a. awlād kaθīr sāfar-u
     boy.PLM many travel.PFV.3-PL
     Many boys have traveled.

    b. awlād galīl sāfar-u
     boy.PLM few travel.PFV.3-PL
     Few boys have traveled.

Like adjectives, they can also occur in a predicative position, as follows in (100):

(100) a. l-awlād kaθīr-īn
      DEF-boys.PLM many-PL
      The boys are many.

     b. l-awlād galīl-īn
      DEF-boy.PLM few-PL
      The boys are few.

This is also true of English quantifiers such as *few* and *many*, as these are also quantifiers that can be used as attributive adjectives, and in predicative positions. However, different from English, these HA quantifiers cannot be modified by a degree modifier such as 'very'. This in turn makes them seem to function more like a noun, than an adjectives.

(101)  *kaθīr marrah min l-awlād     sāfar-u
        many  very  of  DEF-boy.PLM travel.PFV.3-PL
       Intended: Too many of the boys have traveled.

It should be noted that *galīl* and *kaθīr* have superlative forms associated with them: *agall* and *akθar*. While we have mentioned *akθar* in Section 4.2, where it was shown how it participates in a CS construction, there is, on the other hand, no quantifier function associated with *agall* that expresses any proportional reading. It is only a superlative structure that can be available, when using this form, as illustrated in the contrast in (102).

(102)  a. *agall l-awlād      sāfar-u
          fewest DEF-boy.PLM travel.PFV.3-PL
          *Fewest of the boys have traveled.

       b. l-awlād       agall min l-ban-āt
          DEF-boy.PLM fewer from DEF-girl-PLF
          The boys are fewer than the girls.

What could be argued for, given these varied behaviours, is that while quantity words and adjectives may involve the same sort of semantics, they can nevertheless be available in a number of different configurations.[26] However, in their pre-nominal uses, they are nouns, particularly given their lack of degree modification. This is what I will be discussing for quantifiers more broadly, in what follows.

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[26]That quantifiers and adjectives may involve the same sort of semantics has a modest history of support in linguistic semantics (Bresnan (1973); Cresswell (1976); Hoeksema (1983); Grosu and Landman (1998); and Partee (2004)), based on the fact that quantity words can form comparatives and superlatives.

### 2.4.4 Quantifier modification

We have seen that with prototypical nominal forms, the N heads a construction where it triggers GENDER and NUMBER agreement on the predicate, or concord with the NP-internal attributive adjective. Quantifiers do not. As a matter of fact, NP modifiers such as attributive adjectives or relative clauses cannot modify quantifiers. Rather, they target modification of the nominal, as in (103), with 3SGM agreement targeting the quantifier resulting in ungrammaticality, as in (104). This suggests that these quantifiers do not inflect for NUMBER and GENDER, as assumed in literature.

(103)  a.  kull  l-awlād     l-ḥilw-īn
            all   DEF-boy.PLM DEF-beautiful-PLM
            all the handsome boys

      b.  kull l-awlād     illi   gābal-ta-hum
            all   DEF-boy.PLM COMP meet.PFV-1SG-3PLM.ACC
            all the boys who I met

(104)  a.  *kull l-awlād     l-ḥilw
            all    DEF-boy.PLM DEF-beautiful-SGM
            all the handsome boys

      b.  *kull l-awlād     illi   gābal-t-uh
            all    DEF-boy.PLM COMP meet.PFV-1SG-3SGM.ACC
            all the boys who I met

Quantifiers, on the other hands, can be modified by the approximating adverb *tagrīban* 'almost', since this adverb invokes the idea of a full set.

(105)  a.  tagrīban l-kull    sāfar
            almost   DEF-all travel.PFV.3SGM
            Almost all have traveled.

      b.  tagrīban kull l-awlād     sāfar-u
            almost   all   DEF-boy.PLM travel.PFV.3-PL
            Almost all of the boys have traveled.

This thus constitutes yet another distinction from what we observe with respect to modification with nouns.

## 2.5  Quantification in the scope of negation

The quantifier's interaction with the scope of negation has received a lot of attention in the theoretical literature, as the scope reading can be interpreted in two distinct ways, depending on whether the negation has a wide or narrow scope with respect to the quantifier (Horn (1989); Jackendoff (1972); Lasnik (1972); May (1988)).  There is an important need to shed light on HA data in order to determine what goes on in a number of sentences, and the various readings that result when compared to English.  However, difficulties arise when considering Arabic negation, due to the NEG marker's placement in the sentence.[27]  The purpose of this brief discussion is to demonstrate the interaction of the scope of negation with quantifiers.  Here I first start by considering comparative relations with English.  Consider the sentence:

(106)  All the boys didn't leave

This sentence is ambiguous between two readings.  The negation can have a wide scope over the quantifier giving the reading: *It is not the case that all the boys left* ($\neg > \forall$), or it can give the reading where the quantifier has a wide scope over negation, hence the reading: *none of them left* ($\forall > \neg$).

As discussed in the introduction to HA in Chapter 1, Section 2.5, markers of negation in verbal contexts are *lā* and *mā*, and in non-verbal contexts, *mū*.[28] Starting with the verbal negative marker *mā*, the sentence in an SV order is unambiguous, and has only one interpretation, in which the quantifier has a wide scope ($\forall > \neg$), as can be understood from the following example in (107):

---

[27]See Brustad (2000); Benmamoun (2000b); Fassi Fehri (1993), among others, for a discussion on negation in Arabic.

[28]We will here not be concerned with the negative marker *lā*, which is only present in imperative structures.

(107) kull l-awlād      mā   šāf-u          l-mubārāh
     all  DEF-boy.PLM NEG watch.PFV.3-PL DEF-match

     All of the boys didn't watch the match.    [Used in the situation where

     none of them have watched the match]

Other quantifiers such as *baʕḍ* in (108) can be available in the same syntactic environment.

(108) baʕḍ l-awlād      mā   šāf-u          l-mubārāh
     some DEF-boy.PLM NEG watch.PFV.3-PL DEF-match

     Some of the boys didn't watch the match.    [Used in a situation where

     some of them haven't watched the match]

By changing the order to VS, the negation will have a wide scope ($\neg > \forall$).

(109) mā   šāf-u          kull l-awlād      l-mubārāh
     NEG watch.PFV.3-PL all  DEF-boy.PLM DEF-match

     Not all the boys have watched the match.  [Used in the situation where

     some of the boys watched the match]

Evidence that the scope is correct, is confirmed from the ungrammaticality of (110).

(110) #kull l-awlād       mā   šāf-u          l-mubārāh,  bass
     all    DEF-boy.PLM NEG watch.PFV.3-PL DEF-match, but
     baʕḍa-hum
     some-3PL.GEN

     All the boys didn't watch the match, but some of them did.

By changing the order to VS, the negation will have wide scope ($\neg > \forall$):

(111) mā   šāf-u          kull l-awlād      al-mubārāh, bass
     NEG watch.PFV.3-PL all  DEF-boy.PLM DEF-match, but
     baʕḍa-hum
     some-3PL.GEN

     Not all the boys have watched the match, but some of them did.

(110) is contradictory.  This follows from the fact that the quantifier *kull* takes a wide scope reading over negation.  On the other hand, (111) is non-contradictory and allows for a reading where: *Some of the boys watched the match*. Thus, the factor that determines the availability of the quantifier's scopal interpretation in HA is determined by the position of the quantified noun vis-à-vis the negative marker.  This parallel effect can also be seen in object positions, where the interpretation is not perceived to be ambiguous.

(112) mā    šāf              badr   kull l-ḥalagah
      NEG watch.PFV.3SGM Bader all    DEF-episode
      Bader didn't watch all the episode.

The most natural interpretation in (112) is one in which Bader watched some of the episode, but not all of it.  In other words, *all the episode* is interpreted within the scope of negation.

With the nominal negative marker *mū*, once again there is only one interpretation. (113) can only be paraphrased to mean that it is not the case that all the boys watched the match, since the negative marker always precedes nouns, given how, as discussed in Section 2.5 in Chapter 1, the use of *mū* provides us with a constituent negation of the *kull* + Def NP.

(113) mū    kull l-awlād        šāf-u            l-mubārāh
      NEG all    DEF-boy.PLM watch.PFV.3-PL DEF-match
      Not all of the boys watched the match.

Other quantifiers, such as *baʕḍ* cannot be under the scope of negation in such a parallel syntactic environment, i.e. constituent negation.

(114) *mū baʕḍ l-awlād        šāf-u            l-mubārāh
      NEG some DEF-boy.PLM watch.PFV.3-PL DEF-match
      Intended: *Not some of the boys watched the match.

The observed behaviour is similar to the English properties associated with quantifiers (see among others Lasnik (1972); Kroch (1974); Ota (1980); Ota and Kato (1986); and Kaga (1997)), where quantifiers which inherently cannot be within the scope of negation include *some*, *several*, *most*, *a number of*, *a few*, *a little*, *a good deal of*, etc., while quantifiers which have a potential to be within the scope of negation are: *all*, *every*, *many*, *much*, *a dozen*, *a lot of*, etc.

### 2.5.0.1 Distributivity and negation

There is a difference as to what meaning is expressed by the quantifiers, when in the context of negation. Fassi-Fehri (2018) states that modification by the negative marker *laysa* in MSA can combine with *kull*. When it does, the meaning is 'all' or 'every', but not 'each'.

(115) a. laysa kull-u      lāʕib-i-n
        not    every-NOM player.SGM-GEN-INDEF
        šāraka
        participate.ACT.PTCP.SGM
        Not every player participated.

     b. laysa kull-u    l-lāʕib-īn-i       šārak-ū
        not    all-NOM DEF-player-PLM-GEN participate.ACT.PTCP.PLM
        Not all of the players participated.

     c. *laysa kull-u-n    min l-lāʕib-īn-a
        not     each-NOM of    DEF-player-PLM-ACC
        šāraka
        participate.ACT.PTCP.SGM
        *Not each of the players participated.        MSA

The fact that (115c) is ungrammatical suggests that *kull*+INDEF is essentially distributive, whereas when it is universal it takes on the meaning of 'all' or 'every', as in English.

Fassi Fehri (2018) also extends Beghelli and Stowell (1996) logic in which they claim that distributive quantifiers are ungrammatical or awkward when

they scope over negation. Beghelli and Stowell concentrate on structures involving clausal negation, such as those in (116).

(116)  a. ??Every boy didn't leave.

       b. ??Each boy didn't leave.

Fassi Fehri (2018) states that a similar contrast obtains in Arabic, as follows from the dispreferred reading in (117).

(117)  a. ??kull-u      tilmīð-i-n              lam  yu-ɣādir
          every-NOM pupil.SGM-GEN-INDEF NEG 3-quit.IMPV.SGM
          Every pupil didn't quit.

       b. *kull-u-n   mina t-tlāmīð-i          lam  yu-ɣādir
          each-NOM of   DEF-pupil.PLM-GEN NEG 3-quit.IMPV.SGM
          Each of the pupils didn't quit.                                    MSA

The behaviour of *kull* 'each' in (117b) (when it has a strong distributive reading) contrasts significantly with that in (118), where *kull* 'all' is universal, and where, as a result, is fully grammatical.

(118)  kull-u      t-tlāmīð-i              lam  yu-ɣādir-u
       all-NOM DEF-pupil.PLM-GEN NEG 3-quit.IMPV-PLM
       All of the pupils didn't quit.                                        MSA

To recapitulate, Fassi-Fehri concludes that the *kull* which means 'each' is a true distributive quantifier, while 'every' is not. If we consider *kull* meaning 'each' in HA, we observe that this interpretation cannot come about via a co-occurrence with the negative marker *mū*. Rather, the quantifier has to be replaced by interpretation of 'every' or 'all', as in (119b)-(119c).

(119)  a. *mū kull  walad min l-awlād       ðaki
          NEG each boy    of   DEF-boy.PLM clever.SGM
          Intended: Not each boy of the boys is clever.

b. mū kull walad ðaki
NEG every boy.SGM clever.SGM
Not every boy is clever.

c. mū kull l-awlād aðkiya
NEG all DEF-boy.PLM clever.PLM
Not all of the boys is clever.

The gradience of the unacceptability here can be correlated to the availability of negative marker with the strong distributive quantifier 'each'. However, the more usual/prototypical the use of *kull* meaning 'every' or 'all', the more acceptable the sentence becomes.

(120) a. *mā fāz kull walad min l-awlād b-jāyzah
NEG win.PFV.3SGM each boy.SGM of DEF-boy.PLM by-prize
Each boy of the boys didn't win a prize.

b. mā fāz kull walad b-jāyzah
NEG win.PFV.3SGM every boy by-prize
Every boy didn't win a prize.

c. mā fāz-ū kull l-awlād b-jāyzah
NEG win.PFV.3-PL all DEF-boy.PLM by-prize
All of the boys didn't win a prize.

This suggests that the only constraint is in fact the impossibility of direct negation on *kull* when it means 'each'.

## 2.6 Conclusion

This chapter highlighted and accounted for HA noun phrases and their modifiers. It also highlighted some interesting properties of quantifier constructions in HA. It has been shown that quantifiers share properties that are similar to those of nouns. Evidence was given where it was suggested that quantifiers, similar to nouns, can host a definite article and clitics in a CS formation, and can appear in all argument positions, just as nouns would, at least

when the quantifiers are used in a simple form, or when in a CS formation with nouns. It was shown that at times, there can be optional 3SGM agreement on the verb when a quantifier is present. This is however not the case when we have ordinary structures not involving quantifiers. I have additionally aimed at using this chapter to also shed light on the semantic and syntactic behaviour of the quantifier *kull*, and how it interacts with negation.

# HPSG Analysis of Key Aspects of HA Noun Phrases

## 3.1 Introduction

This chapter proposes an HPSG analysis for the HA data reviewed descriptively in the previous chapter. In it, I suggest a foundation of how nouns and their main wider morphosyntactic features and behaviours associated with definiteness, adjectival modification, including relative clauses, possessive complements, and particularly their interaction with pre-nominal quantifiers within the HA system, may be analysed in HPSG. As I do this, I will refer to the descriptive account provided in Chapter 2 of these noun-related aspects of HA.

In this chapter, one central assumption is that the definite article is an affix, rather than a determiner or a clitic. Another is that, as we discussed in section 2.2, the DEFINITENESS of the whole NP in construct state constructions is accounted for by an inheritance constraint from the DEFINITENESS marked on the possessor.

The analysis in this chapter notably provides a uniform account for nouns and quantifiers, whereby the categorial function of the latter is regarded as

nominal, such that quantifiers are analysed as nouns. Although there are some special properties that are only specific to quantifiers, including distinct agreement behaviours, this can all be accounted for by simply adding restrictions on them.

This chapter will further benefit from a review of work conducted within the HPSG framework by Wintner (2000) on parallel phenomena in Hebrew NPs. This is because HA and Hebrew are similar in that, being very closely related languages, they share similar properties, such as word order facts, and agreement in NUMBER, GENDER, and DEFINITENESS, internal to the NP. I also review Alqurashi's (2013) analysis for MSA NPs, although I show that HA is different from MSA, due to the fact that indefinite nouns in HA are not marked with an indefinite marker. By adopting and modifying Wintner's (2000) proposal in this work, I here point out that the lexical rules provided by Wintner are simpler than the type hierarchy being proposed by Alqurashi for HA nouns.

## 3.2   Previous relevant HPSG studies of Definiteness marking and the NP

### 3.2.1   HPSG treatment of English articles

A great deal of research on the syntax of noun phrases assumes a model based on English NP properties. This, for the most part, consists of a separate determiner word (e.g. *the, a*) and a noun which has a projection. In Classical HPSG, determiners can then combine with the head through the SPECIFIER-HEAD SCHEMA (Pollard and Sag, 1994). Therefore, before showing how HPSG deals with languages such as HA, where the articles are not separate words, it is useful to review the basic structure of what constitutes the nominal projection and how HPSG handles articles in that situation.

To provide an analysis of the nominal projection, what is first needed is

$$
\begin{bmatrix}
\text{PHON } \left\langle \textit{John} \right\rangle \\[2mm]
\text{SS} \,|\, \text{LOC} \,|\, \text{CAT} \quad
\begin{bmatrix}
\text{HEAD} & \textit{noun} \\
\text{SPR} & \left\langle \right\rangle \\
\text{SUBJ} & \left\langle \right\rangle \\
\text{COMPS} & \left\langle \right\rangle
\end{bmatrix}
\end{bmatrix}
$$
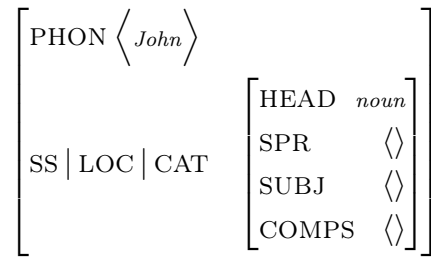
Figure 3.1: The lexical entry of a proper noun

that the NP head is a type of noun which is defined with particular values for certain features, in particular the attribute SPR (SPECIFIER). A proper noun such as *John* will however have a feature structure like that in Figure (3.1).

Since proper nouns take neither specifiers, nor complements, nor subjects, the valence values of SPR, SUBJ and COMPS are the empty list. Hence proper nouns do not project any location/position for an article word to occur. In fact they are usually analysed as being inherently definite by virtue of their lexical entries, and do not normally co-occur with any article in English.

Turning now to common nouns, the situation is quite different. HPSG takes into account the fact that in noun phrases they co-occur with determiners such as articles, demonstratives, cardinals, q-determiners, etc. Many proposals have been made to capture the universal generalizations that may be made about this, while accounting at the same time for languages specific parameterizations which lead to certain differences. In Pollard and Sag's standard version of HPSG (1994), determiners are treated as specifiers. This is also assumed by Sag et al. (2003); Kim (2004); Kim & Sells (2008).[1] Pollard and Sag (1994) in fact posit a valence feature in HPSG called SPECIFIER (abbreviated

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[1]Another proposal has also been made for German NPs by Netter (1994), involving a Determiner-as-head treatment. Netter (1994) presents an analysis which employs a distinction between nouns and determiners in terms of *functional completeness*. Determiners are functionally complete, whereas nouns must combine with a determiner in order to be complete or maximal nominal categories. Yet another treatment of determiners, as functors, is assumed by Allegranza (1998) and Van Eynde (2003b), in which they attempt to account for the rich variety of determiners and their pre-nominal distributional behaviour.

$$
\begin{bmatrix} \text{PHON} \left\langle \mathit{the} \right\rangle \\ \text{SS} \begin{bmatrix} \text{LOC} \,|\, \text{CAT} \begin{bmatrix} \text{HEAD} & \mathit{det} \\ \text{SPEC} & \mathit{noun} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$

Figure 3.2: The lexical entry of *the*

$$
\begin{bmatrix} \text{PHON} \left\langle \mathit{book} \right\rangle \\ \text{SS} \begin{bmatrix} \text{LOC} \,|\, \text{CAT} \begin{bmatrix} \text{HEAD} & \mathit{noun} \\ \text{SPR} & \left\langle \boxed{2}\text{DETP} \right\rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} \left\langle \boxed{2} \right\rangle \end{bmatrix}
$$

Figure 3.3: The lexical entry of *book*

as SPR) which indicates what determiner, if any, the head requires. The determiners can then combine with the head through the SPECIFIER-HEAD SCHEMA. The heads select their specifiers, just as they select their subject and complements. This is encoded in their SPR attribute. On the other hand, the specifiers also select the head with which they co-occur, encoded in their SPEC attribute. The head value for the determiner *the* is represented in Figure (3.2).

The noun *book* then has the feature description in Figure (3.3), indicating in SPR that it can combine with a determiner.

The representations above indicate that the two features SPEC and SPR ensure the lexical selection explained above, i.e. where the determiner selects the nominal head, and at the same time the nominal head selects the determiner. However, none of this straightforwardly applies to languages where the definite articles are not represented by separate words, but form part of the morphological component of the language, as is the case in Scandinavian languages (Hellan and Beermann, 2005), and Semitic languages such as Hebrew, and Arabic (both MSA and HA), as described in Chapter 2. In such systems, the maximal nominal projection for a common noun can be 'determiner-less'.

For example, a sentence can start with an indefinite determiner-less noun, and be well formed, as long as it is modified. (1) is such an illustration for HA.

(1) walad    ṭawīl    jā
    boy.SGM tall.SGM come.PFV.3SGM
    A tall boy came.

In what follows, I engage in a more detailed discussion as to how precisely can HPSG handle this issue for HA.

### 3.2.2 The HA definite article as an affix and not the NP head

The definite article in HA should be considered as an *affix*, rather than as a full-fledged word or a phonologically-deficient clitic (cf. Wintner, 2000). As a result, the combination of the nominal and the definiteness marker takes place in the lexicon in HPSG. This means that it is the noun, and not the determiner, that heads the nominal phrase, and that the complements are selected by the nominal head. Under this view, the definite article is itself not a property of the syntax as such.

That the analysis of the article as an affix in HA means that the article cannot be considered as a candidate for head status within a NP needs further examination. Some HPSG syntacticians such as Netter (1994) have made a case for the determiner being the head of the NP, with the noun as its complement. In many transformational generative approaches, the DP (determiner phrase) headed by articles has been accepted as existing above the NP (Mohammad (1988), Fassi Fehri (1999), and Benmamoun (2000b)), i.e. governing it. In support of the treatment of the HA article, as provided here, similar criteria that have also been used in support of Wintner's (2000) analysis will be used,

in order to illustrate that the HA definite article cannot be viewed as the head of the NP.

I start by first providing criteria that account for the general notion of headedness. Zwicky (1985) indicates that 'the intuition to be captured with the notion HEAD is that in certain syntactic constructs one constituent in some sense 'characterises' or 'dominates' the whole' (p.2). The following five criteria in (2), discussed in Zwicky (1985), are here taken up in order to determine which element serves as the head within HA NPs.  These are individually discussed below.  Through these criteria and the discussion to follow about each of these, I am able to support my claim that the definite article in HA cannot be analysed as the head of an NP, nor as heading its own DP projection; consequently its treatment as an affix does not create any conflict in this respect.

(2)  a. Determination of Concord.

     b. Obligatory constituent.

     c. Distributional Equivalence.

     d. Subcategorisation.

     e. Governor.

The Determination of Concord criterion (Zwicky, 1985) claims that it is the dependent that always triggers agreement on the head.  Zwicky further distinguishes the determinant of concord from the governor as follows: While both involve the morphosyntactic features of one element determining those of another, when concord is involved, the same features are found on both the determiner and the determinant.  In the case of HA, however, this concord criterion is inapplicable, when it comes to concerns related with definiteness, as there is, in any case, no concord between the noun and the definite article.

The Obligatory constituent criterion captures the idea that the head should be the obligatory constituent in the unit. By implication, non-heads are optional. Zwicky makes this criterion more restrictive by narrowing down the meaning of optionality, whereby optionality that is due to ellipses is excluded from consideration. Nouns in Arabic cannot be omitted from the NP, and no NP formation is complete when the only element present is the definite article. Hence the noun emerges as the head on this criterion.

The Distributional Equivalence criterion states that the head in a constituent is the element that belongs to a category with roughly the same distribution as the construct as a whole. Moreover, this ties in with the previous criterion, given that once a head is an obligatory constituent, then one expects to find a distribution that is the same as that of the very construct itself. This is clearly the case for HA NPs, as bare nouns have almost an identical distribution to that of article+N, and other combinations.

Fourth, the Subcategorisation criterion specifies that an element that requires a sub-categorisation statement is a head, and therefore, this characteristic needs to be listed in the lexicon. The definite article in Arabic does not require such information to be stated, as it does not appear to select complements. Since it cannot subcategorize for any category, it cannot be treated as an ordinary determiner, but as an affix.

Finally, the Governor criterion requires the head of a construction to be the constituent that governs the grammatical form of its sister constituent. While the noun does that in relation to the concord that results when an adjective is in its scope, the definite article does not determine the form of the nominal. It does not impose any restrictions to the nominal it attaches to. If anything, in HA, the article's phonology is that which changes to accommodate to the form of the noun, which depends on whether the first radical of the noun happens to be a lunar vs. solar sound.

From this overview of the headness criteria, we can conclude that the definite article in HA displays none of these properties and thus cannot be analysed as the head of the NP. This is in parallel with what is found to be the case with Hebrew NPs. The definite article does not subcategorise for nouns. Neither does it govern the form of the noun. It additionally does not determine concord features on the noun itself. From a syntactic distributional perspective, the definite article is not an obligatory element of NPs. In sum, the HA definite article should not be analysed as being the head of the noun phrases, and this is entirely consistent with it being analysed as an affix.

### 3.2.2.1   The HA definite article as an affix and not the clitic

I use the criteria set up by Zwicky (1977), Zwicky and Pullum (1983), and Miller (1992) for distinguishing between affixes and clitics. Based on these tests I will conclude that the definite article in HA is an affix and not clitic.

(3)  a. The **Binding criterion** claims that affixes are bound morphemes. Bound morphemes cannot stand alone. The definite article in HA cannot stand alone. This thus suggests that it is a bound morpheme.

    b. **Morphophonlogical idiosyncracies** are characteristics that are prototypically idiosyncracies associated with affixes, rather than with clitics. In HA, the article phonologically undergoes an assimilation process in certain contexts. The /l/ of /al/ assimilates to the first radical of the noun if it is one of the so-called 'sun' sounds, i.e. those that are articulated with the tip of the tongue (section 2.1 in Chapter 1). We saw examples of such cases therein, e.g. *aθ-θlaθah*, rather than: \**al-θalaθah*. However, we get: *al-walad* not: \**aw-walad*.

    c. The **Selectivity criterion** states that affixes are more selective than clitics. The definite article is thus expected to combine with all kinds

of nominals, including nouns, adjectives, numerals, and quantifiers, as illustrated through the data presented through Chapter 2.

d. The **Coordination criterion** has been suggested by Miller (1992). He claims that in a coordinate structure, if an item must/has to be repeated on each conjunct, then it must be an affix, and cannot be a clitic. If repetition, on the other hand, is not obligatory, it has to be a clitic. The attachment of the definite article on both conjuncts of a coordinate structure is necessary in HA.

To summarize, the criteria applied in this section suggest that the definite article in HA functions much closer to an affix, rather than to a clitic.

### 3.2.3 HPSG analyses of nouns and definiteness in Arabic and Hebrew

This section provides an overview of the relevant analyses that are currently available for nouns. There is not much published work for the analysis of Arabic nouns within HPSG. The following describes some relevant preliminary work in Hebrew and Arabic. Wintner (2000) extensively discusses the phenomenon in HPSG. He proposes a lexical rule that adds a definiteness feature to nouns and adjectives. Alqurashi (2013), on the other hand, uses a type hierarchy of nouns, and adds a constraint for each subtype. We first consider Wintner's suggestions.

Wintner's (2000) account treats the definite marker in Modern Hebrew as an affix that is able to combine with nouns, adjectives, and numerals, in the lexicon. His rule requires a DEFINITE feature DEF that encodes the value of DEFINITENESS across nominals. DEFINITENESS is not viewed as a syntactic or semantic process, but as a feature that gets associated with the CATEGORY

$$
\begin{bmatrix} word \\ \text{PHON} & \boxed{1} \\ \text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & - \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} word \\ \text{PHON} & definite \ (\boxed{1}) \\ \text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & + \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$
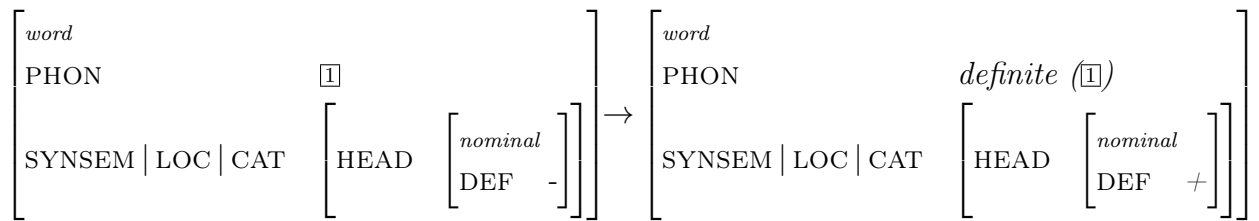
Figure 3.4: The Definite Lexical Rule

$$
\begin{bmatrix} word \\ \text{PHON} & sfer \\ \text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & - \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} word \\ \text{PHON} & ha\text{-}sfer \\ \text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & + \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$
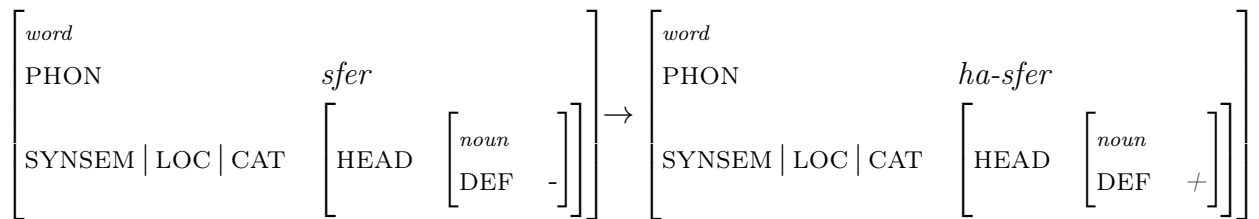
Figure 3.5: The effect of the Definite Lexical Rule on Hebrew nouns

of nominals (among others), and which does not have to do with their CON-TENT.[2] The Definite Lexical Rule (DLR) then operates onto words that have the value of their DEFINITENESS feature DEF as (-), which means that the noun is bare, i.e. with no indefinite marker attached onto it. Its effect on the phonology is determined by the PHON part of the rules. The application of the rule changes the value of the feature DEFINITE from (−) to (+). The DLR is depicted in Figure (3.4) and its effect on Hebrew nouns such as *sfer* 'book' can be illustrated in Figure (3.5).

As observed in Figure (3.5), the noun *sfer* is rendered definite through the DLR. The DLR assumes that the initial value of the noun's DEFINITENESS feature is (−). The *definite* function then applies to the phonology of the indefinite noun, *sfer*, to render the phonology of the definite noun: *ha-sfer*, along with the DEF value (+).

Nominals such as proper nouns, and pronouns, which do not take a definite article, but which are inherently definite and specific, are lexically specified as

---

[2]One place where I depart from Wintner's (2000) analysis is in the treatment of quantifiers. Wintner treats Hebrew quantifiers as determiners, rather than nominals, on the basis of the fact that they cannot attach a definite article.

DEF +, even in the absence of the attachment of a definite article (Wintner, 2000). This thus implies that when it comes to such items, it is not the presence of the article that encodes the DEF feature. DEF can thus be viewed as an abstract agreement feature of nominals that may, or may not, be accompanied by the presence of the article. Wintner describes the rules that govern the presence of the definite article as follows:

- The definite article attaches to words, not to phrases.

- It attaches only to nominals, and to all kinds of nominals.

- It can only combine with indefinite words.

The DLR can have its affect on adjectives too. Wintner (2000) applies the same DLR to adjectives in a way that parallels way this application to nouns. Therefore, adjectives are also assumed to have a DEFINITENESS feature which is initially set as (−). When the DLR is applied to them, it again adds the definite article and returns a specification with a DEF (+) value. Different from nouns, however, adjectives also select the head they modify, and use a feature MOD to ensure that they agree with the head in DEFINITENESS. This is illustrated through the box labelled ③ in Figure (3.6).

As can be seen in Figure (3.6), a crucial point is that the main DEF feature of the adjective is shown to obligatorily have the same value as the HEAD nominal DEF feature, through the value of the MOD feature. Applying the DLR to indefinite adjectives changes them to definite, and consequently also changes the value of the path MOD|LOC|CAT|head|DEF to DEF+. Thus, the MOD feature value ensures matching with the features of the head being modified.

All this HPSG apparatus can work in exactly the same way for HA. For instance, an example from chapter 2 such as in Section 2.3.2 *al-walad að-ðaki*

$$
\begin{bmatrix}
word \\
\text{PHON} & \boxed{1} \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} adj \\ \text{DEF} & \boxed{3}- \\ \text{MOD} & \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}
\end{bmatrix} \rightarrow
$$

$$
\begin{bmatrix}
word \\
\text{PHON} & \boxed{1} \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} adj \\ \text{DEF} & \boxed{3}+ \\ \text{MOD} & \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$
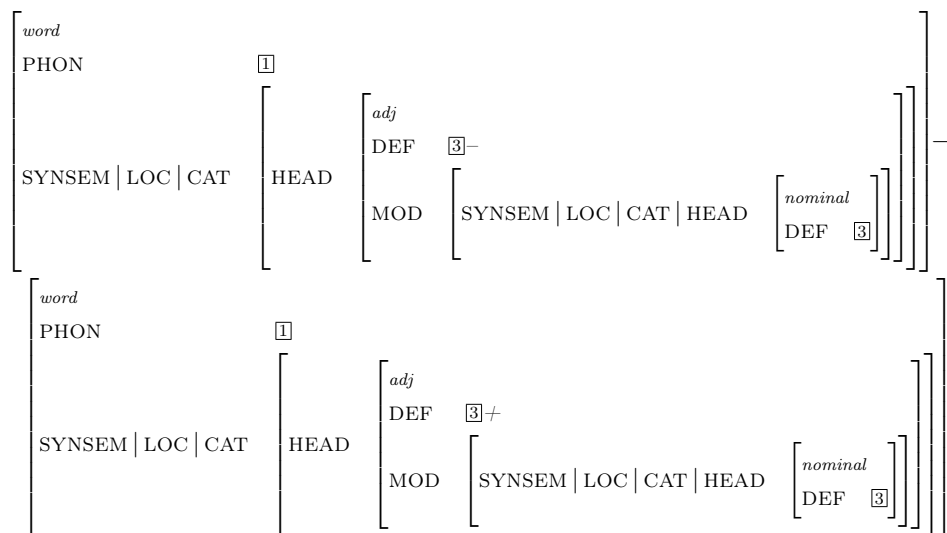
Figure 3.6: The Definite Lexical Rule of Hebrew adjectives

'the clever boy' comes about via the DLR effect presented in Figure (3.6) for Hebrew in exactly the same ways, when applied to HA.

### 3.2.4   HPSG treatment of possessives

Possessors which occur before the head noun, such as that in (4a) in English, are usually analysed as SPEC (specifiers) in HPSG (Pollard and Sag, 1994), like determiners. They often also have near equivalent forms where the possessor is expressed after the head, as in (4b), which are however treated differently. Additionally, within this analysis, nouns lexically select a pre-nominal possessor, which gets to be encoded in their SPR attribute. Possessors, on the other hand, select a nominal that is then encoded in their SPEC attribute. This is just as we have seen to be the case for determiners, including articles as separate words (Section 2.1). The combination of such a type of possessor, and the head noun, to form an NP like (4a) is achieved through the *spec-hd-schema*. Pollard and Sag (1994, p. 375) state that this treatment of possessors is applicable for English and German, but other languages may require different analyses.

(4)   a.  The queen's palace

b. The palace of the queen

Possessive structures in Hebrew by contrast have the possessor always following the head, where it can be present in two distinct constructions: free states, as in (5a), and construct states (CS), as in (5b). This is very similar to what we described for HA in Section 2.2 - Section 2.3 in Chapter 2. (See examples (6) and (20c) therein).

(5)  a.  ha-tmuna    šell dan
         DEF-picture of   Dan
         the picture owned by Dan

     b.  pirxei   ha-gann
         flowers DEF-garden
         the garden flowers                                    (Wintner, 2000)

Wintner (2000) argues that Hebrew possessors should be analyzed as complements. This view is taken by Borsley (1989); Borsley (1995) also for Arabic and Welsh. It is also proposed by Samvelian (2007) for Persian, which is more like Welsh, than Arabic, with respect to its NPs. Borsley (1989; 1995) bases his arguments for the analysis of possessors as complements in both Welsh and Arabic due to these language's alternating subject-initial and verb-initial clauses, due to the availability of constructions in which an argument-taking noun is followed by its subject, the fact that pronominal objects in subject-initial clauses can be realized as clitics, and the fact that the same clitics may appear instead of the pronominal subject of a noun. All these arguments are valid for the Hebrew data too.

With specific reference to Hebrew, Wintner adds that when more than one possessive is expressed, there are some constraints on the order of the possessives. The possessor function in Hebrew can be realized by the most oblique complement, as depicted in (6), where in verbal noun contexts, the

genitive subject can precede the accusative object, or alternatively, the genitive object can precede the optional *by*-PP representing the agent, if present.

(6)

   ha-hrisa            šell ha-caba     ’et   ha-ʕir
   DEF-destruction of   DEF-army ACC DEF-city
   the army's destruction of the city

   ha-hrisa            šell ha-ʕir     ʕalydei ha-caba
   DEF-destruction of   DEF-city by       DEF-army
   the army's destruction of the city                      (Wintner, 2000)

In Wintner's analysis, head/possessed nouns in free (5a) or construct (5b) formations are specified for a possessor in their COMPS list. The difference between the two forms is that in the former there is no DEF inheritance by the free head, from its complement, and the head is prosodically independent. In the construct state, on the other hand, the DEF value of the head is unified with the DEF value of the complement, which is claimed to be phonologically reduced. To account for the similarities and the differences, Wintner assumes that the construct form is generated from the free form by means of a morphological process. The lexical rule accommodates either of the two forms as the input. The rule only has to pick a complement from the list, and change it to either a NP or a genitive PP. There is no inheritance involved, when dealing with free states, as the head is prosodically independent. Figure (3.7) illustrates the effect of the process when applied to nouns.

To account for the absence of overtly marked DEFINITENESS on the head in construct state constructions, in examples such as (5b), Wintner (2000) adopts the claim in Borer (1988), that construct state nouns are prosodically weak words, as a result of their lack of stress.[3] This thus requires them to

---

[3]Danon (2001) also argues that DEFINITENESS spread is just a matter of some kind of phonological weakness that is unique to CSs. In fact, almost all prosody proponents (see e.g. Borer (1999); Siloni (2001); Siloni (2003); Benmamoun (2000a); Benmamoun (2003))

$$
\begin{bmatrix}
\text{PHON} & \boxed{1} \\
\\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & \text{-} \end{bmatrix} \\ \\ \text{COMPS} & \boxed{3} \oplus \left\langle \begin{bmatrix} \text{PP} \end{bmatrix} \right\rangle \oplus \boxed{5} \end{bmatrix} \\
\\
\text{DEP} & \langle \rangle
\end{bmatrix} \rightarrow
$$

$$
\begin{bmatrix}
\text{PHON} & phon\text{-}reduced(\boxed{1}) \\
\\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & \boxed{2} \end{bmatrix} \\ \\ \text{COMPS} & \left\langle \boxed{4} \begin{bmatrix} \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle \oplus \boxed{5} \end{bmatrix} \\
\\
\text{DEP} & \left\langle \boxed{4} \right\rangle
\end{bmatrix}
$$
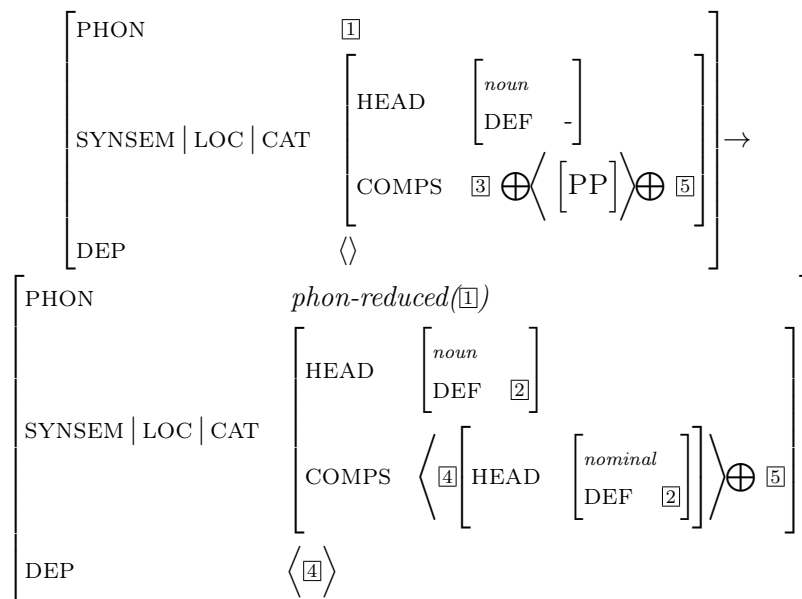
Figure 3.7: The relationship between Free and Construct forms in Hebrew

be attached onto other words. Notwithstanding this analysis, Wintner does not suggest a full theory of prosody in HPSG. Rather he takes advantage of this observation to account for this construction, as follows in Figure (3.7). He first posits the addition of a DEPendency feature to the lexical entry of words. The DEP feature is then used to encode the immediate complement. In other words, DEP points to some element on the ARG-ST list, particularly the most oblique, and hence the last complement in Hebrew. Wintner proposes the *prosodic dependency principle*, provided in (7), which specifies that words that are characterised as prosodically-dependent must first combine with the obligatory complement they depend on, and only then can the obtained phrases combine with other modifiers and complements.

(7) **prosodic dependency principle**:

In a headed phrase in which one of the daughters is a word, either the DEP of this daughter is empty, or it is reentrant with the SYNSEM value of some other daughter.

argue that CSs have word-like properties, claiming that CSs constitute a prosodic unit at PF.

$$
\begin{bmatrix}
phrase \\
\text{PHON} \qquad\qquad pirxei\ ha\text{-}gann \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}
\begin{bmatrix}
\text{HEAD} \quad \boxed{3} \\
\text{COMPS} \quad \langle\rangle
\end{bmatrix}
\end{bmatrix}
$$

$$
\begin{bmatrix}
word \\[4pt]
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}
\begin{bmatrix}
\text{HEAD} \quad \boxed{3}
\begin{bmatrix}
noun \\
\text{DEF} \quad \boxed{2}
\end{bmatrix} \\[6pt]
\text{COMPS} \quad \langle \boxed{4} \rangle
\end{bmatrix} \\[10pt]
\text{DEP} \qquad\quad \langle \boxed{4} \rangle
\end{bmatrix}
\qquad
\begin{bmatrix}
word \\[4pt]
\text{SYNSEM} \quad \boxed{4}\,
\begin{bmatrix}
\text{LOC}\,|\,\text{CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
noun \\
\text{DEF} \quad \boxed{2}+
\end{bmatrix}
\end{bmatrix}
\end{bmatrix} \\[10pt]
\text{DEP} \qquad\quad \langle\rangle
\end{bmatrix}
$$

|
pirxei                                          ha-gann
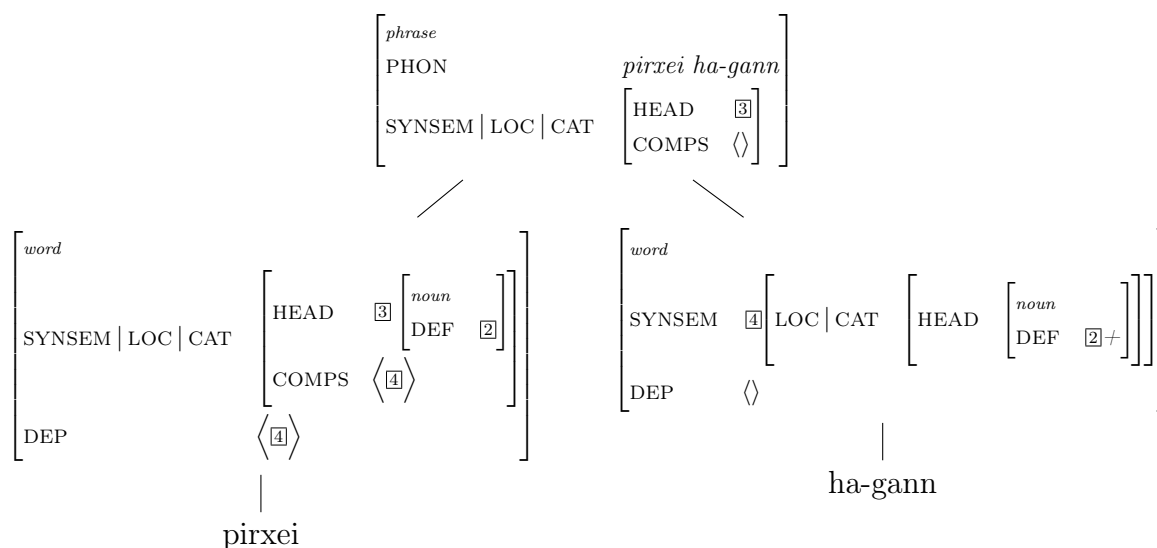
Figure 3.8: Hebrew Construct State NP

We have seen that in the lexical rule in Figure (3.7), the construct state noun is specified for a possessor in its COMPS list on the right hand (output) side of the rule. The feature DEP is not empty, and its value is identified with the COMPS value. To account for the definiteness restriction and how it surfaces on the possessor, the definiteness of construct state nouns is left unspecified. However, it is inherited at the phrase level and thus the DEF values of the head and the complement are identical. Noun-noun constructs then combine by the *hd-comp-schema* to introduce structures like that in Figure (3.8). Note that it is not only a combination of two definites that results. It can also be two indefinites, since Hebrew also allows (8a) alongside (8b).

(8)  a.  pirxei  gann   yapim
         flowers garden beautiful
         beautiful garden flowers

     b.  pirxei  ha-gann     ha-yapim
         flowers DEF-garden DEF-beautiful
         the beautiful garden flowers

The representation in Figure (3.8) does not specify the DEFINITENESS of the head. Heads cannot be rendered definite directly. The DEF feature of the

$$
\begin{bmatrix}
\textit{word} \\
\text{PHON} & \boxed{1} \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS} & \boxed{3} \oplus \left\langle \boxed{4} \right\rangle \oplus \boxed{5} \\
\text{DEP} & \left\langle \boxed{4}\begin{bmatrix} \text{HEAD} & \textit{nominal} \end{bmatrix} \right\rangle
\end{bmatrix} \rightarrow
$$

$$
\begin{bmatrix}
\textit{word} \\
\text{PHON} & \textit{add-suffix } (\boxed{1},\ \boxed{2}) \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS} & \boxed{3} \oplus \boxed{5} \\
\text{DEP} & \langle \rangle
\end{bmatrix}
$$
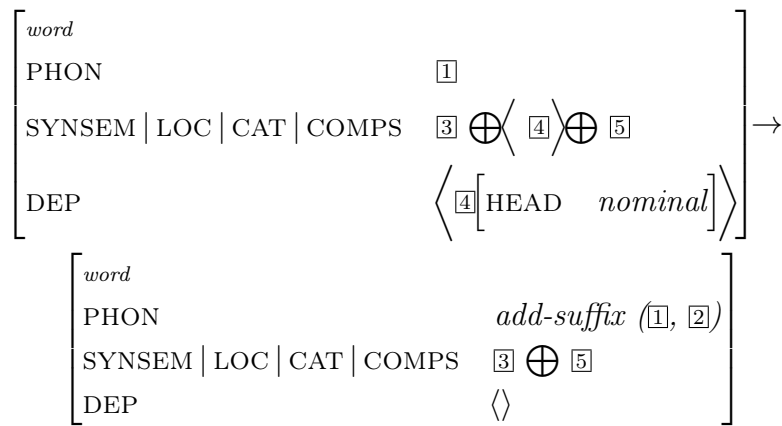
Figure 3.9: Pronominal Affixation Lexical Rule

phrase is inherited from the complement. And since DEF is a head feature it is propagated to the mother node. As a consequence of how inheritance works, independent construct state nouns with no immediate complements cannot be promoted to the status of a phrase, as the dependency principle does not allow its combination with other phrases until its DEP requirements are discharged.

Having accounted for nominal construct state formations, it is now possible to see how pronominal complementation of construct-state nouns can be accounted for, as recall that constructs can be complemented by an affixal (weak) pronoun, instead of a full-fledged noun phrase. Wintner (2000) claims that this is only a special case of prosodic dependency, whereby the phonologically weak construct state nouns can become phonologically independent, when combined with a pronominal affix. In addition to discharging the prosodic dependency, this process also removes a complement from the COMPS list of the construct noun.[4] This lexical process applied to possessive pronouns thus mimics the combination of a full noun phrase with a construct-state noun, as illustrated in Figure (3.9). The tag $\boxed{2}$ stands for the phonology of the pronominal affix. The rule has two effects: It discharges the prosodic dependency and it removes a complement from the COMPS list of the construct state noun.

---

[4]The effects of this process on the semantics of the noun are disregarded here.

Wintner notes that the morphological process results in all nouns having two forms: free and construct. This implies that there will be nouns whose construct phonology is identical to the free form. SGF nouns, however, will not have the same form. This implies multiple lexical entries associated with nominal forms. This should not be viewed as profligate however. The combinatorial properties of free and construct forms are different, and any approach, lexicalist or syntactic, to constructs must somehow account for this distinction.

To sum up we can thus say that the construct state form is derived from free forms by means of a morphological process specified in the lexicon. What the morphological rule has to do is to select a suitable complement from the COMPS list, such as a possessor PP, to convert into a possessor nominal complement. The feature DEP in the lexical entry of the free form of the head is empty, which means that it is not dependent on any nominal. However, it is not empty in the construct state, as the head is dependent on that of the possessor complement.

There yet remains a fundamental problem in Wintner's lexical rules. By assuming that the DEF feature is initially (–) in the lexicon for nouns (and adjective, etc.), there would not be any nouns that are able to head a construct state. Construct heads can be neither marked as indefinite nor definite and thus the DEF value should be [DEF boolean] in the lexicon. Therefore, although Wintner's analysis will be adopted here to account for the HA facts, it will be modified to specifically resolve this issue.

### 3.2.5 An alternative HPSG analysis of definiteness and the NP in Arabic

Alqurashi (2013, 2015) proposes an alternative analysis for the basic properties of NPs, using data from MSA. His analysis again covers simple and

construct state nouns. Similar to Wintner (2000), he treats the definite article as an affix and not as a separate word, and not as a head. Definiteness in MSA nouns (as introduced in Chapter 2 (Section 1) and repeated here), is expressed through the prefixation of a definite article (9a). What differs from the situation in HA and Hebrew is that in MSA, indefinite nouns are suffixed with an indefinite marker -*n*, which follows the case marker (9b).

(9)  a.  l-kitāb-u
         DEF-book-NOM
         the book

     b.  kitāb-u-n
         book-NOM-INDEF
         a book                                                    MSA

Because MSA is different from Hebrew and HA in using an overt indefinite marker, the DLR as formulated above cannot be applied to this system, as it would result in an ill-formed construction. The DLR assumes that the initial value of nominal definiteness is –. The DLR as it stands then returns them as definite, adding the definite prefix *l*-. Therefore, nouns and adjectives will end up marked both with the definite and indefinite markers, clearly resulting in an ill-formed morphological form.

(10)  *l-kitāb-u-n
      DEF-book.SGM-NOM-INDEF
      *the a book

In the case of construct state constructions, the construct head can be neither marked as definite, nor indefinite. Just as was shown in the set of restrictions in CS formations, only the possessor complement can take DEF marking as shown in (11).

(11)  kitab-u          l-muʕallim-i
      book.SGM-NOM DEF-teacher.SGM-GEN
      the teacher's book

*noun*

*def-noun     indef-noun     construct-state-noun*
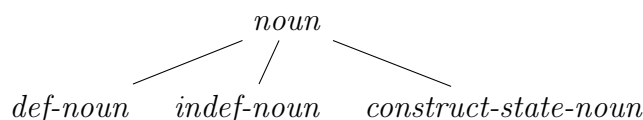
Figure 3.10: Type Hierarchy of the NP in MSA

This would entail that in MSA, nouns and adjectives would initially better start out as being unmarked for DEFINITENESS, except where it is inherent (e.g. in the context of proper names and personal pronouns, which are marked as: DEF +). It might be possible then to resolve this issue by altering the DLR. For instance, if all nominals were initially regarded as unspecified for DEFINITENESS, the Definite Lexical Rule could be revised so as to indicate that unspecified forms can become definite or indefinite without reference to any complements they have, if they lack complements of the type that determine CS. If they have such a complement, however, e.g. a possessive nominal complement, or a possessive PP that is converted into such a nominal, then their DEF depends on the DEF of the complement.

To capture the DEFINITENESS distribution in MSA, AlQurashi (2015) however prefers to suggest a different analysis altogether, which in turn makes use of a type hierarchy, rather than one based on lexical rules, viewing it as a more elegant and economical method. Hence, instead of deriving the definite nouns from indefinite nouns, or indeed from DEF neutral nouns, he uses a type hierarchy (Figure 3.10), in effect subcategorising nouns into three separate types.

The type hierarchy provides three sub-types, into which different nouns are analysed as sub-types. Each sub-type is associated with certain features in MSA. The sub-type *def-noun* is [DEF +], which means that the noun is prefixed with the definite article. The sub-type *indef-noun*, on the other hand, means that the noun is marked with the [DEF -] suffix. The last sub-type is the *construct-state-noun*, indicated with [DEF boolean] which means that the construct noun is unspecified for definiteness, which has two values, as

$$
\begin{bmatrix}
\text{MORPH} & \begin{bmatrix} \text{FORM } _{indef} \ \boxed{1} \\ \text{I-FORM } \boxed{1} \end{bmatrix} \\[2em]
\text{SYNSEM} & \begin{bmatrix} \text{HEAD} & noun \\ \text{DEF} & - \\ \text{ARG-ST} & \neg \left\langle \text{NP} \right\rangle \end{bmatrix}
\end{bmatrix}
$$

Figure 3.11: INDEF-Noun Constraint

it could be either of the two options [DEF +] or [DEF -], depending on the specifications of the accompanying possessor (see further below). By proposing this HPSG mechanism, Alqurashi avoids positing rules that require deriving the indefinite or definite affix from the input, and then apply the DLR to it, in order to obtain the right MSA output.

The sub-type *indef-noun* is subject to the general kinds of constraints in Figure 3.11.

The constraint contains both MORPH and SYNSEM features. The MORPH features are of two kinds: FORM and I-FORM, taken from Millar and Sag (1997). The I-FORM is the inflectional stem of the noun without the indefinite marker. A noun will have various values for this, depending on its case, and whether it is singular or plural (e.g. *kitāb* 'a book', *kutub* 'books'). The value of FORM is the noun suffixed with the indefinite marker: the function $F_{indef}$ adds the indefinite marker to the inflectional form of the noun. As for the SYNSEM feature, the HEAD is marked as DEF – because it is indefinite. The ARG-ST $< \neg$ NP $>$ stipulation ensures that a noun bearing the indefinite marker does not have an argument list whose first member is a possessor, as that is the characteristic of construct state nouns. The application of the constraint is illustrated in Figure 3.12.

This means that the indefinite noun may however have an ARG-ST list which contains other members such as PPs and clausal complements, as we see in the MSA examples in (12).

$$
\begin{bmatrix}
\text{MORPH} & \begin{bmatrix} \text{FORM} & kit\bar{a}bun \\ \text{I-FORM} & kit\bar{a}b \end{bmatrix} \\
\\
\text{SYNSEM} & \begin{bmatrix} \text{HEAD} & noun \\ \text{DEF} & - \\ \text{ARG-ST} & \neg \left\langle \text{NP} \right\rangle \end{bmatrix}
\end{bmatrix}
$$

Figure 3.12: INDEF-Noun *kitābun* 'a book'

(12)  a.  maqāl-u-n          ʕani   l-ʔirhāb-i
          article-NOM-INDEF  about  DEF-terrorism-GEN

          an article about terrorism


     b.  fikrat-u-n          [bi-ʔan   na-jtamiʕ]
          idea.SGF-NOM-INDEF [in-COMP  1PL-meet.IMPV

          an idea that we meet


     c.  *kitāb-u-n          ṭ-ṭālib-i
          book-NOM-INDEF     DEF-student-GEN

          a book of the student


(12c) is excluded, as the stipulation ensures that an indefinite noun does not have an ARG-ST list whose first member is a possessor. The ones in (12a)-(12b) demonstrate the possibility of accepting a PP and clausal complement, respectively.

The constraint can be present in the feature structure as illustrated for (12a), in Figure (3.13). This representation is adapted from Alqurashi (2013, p. 251), and is constructed by the head-complement schema. The COMPS list of the indefinite head daughter has one member whose value is identified as PP by co-tagging with the SYNSEM value of the non-head daughter. Hence, the constraint for the indefinite noun type is not violated, and the structure is well formed.

The *definite-noun* sub-type is subject to the constraint in Figure (3.14) which is exactly in parallel with that for indefinite nouns (Figure 3.11).

$$
\begin{bmatrix}
hd\text{-}comp\text{-}ph \\[4pt]
\text{MORPH} & \begin{bmatrix} \text{FORM } _{findef}\ \boxed{1} \\ \text{I-FORM } \boxed{1} \end{bmatrix} \\[12pt]
\text{SYNSEM} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \boxed{2}\begin{bmatrix} noun \\ \text{DEF} & - \end{bmatrix} \\ \text{SUBJ} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix} \\[20pt]
\text{HD-DTR} & \begin{bmatrix} word \\ \text{PHON} & maq\bar{a}lun \\ \text{SYNSEM} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \boxed{2} \\ \text{SUBJ} & \langle\,\rangle \\ \text{COMPS} & \langle\boxed{3}\rangle \end{bmatrix} \end{bmatrix} \\[20pt]
\text{NON-HD-DTR} & \left\langle \begin{bmatrix} phrase \\ \text{PHON} & \Omega ani\ l\text{-}?irh\bar{a}b\text{-}i \\ \text{SYNSEM} & \boxed{3}\ pp \end{bmatrix} \right\rangle
\end{bmatrix}
$$
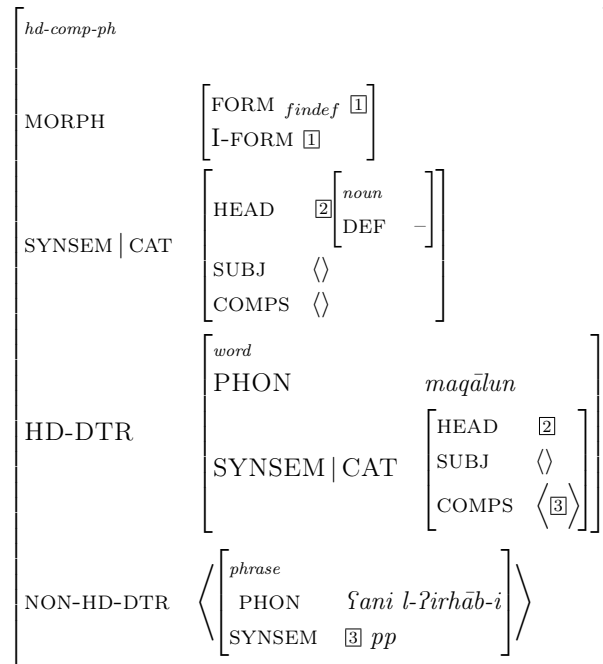
Figure 3.13: INDEF-Noun with PP

$$
\begin{bmatrix}
\text{MORPH} & \begin{bmatrix} \text{FORM } _{fdef}\ \boxed{1} \\ \text{I-FORM } \boxed{1} \end{bmatrix} \\[12pt]
\text{SYNSEM} & \begin{bmatrix} \text{HEAD} & noun \\ \text{DEF} & + \\ \text{ARG-ST} & \neg\left\langle \text{NP,...} \right\rangle \end{bmatrix}
\end{bmatrix}
$$
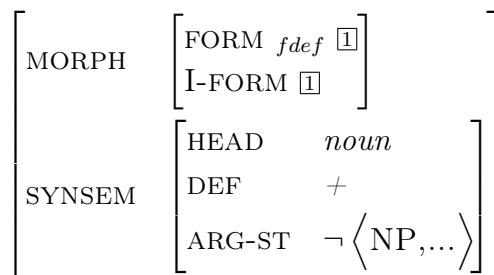
Figure 3.14: DEF-Noun Constraint

The function $_{fdef}$ adds the definite prefix to the basic form of the noun which renders it definite. The ARG-ST $< \neg$ NP $>$ stipulation again ensures that a noun bearing the definite article does not have an ARG-ST list whose first member is a possessor. This means that the definite noun, like the indefinite noun, can have an ARG-ST list which may contain other members, but not a possessor, as illustrated in (13), where the ill-formedness of the example in (13c) is owing to the fact that definite nouns cannot take a possessor, but they can take other complement types such as a PP or a clausal complement.

(13) a. l-fikrat-u        [bi-ʔan    na-jtamiʕ]
        DEF-idea.SGF-NOM [in-COMP 1PL-meet.IMPV]
        the idea that we meet

$$
\begin{bmatrix}
\text{MORPH} & \begin{bmatrix} \text{FORM } \boxed{1} \\ \text{I-FORM } \boxed{1} \end{bmatrix} \\[3ex]
\text{SYNSEM} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} \quad \boxed{2} \end{bmatrix} \\[2ex] \text{ARG-ST} & \left\langle \text{NP} \begin{bmatrix} \text{DEF} & \boxed{2} \\ \text{CASE} & gen \end{bmatrix} \ldots \right\rangle \end{bmatrix}
\end{bmatrix}
$$
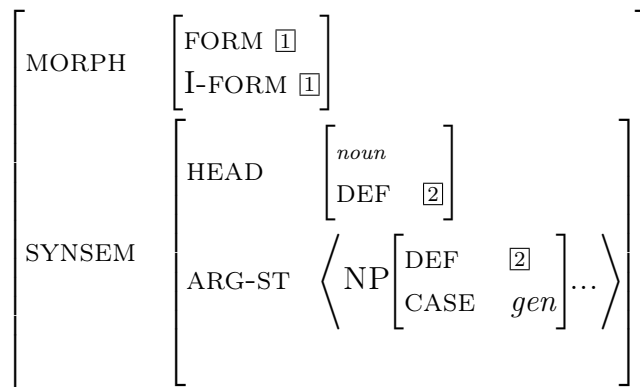
Figure 3.15: Construct State Constraint

b. l-maqāl-u             ʕani   l-ʔirhāb-i
   DEF-article-NOM  about  DEF-terrorism-GEN

   the article about terrorism

c. *l-kitāb-u            ṭ-ṭālib-i
   DEF-book-NOM  DEF-student-GEN

   the student's book

Finally, the sub-type *construct-state-noun* is subject to the constraint in Figure (3.15).

This constraint ensures that the values of the FORM and I-FORM features are identical. It also indicates that a construct-state noun has neither definite nor indefinite morphological markers. Furthermore, the constraint guarantees that the construct-state noun has an ARG-ST list whose first member is a possessor, and which is marked for genitive case, and has the same syntactic/semantic value for DEF as the higher head noun. It thus requires DEFINITENESS agreement between the construct state head noun and the possessor (its complement). This thus accounts for the contrast between the examples in (14), for which data, the absence of the definite article or the indefinite marker is accounted for, given how the constraint ensures that the noun has an ARG-ST list whose first member is an NP, and which has the same value for DEF as the head noun.

(14)  a. (\*l)-kitāb-u      l-walad-i
         DEF-book-NOM DEF-boy-GEN
         the boy's book

      b. kitāb-u-(\*n)      l-walad-i
         book-NOM-INDEF DEF-boy-GEN
         the boy's book

## 3.2.6   HPSG treatment of Post Nominal Order in MSA

Since head nouns are phrase-initial, any complement within that phrase
must follow the head.  Arabic NPs, however, may contain more than one
complement and when this is the case, these have to occur in a prescribed
order.  Consider the contrast in (15), where it is shown that the possessor
must precede the PP complement.

(15)  a. kitāb-u     Sibawayhi fī n-naḥw-i
         book.NOM Sibawih    in DEF-syntax-GEN
         Sibawih's book about syntax

      b. \*kitāb-u    fī n-naḥw-i      Sibawih
         book.NOM in DEF-syntax-GEN Sibawih
         Sibawih's book about syntax

The placement of adjectives, if present, must appear between the possessor
and the PP complement, as follows in (16c). This is in contrast with (16b-c),
whose ungrammaticality illustrates that the adjective cannot appear before
the possessor, or after the PP complement. That the adjective is not available
preceding the possessor is a necessary requirement of the inability to split the
construct state.

(16)  a. kitāb-u     Sibawayhi l-mufīd-u           fī n-naḥw-i
         book-NOM Sibawih    DEF-valuable-NOM in DEF-syntax-GEN
         Sibawih's valuble book about syntax

      b. \*kitāb-u    l-mufīd-u          Sibawayhi fī n-naḥw-i
         book.NOM DEF-valuable-NOM Sibawih    in DEF-syntax-GEN
         Sibawih's valuble book about syntax

c. *kitāb-u    Sibawayhi fī n-naḥw-i        l-mufēd-u
book.NOM Sibawih    in DEF-syntax-GEN DEF-valuable-NOM
Sibawih's valuable book about syntax

If attributive adjectives were (head) noun modifiers, in a binary branching structure, they would be expected to precede possessors. If they were NP modifiers i.e. of the whole construction, they would follow ordinary complements. However, neither of those positions are appropriate for attributive adjectives in MSA. To deal with this issue in HPSG, AlQurashi (2015) adopts Kasper (1994) analysis in which adjectives, as adjuncts, are treated as sisters to complements. Adjuncts are able to syntactically select heads via the feature MOD, and can be potentially anywhere in the COMPS list.

Kasper's (1994) analysis primarily accounts for VP examples in which a head verb and complement are separated by an adverbial adjunct, as the following examples illustrate:

(17)  a. He [went last night to the cinema].

b. She [talked incessantly about syntax].

c. Sandy [said yesterday that he would be here].

VPs are relevant as well, given that adverbs as adjuncts can intervene between verbs and complements, as illustrated in (18):

(18)  a. ta-kallam-tu        bi-wuḍūḥ-i-n          ʕani
REFL-talk.PFV-1SG with-clarity-GEN-INDEF about
l-muškil-at-i
DEF-problem.SGF-GEN
I talked clearly about the problem.

b. ðahab-tu    bi-l-ʔams        ʔilā l-maʕraḍ-i
go.PFV-1SG in-DEF-yesterday to   DEF-gallery-GEN
I went yesterday to the gallery.

$$
\begin{bmatrix}
\text{DTRS} & \left\langle \boxed{1} \right\rangle \oplus \text{list } (\mathit{[ss|mod} \boxed{2} ]) \oplus \left\langle [\text{SS} \boxed{3}],..[\text{SS} \boxed{n}] \right\rangle \\
\text{HD-DTR} & \boxed{1} \begin{bmatrix} \mathit{word} \\ \text{SS} \boxed{2} \ [\text{COMPS} \left\langle \boxed{3},...\boxed{n} \right\rangle] \end{bmatrix}
\end{bmatrix}
$$
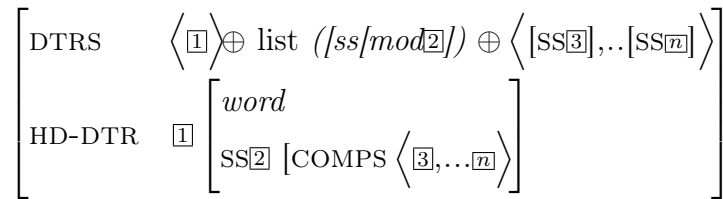
Figure 3.16: *hd-adjunct-comp*
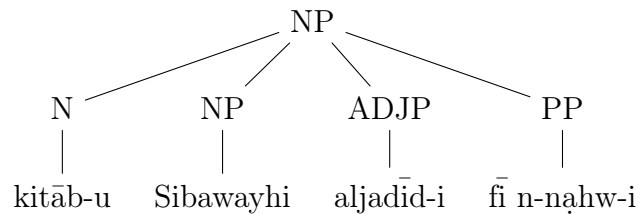


Figure 3.17: Sibawih's new book about syntax

Under this approach, where adjectives are treated as adjuncts that follow nouns in the NP, the nouns appear in *hd-adj-comp* structures in which the head is analysed as taking both an adjunct (adjective), and one or more complements as its sisters. To account for this, a suggested constraint by Alqurashi (2013) is presented in Figure (3.16).

What Figure (3.16) states is that the *head-adjunct-complement* phrase has a head daughter and two lists of non-head daughters. The first list is an optional list of adjunct daughters whose MOD value is identical to the value of SYNSEM in the head daughter. The second list contains complement daughters whose SYNSEM values are identical to the elements of the COMPS value of the head daughter. The constraint allows a flat structure like that in Figure (3.17).

## 3.2.7 Conclusion from previous relevant HPSG studies of definiteness and the NP

Alqurashi's (2013) proposal, in summary, is one which analyses the basic properties of simple and construct state nouns in MSA as involving a type hierarchy of nouns, along with sub-types involving certain constraints. However, HA NPs, which are similar to those in MSA, can best be analysed by modi-

fying Wintner's rules in the morphology, given how they are more generic, as opposed to an analysis that makes use of sub-types with the added constraints in them. The rule analysis, following Wintner's analysis brings together:

1. Complementation via DEP;

2. DEF sameness via the sharing of the head feature;

3. It explains why the possessive is the DEP, and why it is strictly adjacent to the head.

Alqurashi's analysis, on the other hand, requires another basic form that is not even one of the noun sub-types, in order to account for the morphological issues in MSA CSs. He however falls short of accounting for such data, given that free state constructions do not figure in his analysis. On the other hand, Alqurashi's treatment of elements such as APs, relative clauses, etc., as optional complements, illustrating how adjuncts can appear before complements, is adequate, and this approach has been widely adopted.

## 3.3    HPSG analysis of HA definiteness and NPs

We have established in Chapter 2 that HA nouns have three forms, which are closely paralleled in Hebrew: simple (19a), free state (19b), or construct state (19c). They also have a number of possible post-nominal complement types that occur in a certain order, linearly starting first with possessor NPs.

(19)  a. (l)-kitāb
         DEF-book.SGM

         the book

     b. (l)-kitāb         ḥagg (l)-walad
         DEF-book.SGM of    DEF-boy.SGM

         the book belonging to the boy

    c.  kitāb      (l)-walad
        book.SGM DEF-boy.SGM

        the boy's book

We have seen that in the construct state form, the definiteness of the head is dependent on the definiteness of the inner NP. In the free state form, on the other hand, the DEFINITENESS of the head is independent of that of the PP complement.

In the this section I essentially examine the internal structure of HA NPs in the light of a modification of Wintner's (2000) proposal for Hebrew, assuming, as we stated at the start, that NPs are headed by nouns, and not determiners.

### 3.3.1   HPSG analysis of Simple Nouns in HA

Here I will follow Wintner's approach and will be treating the Arabic definite article as an affix. His rule requires a DEFINITE feature that encodes the value of definiteness in nominals, although as we have seen, DEF + is not always represented by the affix *al*. Construct state nouns may be DEF + without *al*; as also are inherently definite words such as proper names and personal pronouns.

The feature DEF is present across HA nominals, including nouns and adjectives. However, our version of Wintner's mechanism supposes that all nominals that are not inherently DEF + have their definiteness feature initially set as (boolean), which means that the noun is bare with no indefinite marker attached onto it, and its DEF feature is neither + nor −. Our version of the Definite Lexical Rule (DLR) for HA then operates on the basis of the features and phonology of these words as stipulated in the lexical entries. The application of the rule changes the value of the feature DEFINITE from (boolean) to (+) and adds the prefix *al*. The DLR is depicted in Figure (3.18).

$$
\begin{bmatrix}
word \\
\text{PHON} & \boxed{1} \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & boolean \end{bmatrix} \end{bmatrix}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
word \\
\text{PHON} & definite\ \boxed{1} \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} nominal \\ \text{DEF} & \boxed{1} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$
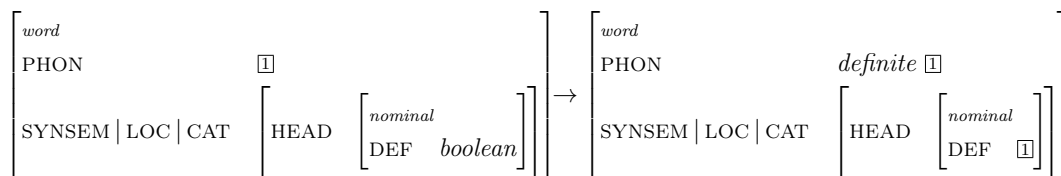
Figure 3.18: The Definite Lexical Rule for HA

$$
\begin{bmatrix}
word \\
\text{PHON} & kit\bar{a}b \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & boolean \end{bmatrix} \end{bmatrix}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
word \\
\text{PHON} & l\text{-}kit\bar{a}b \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & + \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$
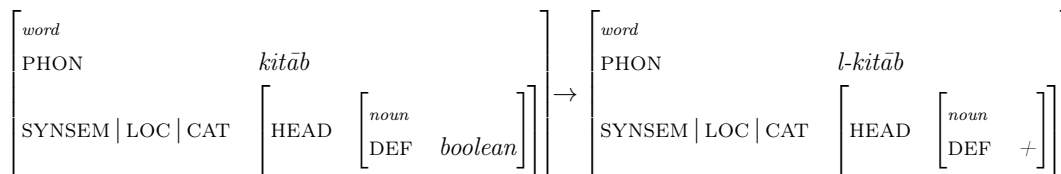
Figure 3.19: The effect of the Definite Lexical Rule on HA nouns

Its effect, when applied to an HA noun such as *kitāb* 'book', is illustrated
in Figure (3.19).

As can be observed from Figure 3.19, the noun *kitāb* is rendered defi-
nite through the DLR. The DLR assumes that the initial value of the noun's
definiteness feature is (boolean). The *definite* function then applies to the
phonology and the features of the indefinite noun: *kitāb*, in turn rendering the
phonology and the features of the definite noun: *l-kitāb*.

## 3.3.2   HPSG analysis of Adjective concord in HA

As we saw in Section 3.2 in Chapter 2, and again, in similar parallels in
Hebrew and MSA, HA NPs can be expanded with adjective phrases (APs).
In this case, adjectives fulfill the function of modifiers, i.e. optional adjuncts
attached to the NP. Adjectives can appear in different kinds of structures, e.g.
in attributive or predicative positions, but we are only concerned with their
occurrence in NPs, i.e. in attributive function. HA adjectives, as shown in the
previous chapter, inflect for GENDER (20a), NUMBER (20b), and DEFINITE-
NESS (20c), just like nouns. Here we will be only concerned with the HPSG
treatment of DEFINITENESS.

(20) a. šanṭah   jadīd-ah
      bag.SGF new-SGF

      a new bag

    b. awlād     aðkiya
      boys.PLM clever.PLM

      clever boys

    c. l-kitāb      l-jadīd
      DEF-book.SGM DEF-new.SGM

      a new book

Previous work on adjectives in HPSG include Arnold and Sadler (1992) for English, and Abeillé and Godard (1999), and Abeillé and Godard (2000) for French. For HA adjectives, I choose to employ the same DLR discussed above, yet this time apply it to adjectives. Like most nouns, we assume that adjectives have a DEFINITENESS feature which is initially set as (boolean). When the DLR is applied to them, it once again adds the definite article, returning a specification with the DEF (+) value. Adjuncts select the head they modify, and use a feature MOD to effect this selection. Restricting myself here to a discussion of nominal modifiers, Figure (3.20) illustrates the effect of the DLR when applied to an attributive adjective such as *jadīd*, as exemplified through (20c).

The adjective *l-jadīd* selects *l-kitāb* via the head MOD feature. The agreement of the attributive adjective is quite simple. Just like agreement in NUMBER and GENDER, agreement in DEFINITENESS is specified in the lexical entry of the adjective. The MOD feature is the head feature of the adjective, which is indicated to have the same SYNSEM value as the head noun. This ensures that an adjective agrees, among other things, in DEFINITENESS with the noun it modifies.

$$\begin{bmatrix} word \\ \text{PHON} \quad jad\bar{\imath}d \\ \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \quad \begin{bmatrix} \text{HEAD} \quad \begin{bmatrix} adj \\ \text{DEF} \quad boolean \\ \text{MOD} \quad \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} \quad \begin{bmatrix} nominal \\ \text{DEF} \quad \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow$$

$$\begin{bmatrix} word \\ \text{PHON} \quad l\text{-}jad\bar{\imath}d \\ \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \quad \begin{bmatrix} \text{HEAD} \quad \begin{bmatrix} adj \\ \text{DEF} \quad \boxed{3}+ \\ \text{MOD} \quad \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{HEAD} \quad \begin{bmatrix} nominal \\ \text{DEF} \quad \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$
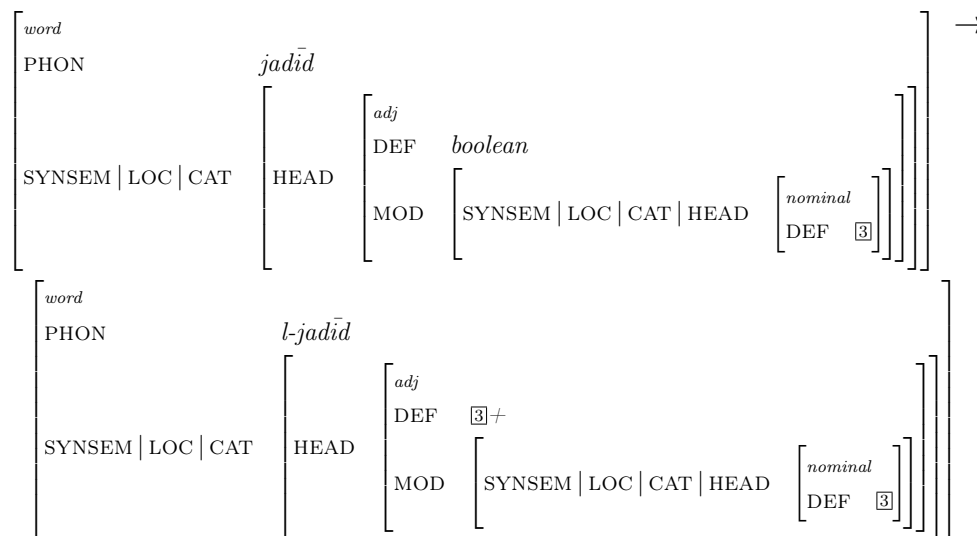
Figure 3.20: The effect of the Definite Lexical Rule on HA adjectives

### 3.3.3   HPSG analysis of Relative clause modification in HA

HA NPs can be expanded with relative clauses too. In this case, relative clauses fulfill the function of modifiers, i.e. optional adjuncts attached to the NP. As described in Section 3.4 in Chapter 2, in HA, (restrictive) relative clauses are of two main types. One type involves the complementiser *illi*, which is available both when no antecedent is available, or when the relative clause's antecedent is definite. Such a relativisation strategy is present both when the clause involves a gap (21a), or a resumptive clitic (21b).

(21)  a.  l-kitāb        illi   ḍāʕ
          DEF-book.SGM COMP lose.PFV.3SGM
          the book that was lost

      b.  l-kitāb        illi   y-ḥubb-uh
          DEF-book.SGM COMP 3SGM-love.IMPV-3SGM.ACC
          the book that he likes

The other type of relative clause involves no presence of *illi*. This is possible only in the context of indefinite antecedents. In such 'bare' clauses, we can once again have either a gap (22a), or a resumptive clitic (22b).

$$rel\text{-}complementizer$$

def-rel-complementizer     indef-rel-complementizer
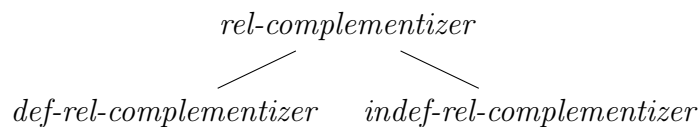
Figure 3.21: Relative Complementizer subtypes

(22)  a.  kitāb       ḍāʕ
          book.SGM lose.PFV.3SGM
          a book that was lost

      b.  kitāb       y-ḥubb-uh
          book.SGM 3SGM-love.IMPV-3SGM.ACC
          a book he likes

Alqurashi and Borsley (2012) adopts the analysis of English relative clauses that was developed by Pollard and Sag (1994). *illi* and its phonologically empty counterpart have many properties in common, and Alqurashi and Borsley (2012) treats them as two subtypes of a single type, as in Figure (3.21).

The properties that the two complementizers share can be associated with the type *rel-complementizer*. The type will have the description in Figure (3.22). According to the analysis as set out in figure (3.22), the relative complementizer functions as a head that has a MOD feature that distinguishes relative complementizers from ordinary complementizers, since it is only the former that carries the feature value: [MOD NP]. Furthermore, this complementizer requires a complement. For this reason, it has a [SLASH {NP⒈}] specification because its complement contains a gap or a resumptive clitic.

The analysis provided in Alqurashi and Borsley (2012) is essentially the description that Alqurashi himself originally proposed for the relative complementizer in HA (Alqurashi, 2013). It ensures that relative clauses modify an NP and contain a gap or a resumptive clitic with the same index as the NP head. This is what results in the agreement in PERSON, NUMBER and GENDER between the NP antecedent and the gap or resumptive clitic. It also ensures that the CONTENT value of a relative clause is a restricted index, with the

$$
\begin{bmatrix}
\textit{rel-complementizer} \\[4pt]
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
c \\[4pt]
\text{MOD}
\begin{bmatrix}
\text{NP} \\[4pt]
\text{CONT}
\begin{bmatrix}
\boxed{1}\ \text{INDEX} \\
\boxed{2}\ \text{RESTR}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix} \\[20pt]
\text{COMP}
\begin{bmatrix}
\text{HEAD} & v \\
\text{SUBJ} & \langle\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix} \\[14pt]
\text{CONT} \quad \boxed{3}\ \textit{proposition}
\end{bmatrix} \\[20pt]
\text{CONT}
\begin{bmatrix}
\boxed{1}\ \text{INDEX} \\
\boxed{2}\ \text{RESTR} \cup \boxed{3}
\end{bmatrix} \\[10pt]
\text{NONLOC}\,|\,\text{SLASH} \quad \left\{\boxed{1}\ \text{NP}\right\}
\end{bmatrix}
$$
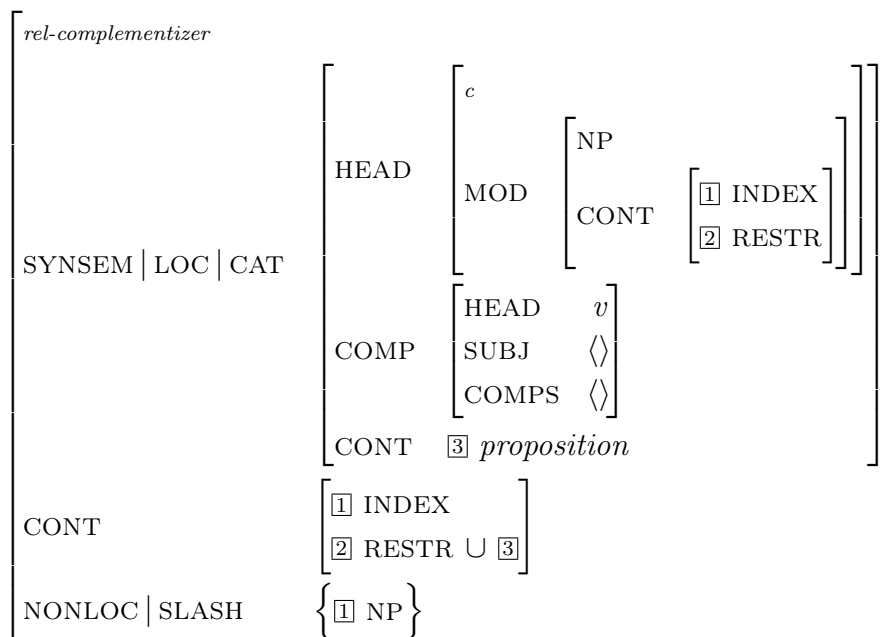
Figure 3.22: Relative Complementizer

restrictions stemming from its complement and the NP it modifies. With this description provided in (Alqurashi, 2013), the gapped definite relative in (21a) has a structure as in Figure (3.23).

Indefinite relatives, such as (22a) will have a similar structure, which is provided in Figure (3.24).

### 3.3.4   HPSG analysis of Construct State nouns in HA

In construct state constructions, as reviewed earlier in Sections 2-3-2.6, the DEFINITENESS of the phrase is inherited from the possessor, allowing for two combinations, not four: either an instance where both are indefinite, as in (23a), or an instance where only the dependent noun is definite, as in (23b), but not both, as shown through the ungrammaticality of (23c). The definite article never combines with the head noun when the morphosyntactic formation is that of a CS.

(23)  a. kitāb        walad
         book.SGM boy.SGM
         a boy's book

NP

NP$_2$          CP

$\begin{bmatrix} \text{DEF} + \end{bmatrix}$   $\begin{bmatrix} \boxed{1} \text{ MOD} \\ \text{SLASH}\{\} \end{bmatrix}$

C          S

$\begin{bmatrix} \boxed{1} \text{ MOD} \\ \text{SLASH}\{NP_2\} \end{bmatrix}$   $\begin{bmatrix} \text{SLASH} \{NP_2\} \end{bmatrix}$

NP

V   $\begin{bmatrix} \text{SLASH} \{NP_2\} \end{bmatrix}$

l-kitāb     illi          ḍāʕ        e
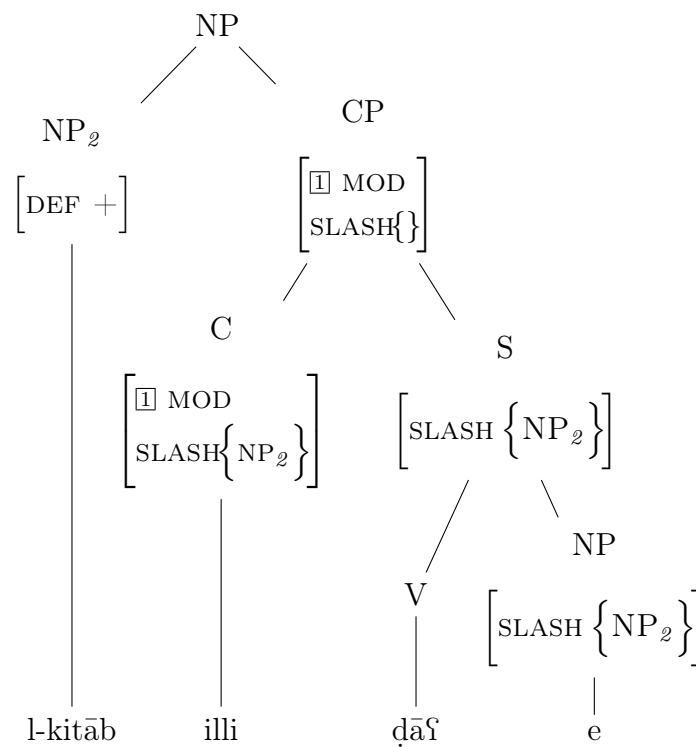
Figure 3.23: Definite NP with a relative clause (Alqurashi, 2013)

b. kitāb      l-walad
   book.SGM DEF-boy.SGM
   the boy's book

c. *l-kitāb       l-walad
   DEF-book.SGM DEF-boy.SGM
   the boy's book

However, as we saw in Section 2.2 in Chapter 2, it is a peculiarity of HA (and other varieties) that all singular feminine nouns have a third form associated with their presence within a CS definite formation, whereby they do not just use the same form as the indefinite in this instance, which is otherwise the norm across the Arabic vernaculars.

(24)  a. zamīlat     l-bint
         friend.SGF DEF-girl
         the girl's friend

      b. *zamīlah   l-bint
         friend.SGF DEF-girl
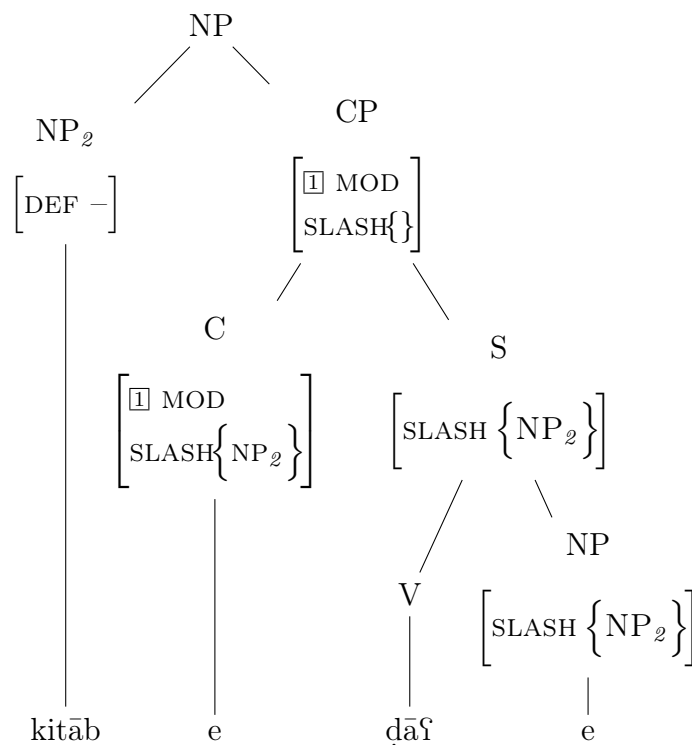
Figure 3.24: Indefinite NP with a relative clause

a girl's friend

Possessors in Arabic can be viewed as the least oblique complements of nouns as we have seen in (15), where the possessor must follow the head and must additionally precede the PP complement. To account for the absence of definiteness from the head, internal to such CS constructions, we use the same rules as Wintner (2000), where the construct state form is generated from a free state one. In this analysis the construct state noun is phonologically dependent, and is specified for a possessor in its COMPS list. Its feature DEP is not empty, and its value is identified with the value in the possessor COMPS list. To account for the DEFINITENESS restriction and how it surfaces on the possessor, matched by possessed head, DEFINITENESS is inherited at the phrase level and thus the DEF values of the head and the complement are identical. Noun-noun constructs then combine by the *hd-comp-schema* to create structures like that in Figure (3.25).

$$
\begin{bmatrix}
phrase \\
\text{PHON} & kit\bar{a}b\ l\text{-}walad \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \boxed{3} \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}
\end{bmatrix}
$$

$$
\begin{bmatrix}
word \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \boxed{3}\begin{bmatrix} noun \\ \text{DEF} & \boxed{2} \end{bmatrix} \\ \text{COMPS} & \langle\boxed{4}\rangle \end{bmatrix} \\
\text{DEP} & \langle\boxed{4}\rangle
\end{bmatrix}
\qquad
\begin{bmatrix}
word \\
\text{SYNSEM} & \boxed{4}\begin{bmatrix} \text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & \boxed{2}+ \end{bmatrix} \end{bmatrix} \end{bmatrix} \\
\text{DEP} & \langle\,\rangle
\end{bmatrix}
$$

kitāb                                      l-walad
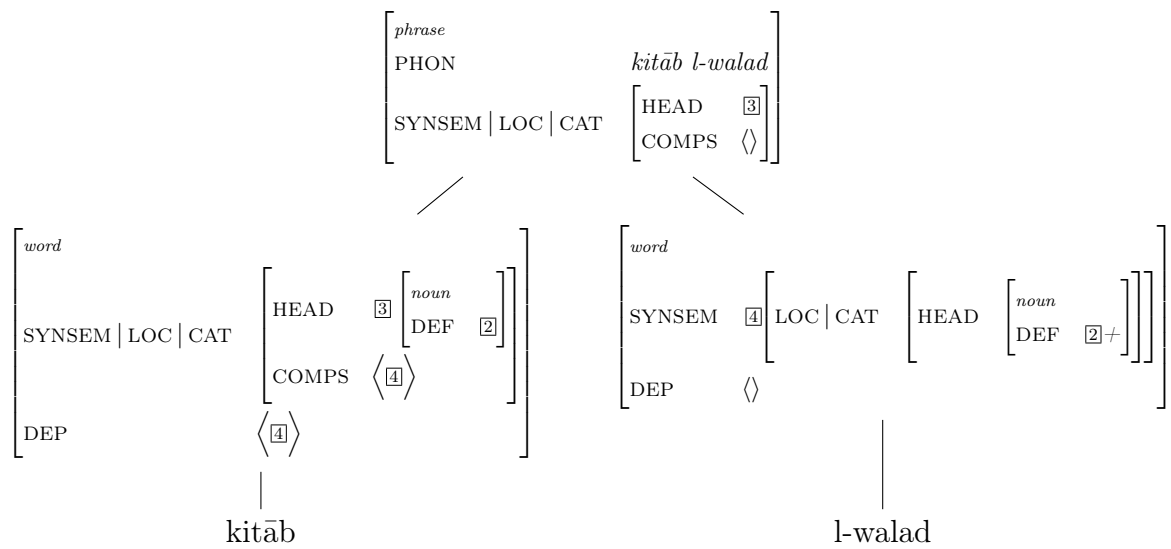
Figure 3.25: HA Construct State NP

$$
\begin{bmatrix}
word \\
\text{PHON} & kit\bar{a}b \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & \boxed{2} \end{bmatrix} \\ \text{COMPS} & \langle\boxed{4}\rangle \end{bmatrix} \\
\text{DEP} & \langle\boxed{4}\begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & \boxed{2} \end{bmatrix} \end{bmatrix}\rangle
\end{bmatrix}
\rightarrow
\begin{bmatrix}
word \\
\text{PHON} & kit\bar{a}b\text{-}uh \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & + \end{bmatrix} \\ \text{COMPS} & \langle\,\rangle \end{bmatrix} \\
\text{DEP} & \langle\,\rangle
\end{bmatrix}
$$
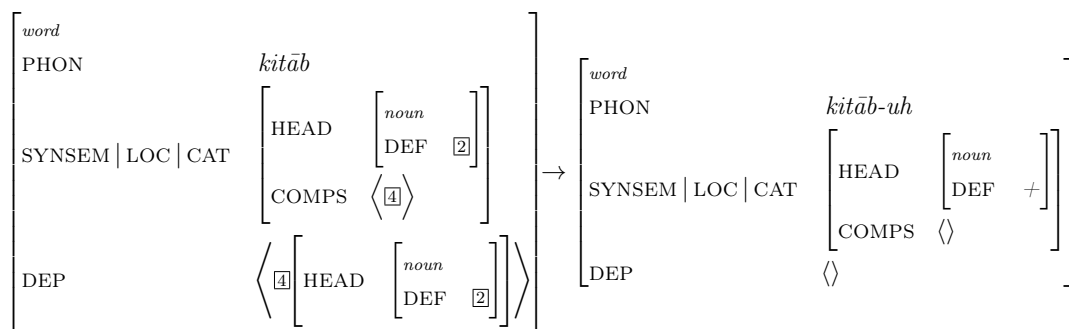
Figure 3.26: Construct State with Clitic Pronoun

Note that the structure in Figure 3.25 does not specify the DEFINITE-NESS of the head which, recall from above, has the default neutral setting (boolean). Heads in construct state cannot be rendered definite, directly. The DEF feature, of the phrase is inherited from the complement. Since DEF is a head feature it is propagated to the mother node. In the case of there being a pronominal complement within the construct state, the phonologically weak head nouns become phonologically independent, when they are combined with a pronominal affix. The lexical rule for this is depicted in Figure (3.26).

### 3.3.5   HPSG analysis of Free State nouns in HA

Free state nouns can also participate into constructions which have a possessive interpretation. However, the difference between construct states and free states is that in the latter, definiteness is not inherited, as the complement is analysed as independent of the head, and primarily this is indicated through an empty DEP list on the head. The morphosyntactic difference between the two forms is illustrated in (25).

(25)   a. zamīl-at     l-bint
          friend-SGF DEF-girl.SGF

          the girl's friend

     b. zamīl-ah     li-l-bint
          friend-SGF for-DEF-girl.SGF

          a friend of the girl

In other words, free state nouns yield four different combinatorial possibilities of definiteness, since both the head and the complement can each be independently either definite or indefinite. The free state construction is generated by a morphological process just like a construct state form. The lexical rule accommodates both forms. The rule only has to pick a complement from the list, and then change it to either a NP or a genitive PP. There is no inheritance involved, when dealing with free states, and the head is prosodically independent. For this reason, its DEP feature is empty.

The application of the rule would work as in Figure (3.27) for the form illustrated in (25). The lexical process that creates a construct form from the free form changes the DEFINITENESS of the nominal that is specified by the head, from - to +. It is that which specifies the value of the DEP feature of the construct head noun, indicating the prosodic dependency that the head noun has on the possessor noun it heads.

$$
\begin{bmatrix}
\text{PHON} & \text{zam\={\i}lah} \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & - \end{bmatrix} \\ \text{COMPS} & \langle\rangle \end{bmatrix} \\
\text{DEP} & \langle\rangle
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{PHON} & zam\={\i}lat \\
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} & + \end{bmatrix} \\ \text{COMPS} & \langle\rangle \end{bmatrix} \\
\text{DEP} & \langle \boxed{4} \rangle
\end{bmatrix}
$$
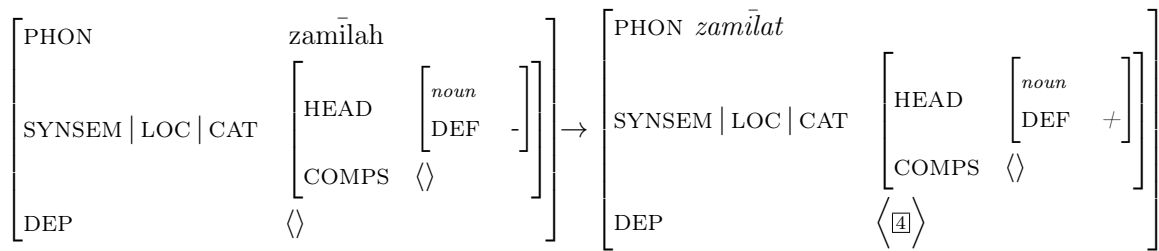
Figure 3.27: The relationship between Free and Construct forms in HA

## 3.4 HPSG analysis of Quantified NPs in HA

In this section, I will analyse quantified noun phrases, such as the data that has been described in Section 4 in Chapter 2, and will adopt an analysis that parallels closely that of NPs above. Arabic quantifiers have not received that much consideration in the literature, and to the best of my knowledge, there is no comprehensive study on the syntax of HA quantifiers in any framework. The striking similarities between nouns, and quantifier constructions imply that they have similar rules. Any analysis that would suggest two different mechanisms to account for both phenomena is bound to be redundant.

### 3.4.1 HPSG treatment of HA Quantifiers as Nouns

We have seen in Chapter 2 (Section 4) that HA quantifiers occur with all noun forms. They can appear in simple, construct state, and free state constructions, as illustrated through the data in (26).

(26)  a.  l-kull
          DEF-all
          all

      b.  baʕḍ l-awlād
          some DEF-boy.PLM
          some of the boys

      c.  kaθīr  min l-awlād
          many of    DEF-boy.PLM
          many of the boys

My proposal is that the nominal quantified phrases in (26) should be treated as NPs, not as DPs, where the quantifier category is N and heads the NP, when this is present. With such an analysis, I propose that there will be no need to postulate a new category Q, and an analysis of quantifiers and nouns can thereby be unified. For disambiguation's sake, I will still be referring to quantifiers as quantifiers, even if the proposed category for them will be N. This will help me keep them distinct from nouns for the purpose of discussion, as is required, since they do not behave like typical common nouns, in every respect.

We may note incidentally that, on the basis of the proposed analysis, which I will be working out below, it seems that HA completely lacks the category D, as neither the definite article, nor quantifiers, seem to be good candidates for membership in this category.

The difference between quantified NPs and ordinary NPs is in this view essentially a semantic one, such that the former expresses perspectives on quantity, and can articulate a part-whole relation within NPs. Such quantifier syntactic head nouns therefore differ from ordinary nouns in that they are 'number transparent'. This means that they allow the number of the entities denoted by their complement NP to percolate up and determine the NUMBER of the whole NP. Consider (27).

(27) a. kull l-awlād      sāfar-ū
       all   DEF-boy.PLM travel.PFV.3-PL
       All of the boys have traveled.

     b. axu          l-awlād      sāfar
        brother.SGM DEF-boy.PLM travel.PFV.3SGM
        The boys' brother has traveled.

In (27a), while *kull* functions as the head, it is the complement noun *al-awlād* that triggers agreement on the verb. In (27b), it is the head noun *axu* that

$$
\begin{bmatrix}
\textit{word} \\
\text{PHON} \qquad\qquad\qquad \textit{l-kull} \\
\text{SYNSEM} \,|\, \text{LOC} \,|\, \text{CAT} \quad
\begin{bmatrix}
\text{HEAD} & \textit{noun} \\
\text{DEF} & +
\end{bmatrix}
\end{bmatrix}
$$

Figure 3.28: *al-kull* 'all'

functions both as the syntactic and semantic head.

I next describe in fuller detail the HPSG representation of quantifiers in simple, construct, and free state. I do so largely by restricting myself to non-floating *kull*, since that is the quantifier that we will be revisiting in later chapters.

## 3.4.2 HPSG treatment of HA simple quantifiers

HA simple quantifiers without complements attach a definite article and serve as an ordinary NP.[5] However, they differ from normal nouns in that they cannot appear in a basic form without the presence of a definite marker. This can be shown through the ungrammaticality of (28).

(28) *kull    jā
     everyone come.PFV.3SGM
     everyone came

Given this behaviour of *kull, al-kull* is the initial form to be stated directly in the lexicon, and is considered as definite, without the need of any additional lexical rule. The lexical entry is depicted in Figure 3.28.

In terms of syntax, the quantifiers occurring as simple heads without complements are not very different from ordinary NPs. For instance they combine

---

[5]This is something which can be observed in other languages too. There are for instance a group of quantifiers in Bulgarian that co-occur with the enclitic definite article.

   i  vsicki(te) / mnogo(to)
      all(the)   / many(the)
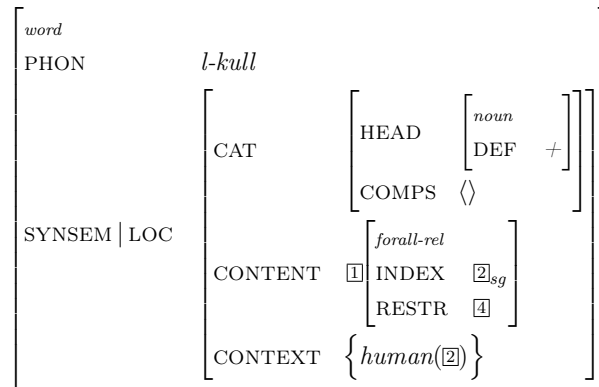
      all/ many               (Tasseva-Kurktchieva, 2006)

with adjectives, relative clauses and various types of complements. However, their NUMBER agreement behaviour can be unusual. A quantifier like *kull* can result in either plural, or singular masculine agreement on the verb, while itself maintaining the same form. The agreement that results renders a collective versus distributive reading. Accordingly, it can trigger default 3SGM agreement when interpreted individually, and 3PL agreement when interpreted collectively. This contrast is illustrated in (29).

(29)  a.  l-kull    jā
         DEF-all  come.PFV.3SGM
         Everyone came.                                                distributive reading

    b.  l-kull    ju
         DEF-all  come.PFV.3-PL
         All came.                                                           collective reading

Finally, as has been discussed in Section 4 of Chapter, the interpretation in the examples is primarily [+Human] in both distributive and collective readings, and that the discourse context is an important source for the quantifier's interpretation. It is unlikely that (29) would be understood as 'Everything has arrived' without some contextual clues to this effect, maybe of a pragmatic nature, although strictly, semantically, *kull* is not limited to [+human]. Perhaps the best approach to this preference is to assume that there is a pragmatic constraint requiring, roughly, that the index bearing the specification be anchored to humans. This is something which I will be integrating in my analysis below.

Assuming that quantifiers do not specify a GENDER or a NUMBER value via INDEX, these specifications are still subject to the anchoring of constraints on indices, i.e. on the sorts of things they may refer to. As we see in connection with examples such as the pair in (29), the entry for (29a) would have to have the properties for being [+Human] in order to serve as an anchor for the NP's index. Figure (3.29) illustrates how this fact then becomes compatible

$$
\begin{bmatrix}
word \\
\text{PHON} \quad \textit{l-kull} \\
\text{SYNSEM} \mid \text{LOC}
\begin{bmatrix}
\text{CAT} \quad
\begin{bmatrix}
\text{HEAD} \quad
\begin{bmatrix}
noun \\
\text{DEF} \quad +
\end{bmatrix} \\
\text{COMPS} \quad \langle \rangle
\end{bmatrix} \\
\text{CONTENT} \quad \boxed{1}
\begin{bmatrix}
forall\text{-}rel \\
\text{INDEX} \quad \boxed{2}_{sg} \\
\text{RESTR} \quad \boxed{4}
\end{bmatrix} \\
\text{CONTEXT} \quad \left\{ human(\boxed{2}) \right\}
\end{bmatrix}
\end{bmatrix}
$$

Figure 3.29: *l-kull* with SG agreement

with a singular referent. The particular value it has in the context becomes determined by the context itself.

The quantifier in Figure (3.29) is specified as *sg*. The INDEX bears this value for the NUMBER feature in accordance with the NUMBER of the entity to which that index is anchored in the discourse. The RESTR denotes individuals that support the distributive interpretation. Note that the HUMAN property here is not being treated as an agreement feature of the quantifier. This would be unmotivated, given the compatibility of the quantifier with both ($\pm$ HUMAN) properties. Additionally, Figure (3.29) also illustrates how the quantifier is being lexically specified for a DEF feature that has a value $+$. This kind of analysis is subject to the following principle:
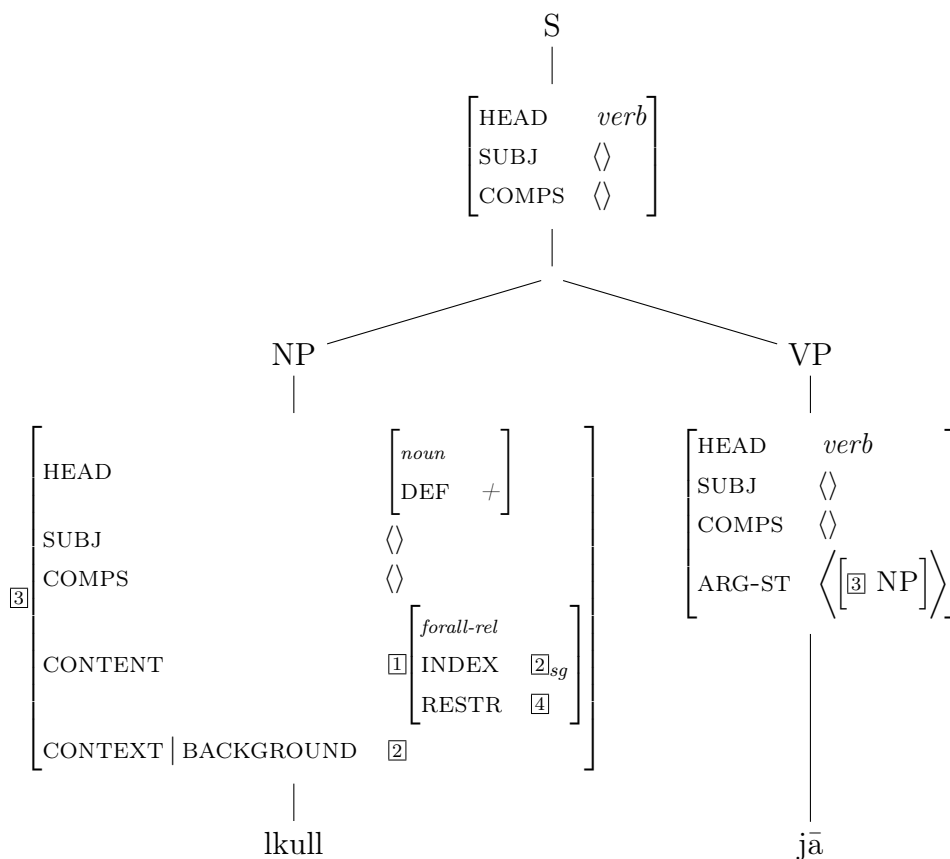
(30) Principle of Contextual Consistency

The CONTEXT|BACKGROUND value of a given phrase is the union of the

CONTEXT|BACKGROUND values of the daughters.
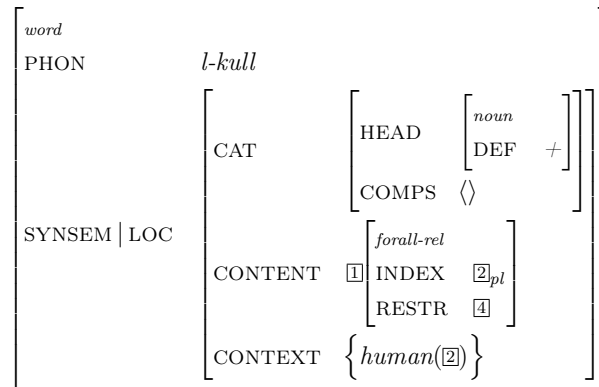
(Pollard and Sag, 1994, p. 333)

The principle ensures that a phrase inherits the BACKGR values of the contextual assumptions. Thus sentence (29a) is assigned the structure sketched in Figure (3.30).

$$
\begin{array}{c}
\text{S} \\
\mid \\
\begin{bmatrix}
\text{HEAD} & verb \\
\text{SUBJ} & \langle\rangle \\
\text{COMPS} & \langle\rangle
\end{bmatrix}
\end{array}
$$

NP

VP

$$
\boxed{3}\begin{bmatrix}
\text{HEAD} & \begin{bmatrix} noun \\ \text{DEF} \quad + \end{bmatrix} \\
\text{SUBJ} & \langle\rangle \\
\text{COMPS} & \langle\rangle \\
\text{CONTENT} & \boxed{1}\begin{bmatrix} forall\text{-}rel \\ \text{INDEX} & \boxed{2}_{sg} \\ \text{RESTR} & \boxed{4} \end{bmatrix} \\
\text{CONTEXT}\mid\text{BACKGROUND} & \boxed{2}
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{HEAD} & verb \\
\text{SUBJ} & \langle\rangle \\
\text{COMPS} & \langle\rangle \\
\text{ARG-ST} & \left\langle \begin{bmatrix} \boxed{3}\ \text{NP} \end{bmatrix} \right\rangle
\end{bmatrix}
$$

lkull

jā

Figure 3.30: *al-kull jā* 'Everyone came.'

The INDEX agreement here is guided by transferred reference, rather than by any inherent agreement properties of the quantifier itself. If the quantifier had its very own inherent singular feature, we might expect the singular to be the form of both the verb-form, as well as, the coreferential pronoun. However, the SGM and PL options are both available on the verb, as shown in (31).

(31)  a.  l-kull      yu-ḥubb          nafs-uh
          DEF-all  3SGM-love.IMPV  self-3SGM.GEN
          Everyone loves himself.                              (distributive)

      b.  l-kull      yu-ḥubb-u        nafsa-hum
          DEF-all  3-love.IMPV-PL  self-3PL.GEN
          All (people) love themselves.                        (collective)

The referential index is a piece of evidence that shows that the value of the NUMBER feature is guided by contextual agreement, rather than grammatical

$$
\begin{bmatrix}
word \\
\text{PHON} \quad\quad\quad l\text{-}kull \\
\\
\text{SYNSEM} \mid \text{LOC}
\begin{bmatrix}
\text{CAT} \quad
\begin{bmatrix}
\text{HEAD} \quad
\begin{bmatrix}
noun \\
\text{DEF} \quad +
\end{bmatrix} \\
\text{COMPS} \quad \langle\rangle
\end{bmatrix} \\
\\
\text{CONTENT} \quad \boxed{1}
\begin{bmatrix}
forall\text{-}rel \\
\text{INDEX} \quad \boxed{2}_{pl} \\
\text{RESTR} \quad \boxed{4}
\end{bmatrix} \\
\\
\text{CONTEXT} \quad \left\{ human(\boxed{2}) \right\}
\end{bmatrix}
\end{bmatrix}
$$

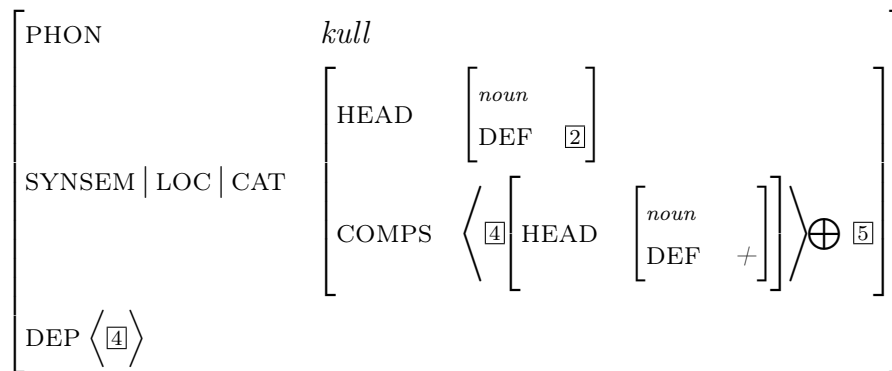Figure 3.31: *l-kull* with PL agreement

agreement. Pronouns show INDEX agreement (Pollard & Sag 1994). The agreement on the reflexive forms here goes on to further show that both types of agreements are possible with quantifiers. The binding of the reflexive pronoun by the quantifier allows for both SG or PL pronominal forms. For completeness sake, Figure (3.31) illustrates the lexical entry of *al-kull* in its triggering of plural agreement on the verb, where RESTR is understood as denoting *groups*, including plural individuals, and hence the INDEX is PL in support of the collective interpretation.

In sum, simple quantifiers are syntactically similar to ordinary definite nouns. However, they are interpreted in a contextually-restricted manner with respect to a [Human] feature (and context). Precisely how, will depend on the context, as has been shown.

## 3.4.3   HPSG treatment of HA Quantified construct states

Quantifiers can occur in a construct state form, where they are dependent, and must be in a tight relation with their NP complement. In this construction the quantifier is always without *al-*, and may be interpreted as DEF+ or DEF- depending on the complement.

(32)  kull  l-awlād
      all   DEF-boy.PLM
      all of the boys

$$
\begin{bmatrix}
\text{PHON} & \textit{kull} \\[2em]
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} &
\begin{bmatrix}
\text{HEAD} & \begin{bmatrix} \textit{noun} \\ \text{DEF} & \boxed{2} \end{bmatrix} \\[2em]
\text{COMPS} & \left\langle \boxed{4}\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{noun} \\ \text{DEF} & + \end{bmatrix} \end{bmatrix} \right\rangle \oplus \boxed{5}
\end{bmatrix} \\[3em]
\text{DEP} & \left\langle \boxed{4} \right\rangle
\end{bmatrix}
$$

Figure 3.32: *kull l-awlād* 'all of the boys'

```
              NP
             /  \
            N    NP
            |     |
          kull  l-awlād
```
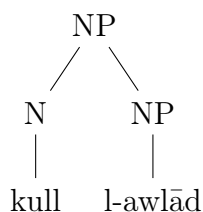
Figure 3.33: *kull l-awlād* 'all of the boys'

Following the analysis of CS nouns in Section 3.3, here I provide a parallel analysis for CS structures involving quantifiers. Based on that, the structure of the quantifier in a CS formation such as *kull l-awlād* 'all of the boys' is illustrated in Figure (3.32).

Assuming that the quantifier is the head, the internal structure of *kull l-awlād* 'all of the boys' will be as represented in Figure (3.33).

Different from simple quantifiers, all information restricting a quantifier within a CS construction comes from sentence-internal restrictive arguments. Most importantly, for my analysis, the quantifier complement functions as an important source for the quantifier's restrictions, just as the possessor in the full noun equivalent construction supplies the value of DEF to its head. The alternating agreement patterns found in the simple form of the quantifier are no longer found in CS formation, as there is an overt complement which is responsible for the quantifier's restrictions.[6]

---

[6]In Hebrew Danon (2013) the verb's agreement can alternate between agreement with the quantifier, and agreement with the noun. Serbo-croatian also shows different types of quantified NPs (Bošković and Lasnik (2003); Stjepanović (1998); Wechsler and Zlatić (2000);

When considering such partitive relations, however, these relations differ syntactically and semantically, depending on the complement noun, in ways that were not paralleled earlier for ordinary common nouns in possessive constructions. The following examples illustrate the use of CS *kull* with definite complement nouns, and its ungrammaticality with indefinite plural nouns.
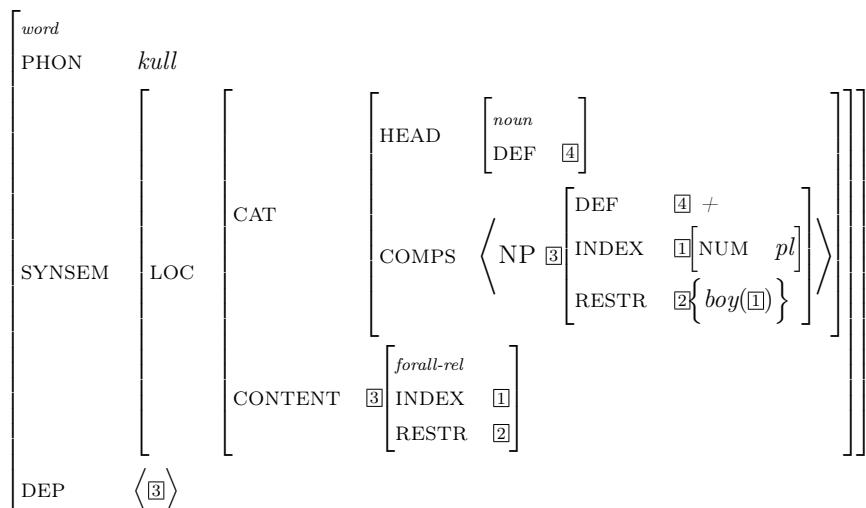
(33) a. kull l-awlād     sāfar-u
       all   DEF-boy.PLM travel.PFV.3-PL
       All of the boys have traveled.

    b. *kull awlād     sāfar-u
       all   boy.PLM travel.PFV.3-PL
       *All of boys have traveled.

    c. kull z-zēt     an-kabb
       All   DEF-oil PASS-spill.PFV.3SGM
       The whole oil was spilled.

When the complement is definite, as in (33a,33c), the complement can be either a plural countable, or a singular mass noun, but it cannot be a singular count noun. In this case, the quantifier is interpreted collectively as '*all; whole*'. However, when the quantifier combines with an indefinite noun, the complement must be a count singular noun, and in this case, the quantifier is interpreted distributively as 'every', as in (34).

(34) kull walad     ʔistalam            šahādah
     all   boy.PLM receive.REFL.PFV.3SGM certificate
     Every boy received a certificate.

The quantifier *kull* can additionally combine with an indefinite noun that itself takes a complement PP, and similarly, in this case too, the quantifier has a distributive interpretation.

Wechsler and Zlatić (2003)). This is not the case in HA, as has been already discussed in Chapter 2 (Section 4).
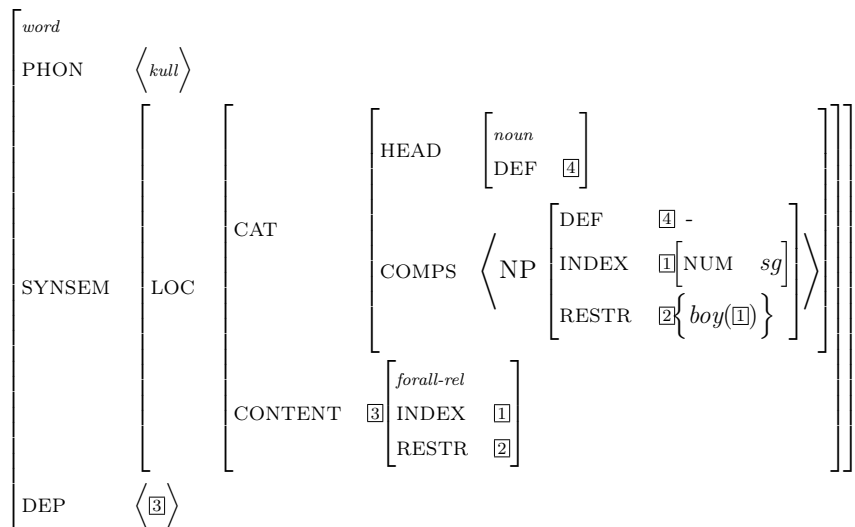
$$
\begin{bmatrix}
\textit{word} \\
\text{PHON} \quad \textit{kull} \\
\\
\text{SYNSEM} \quad
\begin{bmatrix}
\text{LOC}
\begin{bmatrix}
\text{CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
\textit{noun} \\
\text{DEF} \quad \boxed{4}
\end{bmatrix} \\
\\
\text{COMPS} \quad
\left\langle
\text{NP} \; \boxed{3}
\begin{bmatrix}
\text{DEF} \quad \boxed{4}\; + \\
\text{INDEX} \quad \boxed{1}[\text{NUM} \quad pl] \\
\text{RESTR} \quad \boxed{2}\{\, boy(\boxed{1}) \,\}
\end{bmatrix}
\right\rangle
\end{bmatrix} \\
\\
\text{CONTENT} \quad \boxed{3}
\begin{bmatrix}
\textit{forall-rel} \\
\text{INDEX} \quad \boxed{1} \\
\text{RESTR} \quad \boxed{2}
\end{bmatrix}
\end{bmatrix} \\
\\
\text{DEP} \quad \langle \boxed{3} \rangle
\end{bmatrix}
\end{bmatrix}
$$

Figure 3.34: *kull l-awlād* 'all of the boys'

(35)  kull  walad  min  l-awlād       ʔistalam               šahādah
      all   boy    from  DEF-boy.SGM  receive.REFL.PFV.3SGM  certificate

      Each boy from the boys received a certificate.

The quantifier in these constructions takes a NP as a DEP/complement, and the INDEX associated with the quantifier is bound within the restrictor, i.e the complement. I claim that the three functions of the quantifiers are uniform; they all render the same structure. The differences are motivated by the desire that the semantics corresponds to the complement of the quantifier. The distributivity arises only if a complement is definite or indefinite.

As discussed in Section 3.4, the lexical rule for the construct state form was shown to require the head to be neither definite, nor indefinite, such that DEFINITENESS was the NP/pronominal that functions as its dependent. The resulting phrase inherits the definiteness from the dependent complement. The structure of the quantifier with a definite complement, as in (33a), is as follows in Figure (3.34).

Figure (3.34) represents the complement along with its DEF feature specified as +. The resulting phrase is definite. The semantics of the complement noun is required to be a component of the restriction of the quantifier. Thus, the CONTENT value of the quantifier is token-identical with the RESTR and

$$
\begin{bmatrix}
word \\
\text{PHON} \quad \langle kull \rangle \\
\text{SYNSEM} \quad \text{LOC}
\begin{bmatrix}
\text{CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
noun \\
\text{DEF} \quad \boxed{4}
\end{bmatrix} \\
\text{COMPS} \quad \left\langle \text{NP}
\begin{bmatrix}
\text{DEF} \quad \boxed{4} \ - \\
\text{INDEX} \quad \boxed{1}[\text{NUM} \quad sg] \\
\text{RESTR} \quad \boxed{2}\{ boy(\boxed{1}) \}
\end{bmatrix} \right\rangle \\
\text{CONTENT} \quad \boxed{3}
\begin{bmatrix}
forall\text{-}rel \\
\text{INDEX} \quad \boxed{1} \\
\text{RESTR} \quad \boxed{2}
\end{bmatrix}
\end{bmatrix} \\
\text{DEP} \quad \langle \boxed{3} \rangle
\end{bmatrix}
\end{bmatrix}
$$

Figure 3.35: *kull walad* 'every boy'

INDEX value of the complement. In that way, we can account for the fact that *kull* can combine with a plural noun by specifying the RESTR-INDEX value of *al-awlād* 'the boys'.

For *kull walad* 'every boy', the lexical entry will be as in Figure (3.35).

The complement DEF value is – and consequently, the whole phrase is specified as DEF-. The lexical process that creates the construct form has a dual effect: It first changes the DEFiniteness of the nominal that is specified by the quantifier; and secondly, it makes this nominal the value of the DEP feature of the construct state quantifier, consistent with the dependency that the quantifier has on the nominal it quantifies. The RESTR and INDEX of the complement are identical to the CONTENT of the quantifier.

As for the 'each' interpretation, in *kull walad min al-awlād* 'each one of the boys', the quantifier takes a complement NP that itself takes a PP complement.

The resulting structure is represented in Figure (3.37).

Assuming that the preposition *min* 'from' combines with *l-awlād* via the *hd-comp-ph*, the DEF value of this complement will not be inherited, as the
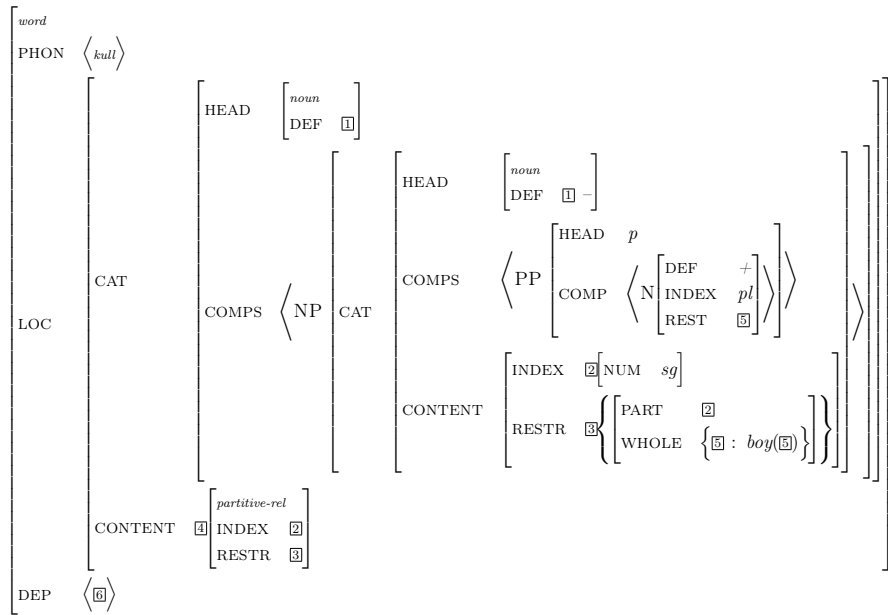
Figure 3.36: *kull walad min l-awlād* 'each one of the boys'

structure is a PP, not a construct state. It is merely the indefinite noun *walad* that selects a PP, and together with it, it forms another *hd-comp-ph*. The combination of the quantifier and the NP is another instance of *hd-comp-ph*, and only then does it form a construct state.

## 3.4.4   HPSG treatment of HA quantifiers in free states

Quantifiers other than *kull* can take *min* + NP constituents as their immediate complement. The resultant semantics is one that involves an assignment from a set from which the quantifier selects. Quantifiers such as *kaθīr* 'many' and *galīl* 'few' can be used in these constructions with definite NPs internal to the PP.

(36)  a. kaθīr   min l-awlād
         many of    DEF-boys.PLM
         many of the boys

      b. galīl min l-awlād
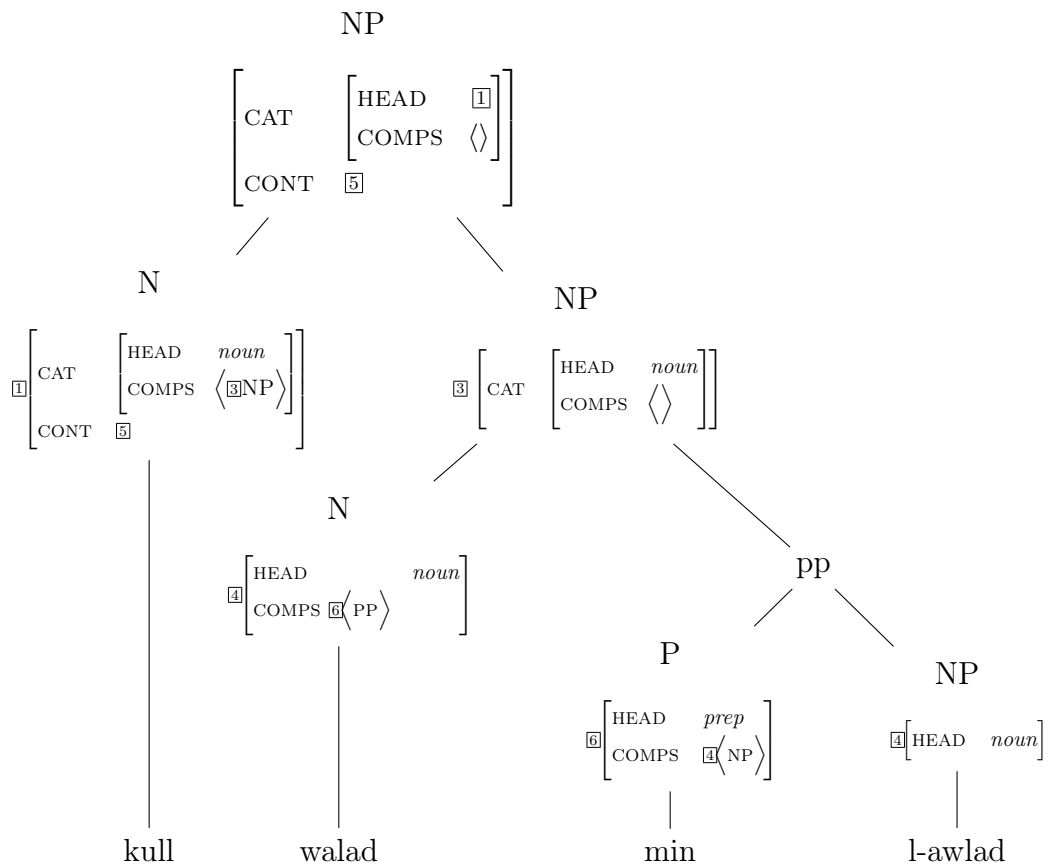         few of    DEF-boy.PLM
         few of the boys

NP

$$\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \boxed{1} \\ \text{COMPS} & \langle\rangle \end{bmatrix} \\ \text{CONT} & \boxed{5} \end{bmatrix}$$

N

$\boxed{1}\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & noun \\ \text{COMPS} & \langle\boxed{3}\text{NP}\rangle \end{bmatrix} \\ \text{CONT} & \boxed{5} \end{bmatrix}$

NP

$\boxed{3}\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & noun \\ \text{COMPS} & \langle\rangle \end{bmatrix} \end{bmatrix}$

N

$\boxed{4}\begin{bmatrix} \text{HEAD} & & noun \\ \text{COMPS} & \boxed{6}\langle\text{PP}\rangle \end{bmatrix}$

pp

P

$\boxed{6}\begin{bmatrix} \text{HEAD} & prep \\ \text{COMPS} & \boxed{4}\langle\text{NP}\rangle \end{bmatrix}$

NP

$\boxed{4}\begin{bmatrix} \text{HEAD} & noun \end{bmatrix}$

kull          walad                      min              l-awlad

Figure 3.37: *kull walad min l-awlād* 'each one of the boys'

Again, the INDEX associated with the quantifier is bound within the restrictor, which is the PP complement (Figure 3.38).

## 3.5   Conclusion

This chapter has shown how noun phrases in HA can be represented in HPSG. In order to achieve this, I have built upon, and modified the HPSG analysis of Wintner (2000), which focused on Hebrew data, in order for me to account for the central properties of simple, construct state, and free state constructions in HA. I also reviewed the analysis of Alqurashi (2015). I have additionally shown that there is no theory-independent reason to believe that non-floated quantifiers in HA are anything other than NPs. Once they are treated as nouns, we can straightforwardly account for their similar behaviours, despite a number of ways in which they differ from normal common nouns. The
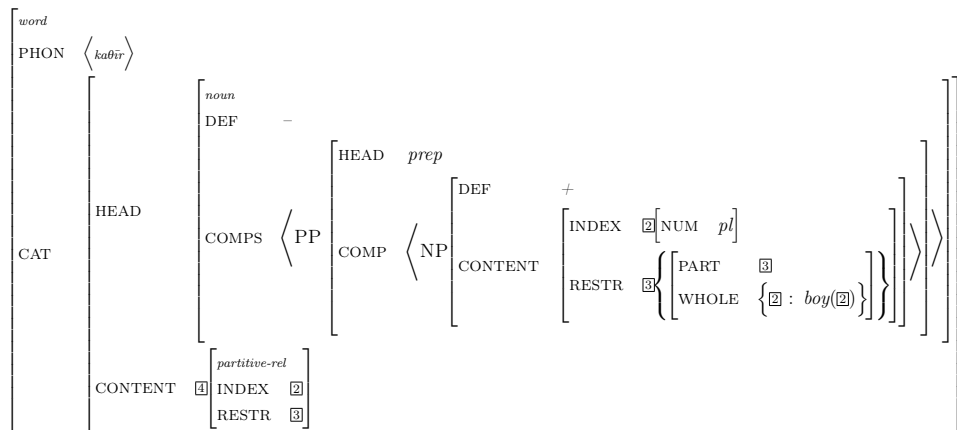
$$
\begin{bmatrix}
word \\
\text{PHON} & \left\langle ka\theta\bar{\imath}r \right\rangle \\
\text{CAT} &
\begin{bmatrix}
\text{HEAD} &
\begin{bmatrix}
noun \\
\text{DEF} & - \\
\text{COMPS} &
\left\langle \text{PP}
\begin{bmatrix}
\text{HEAD} & prep \\
\text{COMP} &
\left\langle \text{NP}
\begin{bmatrix}
\text{DEF} & + \\
\text{CONTENT} &
\begin{bmatrix}
\text{INDEX} & \boxed{2}\begin{bmatrix}\text{NUM} & pl\end{bmatrix} \\
\text{RESTR} & \boxed{3}\left\{\begin{bmatrix}\text{PART} & \boxed{3} \\ \text{WHOLE} & \left\{\boxed{2} : boy(\boxed{2})\right\}\end{bmatrix}\right\}
\end{bmatrix}
\end{bmatrix}
\right\rangle
\end{bmatrix}
\right\rangle
\end{bmatrix} \\
\text{CONTENT} & \boxed{4}
\begin{bmatrix}
partitive\text{-}rel \\
\text{INDEX} & \boxed{2} \\
\text{RESTR} & \boxed{3}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

Figure 3.38: *kaθīr min l-awlād* 'many of the boys'

account of quantifiers necessarily took us into some aspects of their semantics, although the present account cannot in this respect be regarded as complete, yet this topic falls outside of the strict scope of this work.

<div align="right">

## Chapter  4

</div>

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# Floating Quantifiers

## 4.1   Introduction

Very little work exists in the literature on Arabic floating quantifiers (FQs). In particular, this construction is almost completely ignored in the research on HA. The purpose of the chapter is therefore to provide a descriptive overview of floating quantifiers in HA, in which we will present some new perspectives. We will also review some analyses that have been suggested, other than those afforded by HPSG, to which we will devote the following chapter. I demonstrate how floating quantifiers can be either post-nominal NP modifiers, or adverbial elements. This chapter also addresses another type of floating constructions that has hitherto escaped researchers' attention.

The structure of the chapter is as follows. Section 2 starts with the definition of the FQs followed by a discussion of FQs in English and FQs cross-linguistically. Section 3 addresses the main existing approaches to the treatment of FQs in the literature, while Section 4 describes floating quantifiers as used in HA. This section has a detailed description of FQ positions and the contexts that FQs appear in. It is followed by Section 5, which discusses other floating constructions in HA. Section 6 then considers what has been said in

the literature with respect to Arabic floating quantifiers, and essentially establishes that a new approach is needed to account for the problematic issues which are present in previous approaches.

## 4.2   What is a floating quantifier?

A striking feature of quantifiers is that they can occur in positions other than ones adjacent to the NP which they seem to belong to. This has attracted the attention of many scholars in the literature, e.g. Belletti (1982), Dowty and Brodie (1984), Sportiche (1988), Shlonsky (1991), Baltin (1995), and Bobaljik (2003), amongst others. The contrasting French examples from Sportiche (1988) in (1) illustrate the floating phenomenon. In (1a), the quantifier *tous* precedes the NP, while in (1b), *tous* does not merely follow the NP it quantifies. Rather, it comes in between the auxiliary and the verb complex.

(1)   a. **Tous** les enfants  ont   vu    ce    film.
         all      the children  have seen  this  film.

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

A wider range of quantifier constructions can be obtained by considering all occurrences after an NP. There are instances, such as in (2), where one might overlook the fact that the quantifier is floated, given the proximity it still demonstrates in relation to the NP, i.e. being just in a post-nominal position adjacent to it.

(2)   The children all have seen this film.

Since here the floating quantifier *all* is adjacent to the noun *the children*, it will not be analysed as an instance of a floating quantifier. Rather, we will call it post-nominal. In this chapter the focus will mostly be on FQs in the narrow sense, i.e. of quantifiers following their host at a distance.

Such a distribution can clearly be compared with the distribution of adverbs (Dowty and Brody (1984); Bobaljik (1995); Doetjes et al. (1997)), as illustrated in (3), where *all* or *both* could replace *likely* in all the sentences. Notwithstanding this similar behaviour between adverbs and floating quantifiers, this fact should not however be taken to imply that quantifiers are necessarily in fact adverbial in character.

(3)  a.  The children **likely** will have been seen.

      b.  The children will **likely** have been seen.

      c.  The children will have **likely** been seen.

      d.  The children will have been **likely** seen.

Furthermore, the relationship between NPs and their associated floating quantifiers involves certain semantic phenomena different from those arising with adverbs. This relationship is what makes them different from adverbs. Moreover, a number of studies in a variety of languages have demonstrated that floating quantification is not a unified phenomenon, and reveal a series of puzzles that force one to adopt different views.

## 4.2.1  Floating quantifiers in English

In English, only the quantifiers *all*, *each*, and *both* can float. Notably, they all indicate totality, and not a part like *some* or *many*. When floating, they exhibit properties that are different from those of normal quantifiers. Firstly, they are subject-oriented (Yoo, 2001). As can be observed in (4), *all* is quantifying over the subject function, which acts as its antecedent. Position-wise, it can occur before the first auxiliary, or between the auxiliary and the main verb.

(4)  The children (all) would (all) have (all) been (all) saying that.

The antecedent of the floating quantifier is often definite and plural, as above, though Dowty and Brodie (1984) illustrate how the antecedent of the FQ can at times also be specific indefinite plural, as in (5a). Furthermore, when the noun has a universally inclusive meaning, the bare generic plural can be an antecedent, as in (5b). With collective nouns, the definite singular is also possible (5c).

(5)  a. Five children, who were walking back from school, were all attacked by that dog.

   b. Lions will all kill if attacked.

   c. The team has all arrived.

Hoeksema (1996) provides other examples which constitute evidence against an absolute restriction to definite antecedents (6).

(6)  a. Early research results and practical experience **both** suggest that clarithromycin is much more promising than any of the standard treatments.

   b. How could it be, I wondered, that two seemingly upstanding, highly regarded people could **both** be speaking of such diametrically opposed scenarios?

Mass NPs are also possible in FQ constructions (7).

(7)  a. The food was **all** eaten.

   b. The beer has **all** been drunk.

Apart from occurrence before and in between auxiliaries and main verbs, FQs in English can precede any category that follows a copular verb, including VPs, APs, PPs and NPs:

(8) a. The children are **all** healthy.

   b. The boys are **all** in London.

   c. The boys are **all** fools.

Although the FQ seems to display a free distribution, when quantifying over the subject, it cannot occur in sentence final position (Bobaljik (2003), Bošković (2004); Fitzpatrick (2006)):

(9) a. *The children are healthy **all**.

   b. *The boys are in London **all.**

   c. *The boys arrived **all**.

While floating quantifiers in English are primarily subject-oriented, there are certain grammatical sentences with non-subject-oriented FQs, in particular when the object is a pronoun (Maling (1976); Baltin (1995); Bošković (2004); Tsoulas (2003)), as in (10a). This example is additionally special in that it appears to go against what has been shown in (9), i.e. where *all* cannot be sentence final. What allows the acceptability of the sentence final quantifier in (10a) is the fact that the antecedent is a pronoun; an object pronoun in this case. By contrast (10b) with a full noun in the antecedent NP is ungrammatical.

(10) a. Jack loves them **all**.

   b. *Jack loves his children all.

Moreover, floating quantifiers, can be linked to the object when following ditransitive or complex transitive verbs (Sportiche (1988), Bowers (1993); Baltin (1995); Mailing (1976)) as in (11). Here they are not in a final position, since the second part of the complement structure follows them.

(11)   a. She called the men **both** bastards.

     b. Their vision struck the shepherds **all** blind.

     c. The guard saw the prisoners **all** leave.

English FQ constructions additionally illustrate how the FQ is subject to some locality requirement (Bobaljik (2003); Hoeksema (1996); McCloskey (2000)). These requirements can be found in many different environments. In (12a), the FQ cannot be bound by a non-local binder, where the antecedent occurs deeply embedded within the subject NP. This locality constraint parallels that which holds between an anaphor and its antecedent (Kayne 1981:196, Belletti 1982:114). In (12b), the antecedent of the FQ cannot involve a link that crosses across clause boundaries, such that while the quantifier is contained in the embedded clause, the antecedent is in the main clause. This again leads to an ungrammaticality that is caused by a violation of locality.

(12)   a. *[The mother of my friends$_i$] has **all**$_i$ left.

     b. *my friends$_i$ think that I **all**$_i$ travelled.

## 4.2.2   Floating quantifiers in other languages

FQs can be observed in a wide variety of languages. There are restrictions, however, on the positions available for FQs, and which items can float. French, as illustrated through (13), is similar to English. It allows few lexical elements to function as a FQ:

(13)   a. **Tous** les enfants ont  vu   ce   film.
         all    the children have seen this movie

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

Germanic and Romance languages (among others) allow for universal quantifiers to appear in a position left-adjoined to VP, i.e. after an auxiliary, and before the main verb (14-15).  In German, where main clause word order is SOV, this means that the FQ may immediately precede the object NP which precedes the main verb (14b).

(14)  a.  **Alle** die Studenten haben das Buch gelesen.
          All   the students   have   the book  read.

      b.  Die  Studenten haben **alle** das  Buch gelesen.
          The students    have   all   read the    book.

          German: (Sleeman and Perridon, 2011)

(15)  a.  **Tutti** gli  studenti hanno letto il    libro.
          All      the students have   read the book.

      b.  Gli   studenti hanno **tutti** letto il    libro.
          The students have    all      read the book.

          Italian: (Sleeman and Perridon, 2011)

The array of data above seems to suggest that FQs have similar selectional properties, semantics, and syntax across languages.  They appear with NP antecedents along with a subject-oriented restriction; they yield the same universal semantics, and they display a syntactic property that allows them to be detached from the NP. At the same time, in Germanic and Romance languages, quantificational expressions other than the universal quantifier, can display FQ properties.  Numerals are such an example.  The following data from Dutch (16) and Romanian (17) illustrate how the quantifier can combine with a numeral, and together they end up floated in the structure as a unit (Cirillo, 2010).

(16)  a.  **Alle drie** de  studenten hebben het boek gelezen
          All    three the students   have      the book read

All the three students have read the book.

b. De   studenten hebben **alle drie**  het boek gelezen
The students   have     all   three the book read

All the three students have read the book.                    Dutch

(17)  a. **toţi trei** studenţi-i     au   citit care-a
All   three students-the have read book-the

All the three students have read the book.

b. studenţi-i     au   citit **toţi trei** care-a
students-the have read all   three book-the

All the three students have read the book.            Romanian

Similar numeral FQs can be found in other so-called 'classifier languages', such as Japanese and Korean, where the numerals associate with the classifier, and appear floated, as illustrated in (18) below.

(18) gakusei-ga     kinnoo    go-nin kita.
student-NOM yesterday 5-CL   came

Five 'individual' students came yesterday.    Japanese: (Kobuchi-Philip, 2007)

Data such as (18) above, may suggest that the presence of classifiers allows for the availability of floating quantifiers. However, this is not true of Chinese, for example, which is also a classifier language, yet where FQs are limited, and there are no numeral FQs (Kobuchi-Philip, 2007).

Comparing floating quantifiers across a number of languages provides us with a reasonable understanding of the phenomenon. Primarily, the floating quantifier must have an antecedent which is often associated with the internal

arguments of the verb. No language permits floating quantifiers to quantify over adjuncts (Yoo, 2001). Notwithstanding behaviours that appear common to different languages, when one considers the system of floating quantifiers in detail, there are other instances where one language type may show one set of behaviors, while another may display a different pattern.

## 4.3 Proposed analyses in the literature

The non-adjacency of the noun and its associated quantifier has been widely discussed. I first start by considering the two major transformational approaches that have been employed to capture the FQ phenomenon, which make different predications and have distinct implications. I address their advantages, while also raising the issues that have been discussed in the literature through the provision of what counter-examples exist.

One of these is the stranding approach, which argues that the noun and the quantifier are externally-linked to one another at some point of the derivation, and that the noun undergoes a leftward movement at a later derivation (Sportiche (1988); Bošković (2004)). Another approach is the adverbial analysis. This approach motivates an analysis to FQs that parallels that of adverbs. It proposes that the quantifier modifies the VP, and that the noun and the quantifier are not related to one other by movement (e.g. Bobaljik (1995); Bobaljik (2003); Dowty and Brodie (1984); Hoeksema (1996); Sag and Fodor (1994); Kim and Yang (2006)).

In what follows, each section will develop a sense of what is special about floating quantification and why the phenomenon has attracted quite some attention. I will first review the argumentation made within the two major approaches that have attempted to account for this phenomenon: The stranding analysis and the adverbial analysis, addressing their advantages, while also

raising the issues that have been provided in the literature, through the provision of what counter-examples exist.

Following a consideration of the transformational approach, I then move on to summarise the one LFG analysis available in the literature on FQs (Spector, 2008). I leave a consideration of HPSG analyses for the next chapter, which will also incorporate an analysis of these structures.

### 4.3.1    The Stranding analysis

The stranding analysis has been widely adopted by many researchers. It is a movement-based analysis which assumes that the FQ construction is derived from a constituent containing a quantifier, and its associated NP, namely a non-floating quantifier. There are two possible views taking this same approach. The older view suggests that the quantifier moves rightward out of the constituent [Q-NP]. This sort of Q-movement analysis is pursued by Kayne (1969) for French, Kamio (1977); Haig (1980); Okutsu (1969) for Japanese, and McCawley (1988) for English, among others. The latter view suggests that the NP moves leftward out of the constituent [Q-NP]. This NP-movement analysis is pursued by Sportiche (1988) for French and English; Chiu (1990) for Chinese, and Shlonsky (1991) for Hebrew, among others.

The earlier version of the analysis (i.e. that of Kayne (1975)) has been the foundation for all approaches which maintain that there is a syntactic relationship between the floating quantifier and the NP. However, the proposed rightward movement can no longer allow the moved constituent to c-command its trace, thus resulting in a binding violation. This view has nothing to say about the anaphoric properties between the FQ and its antecedent NP (Sportiche, 1988). The latter view, proposed in Sportiche (1988), is to posit a leftward movement of the NP. Although there are a number of authors who

propose variants within this leftward movement, they basically share the spirit of Sportiche's original proposal. I will here present Sportiche's account as representative of the NP-movement analysis. Under Sportiche's assumption, Q-NP starts off in a low position inside the VP, with the NP then moving to a higher position, which becomes the superficial subject position, hence leaving the quantifier stranded. This behavior of FQs has led researchers such as Koopman and Sportiche (1991) to assume that subjects originate inside the VP and then they move out of it. One variant of this explanation is illustrated for the pair in (19) below:

(19) a. **All** the teachers have met the head.

b. The teachers have **all** met the head.

According to the stranding view, *all the teachers* in (19a) is the VP internal subject, which then moves to the superficial subject position. This position can be filled by either the quantified NP, or the NP alone. In the latter case, we end up with (19b), which involves the sole movement of the NPs, and *all* is left stranded in the specifier of the VP. Given this assumption, the floating and non-floating quantifier structures are related transformationally. Semantically, they present the same meaning. Thus, *all* in (19b) still associates with the NP *the teachers* and provides the same meaning that is obtained in (19a). In effect, such an analysis suggests that the transformationally-related examples in (19) are a bit like pairs of the type in (20), which involve examples of *wh*-movement, where the preposition can be also left stranded.

(20) a. To whom did you talk?

b. Who did you talk to?

The stranding analysis of FQs is attractive, as it tends to highlight many advantages. Firstly, it explains the distribution of floating quantifiers, since the

positions of the floating quantifiers can be accounted for by tracking the source, and the progress of the path of the NP movement, also known as A-movement (Bošković, 2004).  Secondly, it explains the semantic relation between floating and non-floating quantifiers. Floating quantifiers are structurally just like non-floating quantifiers.  Therefore, any semantic differences between them will be problematic, on such a syntactic analysis. The stranding analysis also provides an explanation for the agreement between the quantifier and its associated nominal, when and where this arises (e.g. German, French and Italian): FQs show the same agreement as non-floating quantifiers.  This behaviour is exemplified through the following examples from French, as in (21).

(21)  a.  **Toutes** les  femmes sont arrivées.
         all.PLF  the women  are   arrived
         All the women have arrived.

     b.  Les femmes sont **toutes** arrivées.
         the women  are   all.PLF arrived
         The women have all arrived.

     c.  **Tous**   les  hommes sont arrivées.
         all.PLM the men     are  arrived
         All the men have arrived.

     d.  Les hommes sont **tous**   arrivées.
         the men      are   all.PLM arrived
         The men have all arrived.

Sportiche (1988) notes that there are two conditions that FQs must obey. The first of these is that the FQ must be c-commanded by its associated NP, as illustrated in the context in (22).

(22)  a.  [L'auteur   de **tous** ces   livres] a   vu   ce   film.
         the-author of all     these books has seen this movie

     b.  *[L'auteur   de ces    livres$_i$] a   **tous**$_i$ vu   ce   film.
         *The-author of these books$_i$ has all$_i$   seen this movie.

The second condition necessitates that the relation between the quantifier and the NP must be local, which is not the case in (23).

(23)  *Les enfants$_i$ l'ont      persuadé  [CP de **tous**$_i$, acheter ce   livre]
      the   children him-have persuaded      of all   buy     this book.

Given these conditions on the relation involved, Kayne (1983) later claims that the quantifier itself functions as an anaphor for its associated NP.

### 4.3.1.1   The issues with this approach

This movement analysis is not without its problems. Here I provide a review of the issues which this analysis presents us with. Some of these have been noted by Sportiche (1988) himself.

One of the problems that Sportiche (1988) highlights is related to the position of the FQ. The stranding analysis assumes that there is an empty NP location/position that is available in front of each auxiliary verb. Distinct specifier positions must thus be associated with each auxiliary so as to allow for the possibility for FQs to appear therein. If however the first auxiliary is in I/T and the subject is in SpecIP/TP, then there is no position available for the floating quantifier to appear in. The example in (24) shows all the positions where the FQ can appear in, in English.

(24)  The carpets (all) will (all) have (all) been (all) being (all) dusted for two
      hours.

The analysis seems to suggest a prediction that a quantifier should be able to appear in between *the carpets*, and *will*. However, there is no empty NP location there. Moreover, the idea that the subject may be in a higher specifier position is not very plausible.

Further compelling arguments against a stranding analysis, noted already by Sportiche, include the fact that there are many standardly recognised positions for NPs in sentence structures where the location of a stranded FQ

would unexpectedly yield ungrammatical sentences. This includes ones with passives and unaccusative predicates (2), followed by *all* in an object position. In such cases the NP trace is situated post-verbally, and *all* is predicted to appear post-verbally as well. However, this results in ungrammaticality (2). To say that the superficial subject does not originate in object position does not seem to be an option within such movement analyses.

(25)   a. *The vases were broken all by the wind.

       b. *The vases have broken all.

Another problem with such a movement analysis is that it cannot explain why English allows quantifier floating only with a few quantifiers such as *all, each,* and *both* (Bobaljik, 2003). Furthermore, since *every* does not float, it cannot be said that quantifier floating is allowed only with universal quantifiers. Such an analysis would not be far-reaching and is not suitable for languages which allow a different range of quantifier floats, e.g. numerals in Japanese, and partitives in Korean.

One of the strongest arguments against the stranding analysis of FQs comes from the fact that a sentence with a FQ does not always have a corresponding sentence with a non-floating quantifier (Bobaljik, 2003). In English, for example, there seem to be problems with *each*. On the face of it, it is surprising that the first two of the following examples in (26) are good, and the others are bad.

(26)   a. The boys have each won a prize.

       b. Each of the boys have won a prize.

       c. *Each the boys have won a prize.

    d. *The boys have each of won a prize.

    e. *Of the boys have each won a prize.

One cannot simply account for this behaviour by assuming that *of* is deleted when the quantifier is not moved, or that it is not initially present, and is then inserted just in case the quantifier is moved with its complement. Neither approach seems very attractive. Similar problems arise for *all* in (27-28).

(27) a. John, Bill and Tom all came to the class.

    b. *All of John, Bill and Tom came to the class.

(28) a. The students have all three read the book.

    b. *All three the students have read the book.

A parallel issue follows for French, where there are grammatical sentences with FQs, and counterparts with non-floating quantifiers that are ungrammatical (29). This makes the analysis along the lines of floating quantifier structures being analysed as transformationally-related to non-floated ones by simply stranding quantifiers after the extraction of NPs, implausible.

(29) 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 ces   enfants a    lu   un livre diffeérent.
    each     these children has read a   book different
    Each of these children has read a different book. French: (Bobaljik, 2003, 123-4)

Other unexpectedly bad examples arise when a floating quantifier form is different from the non-floating one (Dowty and Bordie, 1984). There are no such examples illustrating these behaviours in English. However, this seems to be an available option in the case of other languages. Languages like Dutch and Mandarin Chinese have different lexical items for non-floating and floating quantifiers. Such instances would force an analysis that would have to 'lexically' restrict certain quantifiers to be stranded:

(30)  a.  Alle  toeristen  zullen  Boston  bezoeken
          all   tourists   will    Boston  visit
          All tourists will visit Boston.

      b.  De  toeristen  zullen  allemaal  Boston  bezoeken
          the  tourists  will    all       Boston  visit
          The tourists will all visit Boston.  Dutch: (Dowty and Brodie, 1984, p.82)

(31)  a.  suo you de   ren       zou le
          all -   PRT  people  left ASP
          All the people have left.

      b.  ren      dou zou le
          people  all  left ASP
          The people have all left.    Mandarin Chinese: (Dowty and Brodie, 1984, p.82)

There is yet another important problem that has been noted by Kim (2009). Within the stranding analysis there is no strict ordering restriction between the VP-adjoined adverbs and the floating quantifier. The assumption that adverbs like *just*, *still*, and *warmly* are left-adjoined to the VP, as well as FQs, allows these items to precede the floating quantifiers themselves. In fact, both orders occur: adverb + FQ as illustrated in (32), and FQ + adverb as in (33).

(32)  a.  When the lights went on five minutes later, we were **still all** lying on the floor.

b. If it's the regular Tuesday morning meeting in your home, you'll probably **just all** go into the office for half an hour.

c. The United States, Australia and Canada are **now all** recovering.

d. Perhaps we shall **soon all** reach the degree of brutishness and indifference of the soldiers of the First Empire.

On the other hand, there are many examples in which the floating quantifier can also precede VP-adjoined adverbs:

(33)  a. Barring coups, the four Southern Cone presidents will **all still** be in office in 1994, and have set themselves a target that is also a spur.

b. I once went out to dinner and discovered that the seven other people present had **all just** finished reading A Dance to the Music of Time.

c. Nor that by marrying John Carrow her daughter had behaved in a wicked, even if understandable, way for which they were **all now** paying the price.

d. However, China, France, Japan, India and the European Space Agency will **all soon** be able to offer satellite surveillance services as an adjunct to their other activities in space.

Kim (2009) argues that the above structures are problematic for the stranding analysis, suggesting that the stranding analysis as it stands, is incomplete.

### 4.3.1.2   Additional semantic issues

In the preceding section, syntactic evidence has been oulined, demonstrating the many issues associated with the stranding analysis. Semantic issues associated with this analysis have also surfaced (e.g. Dowty and Brodie (1984), Bobaljik (2003)).

From a perspective that considers semantics, Bobaljik (2003) claims that a similarity in meaning of the quantificational properties between floating and non-floating constructions does not necessarily guarantee that the pair of sentences are to be associated with the same syntactic structure at some level. The following pair in (34) illustrates that it is in fact quite possible for there to be no significant difference in meaning between a sentence with the adverbial quantifier *mostly*, and a paraphrase with the DP-quantifier *most*. Yet nobody would propose to derive one of these from the other, transformationally:

(34)  a. Media experts in the U.S. tend **mostly** to be too indoctrinated.

      b. **Most** media experts in the U.S. tend to be too indoctrinated. (Bobaljik, 2003, 127)

Such examples lead to the conclusion that the similarity in meaning between two sentences, in this case with reference to their quantificational properties, does not entail that there is necessarily a transformational relationship between them. One might however object that Bobaljik is not in fact in any case correct in regarding the two sentences in (34) as having the same meaning. *Most media experts* must refer to the majority of that group of people. However, *mostly.... too indoctrinated* need not refer to the majority of the experts, but could equally refer to the majority of topics which they talk about, or of the occasions on which they make their voices heard.

Another observation which Bobaljik (2003) makes is to show that while most of the sentences with a FQ have the same meaning as non-FQ counterparts, there are some cases in which an interpretation is possible with the FQ, but not possible with the non-FQ alternative. Consider the following pairs in (35)-(36).

(35)  a. All lions, tigers and bears are scary.

      b. Lions, tigers and bears are all scary.

(36)  a. All students, professors and clowns have come to the meeting.

      b. Students, professors and clowns have all come to the meeting.

Bobaljik assumes that in (35a) there is only one reading. The meaning is generic, indicative of a universal truth, and states that every lion, every tiger and every bear is scary, whereby *all* quantifies over all of the conjuncts as a unit, i.e. [lions, tigers and bears]. (35b) allows for the same reading, as well as a second one, however, which reading is not available with the non-FQ counterpart in (35a), namely, that lions are generally scary, tigers are generally scary, and bears are generally scary, hence a distributive reading. This difference, according to Bobaljik, suggests that the FQ and non-FQ somehow quantifies in different ways. The pair in (36) is non-generic, as the predicate here indicates something true of a specific occasion, but also illustrates a contrast. In fact, here the difference is more marked. (36a) asserts that every member of each group is in attendance, meaning that the quantifier quantifies over all of the coordinated sets [students, professors and clowns]. However, (36b) makes a different assertion, namely that it does not require all students, all professors, and all clowns to have been at the meeting. It could be only *some* of each. This difference matches that present for the different readings of the negative versions: *all...have not* versus have *not all...*, as will be discussed below.

Another important semantic difference between floating and non-floating constructions has been observed by Dowty and Brodie (1984). The interaction of non-FQ and FQ with modality and negation results in scope ambiguities. The readings available vary according to the quantifier's position:

(37)   a. **All** the contestants could have won.


       b. The contestants could have **all** won.


Two readings are available for (37a). In one reading, the universal quantifier takes scope over the modal *could*, whereby the sentence comes to mean that it is true that all the contestants had the capability or possibility to win. In the second reading, the universal quantifier takes a narrow scope under the scope of the modal, and the sentence means that it is possible that all the contestants won, rather than lost. However, there is only one available reading for (37b); this is the one in which the universal quantifier takes a narrow scope under the scope of *could*, and the sentence only comes to mean that it is possible that all the contestants won.

The same can be applied to negation. (38a) has two readings: One involves the FQ takes scope over negation. In this case, the sentence means that no contestant won. The other is the one in which the quantifier takes a narrow scope under the scope of negation. In this case, the sentence means that not all contestants won, namely that some *did* win. On the other hand, in (38b) negation takes scope over *all*, such that the reading that results is only the second: it is not the case that all the contestants won, i.e. some might have won.


(38)   a. All the contestants did not win.


       b. The contestants did not all win.


In the next section I will address the opposing view among other generative linguists, which in turn proposes that FQs are adverbs. This entails that FQs be analysed as base-generated adverbs, just as any other adverbial.

### 4.3.2   The adverbial analysis

The adverbial analysis proposes that the non-floating quantifier directly modifies its associated nominal, whereas the FQ modifies the verb, since it is base-generated in VP-adjoined positions just like an adverb, as in (39).[1]

(39)  a. The students **all** entered the classroom.

b. The students **probably** entered the classroom.

c. The students **slowly** entered the classroom.

d. The students **quietly** entered the classroom.

e. The students **stupidly** entered the classroom.

The FQ is said to be an adjunct to the VP that can adjoin to the left or the right of the verbal elements, such as the auxiliaries and modals. The following example in (40) illustrates this.

(40)  The students all have [$^{\text{VP}}$ (all) [$^{\text{vp}}$ gone home]]

Kayne (1975) claims that not only can floating quantifiers occupy adverbial positions, but they are also banned from positions in which adverbs cannot occur. Sag (1978) observes that FQs pattern with adverbs (and not with negation), in the case of VP-ellipsis. This can be seen in (41).

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

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

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

---

[1] I will continue to use the term floating when I am referring to quantifiers that appear apart from their antecedent. This I will do even whilst reviewing a base-generation analysis.

The early view, which includes Belletti (1982) and Dowty and Brodie (1984)
entails an analysis where FQs seem to be anaphoric adverbs that have to be
bound by their antecedent.[2] A series of later works, including Junker (1990),
Junker (1995), Roberts (1990), Bobaljik (1995), Hoksema (1996), Doetjes
(1997) and Brisson (1998) posit a number of primary motivations in support
of this proposal. Whatever the individual motivation in support of a given ad-
verbial analysis, these approaches however share certain characteristics. They
agree first that there is no transformational connection between a FQ and the
associated NP that it binds with. Secondly, the FQ is generally said to be
in an adjunct positioned somewhere in the realm of the VP, or lower in the
inflectional domain. Finally, a semantic account is proposed to explain the
apparent ability of the adjunct quantificational element to modify the nominal
it appears to also bind with, despite the lack of a local structural relationship
between them both.

One instantiation of these properties is shown through (42), where (42b) is
largely based on the semantic treatment of floating *all* that was developed by
Dowty and Brody (1984), and later adopted by Bobaljik (1995).

(42)  a. Syntax: The students have [vp all [vp had lunch]].

   b. Semantics: *all* 'maximizes' the external argument of the VP. [all] =
      $\lambda P{<}e,t{>}.\lambda x.P(\max(x))$

Due to its lexical meaning, *all* is stated as maximising the interpretation of
the definite plural *the students*, and all exceptions/ambiguities generated by,
or associated with the universal quantification are eliminated, in the context
of plural forms.

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[2]Discussions of the anaphoric nature of floating quantifiers can be found in Jaeggli (1982),
Belletti (1982), and Kayne (1983).

There are weaknesses in the Adverbial analysis, however. One has to do with the relative distribution of the adverb and the FQ. De Cat (2000) discusses the adverb distributions on the basis of Jackendoff (1972). It is pointed out that only one adverb per class can be inserted in the sentence. Therefore, since a given sentence is still grammatical when a floating quantifier is inserted, concurrently with an adverb, then this appears to suggest that floated quantifiers are not in fact present in adverbial positions.

Another weakness associated with the adverbial analysis is that it is generally assumed that adverbs don't carry agreement (Merchant, 1996). Therefore, the analysis cannot explain why floating quantifiers in some languages have to agree with their associated NP, even when adverbs in the same system do not display agreement. The following example from French (43), in parallel to the data in (21), shows the agreement relations that do in fact obtain.

(43)  Les femmes etaient toutes/*tous      bien vetues
      the women   were    all.PLF/*all.PLM well dressed
      The women were all well dressed.

Another reason to reject the adverbial analysis is that there are many examples showing that FQs do not behave like adverbs, nor display the same distribution as adverbs. For this reason, therefore, they cannot be categorized just as any adverbial type (Cirillo, 2009). In (44-46) are illustrations of distinct types of adverbs, along with the ungrammatical (to some people) counterparts that result, when a FQ is present instead.

- **Manner adverbs vs. FQs**

(44)  a. The students have all carefully read the book.

      b. *The students have carefully all read the book.

- **Sentential adverbs vs. FQs**

(45)  a. The students have probably all read the book.

    b. ?The students have all probably read the book.

- **Subject-oriented adverb vs. FQs**

(46)  a. The students all rudely and stupidly insulted the teacher who helped
        them.

    b. *The students rudely and stupidly all insulted the teacher who helped
        them.

One other final weakness of this analysis is based on the fact that FQs need to be c-commanded by their antecedents (47). This is not expected of adverbs:

(47)  *Les enfants l'ont      persuadé [de   tous        acheter ce livre]
     Lit:  The      children him      have persuaded to       all buy  this

     book.
     Intended: The children have persuaded him all to buy this book. French:
     (Sportiche, 1988)

With that overview of the stranding and the adverbial analyses available in the literature, below I next review a lexical account instead, which is framed within LFG.

### 4.3.3   A Topic-subject Lexical Functional Grammar (LFG) analysis

In what follows I concentrate on what has been said in the literature on FQs, in the Lexical Functional Grammar (LFG) framework.[3] While in the generative approaches reviewed above the NP or the QP may involve movement,

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[3] An overview of what has been said in HPSG on the matter, follows in Chapter 5, where I also propose and present my own HPSG analysis of QFs in HA.

this is not the case in theories like LFG and HPSG, which reject the notion of movement. However, very little work exists in the LFG literature on floating quantifier constructions. Here I highlight LFG work from Spector (2008) for Hebrew, and later in Section 6.3 I review another LFG analysis provided for Arabic in Elsaadany and Shams (2012a).

It should be noted from the start that Hebrew is not a language where quantifiers float in positions exactly like those we have considered above, for other languages, so far. Rather, Hebrew allows the word for *all* in subject function to occur not only before, but also after the main verb, as in (48a), which we will see later is also the case in HA, but which, on the other hand, is not a possibility in English, except if after a copula verb. Hence this account, apart from being framed in a different syntactic theory from that considered above, is also not dealing with exactly the same phenomena.

Spector's (2008) analysis for Hebrew treats floating quantifiers as a special instance of *topicalization* which handles 'Triggered Inversion'. That has the ability to allow for both SV and VS linear orders. In this account, the FQ is just an instance of the quantifier occurring in separate positions after its host NP, with the FQ constituting the subject, and the NP the topic. The TOPIC function is identified by its anaphoric binding with the SUBJ function of the FQ, which is represented through the clitic resumptive pronoun that attaches on the FQ, which she argues to function as the SUBJ. This binding relation satisfies the Extended Coherence Principle in LFG, which requires 'that all functions in f-structure be bound. A TOPIC is bound whenever it is functionally identified with, or anaphorically binds a bound function' (Bresnan and Mchombo, 1987). The data in (48) below illustrate an instance of anaphoric binding between the TOPIC NP 'the children' and the pronoun on the quantifier in SUBJ position

later in the sentence. In (48a), the order is VS, so the FQ follows the main
verb. In (48b), the order is SV, whereby the quantifier precedes the verb.

(48)  a. [ha-yeladim-TOP] [halxu kulam-SUBJ la-yam]
         the-children.PLM went   all.3PLM      to.the-sea
         The children went all to the sea.

      b. [ha-yeladim-TOP] [kulam-SUBJ halxu la-yam]
         the-children.PLM all.3PLM      went  to.the-sea
         The children all went to the sea.

The topicalised structures result in an alternation in the word order (SV or
VS), which can be easily explained by Triggered Inversion, which according to
Falk (2004) entails that: 'an element with discourse prominence can be placed
at the beginning of a Hebrew clause', thus resulting in a structure where a
TOPIC function triggers a non-subject initial element in the clause.

The details of this FQ analysis rely on several basic assumptions. First,
the antecedent of the FQ is treated as a TOPIC, rather than a subject. For
Spector, the antecedent *ha-yeladim* represents old information, while the FQ
*kulam* bears the non-discourse function of subject. Specifically, it contributes
new information about otherwise old information already identified in the dis-
course. The new information contributed by the quantifier is that it is *all* of the
children, and not just some of them, that went to the sea. Spector elaborates
on these facts in favour of a topicalization analysis in various ways. According
to Dik (1991), for example, 'the topic presents the entity "about" ' which the
predication predicates something in the given setting'. For Chafe (1976), 'the
topic sets a spatial, temporal or individual framework within which the main
predication holds'. Therefore, *went all to the sea* predicates about *the children*,
namely, it means that 'as for the children, they all went to the sea'. That is
true of both (48a) and (48b).

This approach then essentially requires recognition of multiple locations in
the sentence, other than an initial position, where subjects can occur. Applied

to a language like English, as we have seen, the locations available are ones that come before each of the auxiliaries, and the main verb. In that respect, the LFG version resembles the stranding approach. However, unlike that approach it does not suppose that the NP part of the subject moves to the front of the sentence, leaving the FQ behind. Rather, the NP is separately generated in initial position as a sentence topic, and hosts the FQ.

Further support for Spector's argument comes from Lambrecht (1981), who claims that Topics are usually definite and clause initial. This is true of the Hebrew facts, where the NP in the FQ construction cannot be indefinite:

(49)  *yeladim       halxu kulam     la-yam
      children.PLM went  all.3PLM to.the-sea.
      Intended: Children went all to the sea.

Another argument in support of Spector's analysis that *the children* functions as a TOPIC, and not the SUBJ, comes from the claim that TOPICS constitute islands for *wh*-movement (Shlonsky and Doron, 1992). In wh-questions, the *wh*-word bears the FOCUS function. The ungrammaticality of (50) follows from he fact that *ha-yeladim* cannot be both TOPIC and FOCUS at the same time. Thus, *ha-yeladim* is not a SUBJ.

(50)  *mi ata amarta she ... halxu kulam     la-yam?
      who you say      she ... went  all.3PLM to.the-sea?
      Intended: Who did you say that ...all went to the sea?

The ungrammaticality of (50) illustrates how the FQ needs to possess an anaphoric relation with the TOPIC. (50) thus fails, structurally, since there is no such TOPIC in that structure, and additionally, there is the presence of a *wh*-pronoun that introduces a FOCUS, rather than old information.

Other arguments in favour of the analysis where *kulam* is the subject in the

FQ construction as in Spector's analysis, comes from Fillmore (1986), who proposes that 'semantically unrestricted functions like SUBJ and OBJ can be associated with any semantic role'. This is something which the FQ *kulam* does satisfy, since it can take a wide range of semantic roles, as illustrated in (51).

(51)  a.  ha-yeladim   halxu kulam     la-yam
          the-children went  all.3PLM to.the-sea
          The children went all to the sea.                                                Agent

      b.  ha-yeladim   kiblu      kulam      matanot
          the-children received all.3PLM presents
          The children received all presents.                              Benefactive

      c.  ha-yeladim   ohavim kulam     et     ha-mora
          the-children love      all.3PLM ACC the-teacher
          The children love all the teacher.  Experiencer (Spector, 2008 p. 24)

All these facts taken together can then also explain why the quantifier without the clitic pronoun is then not allowed in a floating position, as illustrated in (52). If this were not the case, there would be no anaphoric identification of the TOPIC. This would, in LFG terms, result in a violation of the ECP. Nevertheless, we have seen that many languages like English allow FQs without any such affixes or clitics indicating such information.

(52)  a.  *ha-yeladim       halxu kol la-yam
          the-children.PLM went  all  to.the-sea
          The children went all to the sea.

      b.  *ha-yeladim       kol halxu la-yam
          the-children.PLM all  went  to.the-sea
          The children all went to the sea.

Overall, this non-transformational topic-subject analysis in Spector's (2008) proposal within LFG overcomes most, but perhaps not all of the disadvantages

that are otherwise related with the stranding and adverbial analyses for FQs
in Hebrew and other languages. Looking back at the problems noted with
the stranding and adverbial analyses (Section 3.1 and 3.2), we observe the
following,

- The central issue for transformational accounts is the fact that a sentence with a FQ does not always have a corresponding sentence with a non-floating quantifier. In English, for example, there seem to be such problems with *each*. Since LFG is not transformational, such a discrepancy is no problem.

- Like the stranding and adverbial analyses, an LFG approach cannot explain why English and other languages allow quantifier floating only with a few quantifiers such as *all*, *each*, and *both*, and why languages differ in this respect.

- The fact that FQs in some languages, such as Hebrew, are marked for agreement with their NP host does not resemble adverb behaviour. However, Spector's analysis does not treat FQs as adverbs so this is not an issue.

Nevertheless, we do take from Spector the idea that a non-transformational theory of syntax overcomes a good many of the problems with dealing with FQs, which partly explains our choice of HPSG, which is also non-transformational.

With that overview in place, I now move on to consider the core of this chapter, which is to provide a description of floating quantifiers and other similar constructions in HA.

## 4.4   Floating quantifiers in HA

This section describes floating quantifier constructions in HA, together with other related constructions, i.e. ones that include floating numerals, floating emphatic reflexives, and anaphoric adverbs. I will adopt from the start a position which will be justified later, that it is useful in HA to separate two types of apparently floating constructions: ones that are post-nominal, i.e. where the quantifier immediately follows the noun, and ones that involve more distant FQs occurring in various locations before and after the verb. The term FQ will be limited to the latter. In Chapter 2 (Section 4.2.2) we have seen a few examples where HA quantifiers appear post-nominally, in which case they obligatorily hosts a pronoun that agrees with the noun in GENDER, PERSON and NUMBER. What differentiates them from post-nominal quantifiers in English, for example, is the fact that the English counterparts are invariant, as we saw in Section 2.1. The more specific characteristic of floating quantifiers, as opposed to post-nominal quantifiers, is that they can appear non-adjacent to the NPs they quantify, and can nevertheless still agree with them in GENDER, PERSON and NUMBER, as shown in (53) below. Here, the NP *al-awlād* functions as the antecedent of the FQ. Like in Hebrew, as discussed in Section 3.3, but not in English, the FQ appears after the main verb.

(53)  l-awlād        rāḥ-u        (kull-a-hum) lil-ḥadīqah
      DEF-boy.PLM go.PFV.3-PL all-3PL.GEN  to-DEF-park.SGF

      Lit: The boys went all-them to the park.

      The boys all went to the park.

The data shows that there are two syntactic restrictions on floating quantifiers in HA. First, as we have just seen, the floating quantifier must be combined with an overt pronoun that is coreferentially related to the antecedent NP (54a). That is more elaborate than the agreement found, for example, in French, between FQs and their antecedents. Second, the floating quantifier

seems to only occur with a definite NP, as an indefinite NP is not possible (54b).

(54)  a.  *l-awlād        rāḥ-u        (kull)  lil-ḥadīqah
          DEF-boy.PLM  go.PFV.3-PL  all     to-DEF-park.SGF
          The boys all went to the park.

      b.  *awlād    rāḥ-u        (kull-a-hum)  lil-ḥadīqah
          boy.PLM  go.PFV.3-PL  all-3PL.GEN   to-DEF-park.SGF
          *Boys went to the park, all of them.

Previous work on Arabic structures involving floating quantifiers has focused on the quantifier *kull*, as we will see in Section 6. The question which immediately arises is whether FQ structures are possible with other quantifiers, or all of the category of quantifiers. However, in contrast to the quantifier *kull* 'all', other quantifiers do not allow FQs, as we see from the ungrammatical behaviours that arise in (55).

(55)  a.  *l-awlād        kallam-u        l-mudīr         baʕḍ-ahum
          DEF-boy.PLM  talk.PFV.3-PL  DEF-head.SGM  some-3PL.GEN
          Lit: *The boys talked to the head, some of them.

      b.  *l-awlād        kallam-u        l-mudīr         aɣlab-hum
          DEF-boy.PLM  talk.PFV.3-PL  DEF-head.SGM  most-3PLM.GEN
          Lit: *The boys talked to the head, most of them.

One may argue that what could explain the difference between the behaviour of the quantifier *kull* in (53), and that displayed by quantifiers such as *baʕḍ* and *aɣlab* in (55), is perhaps simply that any partitive interpretation of the antecedent *al-awlād* 'the boys' with an FQ is ruled out.

In what follows, I concentrate on the FQ quantifier *kull* 'all'. I then illustrate how an account of *kull* extends straightforwardly to post-nominal quantifiers, and some non-quantifier forms.

## 4.4.1   The distribution of HA floating quantifiers

The HA quantifier *kull* can occur after NPs that function as subjects, objects, and objects of a preposition. The following sub-sections discuss each of these in detail.

### 4.4.1.1   Floating from subject

Quantifier floating from a subject position is possible in the contexts of intransitive verbs, as in (56a)-(56b), and transitive structures, as in (56c).

(56)  a. l-buzūrah      (kulla-hum) rāħ-u        (kulla-hum) l-ħadīqah
         DEF-children all-3PL.GEN go.PFV.3-PL all-3PL.GEN DEF-park.SGF
         (kulla-hum)
         all-3PL.GEN
         The children all of them went to the park.

      b. l-buzūrah      nām-u        kulla-hum
         DEF-children sleep.PFV.3-PL all-3M.PL.
         The children all of them slept.

      c. l-ban-āt      ḥaðaf-u        l-maddah    kulla-hum
         DEF-girl-PLF delete.PFV.3-PL DEF-course all-3PLM.GEN
         The girls all of them deleted the course.

It can also appear between the auxiliary verb *kān* and the main verb.

(57) l-awlād        kān-u        kulla-hum    y-ðākr-u
     DEF-boy.PLM be.PFV-3PL all-3PL.GEN 3-study.IMPV-PL
     The boys all of them were studying.

In parallel to the behaviour in (56a) for HA, in Hebrew too, the subject's floating quantifier can appear between the verb and its complement, as we saw in Section 3.3, and again in (58a), or as shown in both (56a)-(56b) for HA, in sentence final position (58b).

(58)  a. ha-yeladim        halxu kulam    la-yam
         the-children.PLM went   all.3PLM to.the-sea
         The children went all to the sea.                         (Spector, 2009)

b. ha-yeladim        medabrim sinit     kulam
   the-children.PLM speak       Chinese all.3PLM
   The children all speak Chinese.              Hebrew: (Slonsky, 1991)

In contrast, FQs in English cannot appear between the verb and its complements (59a) except in copular sentences. Nor can they appear sentence finally, as in (59b), as has also been illustrated through (9), in contrast with (10a).

(59)  a. *The boys watched all the TV.

      b. *The boys watched the TV all.

In HA, floating quantifiers can additionally occur with conjoined subjects, and when they do, they display resolved agreement in PERSON, NUMBER, and GENDER of the conjoined nouns, as in (60).

(60)  a. aḥmad  wa  muḥammad  wa  yāsir safar-u          kulla-hum
         Ahmad and Muhammad and Yaser travel.PFV.3-PL all-3PL.GEN
         Ahmad, Muhammad, and Yaser have all traveled.

      b. aḥmad  wa  huda  sāfar-u        kulla-hum
         Ahmad and Huda travel.PFV.3-PL all-3PL.GEN
         Ahmad and Huda have all traveled.

      c. ana w   axwān-i      sāfarna        kulla-na
         me and brotherPLM-1SG travel.PFV.1PL all-1PL.GEN
         Me and my brothers have all traveled.

Floating quantifiers can also appear in verbless sentences, as exemplified in (61a), which involves an AP predicate, and (61b), which involves an active participle. Once again, the antecedent in such structures is the SUBJ of the construction.

(61)  a. l-awlād        šāṭr-īn      kulla-hum
         DEF-boy.PLM excellent-PL all-3PL.GEN
         The boys are all excellent.

    b. l-awlād        jāy-īn             kulla-um
       DEF-boy.PLM come.ACT.PTCP-PLM all-3PL.GEN
       The boys are all coming.

### 4.4.1.2  Floating from object?

The Arabic quantifier *kull* can occur with the object argument of a transitive verb, as illustrated in (62a), and with the indirect object of a ditransitive verb, as in (62b). At first blush, this position seems to mirror the syntactic restrictions of subject FQ with respect to definiteness, and the binding relation observed. However, what we are seeing are really instances of post-nominal quantifiers that are adjacent to the antecedent. These do not constitute FQs in our restricted sense.

(62)  a. l-mudīr        qābal       ṭ-ṭullāb        kulla-hum
         DEF-head.SGM meet.PFV.3PL DEF-student.PLM all-3PL.GEN
         The head met all of the students.

      b. l-walad        arsal       hadiyah li-l-mudarris-īn
         DEF-boy.SGM send.PFV.3SGM gift     to-DEF-teacher-PLM
         kulla-hum
         all-3PL.GEN
         The boy sent a gift to all of the teachers.

Parallel data is also present in Hebrew. The quantifier can take a NP that functions as an object in (63a), and a NP that functions as the indirect object in (63b).

(63)  a. axalti      et   ha-tapuxim   kulam
         eat.PFV.1SG ACC the-apple.PLM all.3PLM
         I ate all the apples.             (Francez and Goldring, 2012)

      b. natauti      tapuxim la-yladim    kulam
         give.PFV.1SG apple.PLM to.the-boy.PLM all-3PLM
         I gave apples to all the boys.     (Francez and Goldring, 2012)

It should be noted that this is a banned position for post-nominal quantifiers to appear in, in English, at least when such objects are full NPs (64a).

It is debatable, however, whether the restriction is really due to the function being an object, rather than the fact that English avoids the presence of a floating quantifier in sentence final position, when quantifying over full NPs. The reason for questioning this is because many would accept (64b).

(64)  a. *Mike met the boys all.

     b. ?Mike met the boys all for lunch later on.

When more than one NP appears with the verb, the quantifier can be ambiguous as to which noun it is quantifying. The antecedent in (65) can be either *al-mušrifīn* 'the supervisors', or *al-banāt* 'the girls', given that there is no GENDER distinction in the PLURAL.

(65) l-ban-āt      qābal-u       l-mušrif-īn        kulla-hum
    DEF-girl-PLF meet.PFV.3-PL DEF-supervisor-PLM all-3PL.GEN
    a. The girls met all the supervisors.
    b. All the girls met the supervisors.

Such an ambiguity would not exist in MSA, since case-marking, as well as the presence of agreement for GENDER in the PLURAL, as displayed on the quantifier, can disambiguate which noun is being quantified. The quantifier in (66a) takes NOMinative case and hence cannot be associated with *al-mušrifīna* 'the supervisors' in object position, where the NP is otherwise ACCusitive-marked. If the quantifier agrees in case with *al-mušrif-īn-a* 'the supervisors', the quantifier will quantify over it, as in (66b).

(66)  a. ṭ-ṭullāb-u           qābal-u       l-mušrif-īna
       DEF-student.PLM-NOM meet.PFV.3-PL DEF-supervisor-PLM.ACC
       kull-u-hum
       all-NOM-3PL.GEN
       The students all met the supervisors.

b. ṭ-ṭullāb-u                 qābal-u              l-mušrif-īna
   DEF-student.PLM-NOM meet.PFV.3-PL DEF-supervisor-PLM.ACC
   kull-a-hum
   all-ACC-3PL.GEN

   The students met all the supervisors.                              MSA


As mentioned, the above data all involves instances of post-nominal quantifiers. The fact that true floating quantifiers out of objects in HA are not possible is demonstrated by (67), which illustrates an ungrammatical instance where the adverb intervenes between the FQ and the NP, splitting the adjacency.


(67)  a. *l-mudīr        kallam        ṭ-ṭullāb        ṣ-ṣubḥ
         DEF-head.SGM talk.PFV.3SGM DEF-student.PLM DEF-morning
         kulla-hum
         all-3PL.GEN

         The head talked with all the students in the morning.


      b. *l-mudīr        arsal         risālah        li-ṭ-ṭullāb
         DEF-head.SGM send.PFV.3SGM message.SGF to-DEF-student.PLM
         ṣ-ṣubḥ           kulla-hum
         DEF-morning all-3PL.GEN

         The head sent a message to all the students in the morning.


      c. *l-mudīr        t-kallam              maʕ ṭ-ṭullāb
         DEF-head.SGM RECIP-talk.PFV.3SGM with DEF-student.PLM
         ṣ-ṣubḥ           kulla-hum
         DEF-morning all-3PL.GEN

         The head talked with all the students in the morning.


When it is a pronominal object that is involved, judgements vary as to whether the presence of a true floating quantifier is possible or not, as illustrated in (68).


(68)  ?/*šuf-ta-hum              ṣ-ṣubḥ          kulla-hum
      see.PFV-1SG-3PL.ACC DEF-morning all-3PL.GEN

      I saw them all in the morning.

On the basis of the asymmetries in the data presented, I conclude at this point that HA SUBJECT-oriented floating quantifiers, and that the subject or object post-nominal quantifiers should *not* be treated as the same phenomenon. Specifically, I propose that pure QF is only present in contexts where the SUBJECT function is the quantifier's antecedent. On the other hand, with objects, and indirect objects, what we really have are only instances of adjacent quantifiers which function as post-modifiers to the NPs.

### 4.4.2 Locality restrictions on *kull*

As previously mentioned, the NP associated with the FQ needs to be definite and needs to be semantically co-indexed to the FQs. Other anaphor-like conditions between the NP and the FQ also exist and this not only with respect to co-indexation. (69b) shows that the quantifier cannot float from noun complements, and (69a) is only acceptable because what we have is an instance of a post-nominal quantifier which is within/internal to the NP complement.

(69) a. [ṣuwar      l-awlād$_i$      kulla-hum$_i$] an-masaḥ-at          min
        photo.PLF DEF-boy.PLM all-3PL.GEN PASS-delete.PFV-3SGF from
        l-jawāl
        DEF-phone

   The photos of all of the boys have been deleted from the phone.

   b. [*ṣuwar      l-awlād$_i$]      an-masaḥ-at          min l-jawāl
        photo.PLF DEF-boy.PLM PASS-delete.PFV-3SGF from DEF-phone
        kulla-hum$_i$
        all-3PL.GEN

   Intended: The photos of all the boys have been deleted from the phone.

Parallel locality conditions can be found in a range of other environments. The FQ *kull* cannot take a *wh*-phrase, as its antecedent, as is the case of *ayy banāt* 'which girls' in (70a); neither can it take a relative clause, as in (70b),

and nor a topicalized element (70c).[4]

(70)  a.  *ayy  ban-āt   ti-bɣa        layla kulla-hum
          which girl-PLF 2SGF-want.IMPV Layla all-3PL.GEN
          ti-gabil-hum
          3SGF-meet.IMPV-3PL.ACC

          *Which girls does Layla want all of them to meet?

      b.  *ðōla       l-ban-āt     illi layla ti-bɣa          kulla-hum
          Those.PLM DEF-girl-PLF COMP Layla 3SGF.want.IMPV all-3PL.GEN
          ti-gabil-hum
          3SGF-meet.IMPV-3PL.ACC

          *Those are the girls who Layla wants all to meet them.

      c.  *l-ban-āt,    layla ti-bɣa          kulla-hum
          DEF-girl-PLF Layla 3SGF-want.IMPV all-3PL.GEN
          ti-gabil-hum
          3SGF-meet.IMPV-3PL.ACC

          *The girls, Layla wants all to meet them.

### 4.4.3  Constituency tests for adjacent post-nominal quantifiers

As will be discussed later in Section 6.1, Shlonsky (1991) argues that adjacent post-nominal occurrences of quantifiers (NP-Q) and prenominal occurrences are essentially both of the same type, in the sense that they are all within the structure of the NP constituent. If so, that suggests a clear difference between such constructions from true (distant) FQs. He provides evidence for immediate post-nominal instances being part of the NP constituent in Modern Hebrew via tests including clefting (71a), pseudo-clefting (71b), topicalization (71c), and coordination (71d). Hence at this point, it is useful to examine whether the same is true for HA.

(71)  a.  ze hayu ha-yeladim kulam     še-zark-u             avanim
          it was  the-children all.3PLM that-throw.PFV.3-PL stones
          Lit: It was the children, all who threw stones.

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[4]The impossibility with the relative clause is mainly because of the fact that *illi* is not an adequate antecedent in HA, given that it is a complementiser.

b. mi-še    zorek   avanim ze ha-yeladim   kulam
who-that throws stones   it  the-children all.3PLM
Lit: Those who throw stones are the children all.

c. ha-yeladim    kulam,    ani batuax še-zorkim   avanim
them-children all.3PLM I    sure    that-throw stones
Lit: All the children, I am sure that throw stones.

d. etmol     zark-u        štei ban-ot ve-ha-ban-im    kulam
yesterday throw.PFV.3-PL two girl-PL and-the-boy-PL all.3PLM
avanim al  ha-mora
stones   on the-teacher
Lit: Yesterday two girls and the boys, all threw stones on the teacher.

All of these examples confirm the validity of the constituency of NP-Q
constructions according to Shlonsky, since the Q always appear next to the NP
in a sequence such as: lit. 'the boys all-them'. However, issues arise. Spector
(2008), for instance, argues against Shlonsky's tests, where she suggests that
the facts do not point to straightforward behaviours. She claims for example
that clefting may not be such a good test for determining constituency, as
there are strings of words that behave in a way similar to constituents, even
if they are not themselves so. She exemplifies this through the following data
from English:

(72)  a. The allies bombed the city [in Germany] [in 1942].

b. It was [in Germany] [in 1942] that the allies bombed the city.(Spector,
2008)

The argument here is that *in Germany* is part of the object NP constituent
along with *the city*, while *in 1942* is an independent time adjunct constituent
applying to the whole event described. Yet, both can be fronted together in
the cleft version as if *in Germany in 1942* were a distinct constituent.

As for pseudo-clefting, she points out that another possible pseudo-cleft of
(71a) is (73), where the noun 'children' is picked out without the quantifier.

Hence it does not seem that the quantifier must always accompany its host in such structures after all, making clefting not a good test.

(73)  mi-še      zark-u           kulam     avanim ze ha-yeladim
      who-that throw.PFV.3-PL all.3PLM stones   it  the-children

      Who threw all stones were the children.

She again argues that the topicalization test in (71c) also depends on the interpretation of the original sentence. Finally, Shlonsky himself regards the sentence constructed in support of the coordination test in (71d), as marginal.

Our view is that Shlonsky's tests are indeed sufficient to show that Hebrew immediate post-nominal NP-Q constructions can behave as part of the NP constituent, as postmodifiers of that N. However, the account above does not deal with Hebrew examples where the N and the Q are separate. Hence, it does not rule out that Hebrew might have other occasions where the NP and the Q are not in the same constituent. Spector (2008) in fact provides more tests which do support an account where a NP along with the Q in Hebrew does not form a constituent.[5]

We will now show that, similar to the state of affairs which Spector describes for Hebrew, HA FQs do not pass the constituency tests either. We will use some of both Shlonsky's and Spector's tests of constituency to demonstrate whether the floating quantifier *kull* can be outside of the NP or not, in HA.

I here start with the **topicalization** test. What we observe through the data in (74a) is what we would expect for the usual HA basic quantified NP with *kull* preceding the NP, which forms a construct state with it. Naturally, this prenominal Q-NP combination passes the test for being a single

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[5]For more details about the argumentation as to how to determine constituency in the context of Hebrew floating quantifiers, see Spector (2005).

constituent that can be topicalized as a whole. In (74b) we see that a post-nominal *kull+prn* can also behave as a single constituent with the preceding N within the same topicalised structure.

This therefore lends support to the view which I have adopted, i.e. where adjacent postnominal quantifiers in HA are postmodifiers of the N in a larger NP. (74c), by contrast shows that it is also possible for *kull+prn* to occur separate from its host noun, which is topicalized as a constituent on its own. This lends support to my conclusion that true FQs do not belong in the same constituent with the relevant N. Rather, they are separate constituents, with the Ns they quantify upon functioning as their coindexed antecedents.

(74) a. kull l-awlād      bader šāfa-hum         bil-ħadīgah
        all  DEF-boy.PLM Bader see.PFV.3SG-3PL.ACC in.DEF-garden.SGF
        All of the boys, I have seen them in the garden.

   b. l-awlād       kulla-hum    bader šāfa-hum
      DEF-boy.PLM all-3PL.GEN Bader see.PFV.3SGM-3PL.ACC
      bil-hadīgah
      in.DEF-garden.SGF
      The boys all, Bader has seen them in the garden.

   c. l-awlād       bader šāfa-hum          kulla-hum
      DEF-boy.PLM Bader see.PFV.3SG-3PL.ACC all-3PL.GEN
      bil-hadīgah
      in.DEF-garden.SGF
      The boys, Bader has seen them, all of them, in the garden.

The **question fragment answer** test again provides evidence suggesting that the NP can serve as a response to the question, either by itself, or with the FQ *kull*. However, the floating *kull* cannot stand on its own as a response, possibly because it emphasizes the totality of who came, rather than simply providing information as to who came.

(75) mīn jā          l-ħadīgah?
     who come.PFV.3SGM DEF-garden.SGF
     Who came to the garden?

1. kull l-awlād

   all DEF-boy.PLM.

2. l-awlād kulla-hum

   DEF-boy.PLM all-3PL.GEN

3. l-awlād

   DEF-boy.PLM

4. *kulla-hum

   all-3PL.GEN

**Adverb insertion** constitutes another constituency test used by Spector. A sentence adverb cannot intervene between parts of a constituent (Radford (1981); Radford (1988)). From the data in (76a), one observes that the adverb is not able to intervene between a quantifier and the NP, precisely because they form a constituent, and specifically because in Arabic this is a CS formation that in any case does not allow anything to come in between. On the other hand, however, adverbial intervention is a possibility when a NP-Q is involved, as in (76b), thus possibly implying that floated quantifiers do not form a constituent with their antecedents, or if they do, they are instances of discontinuous constituents. Our interpretation is rather that adjacent postnominal quantifiers do form a constituent with their N that is not separable, while a quite separate FQ construction exists, where other material *does* and *can* intervene and the Q is not in the same constituent as its host N. This is of course hard to prove when both postnominal Q and FQ both take exactly the same forms, e.g. *kull*+prn.

(76)   a.   kull  (*ams)        l-ban-āt       ḥaḍar-u          l-faraḥ
            all   (*yesterday) DEF-girl-PLF attend.PFV.3-PL DEF-wedding
            All of the girls attended the wedding, yesterday.

    b. l-ban-at    ams    kulla-hum   ḥaḍar-u
      DEF-girl-PLF (yesterday) all-3PL.GEN attend.PFV.3-PL
      l-faraḥ
      DEF-wedding
      The girls, all attended the wedding, yesterday.

Overall, the tests presented here suggest that in HA the non-floating quantifiers, both of the pre- and post-nominal type are dependent elements, and form a constituent with their N antecedent within the NP. On the other hand, floating quantifiers are independent elements, and do not form a single constituent with their associated NP antecedent.

## 4.4.4   Establishing the grammatical function of floating *kull*

Having established that floating *kull* does not form a constituent with the NP it is bound by, the next question is what, then, is its function within the structure. One possible way to argue our way through is to say that *kull* can be viewed as an argument like any other noun, as it can occur without a NP, as seems to be the case in (77).

(77) kulla-hum    sāfar-u
     all-3PL.GEN travel.PFV.3-PL
     All of them traveled.

However, the full array of data shows that floating *kull* seems to function more as an adjunct, than an argument. The following are data points which are suggestive of this analysis.

First, anaphoric adverbs (to be discussed in Section 5.3 below) can appear precisely in the same position which *kull*+prn appears in, in (77), i.e. pre-verbally, in a context where there is no other overt (binding) antecedent, as shown in (78):

(78)  dōba-hum      sāfar-u
      just-3PL.GEN travel.PFV.3-PL
      They have just traveled.

Second, floating quantifier *kull* cannot be coordinated with other nouns, as
illustrated through the ungrammaticality of (79b), illustrating that it cannot
be merely substituting a NP when in this sentence-initial pre-verbal position.

(79)  a.  l-awlād        wa  l-ban-āt      rāḥ-u
          DEF-boy.PLM and DEF-girl-PLF go.PFV.3-PL
          The boys and the girls went.

      b.  *kulla-hum wa l-ban-āt raḥo-u

          all-3PL.GEN and DEF-girl-PLF go.PFV.3-PL

          All of them and the girls came.

In order for a coordinated sentence such as (79b) to be grammatical, the quan-
tifier has to be preceded by a NP, which can also be a pronominal form, as in
(80b).

(80)  a.  l-awlād        kulla-hum    wa  l-ban-āt      rāḥu
          DEF-boy.PLM all-3PL.GEN and DEF-girl-PLF go.PFV.3-PL
          All of the boys, and the girls went.

      b.  hum kulla-hum    wa  l-ban-āt      rāḥ-u
          They all-3PL.GEN and DEF-girl-PLF go.PFV.3-PL
          All of them, and the girls went.

Just as illustrated through the contrast in (79), and the requirement of a NP
in the presence of a *kull*+prn in (80), it seems safe to conclude that *kull*+prn
cannot be itself the actual subject, and hence does not itself function as the
argument. This of course is not consistent with Spector's analysis of Hebrew
that we described in Section 3.3, where the equivalent of *kull* was regarded
as the subject. This is something which we have also observed in Chapter
2 (Section 4.2.2), where it was illustrated that a *kull*+prn does not simply

substitute a NP argument. In (81), I repeat data from Chapter 2 illustrating how *kull*+prn cannot appear in a position where it substitutes a predicate's object, or an object of a preposition.

(81)  a.  *šuf-t          kulla-hum      bi-l-jāmʕah
          see.PFV-1SG all-3PL.GEN in-DEF-university
          Intended: I saw all of them at the university.

    b.  *t-kallam-t          maʕ  kulla-hum
          RECIP-talk.PFV-1SG with all-3PL.GEN
          Intended: I talked to all of them.

The ungrammaticality of the above examples in (81) is understood to be the result of a missing object argument for the verb, and the preposition, respectively. Only by the attachment of a pronominal form onto the verb or preposition do we end up with grammatical structures, as in (82). This illustrates how it is the pronoun that functions as the actual argument, while *kull*+prn functions as some sort of semantic modifier to that very argument.

(82)  a.  šuf-t-hum              kulla-hum      bi-l-jāmʕah
          see.PFV-1SG-3PL.ACC all-3PL.GEN in-DEF-university
          I saw them all at the university.

    b.  t-kallam-t              maʕ-hum        kulla-hum
          RECIP-talk.PFV-1SG with-3PL.GEN all-3PL.GEN
          I talked with them all.

In contrast to *kull*+prn, other quantifiers can however themselves function as the object argument of a verb, just as any NP, as illustrated in (83).

(83)  a.  šuf-t          baʕḍa-hum      bi-l-jāmʕah
          see.PFV-1SG some-3PL.GEN in-DEF-university
          I saw some of them at the university

    b.  šuf-t          aɣlab-hum      bi-l-jāmʕah
          see.PFV-1SG most-3PL.GEN in-DEF-university
          I saw most of them at the university.

What's additionally particular to the floating quantifier *kull* is that not only is it the quantifier that can float, unlike the case with other quantifiers as illustrated in the ungrammaticality of (55), but it additionally binds a NP that can itself already be quantified, as is the case in (84). This also suggests that the non-floating quantifiers are independent from floating quantifiers and they are not transformationally related.

(84)  aɣlab l-awlād       sāfar-u           kulla-hum
      most  DEF-boy.PLM travel.PFV.3-PL all-3PL.GEN
      Most of the boys all traveled.

Next I go through other syntactic environments where floating *kull* behaves differently from other quantifiers and nouns.

- In the context of negation

In structures involving constituent negation, we find that only the floating *kull* is allowed in (85). Quantifiers such as *baʕḍ* and *aɣlab* do not feature in such structures (86).

(85)  š-šabāb        mū kulla-hum  rāḥ-u       li-l-jim
      DEF-guy.PLM NEG all-3PL.GEN go.PFV.3-PL to-DEF-gym
      Not all of the guys went to the gym.

(86)  *š-šabāb        mū (aɣlab-hum/baʕḍa-hum)        raḥ-u
      DEF-guy.PLM NEG (most-3PL.GEN/some-3PL.GEN) go.PFV.3-PL
      li-l-jym
      to-DEF-gym
      *The guys, not most/some of them went to the gym.

One could argue that this contrast is the result of two cumulative effects. First, this is a special instance of a floated structure, since the quantifier is not adjacent to its host, and of course non-*kull* quantifiers cannot be floated, and these quantifiers can themselves function as the verb's arguments. On the other hand, in line with the modification/ADJunct analysis of floating *kull*,

we observe that an adjunct/adverb such as *ʔams* 'yesterday' can occupy this position, as in (87).

(87) š-šabāb       mū   ams       rāħ-u        lil-jim
     DEF-guy.PLM  NEG  yesterday  go.PFV.3-PL  to.DEF-gym
     It was not yesterday that the guys went to the gym.

- In the context of verbal nouns

Complex event verbal nouns retain the arguments of the verb from which they are derived. Hence their postnominal quantifier has to be able to fill the role of subject. There is no possibility for *kull* to be considered as an argument of verbal nouns, unlike what is the case observed with other quantifiers, which can be placed in that context. This is a behaviour otherwise expected, for any element which possesses argument properties, which *kull*+prn does not.

(88)  a. haði      ihtimām-āt  baʕda-hum
         this.SGF  interest-PLF  some-3PL.GEN
         Those are some of their interests.

      b. haði      ihtimām-āt  aɣlab-hum
         this.SGF  interest-PLF  most-3PL.GEN
         Those are most of their interests.

         vs.

      c. *haði      ihtimām-āt  kulla-hum
         this.SGF  interest-PLF  all-3PL.GEN
         Those are all of their interests.

Once again I account for the ungrammaticality of (88c) to be the result of a missing argument required by the verbal noun. Grammaticality only results after attaching a pronoun onto the verbal noun, thus 'doubling' the pronoun in *kull*+prn.

(89)  haði        ihtimām-āta-hum         kulla-hum
      this.SGF interest-PLF-3PL.GEN all-3PL.GEN
      Those are all their interests.

- In the context of an embedded clause

Embedded clauses introduced by *inn* are restricted to a SV order in HA. Once again one could argue that *kull*+prn is a subject in that position, as in (90a). However, anaphoric adverbs can appear in that position too, as shown in (90b).

(90)  a.  a-twaggaʕ          inn    kulla-hum      sāfar-u
          1SG-think.IMPV COMP all-3PL.GEN travel.PFV.3-PL
          I think that all of them traveled.

      b.  a-twaggaʕ          inn    dūb-hum        sāfar-u
          1SG-think.IMPV COMP just-3PL.GEN travel.PFV.3-PL
          I think that they have just traveled.

As expected, we can then also find *kull*+prn doubling the attached pronoun on the complementizer (91). As the contrastive behaviour in (92) illustrates, other quantifiers or nouns do not display the same behaviour.

(91)  a-twaggaʕ          inna-hum         kulla-hum      sāfar-u
      1SG-think.IMPV COMP-3PL.ACC all-3PL.GEN travel.PFV.3-PL
      I think that they all traveled.

vs.

(92)  a.  *a-twaggaʕ         inna-hum         baʕḍa-hum/aɣlab-hum
          1SG-think.IMPV COMP-3PL.ACC some-3PL.GEN/most-3PL.GEN
          sāfar-u
          travel.PFV.3-PL
          Lit: I think that they, some/most of them traveled.

      b.  *a-twaggaʕ         inna-hum         l-awlād        sāfar-u
          1SG-think.IMPV COMP-3PL.ACC DEF-boy.PL travel.PFV.3-PL
          Lit: I think that the boys, traveled.

From the data above, it can be generalised that *kull*+prn mostly requires a co-referential NP. This can be an overt NP, a bound pronoun, or a null *pro* (90a).

With this I conclude what there is to say with respect to the syntax of the floating quantifier *kull*, where I have demonstrated how *kull*+prn displays different syntactic and semantic properties, when contrasted with the non-floating counterparts, for which reason I suggest that a different structure is involved. The *kull*+prn form appears in positions that are not associated with NP arguments. Given this, it is unclear how the stranding analysis discussed in Section 3.1 can explain such cases, nor indeed Spector's analysis, where the FQs are SUBJECTS (Section 3.3). It suggests that something closer to the adverbial analysis might be appropriate. Section 6.1 will delve deeper into the matter.

In what follows I discuss a number of other items in the HA grammatical system which also seem to float. The aim is to draw up parallels and contrasts through the observed behaviours of items that float. Section 5.1 discusses numerals, Section 5.2 discusses emphatic reflexives, and Section 5.3 discusses anaphoric adverbs.

## 4.5 Other related postnominal and floating constructions

### 4.5.1 Floated numerals

Like those in many other languages such as Korean (Kim, 2011), and Japanese (Miyagawa (1989); Miyagawa and Arikawa (2007)), Arabic numerals can float out of prenominal positions, and can occur in a post-nominal position, or floated away from their host subjects, objects, and objects of a preposition. The distribution of numerals in HA has not been investigated before as a study

in itself.[6] The distribution is illustrated through (93).

(93)  a.  l-ban-āt            (θalāθ-at-hum)    ḥaḍar-u              (θalāθ-at-hum)
           DEF-girl.PLF three-F-3PL.GEN attend.PFV.3-PL three-F-3PL.GEN
           al-ʔijtimāʕ    (θalāθ-at-hum)
           DEF-meeting three-F-3PL.GEN

           The girls, the three of them, attended the meeting.              SUBJ

      b.  šuf-t            l-ban-āt        θalāθ-at-hum
           see.PFV-1SG DEF-girl-PLF three-F-3PL.GEN

           I saw the three of the girls.                                         OBJ

      c.  t-kallam-t              maʕ l-ban-āt      θalāθ-at-hum
           RECIP-talk.IMPV-1SG with DEF-girl-PLF three-F-3PL.GEN

           I talked with the three of the girls.                             OBJ of P

The difference between the floating quantifier *kull*+prn and floating numerals is that the latter appears to be able to stand as an argument in the sentence. It takes the distribution of a subject, object, or object of preposition.

(94)  a.  θalāθ-at-hum        ḥaḍar-u          l-ʔijtimāʕ
           three-F-3PL.GEN attend.PFV.3-PL DEF-meeting

           The three of them attended the meeting.                      SUBJ

      b.  šuf-t            θalāθ-at-hum
           see.PFV-1SG three-F-3PL.GEN

           I saw the three of them.                                           OBJ

      c.  t-kallam-t              maʕ θalāθ-at-hum
           RECIP-talk.PFV-1SG with three-F-3PL.GEN

           I talked with the three of them.                             OBJ of P

It should be noted that numerals in pre-nominal position cannot form a construct state with definite complements, as the ungrammaticality of (95) illustrates. This is therefore another difference between numerals and *kull*.

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[6]More generally, while some Arabic literature provides brief discussions on what are termed emphatic numerals, the phenomenon is not discussed in the literature on Arabic that is written in English.

What the ungrammaticality in (95) is indicative of, is the fact that while one could assume an analysis whereby floating constructions are derived from positions where they are in a pre-nominal position within a construct state, this cannot be true of the data, since it is not possible to get numerals in pre-nominal construct state positions, yet they can still float around. Such behaviours are clearly problematic for the stranding analysis reviewed in Section 3.1.

(95)  *θalā̄θ-at l-awlād        ħaḍar-u          l-ʔijtimāʕ
     three-F    DEF-boy.PLM attend.PFV.3-PL DEF-meeting
     The three boys attended the meeting.

Pre-nominal numerals, on the other hand, can be part of a free state form.

(96)  θlā̄θah min al-awlād      ħaḍar-u          l-ʔijtimāʕ
     three   of   DEF-boy.PLM attend.PFV.3-PL DEF-meeting
     Three of the boys attended the meeting.

What this behaviour suggests is that there seems to be no necessary syntactic relation between floating and non-floating counterparts, i.e. quantifiers that appear pre-nominally. Additionally, it seems that floating is not restricted to the availability of the formation of a construct state, where the quantifier is positioned pre-nominally.

### 4.5.2  Reflexives in HA

HA reflexives, as is the behaviour displayed by other reflexives crosslinguistically, can function as an argument NP. HA reflexives seem to be able to float and be used as emphatic adjuncts. Such cases of reflexive adjuncts are referred to as **emphatic reflexives** (ERs). As noted by Konig and Siemund (2000), the formal identity of emphatic reflexives and reflexive anaphors is widespread in many languages and language groups besides Indo-European, including Turkic, Finno-Ugric, Semitic, Caucasian, as well as Mandarin and Japanese (see

also Gast and Siemund (2006)). Here I start by providing the basics of reflexive pronouns in HA (Section 5.2.1), and I then consider the morphosyntax of ERs in Section 5.2.2, given how we will see that their behaviour is similar to floated quantifiers. There is very little research on Arabic ERs, and to the best of my knowledge, there is no study that covers what I will cover here, which is why I will have a close look at them.

### 4.5.2.1   Reflexive pronouns

Reflexive pronouns in HA are formed out of the word *nafs* 'self' along with an attached GEN pronoun, forming a CS. The pronoun must agree with the antecedent of the reflexive in PERSON, NUMBER, and GENDER values.

(97) fahad jaraḥ        nafs-uh
     Fahad hurt.PFV.3SGM self-3SGM.GEN
     Fahad hurt himself.

The word *nafs* can itself be used in a CS in other contexts, independent of its reflexive function. It can be used to mean 'same', and when used as such, it takes on argument or discourse function positions, just as other NPs (98).

(98) a. nafs l-walad       šuf-t-uh               ʔams       fi l-maħall
        same DEF-boy.SGM see.PFV-1SG-3SGM.ACC yesterday in DEF-shop
        The same boy, I saw him in the shop.

     b. haða l-fustān,    šuf-t        nafs-uh         fi s-sūq
        This dress.SGM, see.PFV-1SG same.3SGM.GEN in DEF-mall
        This dress, I saw the same in the mall.

*nafs*+prn has in HA also developed as a pseudo-verb meaning 'wish', and precedes imperfective verbs, which it embeds as its complement.

(99) ana nafs-i         ʔa-sāfir          fi-l-ʔīstar
     I    wish-1SG.GEN 1SG-travel.IMPV in-DEF-Easter
     I wish to travel in Easter.

The varied uses of *nafs*+prn thus imply that the requirement for *nafs*+prn to be interpreted as reflexive comes about only when it takes on an argument function, in which case it is bound by an antecedent that also takes on an argument function.

### 4.5.2.2 The emphatic reflexive

The same set of reflexive pronouns are able to be used as emphatic adjuncts to NP arguments themselves, as shown in (100).

(100) l-bint          nafsa-ha       rāħ-at         aʕtaðar-at
      DEF-girl.SGF self-3SGF.GEN go.PFV-3SGF apologize.PFV-3SGF
      li-l-mudīr-ah
      to-DEF-head-SGF
      The girl herself went and apologized to the head.

A constraint appears to be present, however, which delimits the distribution of the presence of an ER. It is not possible for the emphatic adjunct to be separated from its NP, as the ungrammaticality of the example below indicates:

(101) *l-bint   rāħ-at        nafsa-ha       aʕtaðar-at
      DEF-girl go.PFV-3SGF self-3SGF.GEN apologize.PFV-3SGF
      li-l-mudīr-ah
      to-DEF-head-SGF
      The girl herself went and apologized to the head.

The emphatic reflexive must therefore be strictly adjacent to its antecedent, which is the head of the NP, and the function of the ER is to specify further the identity of the associated NP, therefore it is $_{NP}$ER, i.e. a NP-oriented ER. The following are characteristic properties of this NP type:

- The NP cannot be deleted:

(102) *nafsa-ha        rāħ-at         aʕtaðar-at         li-l-mudīr-ah
      self-3SGF.GEN go.PFV-3SGF apologize.PFV-3SGF to-DEF-head-SGF
      *Herself went and apologized to the head.

- The NP head of an $_{NP}$ER can refer to inanimate nouns:

(103)  l-waraqah        nafsa-ha        ma-wjūd-ah              ʕala
       DEF-paper.SGF self-3SGF.GEN PASS.PTCP-exist-SGF on
       maktab-i
       office-1SG.GEN
       The paper itself is in my office.

- The $_{NP}$ER cannot function as the object:

As illustrated through the inability of the NP to be deleted, in subject position, the same holds true when functioning as an object, or in any other position in which it may be involved, for that matter, as illustrated in (104).

(104)  *gābal-t           nafsa-ha        fi-l-jāmʕah
       meet.PFV-1SG self-3SGF.GEN in-DEF-university
       *I met herself at university.

   The overt NP antecedent is obligatory:

(105)  a. gābal-t        l-bint         nafsa-ha        fi-l-jāmʕah
          meet.PFV-1SG DEF-girl.SGF self-3SGF.GEN in-DEF-university
          I met the girl herself at university.

   b. *t-kallam-t        maʕ-ah            nafsu-h
      REFL-talk.PFV-1SG with-3SGM.GEN self-3SGM.GEN
      *I talked with him himself.

Through all the above data instances we observe how the emphatic reflexive cannot itself be in an argument position. It always requires to be bound by an overt NP. Thus, the important difference between FQs and $_{NP}$ERs is that the latter are NP adjacent modifiers, and they cannot have a null *pro* (102), or a pronominal object (105b) as a co-referential argument, unlike what is the case with *kull*, as observed in (77), which on the other hand can occur pre-verbally in the context of a null *pro* in subject position. The $_{NP}$ER function is to contrast or compare the NP against alternative referents or other salient individuals in the context.

### 4.5.2.3  Other positions of ER

An emphatic reflexive can additionally attach onto the preposition *bi* 'by'. The preposition in such a context comes to function as some sort of proclitic that takes the whole *nafs*+prn as its argument. The interpretation that results is 'by oneself'.

(106)  fahad  bi-nafs-uh        ṣallaħ             s-sayyārah
      Fahad by-self-3SGM.GEN repair.PFV.3SGM DEF-car
      Fahad repaired the car by himself.

This ER can be paraphrased as *without any help*, i.e. where 'there is no external agent' involved. This type of ER is the adverbial exclusive (Konig and Siemund, 2000). It can appear anywhere in the sentence, just as though it were an adjunct to the whole clause, and does not need to be adjacent to the NP. This makes it different from ERs in NP contexts, where there we observed strict adjacency between the NP and the ER. We can therefore refer to this ER as: $_{VP}$ER.

(107)  fahad  (bi-nafsuh)        ṣallaħ            (bi-nafsuh)
      Fahad (by-self-3SGM.GEN) repair.PFV.3SGM (by-self-3SGM.GEN)
      s-sayyārah (bi-nafs-uh)
      DEF-car     (by-self-3SGM.GEN)
      Fahad by himself repaired the car.

Now consider the following. (108) can have two readings. It can have a $_{VP}$ER exclusive reading which suggests that Fahad called the police by himself, without any help, or it can have another reading which suggests that Fahad himself, and not his brother, for instance, called the police.

(108)  fahad  ittaṣal          ʕala l-pulīs      bi-nafs-uh
      Fahad call.PFV.3SGM on    DEF-police by-self-3SGM.GEN
      Fahad called the police himself / by himself.

Alongside other clearly ᵥₚER functions, we find that some examples are ambiguous, as in (109). It is not entirley clear whether the reading is that the king himself, as opposed to someone in his entourage, attended the match, or whether what is being expressed is that the king attended himself, without delegating this to someone else.[7]

(109)  l-malik            bi-nafs-uh          ḥaḍar            l-mubārāh
       DEF-king.SGM  by-self-3SGM.GEN  attend.PFV.3SGM  DEF-match
       The king attended the match by himself.

The ᵥₚER reading, however, seems to be constrained by the nature of the verbs it can occur with. For example, stative verbs do not allow for a ᵥₚER reading.

(110)  taɣrīd    bi-nafsa-ha        simʕ-at          l-harjah
       Tagreed  by-self-3SGF.GEN  hear.PFV-3SGF  DEF-story
       Tagreed heard the story by herself.

The reading in (110) is unambiguous, such that it can only mean:

a. Tagreed herself heard the story, and not someone else.

but not:

b *Tagreed heard the story without any help.

With this I conclude that there are therefore two types of emphatic reflexives in HA: ₙₚER and ᵥₚER. The ₙₚER is an adnominal modifier. It must be preceded by its NP. The ᵥₚER attaches to a preposition and can appear in a number of positions in the sentence. While it may modify the clause, it can still have a semantic relationship with the NP itself, possibly as its modifier, even if not adjacent to it. Other data can be used to illustrate further morphosyntactic differences between the two. The contrast in (111) vs. (112) illustrates

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[7]For more discussion about ER semantic/pragmatic functions, see König and Siemund (2000).

how for instance the <sub>VP</sub>ER reading is that which can modify a *wh*-pronoun, apart from a NP.

- <sub>NP</sub>ER

(111) a. sāra nafsa-ha gābal-et l-mudīr
      Sara self-3SGF.GEN meet.PFV-3SGF DEF-head-SGM
      Sara herself met the head.

   b. *mīn nafsa-ha gābal-at l-mudīr?
      who self-3SGF.GEN meet.PFV-3SGF DEF-head.SGF
      *Who herself met the head?

- <sub>VP</sub>ER

(112) a. sāra ħall-at l-wājib bi-nafsa-ha
      Sara answer.PFV-3SGF DEF-homework by-self-3SGF.GEN
      Sara answered the question by herself.

   b. mīn ħall-at l-wājib bi-nafsa-ha?
      who answer.PFV-3SGF DEF-homework by-self-3SGF.GEN
      Who answered the question by herself?

Yet another difference between the two readings comes in their use with respect to object functions. While <sub>NP</sub>ER can modify an object, this is not the case with a <sub>VP</sub>ER, which seems to suggest that the latter is a subject-oriented sort of modifier, as already shown to be the case in (106)-(107). In this respect I argue that pure floating is only present in subject-oriented contexts, because in the context of non-subject arguments, what we really get are adjacent post-nominal modifiers.

(113) a. gābal-t sāra nafsa-ha
      meet.PFV-1SG Sara self-3SGF.GEN
      I met Sara herself.

b. *gābal-t      sāra bi-nafsa-ha
   meet.PFV-1SG Sara by-self-3SGF.GEN
   Intended: I met Sara on her own.

### 4.5.2.4   The relationship between FQs and $_{\mathrm{VP}}$ER

There appear to be similarities between floating quantifiers, which can also be understood to be functioning emphatically, hence emphatic quantifiers, and $_{\mathrm{VP}}$ER constructions. The emphatic quantifier *kull* in its association with an antecedent in subject position can appear anywhere in the sentence, as shown in (114).

(114) š-šabāb       (kulla-hum)   rāħ-u       (kulla-hum)   li-l-jim
      DEF-guy.PLM (all-3PL.GEN) go.PFV.3-PL (all-3PL.GEN) to-DEF-gym
      (kulla-hum)
      (all-3PL.GEN)
      The guys all went to the gym.

If we are to substitute *kull* with other ERs, as expected from the review of the differences which obtain between $_{\mathrm{NP}}$ERs vs. $_{\mathrm{VP}}$ERs, we find that it is only the latter, as in (115b), which display the exact same distribution as *kull*+prn. $_{\mathrm{NP}}$ER is limited to appear in strict adjacency with the subject NP (115a).

(115)  a. š-šabāb       (nafsa-hum)   rāħ-u       (*nafsa-hum)
          the-guy.PLM (self-3PL.GEN) go.PFV.3-PL (*self-3PL.GEN)
          li-l-jim       (*nafsa-hum)
          to-DEF-gym (*self-3PL.GEN)
          The guys themselves went to the gym.                          $_{\mathrm{NP}}$ER

       b. š-šabāb       (bi-nafsa-hum) rāħ-u       (bi-nafsa-hum)
          the-guy.PLM (self-3PL.GEN) go.PFV.3-PL (self-3PL.GEN)
          li-l-jim       (bi-nafsa-hum)
          to-DEF-gym (self-3PL.GEN)
          The guys themselves went to the gym.                       bi-$_{\mathrm{VP}}$ER

Distributional parallels between floating quantifiers and emphatic reflexives have also been found in English (Baltin (1982), Jayaseelan (2001)), and what we observe here is that they are subject oriented.

(116)  a. The men **all** would have been working.

  b. The men would **all** have been working.

  c. The men would have **all** been working.

  d. The men would have been **all** working.

(117)  a. The men **themselves** would have been working.

  b. The men would **themselves** have been working.

  c. The men would have **themselves** been working.

  d. The men would have been **themselves** working.

These distributional similarities allow for the possibility that FQs, and emphatic reflexives be generalized with respect to this interpretive function; that is, that the float position generally triggers a re-evaluation of the subject with respect to the predicate.

If we then consider the potential co-occurrence of these various emphatic items, i.e. of the floated quantifier and the emphatic reflexives, we find that from the contrast in (118), it is only a ₜₚER that is able to co-occur. Furthermore, the emphatic reflexive, in this context, can only occur with the floating quantifier, when this reflexive takes the VP in its scope, rather than just the NP.

(118)  a. *l-awlād  kulla-hum rāħ-u  li-l-jim  nafsa-hum
   DEF-boy.PLM all-3PL.GEN go.PFV.3-PL to-DEF-gym self-3PL.GEN
   Lit: The boys all went to the gym, themselves.    ₙₚER

  b. l-awlād  kulla-hum rāħ-u  li-l-jim
   DEF-boy.PLM all-3PL.GEN go.PFV.3-PL to-DEF-gym
   bi-nafsa-hum
   by-self-3PL.GEN
   Lit: The boys, all of them, went to the gym by themselves. bi-ₜₚER

I take this contrastive behaviour in (118) to suggest that the ₙₚER in (118a) is in complementary distribution with the quantifier, such that the function that has been assumed for ₙₚER may well follow for the quantifier in that position (i.e. when it is adjacent to the subject NP), except that the quantifier can occur outside of the NP proper, in parallel with ᵥₚER, whereas ₙₚERs cannot. I take this assumption to be indicative of the fact that the quantifier adjacent to the subject is a NP modifier, and not a VP modifier. This analysis in turn accounts for the semantic differences in the scope of negation.

(119)  a. l-awlād        kulla-hum    mā  jō
          DEF-boy.PLM all-3PL.GEN NEG come.PFV.3.PL
       The boys all did not come.

       b. l-awlād        mā  jō              kulla-hum
          DEF-boy.PLM NEG come.PFV.3.PL all-3PL.GEN
       The boys did not all come.

### 4.5.3   Anaphoric adverbs

Parallels between floating quantifiers and other items in the system extend to certain less obvious cases. In HA, certain adverbs can share similar syntactic restrictions. I will refer to the items to be discussed here as **anaphoric adverbs**. These adverbs carry an enclitic pronoun that has an anaphoric relation with the NP that functions as its antecedent. The HA adverbs in question, identified in (120), illustrate a relation of 'how and when' with respect to the predicate.

(120)  a. l-awlād        jō              dūba-hum
          DEF-boy.PLM come.PFV.3.PL just-3PL.GEN
       The boys have just come.

       b. l-awlād        jō              waħda-hum
          DEF-boy.PLM come.PFV.3.PL alone-3PL.GEN
       The boys came alone.

     c. l-awlād      lissa-hum    ṣɣār
       DEF-boy.PLM still-3PL.GEN young.PLM

      The boys are still young.

The fact that these adverbs attach a pronominal form strongly supports the idea that the presence of a parallel sort of pronominal attachment does not imply that the quantifier is generated as part of the NP.[8]

Given all the facts above, one is tempted to take a strong position and assume a unified analysis for floating quantifiers, emphatic reflexives, and anaphoric adverbs to all be functioning as VP modifiers. However, a unified analysis that reduces floating quantifiers and emphatic reflexives to a single configuration, i.e. as NP adjuncts or VP adjuncts, does not seem to be empirically correct. In some instances, a good case can be made that they are NP adjuncts, when adjacent to their NPs, and in others, they seem to behave like VP adjuncts. To specifically determine what properties make them function like NP adjuncts, and which ones function as VP adjuncts, I draw up the following table in (4.1) to summarise the parallel behaviours observed.

|  | post-nominal modifiers | float from subject | float from object |
|---|---|---|---|
| quantifier *kull* | yes | yes | no |
| numerals | yes | yes | no |
| emphatic reflexives | yes | yes | no |

Table 4.1: Floating constructions in HA

With that overview of the data, I here summarise the empirical consequences of the assumptions that have been made. Starting off, post-nominal modifiers are NP modifiers. The NP associated with the post-nominal modifier

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[8]Interestingly, the anaphoric adverb *dūba-hum* 'just-3PL.GEN' is also a subject-oriented adverb, and cannot occur with an object.

(121) *gābal-t      l-awlād      dūba-hum
      meet.PFV-1SG DEF-boy.PLM just-3PL.GEN

      I have just met the boys.

can be a subject, object, object of preposition, or even a NP that is not an argument. Additionally, it has been shown how adverbial floating modifiers show the distribution of certain types of adverbials. The nominal antecedent associated with adverbial floating modifiers is always the subject function. Floating adverbials additionally carry an emphatic reading.

To set the stage for my syntactic analysis of floating constructions which I will present in the next chapter, I here consider what analyses have been provided for FQs in Arabic, more generally.

## 4.6    Previous treatments of Arabic FQs

In this section I consider what analyses are present in the literature, which attempt at accounting for FQs in Arabic. The literature reviewed essentially falls under the three analyses which I have reviewed in Section 3. I here thus discuss Arabic FQs in relation to the stranding analysis (Section 6.1); an adverbial analysis (Section 6.2), and a lexical LFG-based analysis in Section 6.3.

### 4.6.1   Arabic FQs are not stranded

In Section 3.1 I took to the task to consider the strong syntactic and semantic argumentations that have been addressed to demonstrate that the stranding analysis is either flawed, or not compelling. This section will discuss Shlonsky's (1991) refined stranding proposal for Arabic and Hebrew. It illustrates that even the refined proposal has some shortcomings, and there is data that cannot be dealt with, under this approach.

Shlonsky (1991) offers a refined stranding account of the stranding analysis reviewed above by treating the quantifier as a head that selects a NP as its complement. He does this by drawing on Hebrew data such as the following

in (122).

(122)  a. katafti     et    kol / *kulam     ha-praxim bi-zhirut
           (I)-picked ACC all  / *all.3PLM the-flowers with-care
       I picked all the flowers carefully.

      b. katafti     et    ha-praxim kulam     / *kol bi-zhirut
         (I)-picked ACC the-flowers all.3PLM / *all  with-care
         I picked all the flowers carefully.

      c. ha-yeladim   yašnu kulam      / *kol
         the-children slept  all.3PLM / *all
         The children all slept.

In Hebrew, the quantifier *kol* can occur before or after the NP. When it precedes the NP, the quantifier must be bare, and occurs in a construct state, as in (122a). However, when it follows the NP, it also forms a construct state, which is required to display an attached pronoun that agrees with the NP. As has been illustrated through the examples through Sections 5-6, this is also true in HA, as repeated below:

(123)  a. kull l-awlād       jō
           all  DEF-boy.PLM come.PFV.3.PL
       All the boys came.                                    Bare Q > NP

      b. l-awlād       jō          kulla-hum
         DEF-boy.PLM come.PFV.3.PL all-3PL.GEN
         The boys all of them came.                       NP > FQ

Shlonsky proposes that the quantifier in both constructions is the head of a QP which in turn takes the NP as its complement. On the basis of the alternations illustrated in (123), the quantified DP may appear to the left of Q, in which case Q bears agreement. It has been suggested that this should be analysed as an instance of the movement of the quantified DP into the [Spec/Q]. The obligatory occurrence of agreement in (123b) is then taken to
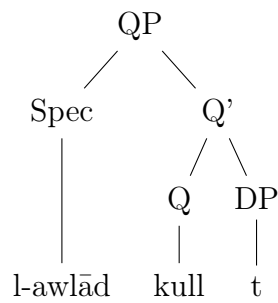
Figure 4.1: *kull l-awlād* 'all of the boys'
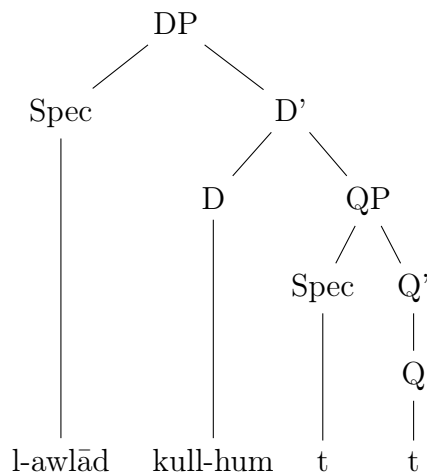


Figure 4.2: *l-awlād kullahum* lit. 'the boys, all of them'

indicate that the operation of quantifier float takes the quantified DP and moves it into the subject position of the clause, specifically in [Spec/Q]. The structures for the pair in (123) are provided in Figures 1-2.[9]

Shlonsky, moreover, suggests the view that subjects in Hebrew originate at the right-edge of the VP. This enables an account for floating quantifiers that end up in a clause final position, as in (124):

(124)  a.  ha-yeladim   medabrim sinit      kulam
           the-children speak       Chinese all.3PLM
           The children all speak Chinese.

       b.  ha-saparim  hiku  et    ha-yeled kulam
           the-barbers hit   ACC  the-boy  all.3PLM

---

[9]A recent similar proposal by Al Khalaf (2019) suggests that Arabic floating quantifier and its associate are merged together in a syntactic position as a set of autonomous phrases; the associate moves out of the set in order for the set to be labeled.

The barbers all hit the boy.

Parallel Arabic data is provided in (125):

(125) ṣ-ṣuɣār       yi-t-kallam-u            ingliš   kulla-hum
      DEF-children 3-REFL-speak.IMPV-PL English all-3PL.GEN
      The children all speak English.

While accounting for the above sets of data, Shlonsky still does not explain why some floating quantifier constructions such as the ones in (126) lack a non-FQ counterpart:

(126)  a. aḥmad wa  ʕumar wa  bilāl   kulla-hum    najaḥ-u
          Ahmed and Omar  and Bilaal all-3PL.GEN pass.PFV.3-PL
          Ahmad, Omar, and Bilal all passed.

       b. *kull aḥmad wa  ʕumar wa  bilāl najaḥ-u
          all    Ahmed and Omar  and Bilal pass.PFV.3-PL
          Intended: Ahmad, Omar, and Bilal all passed.

Moreover, there are examples where the adverb can intervene between the NP and the FQ which however cannot be accounted for within the stranding analysis. The intervention of the adverb prevents the FQ from being transformationally-related to the non-floating structure. The following are such examples from Arabic and Hebrew:

(127) l-ban-āt        (ams)       kulla-hum   (ams)       safar-u
      DEF-girl-PLF (yesterday) all-3PL.GEN (yesterday) travel.PFV.3-PL
      (ams)
      (yesterday)
      The girls all traveled yesterday.                              HA

(128) (vadai)     ha-tapuzim (vadai) kulam     (vadai) hayu (vadai) rekuvim
      (certainly) the-oranges (cert.)  all.3PLM (cert.)  were (cert.)  rotten
      ?(Certainly) the oranges (certainly) all (certainly) were (certainly) rot-
      ten.                                                   Hebrew (Spector,
      2008)

Other problems with the analysis include issues of a more semantic nature. Elsaadany and Shams (2012) propose that the floating and non-floating constructions in Arabic (as well as Hebrew) give rise to scope ambiguities, when in the context of modal and negation environments.[10] The contrast in (129) from Arabic illustrates this through the use of the presence of modals.

(129)   a. kull ṭ-ṭullāb          yumkin yi-njaḥ-ū
           all   DEF-student.SGM may     3-succeed.IMPV-PL
        All the students can/may succeed.

        b. ṭ-ṭullāb              yumkin kull-u-hum         yi-njaḥ-ū
           DEF-student.PLM may     all-NOM-3PLM.GEN 3-succeed.IMPV-PL
        The students can/may all succeed.        MSA: Elsaadany and Shams
        (2012b)

Sentence (129a) has two ambiguous readings: One in which *all* takes scope over the modal, with the resultant reading being that all the students may succeed, and one in which the quantifier takes a narrow scope under the scope of the modal. In this instance, the sentence means that it is possible that all the students succeeded. In sentence (129b) the floating quantifier takes scope over the modal, and the only reading that results is that it is only true that all the students succeeded.

A parallel pattern obtains with data involving negation, as in (130). Only one reading is available for (130a). The quantifier takes scope over negation and the only reading is such that no student succeeded. (130b), on the other hand, has two readings: One in which the FQ takes scope over negation; in which case the sentence means that no girl traveled, and one in which the quantifier takes a narrow scope under the scope of negation. In this case, the meaning that comes about is that not all girls traveled.

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[10]For Hebrew scope ambiguity, see Spector (2008).

(130)  a. kull ṭ-ṭullāb          lam  ya-njaḥū
           all   DEF-student.PLM  NEG  3-succeed.IMPV-PL

       All the students did not succeed.

       b. ṭ-ṭullāb              lam  ya-njaḥū           kull-u-hum
          DEF-student.PLM  NEG  3-succeed.IMPV-PL  all-NOM-3PLM.GEN

       The students did not succeed all.        MSA: (Elsaadany and Shams,

       2012b)

The scope ambiguity observed in (130) does not exist in HA, given that
the quantifier, whether pre-nominally or floating, takes scope over negation,
at least if it precedes negation. Alternatively, it is always under the scope of
negation when it follows negation, independent of its position with respect to
the NP. Such data is provided in (131).

(131)  a. kull l-awlād         mā  jō
           all   DEF-boy.PLM  NEG  come.PFV.3.PL

       All of the students didn't come.                                    $\forall > \neg$

       b. l-awlād            kulla-hum      mā  jō
          DEF-boy.PLM  all-3PL.GEN  NEG  come.PFV.3.PL

       The boys all did not come.                                          $\forall > \neg$

       c. mā  jō               kull l-awlād
          NEG  come.PFV.3.PL  all   DEF-boy.PLM

       Not all the boys came.                                              $\neg > \forall$

       d. mā  jō               l-awlād         kulla-hum
          NEG  come.PFV.3.PL  DEF-boy.PLM  all-3PL.GEN

       Not all the boys came.                                              $\neg > \forall$

The above syntactic and semantic issues all support the claim that the
stranding analysis is not applicable for Arabic, particularly as the structures
involving *kull*-NP and NP-*kull* cannot be said to be derivationally-related.

## 4.6.2   Benmamoun's (1999) adverbial-based proposal for Arabic FQs

In Section 3.2 I presented the adverbial analysis and the argumentation against it. Here I review the treatment of Arabic FQs in Benmamoun (1999). He entertains an analysis suggesting that FQs display properties similar to adverbs, thus adhering closely to the adverbial analysis of FQs. His proposal remains incomplete, however.

Benmamoun (1999) suggests that floating and non-floating counterparts are independent of each other, i.e. non-transformationally related. He addresses two important points. The first is that, in Arabic, movement out of a construct state is impossible. Secondly, the head of the FQ is not the quantifier, but the NP, namely because the quantifier following the NP must have the same case as the NP, in MSA, thus making it a dependent to the NP, rather than the NP's head. This is in contrast to non-floating constructions, in which case he takes the quantifier to be the head of the structure. The following examples illustrate this distinction from MSA.

(132)  a. jāʔa        kull-u    l-awlād-i
           come.PFV  all-NOM  DEF-boy.PLM-GEN

           All the boys came.


       b. jāʔa  l-awlād-u          kull-u-hum
          came  DEF-boy.PLM-NOM  all-NOM-3PLM.GEN

          All the children came.                                      MSA

Benmamoun proposes that post-nominal quantifiers, as in (132b), indirectly agree with their antecedent. This he argues to involve the quantifier agreeing with a null pronominal PRO, and that PRO then agrees with the noun. This provides us with the structure represented in Figure 3.
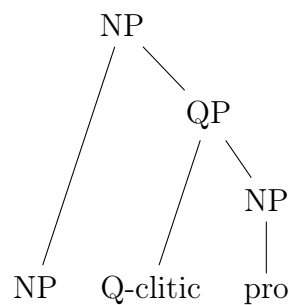
NP
QP
NP
NP Q-clitic pro

Figure 4.3: NP-Q-clitic

As Figure 3 suggests, the NP heads its projection and selects the quantifier as its complement. The clitic appearing on the quantifier results from the (necessary) agreement with PRO that becomes co-indexed with the NP it is associated with. Benmamoun does not however discuss whether it is the same mechanisms that can be applied, or can be applied, in the case of clause final subject FQs, or object FQs. Benmamoun's analysis additionally proposes that heads of adverbial phrases can carry agreement depending on the internal structure of the constituent they head. This is itself understood as an argument against the treatment of floating quantifiers as stranded quantifiers. He better illustrates this behaviour through the following Moroccan Arabic examples involving the adverb *waħd* 'alone'.

(133) a. l-wəld buħd-u ža
         the-boy alone-3SGM.GEN come.PFV.3SGM
         Only the boy came./ The boy came alone.

      b. l-wəlad ža waħd-u
         the-boy come.PFV.3SGM alone-3SGM.GEN
         The boy came alone/ Only the boy came. Moroccan: (Benmamoun, 1999, p.638)

It additionally cannot be said that the above example is an instance of a floating quantifier that agrees with its antecedent *the boy*. This is because it can be conjoined easily with a PP adverb, as in (134).

(134)  ma-ʕraf-t-š                 waš      umar  ža
       NEG-know.PFV-1SG-NEG  whether  Omar  come.PFV.3SGM
       buħd-u              wla  maʕ  xu-h
       alone-3SGM.GEN  or   with  brother-3SGM.GEN

       I don't know whether Omar came alone or with his brother.  Moroccan

       (Benmamoun, 1999)

The coordination of the adverb with a PP can be taken as an argument against treating floating quantifiers as stranded quantifiers.

Benmamoun's (1999) proposal is nevertheless incomplete, as it does not discuss how other FQ positions come about without them causing violations to movement principles. He himself leaves open the question as to whether the FQ is to be treated as a NP adjunct/modifier, or a VP adverb.

### 4.6.3   LFG account for Arabic FQs

Elsaadany and Shams (2012a; b) apply an LFG analysis for MSA FQ constructions. While they apply the same analysis as that in Spector's (2008) study on Hebrew, they unfortunately do not make reference to her work. Their analysis - also Spector's analysis - is not without problems, and some of these issues are noted by Elsaadany and Shams themselves.

One of the arguments they mention is that their claim does not examine all so-called floated positions, such as subject floating quantifiers at the sentence final position (135a), or object post-nominal quantifiers (135b). In (135a), if *kull*+prn is to be analysed as the subject, then this entails that we have a VOS order. The problem with (135b) is that *the students* cannot be analysed as a discourse function, i.e. a TOPIC, given that it linearly comes after the verb. So if *the students* is the object, then it is impossible for *kull*+prn to be analysed as a grammatical function such as SUBJect, OBJect, etc.

(135) a. ṭ-ṭullāb-u          katab-ū       d-dars-a
         DEF-student.PLM-NOM write.PFV.3-PL DEF-lesson-ACC
         kull-u-hum
         all-NOM-3PLM.GEN
         The students all wrote the lesson.

    b. šahad-tu     ṭ-ṭullāb-a          kull-a-hum
       see.PFV-1SG DEF-student.PLM-ACC all-ACC-3PLM.GEN
       I saw all of the students.

Another argument that would need to be somehow integrated within an LFG analysis is the fact that the FQ construction in Arabic is only used for emphasis. In being so, it is therefore infelicitous to assume that the FQ is a SUBJect that is providing new information. The NUMBER specification of the OBJect is already supported through the use of definite plural NPs, which implies that it is referring to *all the students*. Therefore, the use of *all*, here, is merely meant to provide a clarification to any discourse ambiguity that might arise. Hence, the function of *kull* mainly boils down to that of emphasis.

There is yet another issue with the analysis of Arabic FQs as grammatical functions. Given the distribution discussed in Section 4, represented through HA data, they have been shown to be restricted to SUBJect postions. The issue with this analysis is that *kull*+prn seems to not be able to appear in other argument positions. The ungrammaticality of (136) seems to suggest that there must be other constraints which somehow disallow the FQ to function as the OBJ, even if it can indeed occur within the OBJect's NP, since it is able to 'double' a real OBJect argument. The alternative analysis, under the topicalisation analysis, would be that *kull*+prn in (136), functions as the OBJect. The structure is nevertheless ungrammatical. This is because the Q would need to be involved in some binding relation, e.g. with a TOPIC.

(136) *šuf-t        kull-a-hum
       see.PFV-1SG all-ACC-3PLM.GEN

I saw all of them.

On the account that *kull*+prn can in fact function as a grammatical function, but is restricted to a SUBJect function, we once again encounter issues, as such an analysis of the FQ as a subject will predict that it can be conjoined with other NPs, in a coordinated structure that functions as a SUBJect. However, this prediction is not borne out, as illustrated through the ungrammaticality of (137)

(137)  *kulla-hum   w    taɣrīd   jō            l-ħaflah
       all-3PL.GEN and Tagreed come.PFV.3.PL DEF-party
       Intended: All of them and Tagreed came to the party.

These shortcomings all suggest that further investigations are needed to shed light as to how best to approach FQs in Arabic. The analysis I provide in Chapter 5 offers itself as a possible account that can analyse the behaviours of the HA FQ data set.

## 4.7   Conclusion

This chapter started by looking at FQs cross-linguistically. This was then followed by a review of the major approaches of the treatment of FQs as addressed in the literature. On the whole it was shown that each of the different approaches has its own shortcomings. The same is true of the accounts provided for the Arabic facts more broadly. The core of the chapter also aimed at surveying the use of floating quantifiers in HA. It has also addressed floating constructions that have hitherto escaped the attention of previous researchers. These include reference to the behaviour of emphatic numerals and emphatic reflexives. In what follows I review some previous HPSG analyses that have been provided for FQs, and I will then provide the analysis which I will be assuming for HA QF.

# Toward an HPSG Account of Floating Quantifiers in HA

## 5.1 Introduction

In Chapter 3 I have already suggested an HPSG analysis for HA quantifiers in pre-nominal positions. This chapter now deals with the English and HA post-nominal and floating constructions described in Chapter 4, and investigates how the syntactic and semantic characteristics of such constructions can be explained within the framework of HPSG. In contrast to analyses that entail movement, reviewed in the previous chapter, this chapter presents an analysis in which post-nominal and floating constructions are analysed as involving base-generated elements within a theory where 'syntactic' and 'semantic' components are treated as sub-parts of a structural representation that is defined by the lexical information associated with these items.

As I provided the descriptive element of the data in Section 4 and 5 in the previous chapter, I have shown that in HA there are two types of quantifiers and emphatic reflexives: ones which can float, and which were shown to be

subject-oriented, and those which are adjacent to the NP which they modify, and arguably do not float, and which I refer to as post-nominal NP modifiers. The question that follows is whether it is possible to have a single, uniform treatment for these varied structures, since we have seen that floating and post-nominal structures contribute the same semantics. In the analysis that follows I will show how the HPSG analysis allows a close interaction between syntax and semantics, and in a streamlined way accounts for the apparent mismatches of the syntax in floating, and post-nominal constructions in HA. We begin by reviewing some HPSG work done on English, which may inform our later HPSG account of HA, even though the behaviour of post-nominal and floating quantifiers is not identical in the two languages.

## 5.2   English Post-nominal and Floating quantifiers in HPSG

In this section I choose to focus my review on HPSG studies that consider floating quantifiers in English.

### 5.2.1   Syntactic treatment of English FQs as adverbs in HPSG

There has been relatively little work done on floating quantifiers in HPSG. Park (1995), Kim and Kim (2009), and Yoo (2001) however propose an HPSG analysis where floating quantifiers in English are treated as adverbs modifying verb phrases.

Kim and Kim (2009) propose that adverbs can generally be pre-modifiers which precede the head they modify, or post-modifiers that follow the head. FQs in English, however, cannot post-modify the verb. To capture such a limited distributional possibility for an adverb, they use the feature POST-MOD $\pm$

$$
\begin{bmatrix}
\text{PHON} & \langle \text{ALL} \rangle \\[4pt]
\text{HEAD} & \begin{bmatrix} \text{POS} & adv \\ \text{POST-MOD} & - \end{bmatrix} \\[4pt]
\text{VAL} \,|\, \text{MOD} & \langle \text{VP} \rangle
\end{bmatrix}
$$
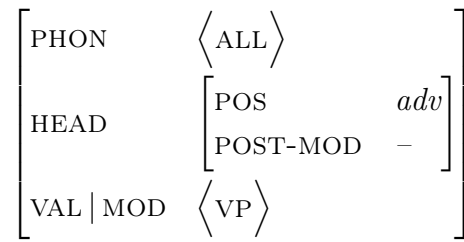
Figure 5.1: The lexical entry for the FQ *all* (to be revised)(Kim and Kim, 2009, p. 68)
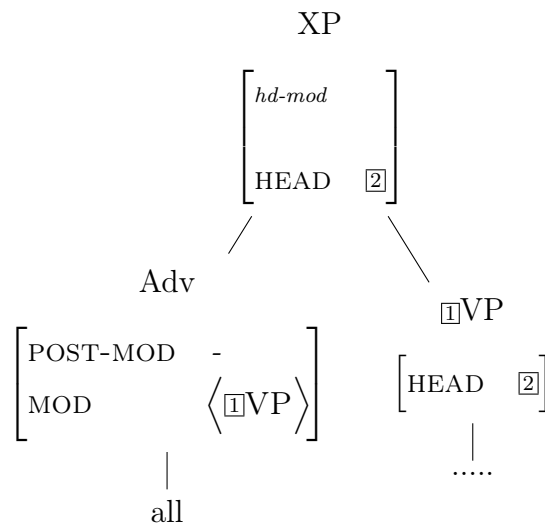


Figure 5.2: English floating 'all' as a VP modifier (Kim and Kim, 2009, p. 68)

with the following English-specific Linear Precedence Constraint to indicate that something that is specified as negative for post-modification in fact only precedes the head.

(1)  LP:[POST-MOD - ] $\prec$ HD-DTR

English FQs as pre-modifying adverbs are then provided with the structure and lexical specification presented in Figure (5.1).

The lexical entry in (5.1) provides an explanation for the properties of FQs in English, where the floating *all* functions as an adverb that modifies any VP, finite or nonfinite. It has the value - for the feature POST-MOD, which means that it always precedes the head verb. The VP and the quantifier form a head-modifier construction, as in Figure (5.2).

$$\begin{bmatrix} \text{PHONE} & \left\langle \text{ALL} \right\rangle \\ \text{HEAD} & \begin{bmatrix} \text{POS} & adv \\ \text{POST-MOD} & \text{-} \end{bmatrix} \\ \text{VAL} \,|\, \text{MOD} & \left\langle \text{XP[PRD +]} \right\rangle \end{bmatrix}$$

Figure 5.3: The lexical entry for the FQ *all* (Kim and Kim, 2009, p. 70)

The POST-MOD feature plays an important role as it blocks the FQ adverb from modifying the head in the post-modifier position, as that would result in the ungrammaticality in (2).

(2)  *The boys have arrived all.

However, Kim and Kim (2009) extend the analysis to capture the distributional possibilities of when the FQ also modifies predicative APs, PPs, and NPs.

(3)  a. They're **all** young and very wet behind the ears. (ICE-GB:S1A-010 028:1:B)

   b. Well they obviously don't approve of it and they're **all** in the same boat. (ICE-GB:S1A-059 132:1:B)

   c. The world is unified at the ideal level, but the physical manifestations of the vertebrate archetype are **each** a distinct product of the Creator's will. (BNC: G0H 294)                (Kim and Kim, 2009)

In order to deal with these additional distributional facts, the feature PRD is included in the modified lexical entry (Figure 5.3), thus extending further the syntactic contexts which allow for FQs to linearly precede them.

One however still finds issues with this analysis, as pointed out by Kim and Kim (2009) themselves. This has to do with the occurrence of quantifiers in positions where they are clearly not adverbs modifying a verb head, i.e.

not floating. The rules above do not deal with English quantifiers in a pre-determiner position, as in (4), for instance, or as post-modifiers of pronouns, independent of whether these are functioning as subjects or associated with object pronouns in sentence final positions (5).

(4)   a. All the students came.

      b. Both the students came.


(5)   a. His kindness amazed us all.

      b. Daniel watched them both.

Although this analysis develops the modifier analysis (which I will also be assuming for HA floating quantifiers) by linking the floating quantifier to the notion of predication, it does not deal with the semantics of the FQs constructions, since it does not link the FQ with the NP it quantifies over.

## 5.2.2   Semantic representations of English FQs in HPSG

Yoo (2001) suggests an explanation of how logical forms can be assigned to sentences with floating quantifiers. She proposes that the floating quantifier in English is syntactically an adjunct daughter of the larger VP which carries all semantic information, including the quantifier's meaning. Since the NP associated with the floating quantifier is a plural NP, Yoo (2001) along with Link (2002) and Dowty et al. (1987) argue that plural NPs invoke a universal quantification force along with the floating quantifier, and together they have an effect, which has been referred to as the Maximizing Effect, which requires the predicate to be true of every member of the group. The logical form of the sentence containing the floating quantifier can be expressed as in (6).

(6)   a. The students all sneezed.

b. [the y ‖students'(y)]([∀x ‖constituent-of'(x,y)](sneezed'(x)))

The 'constituent-of' in (6) that Yoo (2001) uses resembles Link's (1983) relation 'atomic-part-of'. This function identifies each member $x$ of the group $y$. In the case of the predicate having a collective meaning, however, the predicate cannot hold for each member of the given group. In that case, it is the group entity itself that should be predicated, such that the logical form is as in (7).

(7)  a. The students all gathered.

b. [the y‖ students'(y)](∃x ‖ group'(x) & ([∀z ‖ constituent-of'(z,y)] (constituent-of'(z,x)))](gathered'(x)))

The logical forms in (6) and (7) indicate the logical representations of floating quantifier sentences. The choice between these forms varies depending on the interpretation of the predicate, i.e. whether it is distributive or collective. It is not difficult to incorporate such representations into HPSG, using the system described by Pollard and Sag (1994). The type *psoa* (parameterized-state-of-affairs) can include quantifiers. A *psoa* has the attributes QUANT(IFIER)S and NUC(LEUS). The former takes as its value a list of quantifiers, and the latter takes as its value a quantifier-free *psoa*. The quantifier in the QUANTS list is taken to have scope over the NUC(LEUS) value. Therefore, the CONT of (6) can be presented as in Figure (5.4). The numeral tag ⑥ indicates a plural entity, while ⑧ expresses a constituent member of the plural entity. Therefore, the QUANTS includes a definite quantifier followed by a universal quantifier.

## 5.2.3   Quantifier retrieval in the manipulation of English FQ semantic representations in HPSG

There is a need of a mechanism for introducing quantification into the semantic content of the sentence at the appropriate level. For this, the familiar

$$
\begin{bmatrix}
\text{QUANTS} & \left\langle \boxed{2} \begin{bmatrix} \text{DET} & \textit{the} \\ \text{IND} & \boxed{6} \\ \text{DESTR} & \left\{ \begin{bmatrix} \textit{students} \\ \text{INST} & \boxed{6} \end{bmatrix} \right\} \end{bmatrix}, \; \boxed{4} \begin{bmatrix} \text{DET} & \textit{forall} \\ \text{IND} & \boxed{8} \\ \text{RESTR} & \left\{ \begin{bmatrix} \textit{const-of} \\ \text{CONSTITUENT} & \boxed{8} \\ \text{SUM} & \boxed{6} \end{bmatrix} \right\} \end{bmatrix} \right\rangle \\
\text{NUC} & \boxed{3} \begin{bmatrix} \textit{sneeze} \\ \text{SNEEZER} & \boxed{8} \end{bmatrix}
\end{bmatrix}
$$
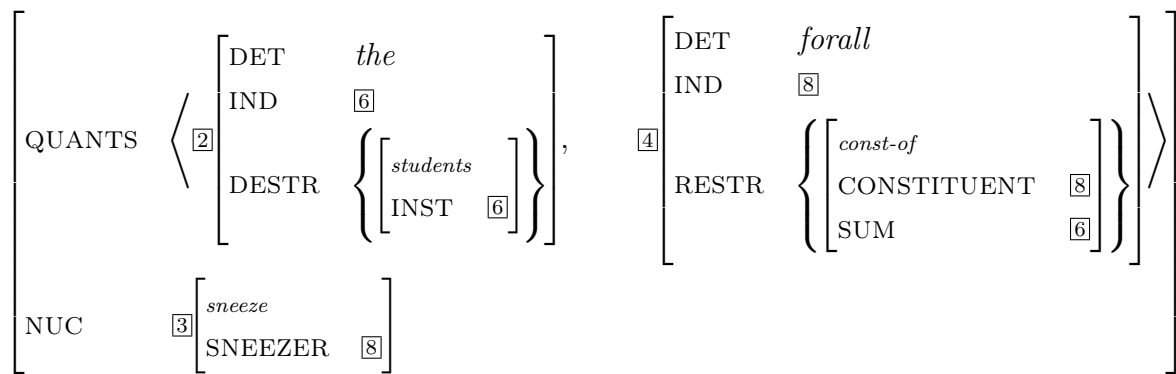
Figure 5.4: The CONT of 'the students all sneezed'

storage method of Cooper (2013) is employed in Pollard and Sag (1994) by using the feature STORE, to which existentially quantified elements are added by lexical/phrasal constituents, and from which they are retrieved to form part of the sentence's semantics. The storage mechanism was revised and extended in Pollard and Yoo (1998) to account for the quantifier scope in some constructions in English (e.g. raising structures, and unbounded dependency constructions). Pollard and Yoo (1998) have QSTORE as a LOCAL attribute, and POOL and RETRIEVED as top-level attributes of signs. Quantifiers are collected in POOL, which is the union of the QSTORE values of the selected arguments. The POOL, according to the assumption in Pollard and Yoo (1998, p. 421), is defined as either through:

(8) a. thematic elements selected via the SUBJ or COMPS feature,

    b. elements selected via the SPR feature, or

    c. elements selected via the MOD feature.

The QSTORE value of a sign is the POOL value minus the elements in RETRIEVED. Combining the QSTORE, POOL, and RETRIEVED values, the following constraint in (9) is presented:

(9) For a sign, the RETRIEVED value is a list whose set of elements forms

a subset S of the POOL value; and the QSTORE value is the relative complement of the set S.

Concerning the FQ *all* in the lexicon, the natural assumption is that it introduces a quantifier in its POOL, just as unfloated pre-nominal *all* as a quantificational determiner would. In Pollard and Yoo, the items that have quantifier meanings are classified as quant(ifier)-words, and their POOL and QSTORE values are lexically specified. These words are different from ordinary lexical heads because their QSTORE values are not the union of all the QSTORE values of their arguments. What Yoo (2001) also assumes is that the RETRIEVED value of some quantifier-introducing words should be lexically specified. She claims, therefore, that in addition to ordinary cases where a quantifier is retrieved at some structural node, in its adherence to the set of constraints specified on the features POOL, QS(TORE), RET(RIEVED), and QUANTS, the RET (and thus QUANTS), values must be specified lexically, in the case of quantifier-introducing words.

### 5.2.4   Lexical entries for English FQs in HPSG

Yoo (2001) proposes that quantifier scope in English sentences involving FQs can be accounted for by specifying retrieved quantifiers in their own lexical entries, such as in the lexical entry of *all*. As discussed in §2.1, the precise meaning which the FQ assigns in the sentence in which it appears varies depending on the semantic type of the predicate. Accordingly, two lexical entries are provided for the FQ *all*. The first entry (Figure 5.5) is representative of sentences with a distributive reading.

In the lexical entry (Figure 5.5), the QUANTS list, which has the same value ⑤ as that of RET, includes in POOL, two quantifiers: ② and ④. ② indicates a definite quantifier arising from the subject NP, and ④ correlates with the restricted quantifier part ($\forall$ x (P(y) & a-constituent (x,y))), shown

$$
\begin{bmatrix}
\text{MOD} & vp \vee ap \begin{bmatrix} \text{SUBJ} & \left\langle \text{NP} \begin{bmatrix} \text{QS}\boxed{2} \end{bmatrix} \right\rangle \end{bmatrix} : \boxed{3} \\[3ex]
\text{CONT} & \begin{bmatrix} \text{QUANTS} & \left\langle \boxed{5} \right\rangle \\ \text{NUC} & \boxed{3} \begin{bmatrix} \text{ARG}\boxed{8} \end{bmatrix} \end{bmatrix} \\[3ex]
\text{POOL} & \left\{ \boxed{2} \right\} \cup \left\{ \boxed{4} \right\} \\[1ex]
\text{QS} & \{\} \\[2ex]
\text{RET} & \boxed{5} \left\langle \boxed{2} \begin{bmatrix} \text{DET} & the \\ \text{IND} & \boxed{6} \end{bmatrix}, \boxed{4} \begin{bmatrix} forall \\ \text{IND} & \boxed{8} \\[1ex] \text{RESTR} & \left\{ \begin{bmatrix} const\text{-}of \\ \text{CONSTITUENT} & \boxed{8} \\ \text{SUM} & \boxed{6} \end{bmatrix} \right\} \end{bmatrix} \right\rangle
\end{bmatrix}
$$
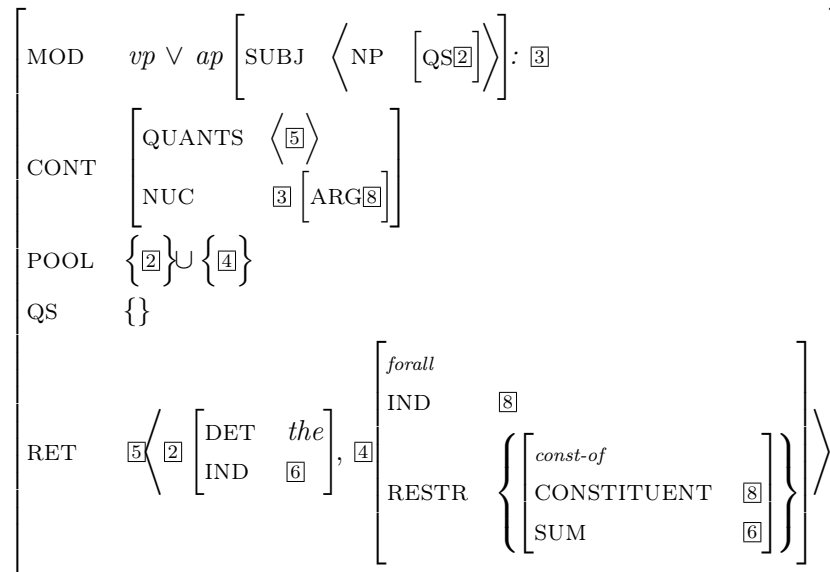
Figure 5.5: The lexical entry of *all* in the context of distributive predicates

in RESTR. When the FQ appears in a sentence, the quantifier scopes over the NUC(LEUS) value, which is the CONT of the VP. The relation *constituent-of* predicts that the host of a FQ must be a plural entity. Thus, it rules out the examples in (10), since the hosts express singular entities, when a plural entity is otherwise required.

(10)   a.   *The boy has all arrived.

   b.   *Each boy had all arrived.

The second lexical entry (Figure 5.6) is associated with FQ *all* when in the context of collective predicates:

Yoo (2002) assumes that the choice between distributive and collective representations in the association of the distinct lexical entries involving FQs such as *all* is made on semantic grounds. In that way, the precise interpretation of both the unfloated, and the floating quantifier are accounted for.

In this English-oriented analysis of FQs, these are syntactically analysed as modifiers of the main sentence predicate. Consequently, since the index $\boxed{8}$ of the quantifier is related to that of the subject of the predicate $\boxed{6}$, via the

$$
\begin{bmatrix}
\text{MOD} & vp \lor ap \begin{bmatrix} \text{SUBJ} & \left\langle \text{NP}\begin{bmatrix} \text{QS}\boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}{:}\boxed{3} \\[2ex]
\text{CONT} & \begin{bmatrix} \text{QUANTS} & \left\langle \boxed{5} \right\rangle \\ \text{NUC} & \boxed{3}\begin{bmatrix} \text{ARG}\boxed{8} \end{bmatrix} \end{bmatrix} \\[2ex]
\text{POOL} & \left\{ \boxed{2} \right\} \cup \left\{ \boxed{4} \right\} \\[1ex]
\text{QS} & \{\} \\[2ex]
\text{RET} & \boxed{5} \left\langle \boxed{2}\begin{bmatrix} \text{DET} & the \\ \text{IND} & \boxed{6} \end{bmatrix}, \boxed{4} \begin{bmatrix} exists \\ \text{IND} & \boxed{8} \\ \text{RESTR} & \left\{ \begin{bmatrix} group \\ \text{INST} & \boxed{8} \end{bmatrix}, \begin{bmatrix} \text{QUANTS} & \left\langle [\, \forall\, \boxed{7} \mid const\text{-}of\,(\boxed{7},\boxed{6})\, ] \right\rangle \\ \text{NUC} & \begin{bmatrix} const\text{-}of \\ \text{CONSTITUENT} & \boxed{7} \\ \text{SUM} & \boxed{8} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix} \right\rangle
\end{bmatrix}
$$
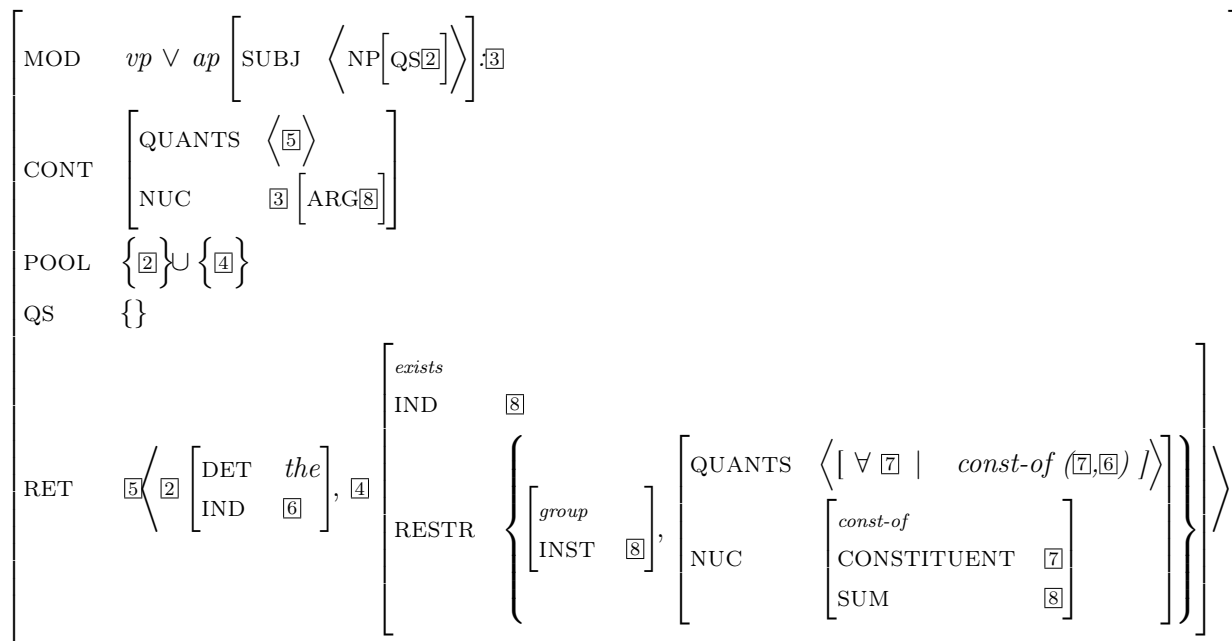
Figure 5.6: The lexical entry of *all* in the context of collective predicates

relation *constituent-of*, the relation between the subject and the floating quantifier is correctly accounted for. To prevent the quantifier from appearing post-verbally, Yoo (2002) adopts a Linear Precedence (LP) statement such as that described in (1). In that way, *all* functions as an adjunct daughter, and syntactically combines with the VP (or predicative AP, PP etc.) forming a *head-adjunct-phrase* as illustrated in Figure (5.7), consistent with Figure (5.5) for the sentence in (6). The universal quantifier associated with the FQ is required to be retrieved lexically, and it eventually takes scope over the VP that it modifies.

In Figure (5.7), both the subject and the adverb give rise to a quantifier in storage. The RETRIEVED value of the ADV is a list whose set of elements is identical to the union of the QSTOREs. The QUANTS value of the semantic head, the ADV, is identical to the RETRIEVED value.

We shall see below that a great deal of this HPSG apparatus with which we have just described English FQ semantics will be extended to account for HA

S
$\begin{bmatrix} \text{CONT} & \boxed{12} \end{bmatrix}$

$\boxed{1}$ NP
$\begin{bmatrix} \text{QS} & \left\{ \boxed{2} \right\} \end{bmatrix}$

VP
$\begin{bmatrix} \text{CONT} & \boxed{12} \end{bmatrix}$

ADV
$\begin{bmatrix} \text{MOD} & \boxed{10} \\ \text{CONT} & \boxed{12} \begin{bmatrix} \text{QUANTS} & \boxed{5} \\ \text{NUC} & \boxed{3} \end{bmatrix} \\ \text{POOL} & \left\{ \boxed{2}, \boxed{4} \right\} \\ \text{RET} & \boxed{5} \left\langle \boxed{2}, \boxed{4} \right\rangle \end{bmatrix}$

$\boxed{12}$VP
$\begin{bmatrix} \text{SUBJ} & \left\langle \boxed{11} \right\rangle \\ \text{CONT} & \boxed{3} \end{bmatrix}$
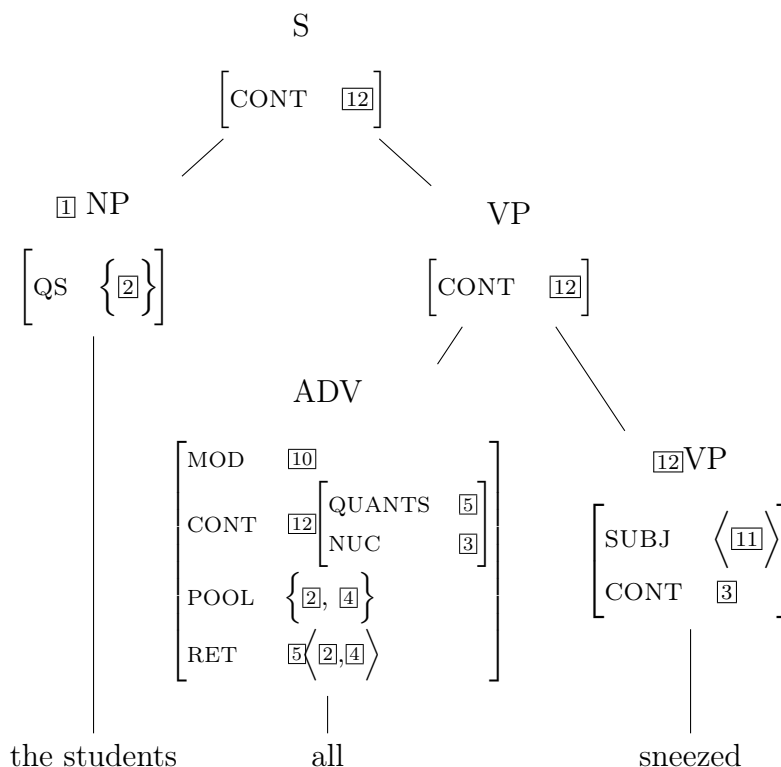
the students      all      sneezed

Figure 5.7: The structure of: *The students all sneezed.* (Yoo, 2002, p. 359)

FQs as well. Before I do so, first I revisit the highlights of the HA data related with floating quantifiers and emphatic reflexives, as described in the previous chapter. Following that I will provide an HPSG analysis to account for the syntactic and semantic properties of these structures. What my analysis will not include, however, is reference to the different distributive vs. collective readings that result in the context of FQs and post-nominal structures, depending on the nature of the predicate involved. In fact, a discussion on the matter has not figured in the descriptive chapter, either, and I leave these additional semantic nuances for further research.

## 5.3 An HPSG analysis of HA floating constructions

Throughout Chapter 4 I have detailed out the behaviour of HA floating quantifiers and emphatic reflexives, and which I have grouped together as

emphatic constructions/modifiers, due to their similar behaviour. Common amongst them is the fact that these can appear in two linear syntactic positions: Post-nominally they are strictly adjacent to the noun, or floated, where they occur distant from the noun, and appear to display adverbial qualities. In a post-nominal position, the emphatic modifier is linked to the preceding NP subject or the object, etc., and forms a syntactic unit with it. This is observed in (11), which involves data with the quantifier, and in (12), which includes data involving reflexives.

(11) a. **l-awlād      kulla-hum** šāf-u          l-mubārāh
        DEF-boy.PLM all-3PL.GEN see.PFV.3-PL DEF-match
        The boys all saw the match.

   b. šuf-t          **l-awlād        kulla-hum**
      see.PFV-1SG DEF-boy.PLM all-3PL.GEN
      I saw the boys, all of them.

(12) a. **l-walad nafs-uh**        kallam          l-mudīr
        DEF-boy self-3SGM.GEN talk.PFV.3SGM DEF-head.SGM
        The boy himself talked to the head.

   b. gābal-t        **l-walad nafs-uh**
      meet.PFV-1SG DEF-boy self-3SGM.GEN
      I met the boy himself.

   Meanwhile, the adverbial floating emphatics, whether involving a quantifier or not, appear in non-adjacent positions to the noun they modify, and may even follow the verb. When this is the case, these can only ever be associated with the subject function, as in (13), such that no ambiguity arises, even in contexts of the type in (13b), where both the subject and the object are 3SGM.[1]

(13) a. l-awlād         [šāf-u          (**kulla-hum**) l-mubārāh (**kulla-hum**)]
        DEF-boy.PLM see.PFV.3-PL all-3PL.GEN   DEF-match all-3PL.GEN
        Yesterday, the boys all saw the match.

_____

[1]Recall from the discussion in Chapter 4 Section 5.2.2 that floating modification involving emphatic reflexives must be always *bi*-introduced, and should be subject-oriented.

b. **l-walad** [$_{vp}$(**bi-nafsuh**) kallam (**bi-nafsuh**)
DEF-boy.SGM by-self-3PLM.GEN talk.PFV.3SGM by-self-3SGM.GEN
l-mudīr (**bi-nafsuh**)]
DEF-head.SGM by-self-3SGM.GEN
The boy talked to the head by himself.

I propose that essentially, the two distinct linear positions which HA emphatic quantifiers and reflexives can occupy in the sentence, really boils down to a distinction that has to do with the nature of the category they end up adjoined to. Post-nominal instances are adjoined as post-modifiers to nouns, regardless of their grammatical function, i.e. whether they are subject, object etc. Floated adverbial instances are associated semantically only with subjects, and are adjoined to verbs or other sentence predicates as either pre- or post-modifiers, in contrast to English, where they can only ever pre-modify such predicates.

## 5.3.1 An account of post-nominal quantifiers in HA

I here start by considering the HA post-nominal structures, described in detail in Chapter 4 Section 4.4.3. The post-nominal quantifier with its associated NP behaves as a syntactic unit, forming a type of construct state structure, which in turn accounts for the strict adjacency observed, where the two units, i.e. the N and the quantifier can never be separated. In addition, we observe that the associated NP can be a maximal NP, as we observe through (14b), which involves a NP inclusive of a relative clause.

(14) a. [ðōl l-awlād] kulla-hum
those DEF-boy.PLM all-3PL.GEN
Lit: those boys, all of them

All those boys

b. [l-awlād illi gābal-ta-hum] kulla-hum
DEF-boy.PLM COMP meet.PFV-1SG-3PL.ACC all-3PL.GEN
All of the boys who I met

What this fact implies is that the post-nominal quantifier attaches to the preceding nominal antecedent, forming a full NP. As a way of dealing with this property we can state that the post-nominal NP functions as a modifier of its associate head NP.

However, first let us consider the lexical entry for *kullahum* 'all-them' on its own.  Although it morphologically looks like a construct state, functionally it is not, as we have discussed in Chapter 4.  There we have seen how the construct as a unit cannot appear in argument positions, and additionally displays distinct agreement properties than otherwise observed for construct states involving nominal heads. Most importantly, for the purposes of the account here, I claim that given how this form obligatorily inflects through the use of pronominal/inflectional forms, I choose to analyse *kull* very much like the analysis of *kull* in Maltese in Ambros (1998), and Camilleri (2016), where *kull* is analysed as a quantifier that non-canonically inflects for the subject function it modifies.  The obligatory prevalence of pronominal forms internal to the construct state structure formed by the quantifier, as opposed to what is the case with construct states involving nominal heads, where the possessor can be both a NP or a pronoun, is also mentioned in Benmamoun (1999).

According to the standard HPSG approach of Pollard and Sag (1994), adjuncts are treated as the semantic selectors. The selection proceeds via the MOD feature. *kullahum* 'all.3PL.GEN' thus selects an NP via the MOD feature, and as an adjunct daughter, it combines with a NP, and together they constitute a head adjunct phrase.[2] Following Yoo (2002), plural definite NPs are treated as instances of quantificational expressions, in that their CONTENT specification contains a universal quantifier. Moreover, these NP quantifiers are handled by

---

[2]Other quantifiers, which do not necessarily display the same behaviours, as well as ordinary nouns, can in turn have the MOD value as: *none.*

$$
\begin{bmatrix}
\text{PHON} & \textit{kullahum} \\[6pt]
\text{SYNSEM}\,|\,\text{LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{noun} \\ \text{MOD} & NP\begin{bmatrix} \text{QS} & \{\boxed{2}\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\[14pt]
\text{CONT} & \begin{bmatrix} \text{QUANTS} & \langle \boxed{5} \rangle \\ \text{NUC} & \boxed{3}\begin{bmatrix} \text{ARG}\boxed{8} \end{bmatrix} \end{bmatrix} \\[10pt]
\text{POOL} & \{\boxed{2}\} \cup \{\boxed{4}\} \\
\text{QS} & \{\} \\[10pt]
\text{RET} & \boxed{5}\Big\langle \boxed{2}\begin{bmatrix} \text{DET} & \textit{the} \\ \text{IND} & \boxed{6} \end{bmatrix}, \boxed{4}\begin{bmatrix} \textit{exists} \\ \text{IND} & \boxed{8} \\ \text{RESTR} & \left\{ \begin{bmatrix} \textit{group} \\ \text{INST} & \boxed{8} \end{bmatrix}, \begin{bmatrix} \text{QUANTS} & \langle [\, \forall \boxed{7} \mid \textit{const-of}\, (\boxed{7},\boxed{6})]\rangle \\ \text{NUC} & \begin{bmatrix} \textit{const-of} \\ \text{CONSTITUENT} & \boxed{7} \\ \text{SUM} & \boxed{8} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix} \Big\rangle
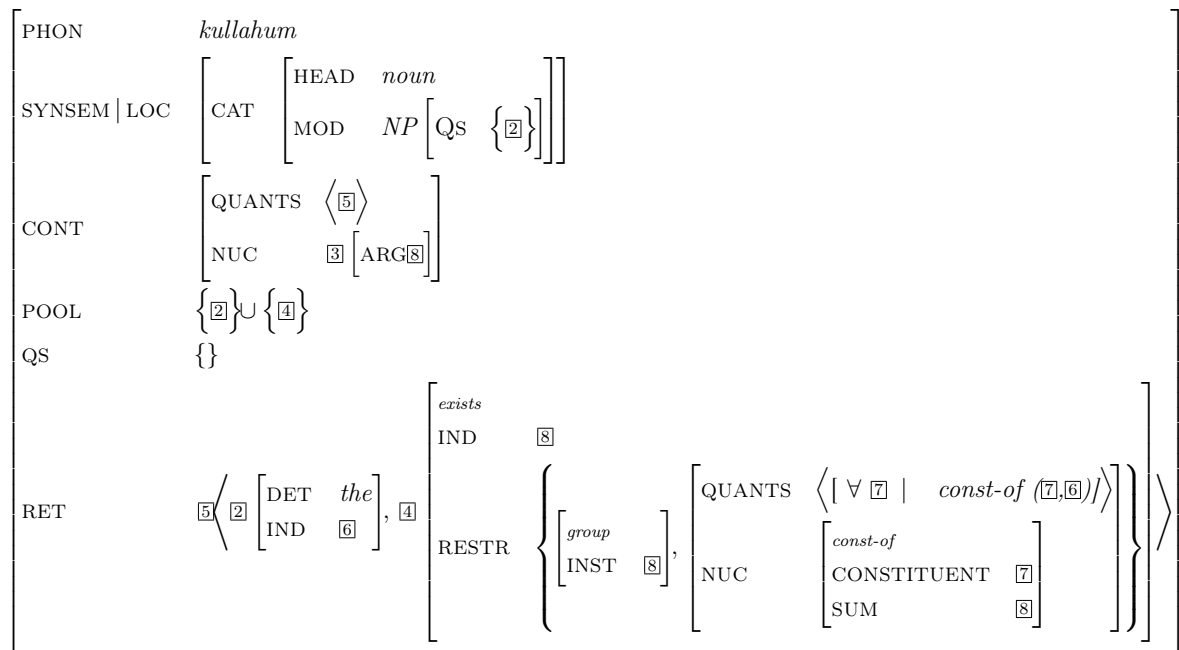\end{bmatrix}
$$

Figure 5.8: A representative lexical entry for post-nominal quantifiers in HA

the same storage and retrieval mechanism as quantifiers in general. Given this, the post-nominal quantifier will have the description in Figure (5.8).

In accordance with the description represented in Figure (5.8), the post-nominal quantifier modifies a NP whose Qstore value set contains the quantifier $\boxed{2}$, originating from a definite article arising from the NP. The QUANTS list has the same value $\boxed{5}$ as the RET, and contains $\boxed{2}$ and $\boxed{4}$, which correspond to '[∀ x constituent-of (x,y)]'. The agreement properties are accounted for via the fact that the index of the quantifier $\boxed{8}$ is related to that of the NP $\boxed{6}$.

The generalisation that post-nominal quantifiers are hosted by definite NPs is accounted for, since the modified NP has a QS member whose DET is *the*, capturing the fact that the following in (15) is ungrammatical.

(15)  *awlād   kulla-hum
      boy.PLM all-3PL.GEN
      *boys all

Given this lexical information, an approximation of the structure of the NP

NP

$$\begin{bmatrix} \text{QS} & \left\{ \boxed{2}\ \boxed{3} \right\} \\ \text{POOL} & \left\{ \boxed{2}\ \boxed{3} \right\} \end{bmatrix}$$

NP

$\boxed{5}$NP

$$\begin{bmatrix} \text{QS} & \left\{ \boxed{2} \right\} \end{bmatrix}$$

$$\begin{bmatrix} \text{MOD} & \boxed{5}\begin{bmatrix} \text{QS} & \left\{ \boxed{2} \right\} \end{bmatrix} \\ \text{QS} & \left\{ \boxed{2}\ \boxed{4} \right\} \\ \text{POOL} & \left\{ \boxed{2}\ \boxed{4} \right\} \end{bmatrix}$$

l-awlād                   kullahum

Figure 5.9: The structure of an HA NP modified by a post-nominal quantifier

is represented in Figure (5.9).

This treatment of post-nominal quantifiers as modifiers to the NP can account for object NP modification, as in (16a), as well as non-argument NP modification, as in (16b).

(16)   a.   šuf-t           l-awlād        kulla-hum
             see.PFV-1SG  DEF-boy.PLM  all-3PL.GEN
             I saw all of the boys.

       b.   ar-riħlah      maʕ l-awlād        kulla-hum
             DEF-journey  with DEF-boy.PLM  all-3PL.GEN
             The journey with all of the boys

## 5.3.2   An account of post-nominal emphatic reflexives in HA

The general distribution of post-nominal quantifiers shows strong similarities with that of post-nominal emphatic reflexives. They behave like a syntactic unit with their antecedents, yet semantically, emphatic reflexives have a contrastive meaning, such that their function is to contrast an individual NP

against a set of possible alternatives. To remind the reader of this behaviour, I provide the sentence in (17) below.

(17) **l-walad      nafs-uh**      kallam      l-mudīr
     DEF-boy.SGM self-3SGM.GEN talk.PFV.3SGM DEF-head.SGM
     The boy himself talked to the head.

The meaning of the emphatic reflexive is its identification function, which takes its antecedent as its argument. In (17), *nafsuh* 'himself' denotes ID, where its argument is *l-walad* 'the boy', and its output is *l-walad* 'the boy' (König and Gast (2002); Eckardt (2001); Kim (2012)). I derive the meaning as follows:

(18)  a. $[\![himself]\!] = \lambda x.\text{ID}(x)$

    b. $[\![the \quad boy \quad himself]\!] = \text{ID} ([\![the \quad boy]\!]) =$ the boy

As illustrated in (18), the ID function takes the NP as its argument and maps it onto itself. While this ID does not contribute anything to the meaning of the sentence, it becomes meaningful only if it is in focus. Thus, the contrastive focus which the emphatic reflexives yield to the overall structure is represented in their lexical entry by specifying this focus as the value of the information-structure, as illustrated in the representative lexical entry provided in Figure (5.10).

The lexical information in Figure (5.10) specifies that the emphatic reflexive modifies a NP whose index is identical with its own index, i.e. where it shares the values for PERSON, NUMBER, and GENDER features, as indicated by the shared boxed number ①, and whose restriction is the ID that takes the modified NP as its argument. The modified NP needs to be definite in order to capture the following contrast. Consequently (19) is ungrammatical, when the NP is indefinite.

(19) ***walad  nafs-uh**      kallam      l-mudīr
     boy.SGM self-3SGM.GEN talk.PFV.3SGM DEF-head.SGM
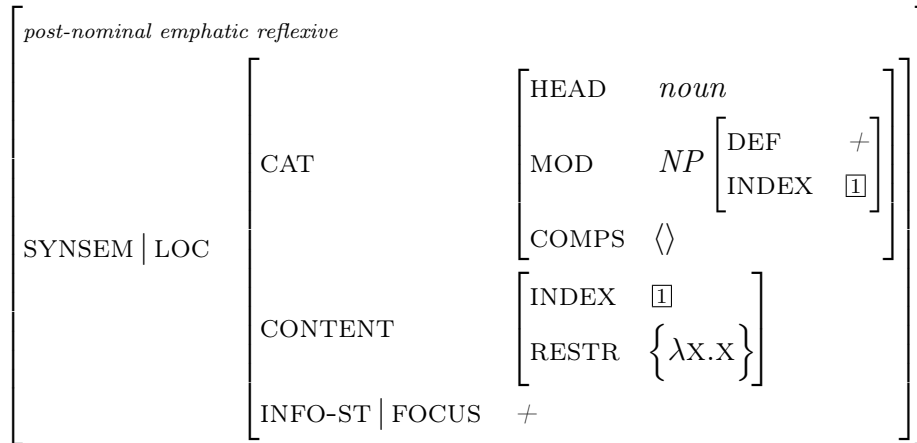     *A boy himself talked to the head.

$$
\begin{bmatrix}
\textit{post-nominal emphatic reflexive} \\[2ex]
\text{SYNSEM} \mid \text{LOC}
\begin{bmatrix}
\text{CAT}
\begin{bmatrix}
\text{HEAD} & \textit{noun} \\[1ex]
\text{MOD} & NP\begin{bmatrix} \text{DEF} & + \\ \text{INDEX} & \boxed{1} \end{bmatrix} \\[2ex]
\text{COMPS} & \langle\rangle
\end{bmatrix} \\[3ex]
\text{CONTENT}
\begin{bmatrix}
\text{INDEX} & \boxed{1} \\
\text{RESTR} & \{\lambda X.X\}
\end{bmatrix} \\[2ex]
\text{INFO-ST} \mid \text{FOCUS} \quad +
\end{bmatrix}
\end{bmatrix}
$$

Figure 5.10: A representative lexical entry for post-nominal ERs in HA
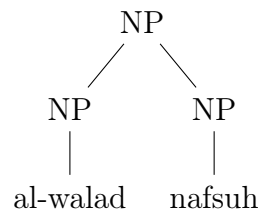


Figure 5.11: The structure of an HA NP modified by a post-nominal ER

The contrastive focus in the lexical entry, as illustrated in Figure (5.10) has to do with the contrastive meaning of the emphatic reflexive. The meaning of the emphatic reflexive is an identification function. This means that the emphatic takes its definite antecedent as its argument. The lexical entry then projects a head-modifier structure like that represented in (Figure 5.11).

### 5.3.3   An account of FQs in HA

HA floating constructions share essential properties with English floating quantifiers. They are both predicative modifiers, and are subject-oriented. Adopting Yoo's (2002) analysis of English FQs, I propose that HA floating quantifiers are verbal modifiers. However, as shown in Chapter 4, they differ form English with respect to the floated positions they can appear in.

(20) The boys (all) have (all) watched (*all) the movie (*all).

vs.

$$hd\text{-}adj\text{-}comp\text{-}ph \rightarrow \begin{bmatrix} \text{HD-DTR} & \boxed{1} \\ \text{DTRS} & \left\langle \boxed{1}\begin{bmatrix} word \\ \text{SS} & \boxed{2}\begin{bmatrix} \text{COMPS} & \left\langle \boxed{3},\dots \boxed{n} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle, \ \oplus \ list\left( \begin{bmatrix} \text{SS}\begin{bmatrix}\text{MOD} & \boxed{2}\end{bmatrix} \end{bmatrix} \right) \bigcirc \left\langle \begin{bmatrix}\text{SS}\boxed{3}\end{bmatrix},\dots \begin{bmatrix}\text{SS}\boxed{n}\end{bmatrix} \right\rangle \end{bmatrix}$$

Figure 5.12: *hd-adj-comp* schema

(21)  l-awlād        šāf-u              (kulla-hum)    l-mūvi          (kulla-hum)
      DEF-boy.PLM  see.PFV.3-PL  (all-3PL.GEN)  DEF-movie  (all-3PL.GEN)

      The boys all watched the movie.

The lexical entries that have been provided for English floating *all* in Figures (6-7) show that the adverb *all* modifies a VP, which means that it attaches to a higher projection. However, what we see with the HA floating quantifier is that it can intervene between the verb and its complement or indeed follow its complements (21). Hence I argue that HA floating quantifiers should be treated on a par with complements, in that they are sisters of the head.

In what follows I therefore assume that HA floating quantifiers combine with verbs in a head-complement-adjunct structure (Figure 5.12). This is similar to Kasper's (1994) Adjunct-as-Complement approach.

This constraint states that a *head-adj-complement* phrase consists of a head daughter whose value is a word, and non-head daughters. One of the non-head daughters is an optional adjunct whose MOD value is identical to the SYNSEM values of the head daughter. The other non-head daughter is a complement daughter whose SYNSEM values are identical to the COMPS value of the head daughter. The symbol $\bigcirc$ represents the shuffle operator, which was introduced by Reape (1994) to combine two lists. The resulting list must include all elements of the combined two lists, and the relative order of the respective lists has to be maintained. For example, if we shuffle the two lists $< 1, 2, 3 >$ and $< 4, 5 >$, we get all lists fused, where 1 is before 2, and 2 is before 3, and 4 is before 5. But 4 and 5 may appear before, or in between the
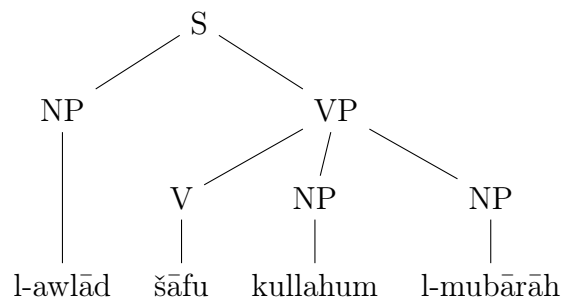
Figure 5.13: Representing the floated quantifier following the V and preceding the object complement
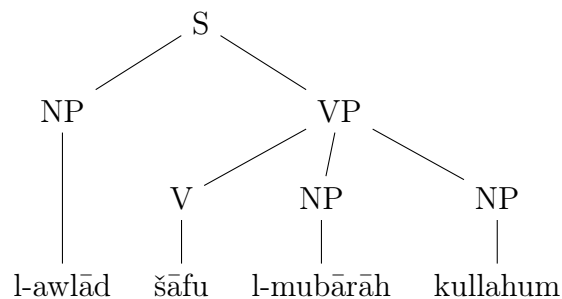


Figure 5.14: Representing the floated quantifier following the object complement

elements in the first list. $< 4, 1, 5, 2, 3 >$ would be a possible combinatorial result of the shuffle operation. For the constraint above, what this implies is that the adjunct can be positioned before, or after the complement.

A possible solution that can account for the array of linear positions in which emphatic items can appear in HA could be to posit a flat structure for the HA clause. Under this approach, we can have structures like the following in Figure (5.13) and (5.14), which are two possible flat structures that can both account for a sub-set of the different adverbial positions in which emphatics can appear. As a result of such a flat syntactic analysis, complements and floating quantifiers are both analysed as sisters of the head.

Because the V is unsaturated for its subcategorized subject, this subcategorization is represented as the value of the syntactic attribute ARG-ST whose first element corresponds to the subject.[3] I propose that HA floating quanti-

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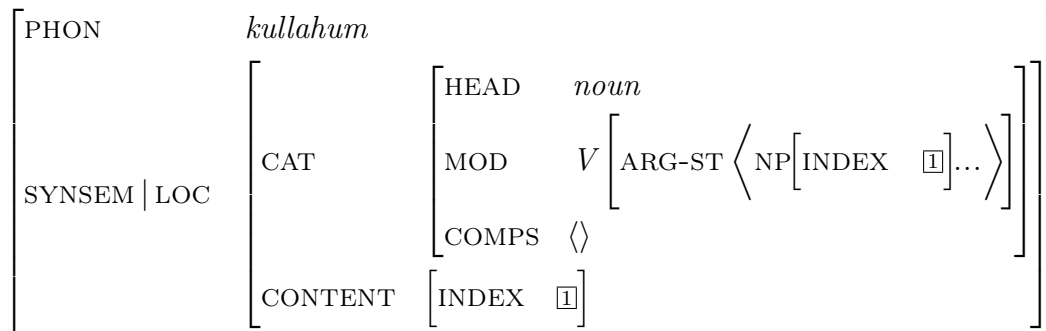[3]This also will account for the null pronoun *pro* that can be a syntactic subject in HA.

$$
\begin{bmatrix}
\text{PHON} & kullahum \\[2mm]
\text{SYNSEM} \mid \text{LOC} &
\begin{bmatrix}
\text{CAT} &
\begin{bmatrix}
\text{HEAD} & noun \\[1mm]
\text{MOD} & V\begin{bmatrix} \text{ARG-ST} & \left\langle \text{NP}\begin{bmatrix} \text{INDEX} & \boxed{1} \end{bmatrix} ... \right\rangle \end{bmatrix} \\[2mm]
\text{COMPS} & \langle \rangle
\end{bmatrix} \\[2mm]
\text{CONTENT} & \begin{bmatrix} \text{INDEX} & \boxed{1} \end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

Figure 5.15: A representative lexical entry of FQs in HA

fiers have the following lexical description as represented in Figure (5.15).

Figure (5.15) says that floating quantifiers are represented as adjuncts, and must be coindexed with the subject of the verb. Just like their post-nominal counterparts, they are modifiers. The difference is based on what they are constrained to modify, FQs are verb modifiers, while post-nominals are NP modifiers.

## 5.3.4 The semantics of floating *kull*

We have stated above that definite NPs are treated as instances of quantificational expressions in that their CONTENT specification contains a universal quantifier. These NP quantifiers are also handled by the same storage and retrieval mechanism as quantifiers in general. Therefore, the CONT of the predicate in *šāf* 'see; watch' (21) can be presented as in Figure (5.16).

The QUANTS list in Figure (5.16) has two quantifiers; the definite quantifier associated with the subject ②, and the universal quantifier arising from *all* ④. The index of the quantifier ⑧ is related to that of the verb subject ⑥, via the relation *constituent-of*. Following Pollard and Yoo (1998), the HA FQ *kullahum* is argued to introduce a quantifier in its POOL in the lexicon. QSTORE and RETRIEVED values are additionally lexically-specified in the lexical entry. The predicate, along with the FQ as its modifier, is described in

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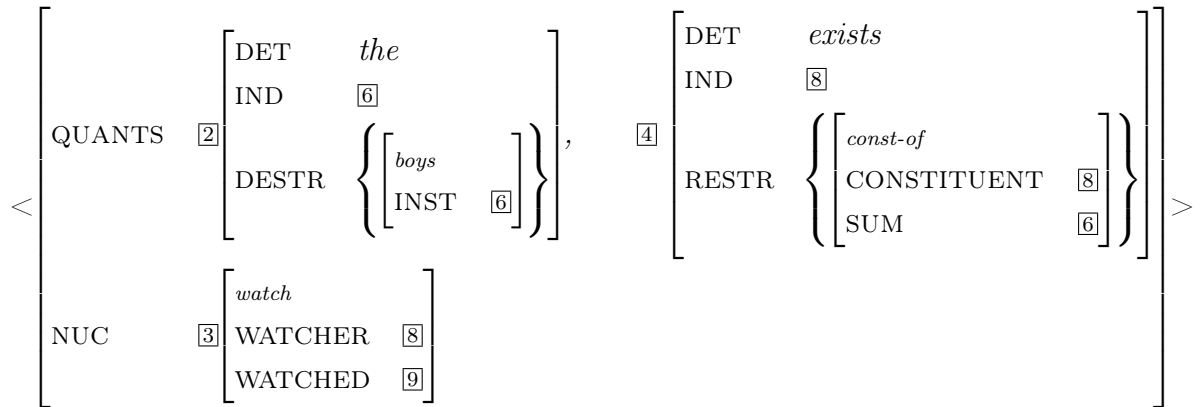This unexpressed subject will be an ARG-ST element that does not have a corresponding valence expression.

$$
\left\langle
\begin{bmatrix}
\text{QUANTS} & \boxed{2}
\begin{bmatrix}
\text{DET} & \textit{the} \\
\text{IND} & \boxed{6} \\
\text{DESTR} & \left\{ \begin{bmatrix} \textit{boys} \\ \text{INST} & \boxed{6} \end{bmatrix} \right\}
\end{bmatrix}, \quad
\boxed{4}
\begin{bmatrix}
\text{DET} & \textit{exists} \\
\text{IND} & \boxed{8} \\
\text{RESTR} & \left\{ \begin{bmatrix} \textit{const-of} \\ \text{CONSTITUENT} & \boxed{8} \\ \text{SUM} & \boxed{6} \end{bmatrix} \right\}
\end{bmatrix} \\[4em]
\text{NUC} & \boxed{3}
\begin{bmatrix}
\textit{watch} \\
\text{WATCHER} & \boxed{8} \\
\text{WATCHED} & \boxed{9}
\end{bmatrix}
\end{bmatrix}
\right\rangle
$$

Figure 5.16: The content of the predicate 'see; watch'

$$
\begin{bmatrix}
\text{MOD} & V\begin{bmatrix} \text{ARG-ST} & \left\langle \text{NP}\begin{bmatrix}\text{QS}\boxed{2}\end{bmatrix}... \right\rangle \end{bmatrix}:\boxed{3} \\[2em]
\text{CONT} & \begin{bmatrix} \text{QUANTS} & \left\langle \boxed{5} \right\rangle \\ \text{NUC} & \boxed{3}\begin{bmatrix}\text{ARG}\boxed{8}\end{bmatrix} \end{bmatrix} \\[2em]
\text{POOL} & \left\{\boxed{2}\right\} \cup \left\{\boxed{4}\right\} \\
\text{QS} & \{\} \\[1em]
\text{RET} & \boxed{5}\left\langle \boxed{2}\begin{bmatrix}\text{DET} & \textit{the} \\ \text{IND} & \boxed{6}\end{bmatrix}, \boxed{4}\begin{bmatrix}\text{DET} & \textit{exists} \\ \text{IND} & \boxed{8} \\ \text{RESTR} & \left\{\begin{bmatrix}\textit{group} \\ \text{INST} & \boxed{8}\end{bmatrix}, \begin{bmatrix}\text{QUANTS} & \left\langle [\ \forall\ \boxed{7}\ |\ \ \textit{const-of}\ (\boxed{7},\boxed{6})/]\right\rangle \\ \text{NUC} & \begin{bmatrix}\textit{const-of} \\ \text{CONSTITUENT} & \boxed{7} \\ \text{SUM} & \boxed{8}\end{bmatrix}\end{bmatrix}\right\}\end{bmatrix}\right\rangle
\end{bmatrix}
$$
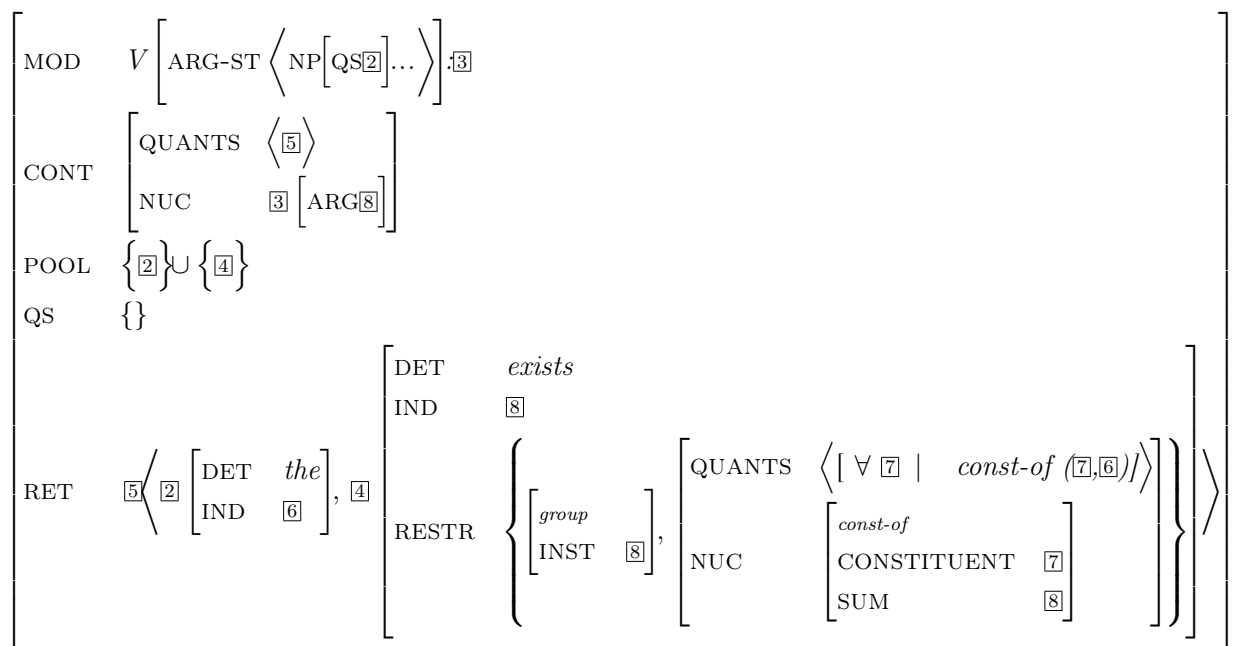
Figure 5.17: *all* for HA predicates

Figure (5.17).

In the lexical entry (Figure 5.17), the QUANTS list, which has the same value $\boxed{5}$ as that of RET, includes in POOL, two quantifiers: $\boxed{2}$ and $\boxed{4}$. $\boxed{2}$ indicates a definite quantifier arising from the subject NP, and $\boxed{4}$ correlates with the restricted quantifier part ($\forall\ \boxed{7}$ constituent-of ($\boxed{7},\boxed{6}$)), shown in RESTR. When the FQ appears in a sentence, the quantifier scopes over the NUC(LEUS) value, which is the CONT of the VP. The relation *constituent-of* predicts that the host of a FQ must be a plural entity.

$$
\begin{bmatrix}
\textit{floating emphatic reflexive} \\
\\
\text{SYNSEM} \mid \text{LOC}
\begin{bmatrix}
\text{CAT}
\begin{bmatrix}
\text{HEAD} & \textit{prep} \\
\\
\text{MOD} & V\begin{bmatrix}\text{ARG-ST} & \left\langle \text{NP}\begin{bmatrix}\text{INDEX} & \boxed{1}\end{bmatrix}...\right\rangle\end{bmatrix} \\
\\
\text{COMPS} & \left\langle \text{NP}\begin{bmatrix}\text{INDEX} & \boxed{1} \\ \text{RESTR} & \boxed{2}\{\lambda\text{X.X}\}\end{bmatrix}\right\rangle
\end{bmatrix} \\
\\
\text{CONTENT}\begin{bmatrix}\text{INDEX} & \boxed{1} \\ \text{RESTR} & \boxed{2}\end{bmatrix} \\
\text{INFO-ST} \mid \text{FOCUS} \quad +
\end{bmatrix}
\end{bmatrix}
$$
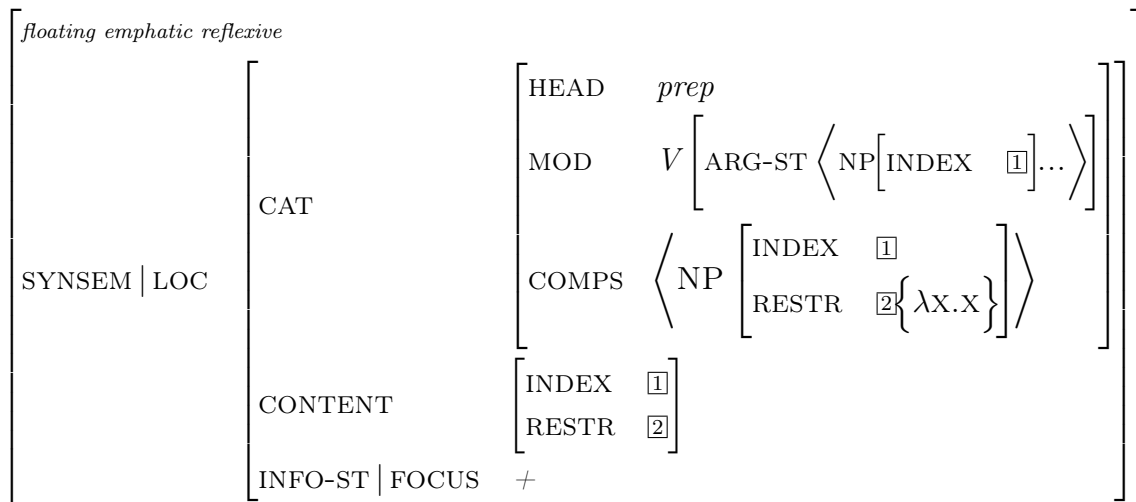
Figure 5.18: A representative lexical entry for floating ERs in HA

## 5.3.5 An account of floating reflexives in HA

In this section, I show that the structural models presented in the above sections can account not only for the constructions with a floating quantifier, but also for floating adverbial emphatic reflexives. I therefore turn to consider a parallel syntactic analysis of PP adverbial emphatic reflexives, as the following in (22), in parallel to the example in (13b) above.

(22) l-walad      kallam          l-mudīr          bi-nafs-uh
     DEF-boy   talk.PFV.3SGM   DEF-head.SGM   by-self-3SGM.GEN
     The boy talked to the head by himself.

The PP emphatic reflexive here is similar to the floating quantifier in that this too can only take a subject as its antecedent. I thus posit the lexical entry in Figure (5.18), for such adverbial emphatic reflexives, which is on the same lines as that for the FQ.

The account runs as follows: In accordance with the description in Figure (5.18), the head is the preposition which gets its value elements (INDEX and RESTR) from its selected argument, which is the emphatic reflexive. The MOD value specifies that the emphatic reflexive modifies the verb whose sub-

ject's INDEX is identical with its own INDEX in terms of the PERSON, NUM-BER and GENDER values, as indicated by the shared boxed number ①, and whose restriction is the ID that takes the NP as its argument. The contrastive focus is specified as the value of the information structure. In this connection, it should be noted that, being an adjunct, the PP is the semantic head of the verb.

## 5.4   Conclusion

The above analyses appear to unify two important types of emphatic constructions: quantificational and reflexive ones, both in English and HA. Using the HPSG framework, I have shown that, aside from pre-nominal occurrence, both quantifiers and emphatic reflexives can be classified into two other types of structures, on the basis of their distributional syntactic properties: post-nominal vs. adverbial modification. The post-nominal instances modify a preceding NP, while the adverbial ones modify the verb, just as any other adverb does, except that they are additionally semantically and indexically linked to the subject.

From what we have discussed, an important difference between English and HA FQs emerges, however. English FQs are adjuncts modifying VPs, while HA FQs are modifying Vs. In representing such structures in this way, such an HPSG analysis avoids many of the pitfalls associated with previous analyses. There is no movement rule which needs to be stipulated, and no grammatical process that needs to be posited that moves FQs from one place to another. Semantically, the FQ is tied to its host NP in both languages. This analysis also accounts for the reflexive kind of floating emphatic constructions in HA, which display similar properties and behaviours.

# Chapter 6

# Conclusion

## 6.1 Summary and main findings

Two key related issues have been the central concern associated with this thesis, and in fact have constituted the main chapters of this dissertation, alongside with an analysis accounting for each of these issues. The first is the issue that was mainly concerned with an identification of the category that best characterises quantifiers in HA, and their distributional restrictions within the noun phrase. The second issue has been concerned with the syntactic and semantic properties of floating quantifiers.

I have attempted to model my first descriptive account ever, of the HA data presented here, within the constraint-based lexical framework of HPSG. Through it I have shown how it can sufficiently account for the varying quantifier behaviours in HA. It has primarily provided us with the possibility to state multiple lexical entries in association with the quantifier *kull*, which essentially correlate with its distinct syntactic distributions, and semantic readings. It has additionally provided us with the possibility to provide a base-generated analysis that is able to deal with the phenomenon of floating quantifiers, which has otherwise been considered as a phenomenon that has provided the strongest

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evidence for the presence of a movement rule.

This study is unique, and a first of its kind, as it is one of the first to have specifically concentrated on an examination of the structure of quantifiers within an Arabic dialect, with the additional first to have had these facts accounted for within HPSG. In association with quantifier structures, this study has also uncovered, and linked, previously unreported constructions, with the observed behaviours of floating quantifiers. In doing so, I have also sought to compare the structures of floating quantifier constructions along with that of other types of floating items. While this study's main concentration has been on the quantifier *kull*, given its versatility in its syntactic and semantic functions, I have however additionally provided comparisons with other types of quantifiers in the language. I have demonstrated how in fact, quantifiers do not form a uniform set in HA, both in terms of their morphosyntax, as well as, as expected in terms of their semantics.

The thesis has highlighted that quantifiers in HA share morphosyntactic and structural properties that identify them with nouns. Quantifiers, similar to nouns, can:

1. Host a definite article;

2. Host pronominal enclitics;

3. Be found in three types of structures: In a simple form, a construct state, and a free state.

Given this behaviour, I have proposed a uniform analysis for both nouns and quantifiers. Two further analytical components hinge on the analysis provided: Definite articles in Arabic are prefixes. What this means is that these DEFINITE-marking items combine with the nominals (and the quantifiers) in

the lexicon. Consequently this implies that there is no such D category in the syntactic-structure. This aligns itself with the fact that the quantifiers are here analysed as nouns, categorically, and hence not associated with a functional category D, or Q, in contrast to what is usually claimed in the literature. The lexical analysis also accounted for the phenomenon of DEFI-NITENESS inheritance in the context of construct state formations, while the nominal-like analysis has been able to account for the agreement phenomenon, and the co-indexation that arises, on the basis of the PERSON, NUMBER and GENDER features between quantifiers and their complements. This analysis has proposed that quantifiers lack a specification for any of these features and moved away from suggestions in the literature that they are merely singular masculine forms, for agreement purposes.

I have discussed floating quantifiers in HA by first characterising them in the context of what we know of such structures, and the very phenomenon of floating, crosslinguistically. That chapter also discussed the main approaches of FQs in the literature, along with the analytical treatments they have been provided with. It was particularly shown how the different approaches each had their own shortcomings. The same is true of the accounts that had aimed to provide an analysis of the Arabic facts more broadly, which have themselves been characterised within either of the two main transformational accounts present in the literature. Thanks to the lexicalist nature of the account provided in this study, i.e. the HPSG framework, I was not forced to provide a uniform analysis that was to link the floated vs. non-floated distributions of quantifiers in HA, via transformations. Rather, I put forth the argument that the non-floating quantifiers in HA are structurally, and functionally different from floating quantifiers. Essentially I posited an analysis where the former always occupy argument positions, which for HA were shown to include, subject, object, and object of preposition functions, while floating quantifiers, on

the other hand were considered to be functioning as adjuncts that either take a NP under their scope, or a larger verbal projection. Distinguishing between quantifiers that took a NP- vs. V-scope was shown to depend on the nature of the linear distribution of the adverbial quantifier, with respect to the NP involved. Essentially it was post-nominal quantifiers, which are themselves no floated quantifiers as such, which function as NP modifiers, rather than verbal modifiers. It is the lexical information associated with them, within the lexical entry that links them up with a particular syntactic structure projection, with the additional associated semantic representations. To ensure the correct semantic contribution, I made use of the assumption that quantifier storage and quantifier retrieval take place lexically at the sites in which the quantifiers appear. Through the postulation that all relevant information is to be specified as part of the description present within the lexical entry of the different floating quantifiers, an account as to how such quantifiers interact with their antecedents in terms of scope could be determined.

As I provided the description and analysis of floating quantifiers for HA, it became somewhat clear to me that there are indeed other structures in HA, and Arabic more broadly, even if their description has not yet received any significant attention, which indeed display a number of interesting parallel behaviours as those expressed by floating quantifiers. These other floating type structures included emphatic numerals and emphatic reflexives. Just as floating quantifiers they function as emphatics over the NP they associate with, and in the same way as was found to be the case for HA floating quantifiers, these other sorts of emphatic items as also only ever possible to scope over NPs that function as subjects. In other words, therefore, emphatic constructions, of which I argue, floating quantifiers belong, are subject-oriented. Furthermore, the adverbial analysis provided for V-scoping floating quantifiers was associated with the behaviour of another set of special adverbs in HA, which I

here referred to as *anaphoric adverbs*. I have shown how such adverbs behave like floating quantifiers with respect to both their linear distribution in the sentence structure, as well in their ability to display agreement with the NP they appear to be anaphorically-bound to.

## 6.2 Directions for Future Work

Given that the focus of this study has mainly been the syntactic and morphosyntactic properties of quantifiers and the constructions in which they are found, there have been a number of semantic properties and behaviours which have been dealt with, in studies associated with quantifiers in natural languages, which I have however left out from any detailed consideration, and which I also deemed to go beyond the scope of this work. In that sense, therefore, there is much more to be said, particularly with how to better account for the distinct distributional vs. collective readings associated the different quantifiers.

This work has also been biased towards a thorough account, and an eventual analysis of the quantifier *kull*. It has been shown, however, as I discussed the descriptive part of quantifiers more broadly in Chapter 4 how in fact, other quantifiers display distinct behaviours. Consequently this begs for a much broader comparative investigation of quantifier behaviours in HA. What was clear from the first preliminary description provided when contrasting between a number of HA quantifiers, a uniform account or analysis across the different quantifiers cannot be sought. Moreover, even if this study did zoom in on *kull*, it has however not discussed in any detail, or analysed the interaction of *kull* with, and in the scope of, negation. This still needs to be done, and eventually to be done with respect to quantifiers other than *kull*, as well. Similarly, this account did not provide any particular attention to quantifiers internal to verbless constructions, or their interaction with the presence of the

copula in the structure, which copula can in fact be a negative one. Further work on the subject matter will need to articulate this interaction more clearly.

Although I have here focused on HA, I anticipate that the core proposals this thesis offers, as well as the different highlighted future research prospects, can be extended to other dialects of spoken Arabic, and to other crosslinguistic comparisons. In doing so, I believe that the very initial approach to floating vs. non-floating quantifiers and structures presented here for the Arabic variety of HA, could itself be further refined, while it can simultaneously itself lead to an additional refinement of the many existing approaches of quantifiers, and constructions involving floating quantifier, more broadly.

On the other hand, with respect to the analytical dimension of this study, a uniform lexical rule that is able to account for all nominals in HA is still missing. Even in my account of the construct state construction I have not, for example, incorporated the analysis of construct states headed by a number of categories, such as nominalised adjectives, numerals, or verbal nouns.

Notwithstanding the above mentioned shortcomings, and the further investigation which still needs to be done, I hope to have provided an initial step towards a better understanding of quantifiers within an Arabic dialect, represented here from the specifics of HA data.

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