Constructing Feminine to Mean

Gender, Number, Numeral, and Quantifier Extensions in Arabic

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To my mom Aïcha,

my daughter Basmah, my wife Nadia,

all of whom are a triumph of the Feminine.

Contents

Introduction

Building Feminine to Mean Gender, Number, Numeral, and Quantifier Extensions in Arabic

The first unifying theme of this book is *Feminine*. Why are so many constituents of Arabic constructions feminine, in the sense that a feminine form (or morphology, the marked member of the category "Gender") manifests itself on "goals" and/or "probes"? Gender enters an Agree relation in Chomsky's (1995, 2000) sense, making one Gender "interpretable" (or valued) on its original locus (or "controller"), and uninterpretable ("unvalued"), or "displaced" in Moravcsik's (1988) sense, on its "target" (keeping in mind the insightful discussion of "semantic agreement" in Dowty and Jacobson 1988).[1] How come, then, not only traditional categories such as nouns, verbs, adjectives, or adverbs are "gendered" (or "feminized"), but counting terms or numerals, quantifiers, pluralities, and singularities are also (unexpectedly) feminine? Can this "generalized feminization," which I establish strikingly for Arabic (but which naturally "spreads" to various other Afro-Asiatic, Romance, Germanic, Slavic languages, etc.), be just accidental, formal, or arbitrary as usually thought? Starting with the answer "no," I show in this book that Gender (or feminine) is meaningful or interpretable on all "nominal" categories (as well as others). An immediate consequence is that Gender cannot be "inherent" or confined morpho-syntactically to nouns or *n* (contra, e.g., Corbett [1991], Alexiadou [2004], Kihm [2005], Lowenstamm [2008], Kramer [2014], and many others). Semantically, Gender is not limed to sex or animacy denotations (as in Corbett [1991] or Dahl [2000]). It contributes individuation, evaluation, performativity, in addition to partition and classification. If Gender in the nominal domain is not "inherent" or "lexical," but rather *constructional* (or built in structure), then it can be distributed over various categories in the nominal spine (including RootP, nP, NumP, and DP), and even higher in the Speech Act Phrase (SAP) in the clause structure, as in Speas and Tenny (2003) and Hill (2014), producing various senses at

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the various layers. Then reducing Gender to the *n* level or meaning is empirically inadequate.

   The second important unifying theme of the book is *Unity* (unities or units) and the role it plays in the grammar of individuation and Number. It is an important achievement of this study that it establishes that some singularities and pluralities are unities, whereas others are not. When entities qualify as *individuals*, two subclasses of the latter can be identified and distinguished: *atomicities* and *unities*. Unities are grammatically marked as feminine, and they are realized as *singulatives* for singulars, and *pluratives* for plurals. The need for an elaboration of the (grammatically relevant) notion of individuation (or "divisive reference" in Quine's 1960 sense) has been called for earlier in the literature by a number of authors in various forms (including Krifka [1995], Fassi Fehri [2003–2004], Cheng and Sybesma [2005], Arsenijević [2006], Rothstein [2010], Zhang [2012], and de Belder [2008], among others), proposing refinements of the coarser DivP argued for by Borer (2005). What is the most novel here is the identification of the two subclasses as unities, projecting as UnitP, and atomicities, projecting as AtomP, with cross-classifying and interacting feature values, deriving the traditional classes found in natural languages. The theory of individuation and Number is then enlarged to include not only "singular-plural languages," usually represented by Indo-European, but also "singulative-plurative languages" like Welsh-Celtic or Arabic-Semitic (see Wiese [2012], Grimm [2012a–b], Fassi Fehri and Vinet [2008], Mathieu [2013], and Acquaviva [2015], among others, for many more languages making essential use of variation along these lines). In fact, the properties of unities go even further to enable us to understand why traditional rigid typologies built on the divide of "classifier languages," such as Sino-Tibetan or Amazonian, and "gender languages," such as Indo-European, are neither empirically nor theoretically adequate (see Derbyshire and Payne [1990], Seifart [2009], and Luraghi [2011], among others). Thus although the core empirical part of the book is built on Arabic, in comparison with a number of diverse languages, the theoretical machinery enables us to rethink typology and variation in terms of vocabulary, or micro-parameters, rather than macro-choices, assumed in the traditional typologies discussed (once the locus of variation in the grammar is viewed as essentially the lexicon of morpho-syntactic features, or the vocabulary properties at PF, pronounced or silent, as in Kayne [2005a–b], Cinque [1999], and Rizzi and Cinque [2016], among others).

   Such a trend is even salient in discussing the structure of Quantifier expressions in Arabic. It is shown that the trilogy of the English vocabulary used to express universal quantification, namely *all*, *every*, and *each*, has a single vocabulary counterpart in Arabic, namely *kull*, although with various

syntactic expansions, involving distinctive features, namely [±dist] distributive, [±part] partitive, in addition to [±def] definite. An attempt is made in chapter five to dispense with [±dist] in favour of [±unit], already motivated for individuation, in addition to [±atom].

Other "peculiarities" of Arabic include counting "in the feminine." Why should an Arabic speaker count by using feminine numbers, while a Hebrew speaker prefers (at least nowadays) the masculine, although both languages manifest the so-called Gender polarity in their counting for objects? Is it too "dangerous" for Hebrew, as Lakoff (1987) would say? The answer depends on understanding how we count, not only by using "smooth" Merge (as in Chomsky [2008] and Watanabe [2017]), but also by integrating whatever further grammatical (and complex) properties of the objects we count (Krifka [2004]; Kayne [2016]; Rothstein [2017]; Zabbal [2006]), including numerals seen as unities.

As already observed, Gen(der) has often been conceived as denoting sex and/or animacy at best, or as just a formal or arbitrary concept, ignoring its vastness of meanings and polysemy, as well as the nature of its origins. If such concepts were accurate, then the fact that Gen behaves like noun classes, classifiers, or pronouns (for referent tracking), or that it expresses mass/count, individuation, and interacts with plurality syntax and semantics, would turn out to be accidental. Also, significant roles played by Gen in evaluatives (diminutive, augmentative, pejorative) or performative expressions would be left unexplained. Its characterization as a single "lexical" *specific* noun-categorizing device, or a feature of the low-level category *n* in root-category-based models, precluding its occurrence on other (high) categories (or categories higher than n, such as Num(ber) or D, determiner), its "stacking" nature (Richards 2007; Pesetsky 2013), or its ability to be "constructed" in the structure, are in contradiction to the complexity actually found cross-linguistically (Fassi Fehri 2006; Acquaviva 2017; Manzini and Savoia 2016; Luraghi 2010, 2011; Arsenijević 2016). Moreover, denying the ability of Gen to be a projecting syntactic category, or GenP (as in Picallo [1991, 2008]; see Lowenstamm [2012] for a critique), and seeing it essentially as a parasitic feature on Num (Ritter [1993] and others), and excluded from being at the Root, or at D, is contrary to accepted empirical evidence (Fassi Fehri 2016a–c; Steriopolo and Wiltschko 2010; Atkinson 2015; Fathi and Lowenstamm 2016). Part of the aim of the first two chapters of this book is to investigate and clarify these various issues, situate Gen in the feature-category system and its projections and labels, and account for its multitude of uses and senses, in light of very recent attempts to re-conceptualize the roles and uses of Gen in grammar, with converging evidence that it is distributed over more than one category projection inside the DP, or even in the clause, at CP.

The structures of numerals are known to be particularly complex (even "squishy" and heterogeneous), but their computation not only involves simple operations such as Merge (and Agree; Chomsky 2008, Watanabe 2017), but more complex structures, which include classifiers or silent heads such as *Number* (Kayne 2003, 2016), or mediating functions, including M (measure) and # (Krifka 1995; Scha 1981; Zabbal 2005; Stickney 2009; Scontras 2014; Ouwayda 2012). Thus, instead of taking Gender on numerals as an arbitrary formal feature, the author argues that Gen is playing a mediating role, as a Classifier, which is similar to the role it plays in forming nominal groups, or "gendered" quantifiers. It also turns out that Gender plays an important role in the taxonomy of numerals in Arabic varieties and Hebrew, when counting *objects*, or counting *numbers*, as well as in the so-called "Gender polarity" found in Semitic cardinal count nP constructions, in particular in construct state and complex numerals. Likewise, the role played by Gen in Slavic collective numerals is investigated, (un)surprisingly corroborating the taxonomy found in Semitic (Lučić 2015; Arsenijević 2016).

As for Number, it is often taken to be a uniform category, and plurality is often analysed in terms of sets and join semi-lattices à la Link (1983), and implemented in, for example, Chierchia (1998a–b), as one level category, which is allowed to occur only once on a nominal (or DP) structure. As a consequence, mass pluralization is precluded (given that mass is conceived as a "lexical" plural), as is double pluralization, etc. If such were the case, then how come masses pluralize (Tsoulas 2009; Fassi Fehri 2002, 2012), or plurals re-pluralize (in "double plurals," Acquaviva [2008]), etc., yielding plurals of distinct nature, with distinct internal structures, yet all formally plural? Empirical evidence supports the view that they are "many" plurals, not just one, which differ in their characteristics and their structures or sources (Fassi Fehri 2012; Acquaviva 2015; Mathieu 2014), as well as in terms of morphological behaviours—for example, the sound/broken/plurative taxonomy, but also other morphological distinctions that may or may not reflect in syntax (McCarthy and Prince 1990; Ratcliffe 1998). The multitude and "mobility" of plurality is comparable to that of feminine and has consequences for the design of the grammar of Number, given that more than a single source can be found in the structure of the DP. Furthermore, plural and feminine are not totally separate categories: they interact specifically in "building" (various) "collectives," being exponents of each other (Ojeda 1998, Mous 2008, Zabbal 2002–2005), and they are found in cross-linguistic variational relationships (in line with Borer's 2005 "Functional Universalism"), and contrary to the complementarity or parametric distribution view (developed by Sanches [1973], or Chierchia's [1998b] "Nominal Parameter"). It is only by introducing the Unity feature discussed above that "collectives" and singulatives can be appropriately accounted for.

By way of extension, various structures of quantifiers and their properties are examined and compared to those of numeral constructions. Building on previous work by Fassi Fehri (1980–1981, 1998–1999), Shlonsky (1991), Benmamoun (1999), and Hallman (2009, 2016), among others, I analyse the distributions of construct state prenominal quantifiers, prenominal partitive quantifiers, post-nominal pronominal quantifiers, or bare quantifiers in post-nominal or floating positions, which exhibit striking similarities and common properties with numerals.

Genders, Numerals, Quantifiers, and Numbers as grammatical categories have constantly posed serious challenges for current theories of grammar as well as for typological descriptions, given their complex structure, the variable patterns and systems found in natural languages, in addition to the search for appropriate mechanisms in the grammar to account for the vastness of variation, parametrization, and computation. Investigating these topics in some Arabic and Semitic varieties is particularly informative in clarifying the nature of the categories and features involved, their inventory, their roles, and their projections in the nominal spine and clausal architecture. Standard and colloquial Arabic varieties, although enjoying a relatively rich pre-modern linguistic tradition of description and thought as well as various valuable descriptions and analyses in terms of modern linguistic theory, are constantly in need of permanent synthesis, elaboration, extension, and integration in more homogeneous and broad views, in terms of theory and description. I know of no available work dedicated to Arabic varieties and integrating the topics and issues addressed here. The available contributions to the topic by the author, including three recent original contributions on Gender (Fassi Fehri 2016 a, b, and c), one very recent (unpublished) paper on Numerals (Fassi Fehri 2017), and other less recent work on nominal or verbal Number (Fassi Fehri 2003–2004, 2012) are scattered in various articles and at various periods, various frameworks, etc. I hope that the present monograph will be welcomed, not only for the sake of describing the language varieties in question, but also because of its particular importance for linguistic theory in general, given the richness, diversity, and originality of the patterns and phenomena brought up in the investigation.

For implementation sake, I adopted the broad lines of grammar design led by Chomsky's (1995) Minimalism, Halle and Marantz's (1993) Distributed Morphology, and Borer's (2005) and Harley's (2014) root-category model of words. But the analysis is meant to be "non-mechanical," and it takes the model as a heuristic tool rather than a fossilized "bible." The book is also meant to be less technical, in order to facilitate its reading by a wide linguists' audience rather than just generativists, or by Arab scholars and students interested more in modern analyses of Arabic than in pure formal issues or technicalities.[2]

NOTES

1. For Moravcsik (1988, 90), an information expressed is said to be "displaced" in the sense that "one word carries the grammatical meaning relevant to another." Audring (2014, 4) observes that "gender appears overwhelmingly elsewhere [not on the noun where it belongs; on the contrary] . . . many languages do not mark it on the noun at all." The displacement property is a property of agreement in general, which has been seen as criterial for defining Gender.

2. Parts of this work were presented at various occasions, including Qatar University Linguistic Gulf 5 Conference keynote address (March 2015), the Linguistic Society of Morocco Meeting (April 2014), Paris VII University linglunch (February 2015), the Syntax Workshop of Arabic Varieties at the Université de Genève (August 2015), the SLE Conference in Leiden (September 2015), the Ottawa Workshop on Gender and the Nominal Spine (September 2015), the Olomouc Linguistics Colloquium (June 2016), the SLE Symposium (Naples, September 2016), BLINC2 at the University of Budapest, and TEAM 2017 at the University of Padova. I would like to thank the organizers of the events, as well as the audiences, and acknowledge useful comments and discussions on these occasions and others by Noam Chomsky, Anders Holmberg, Peter Hallman, Paolo Acquaviva, Joseph Emonds, Anna-Maria Di Sciullo, Marten Mous, Frederic Hoyt, Ahmad Rizwan, Rita Manzini, Leonardo Savoia, Ur Shlonsky, David Pesetsky, Margherita Pallottino, Bernard Fradin, Pascal Amisli, Shigeru Miyagama, Danièle Godard, Marcin Wagiel, Nadia Amiri, Michelle Sheehan, Laura Bailey, Ludmila Veselovska, Noha al-Shorafa, and Maathir Al-Rawii, among many others. I would also like to acknowledge helpful remarks and suggestions by anonymous reviewers, including those of Fassi Fehri (2016a and 2016b/2018). The usual disclaimers apply.

Chapter 1

Semantic Diversity of Gender and Its Architecture in the Grammar of Arabic*

In this chapter, I present illustrations of the rich semantic diversity of Gender found in Standard Arabic and Moroccan Arabic varieties.[1] Contrary to the widespread sex-based typology/theory of Gender (found in, e.g., Caspari [1859] and Wright [1971] for Semitic, or Corbett [1991] for various languages, back to Jacob Grimm [1822]), the feminine (or Gen[der]) in standard and colloquial Arabic varieties connects strongly to *individuation*, *quantity*, or *size*, as in Brockelmann for Semitic (1910), or Brugmann (1897) for Indo-European, back to the various sources in the Arabic grammatical tradition (including Sibawayhi [1938] and Suyutii [1998], among others).[2] The feminine expresses also *evaluation* ("depreciative," "appreciative," "endearing", etc.), as is partially described in Arabic traditional grammars and appropriately extended here. Finally, Gen expresses *perspectivization* of plurality (in line with Leiss [1994], among others), or it contributes to *performativity* in expressive contexts (as will be shown). Therefore, Gen is far from being limited to a nominal categorizing (or a derivational) feature forming *n* (as in a number of generative works in a Distributed Morphology framework, including Kihm [2005], Lowenstamm [2008], or Kramer [2014], to cite a few). It is rather multi-layered or distributed over various layers of the DP (and CP) structure (in line with Steriopolo and Wiltschko [2010], Pesetsky [2013], and Ritter [1993], among others), and in fact, more granular, as we will see.

Since Gender turns out to express a wild variety of meanings, including *individuation*, *collectivity*, *abstractness*, *quantity*, *size*, *evaluation*, and *perspectivization* (in addition to the most known *sex-animacy*), it cannot just be

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confined to (a) a *nominal class* marking device, (b) semantically *sex-based*, and (c) syntactically *reflected in agreement* (through sexed-animate controllers, as in, for example, Kibort and Corbett 2008). I propose, instead, that Gender is *constructional*, involving a multi-layered architecture. This analysis takes into account its polysemous nature, and it provides room for more "unorthodox" syntactic distributions.

In addition to presenting and analysing this rich diversity of the senses of Gender in section 1, I investigate the properties of the *singulative* construction in section 2, as well as those of what I will call the *plurative* construction, both of which are marked by feminine morphology, and control (a special form of) *gender agreement*, yet express unitization. In section 3, I discuss the essential characteristics of the polyvalued agreement involved in plurative expressions, suggesting that it is *perspective oriented*. In section 4, I provide a brief sketch and motivation of five potential layers of Gen structure that produce the various interpretations, including the evaluative "performative" Gen, by making use of a minimalist distributed model of grammar (based on Chomsky [1995], Halle and Marantz [1993], Marantz [1997, 2001], and Embick and Noyer [2007], among others). Depending on the structure layer, and whether it is interpretable or non-interpretable, Gen involves multiple features and values, including [±fem], [±indiv], [±group], [±small/big] (size), [±endearing], or [±good/bad] (evaluative/expressive), etc. Overall, the chapter aims at providing a more exhaustive and integrative description of the Arabic gender peculiarities than the narrow sex-based/n-based view allows for. The multi-layered and polysemous view adopted also provides new grounds for conceiving variation in Gen and its interpretation, unlike the dominant "lexical" or "natural" *n* view.

1 THE MANY SENSES AND USES OF GEN

1.1 Sex-Based Gender

"Natural" sex gender (interpretable as *female/male*) plays quite a productive role in the grammar of Arabic "inflection" (the *-at* suffix often marking the feminine). In (1), the feminine suffix *-at* is added to the "masculine" form to derive the feminine:

  (1) *kalb* 'dog'; 'he-dog' ⟶ *kalb-at* 'dog-fem'; 'she-dog'

But the feminine is also largely expressed as an (inherently) "lexical" gender, as in (2):

  (2) a. *qird* 'monkey'; 'he-monkey' ⟶ *qišš-at* 'she-monkey'

b. *ḥimaar* 'donkey'; 'he-donkey' ⟶ *ʔaṯaan* 'she-donkey'

Note, however, that the morphological feminine tends to replace the "lexical" counterpart in modern standard usage, as exemplified in (3). In the colloquials, only the regular morphological formation tends to be used, as exemplified by the Moroccan Arabic (MA) pairs in (4):

(3) a. *qird* 'monkey'; 'he-monkey' ⟶ *qird-at* 'monkey-fem'; 'she-monkey'
    b. *ḥimaar* 'donkey'; 'he-donkey' ⟶ *ḥimaar-at* 'donkey-fem'; 'she-donkey'
(4) a. *qard* "monkey"; 'he-monkey' ⟶ *qard-a* 'monkey-fem'; 'she-monkey'
    b. *ḥmaar* 'donkey'; 'he-donkey' ⟶ *ḥmaar-a* 'donkey'; 'she-donkey'

1.2 Formal Gender

Formal "idiosyncratic" gender has been claimed to be a property of nouns like the following:

(5) a. *šams* 'sun,' fem (compare with French 'soleil,' masc)
    b. *qamar* 'moon,' masc (see French 'lune,' fem)
    c. *nahr* 'river,' masc (see French 'rivière,' fem)
(6) "double gender" nouns
    a. *suuq kabiir*, *kabiir-at* 'a big market' (masc or fem)
    b. *ṭariiq muʕwajj*, *muʕwajj-at* 'a curved road' (masc or fem)

1.3 Human-Based Plural Gender

The [± human] opposition (rather than sex) is a relevant feature for plurals. Non-human plurals are then treated as "feminine singular":

(7) *l-kilaab-u   nabaḥ-at*   (* *nabaḥ-uu* 'barked-pl')
the-dogs-nom barked-fem
'The dogs barked.'

But they are not semantically feminine, as (7) can be a statement about a plurality of male dogs. Nor are they semantically singular, because they denote a plurality, and they support reciprocity:

(8) *l-kilaab-u   t-aʕaḍḍ-u baʕḍ-a-haa   baʕḍ-an*
the-dogs-nom fem-bite   some-nom-her   some-acc
'The dogs bite each other.'

The system then turns out to be more complex, not only because it involves both sex-based and human-based specifications, but also because singularities and pluralities call for distinct genders. Moreover, many other meanings or functions of the feminine remain outside the oversimplified picture, and counting "the number of genders" (two or three or more), a frequent practice of typologists, turns out not to be an easy matter given the complexity that will be established and examined below.

1.4 More Meaningful Genders

The list of gender meanings investigated here, although appealingly diverse, does not pretend to be exhaustive.

1.4.1 Singulative

In singulative expressions (traditionally called "nouns of unit" [*ism waḥd-ah*]), a "feminine" suffix (*-at*) forms a singular nP denoting a discrete unit entity from a kind base, and it controls feminine agreement (although it is not semantically feminine):

(9) a. *naḥl* 'bee'; 'bees' ⟶ *naḥl-at* 'bee-unit,' 'a bee'
    b. *štaray-tu   samak-an kabiir-an,   samak-at-an   kabiir-at-an*
        bought-I   fish-acc big-acc,   fish-unit-acc big-fem-acc
        'I bought big fish, a big fish.'

The singulative plays the same role as an individualizing classifier ("count" or "unit"; see Greenberg [1972], after the Arabic tradition; Fassi Fehri [2003–2004, 2012], Zabbal [2002–2005], Mathieu [2012], among others). Typologically, in fact, the singulative is closer to (noun) Class than other categories (typically Number) in specific ways (see Seifart [2010] for distinctive criteria and references; see also Crisma et al. [2011] for comparison of the various classifying systems).

1.4.2 Plurative

In plurative expressions, the same gender morpheme *-at* forms a *group* or a collection individual (Fassi Fehri 1984–1988a, 2012) from a singular or a plural of individuals:

(10) a. *muʕtazil(-ii)* 'a solitary'; 'a member of the (so named) theologian thinker group' ⟶ *muʕtazil-at* 'the (so named) theologian thinker group';

   b. *naṣraan-ii* 'a Christian individual' ⟶ *naṣraan-iyy-at* 'christian-fem' 'Christians (as a group)'
   (also a female Christian)

(11) a. *barbar* 'berber kind'; 'berbers' ⟶ *baraber* 'berbers' ⟶ *baraber-at* 'berbers (as a group)'
   b. *ʔusquf* 'patriarch' ⟶ *ʔasaqif* 'patriarchs' ⟶ *ʔasaaqif-at* 'patriarchs (as a group)'
   c. *karaadil-at* 'cardinals'

Some of these forms denote normal plurals in some contexts. But in the relevant cases, the constructed nP can denote an *integrated whole*, and the morpheme contributes to shape this whole. The feminine morpheme can then be thought of as a sort of classifier (or a "grouper"). I return later on to this terminology, and to the properties of both the singulative and the plurative. Note that the plurative also controls a feminine singular agreement, as we will see below.

1.4.3 Gendered Diminutive

When a diminutive is (internally) formed, the morpheme *-at* can be suffixed to it; it then expresses "intensive" decrease in size, "evaluativeness," or eventually a "unit reading," as exemplified by the various meanings of (12):

(12) *zayt* 'oil' ⟶ *zuwayt* 'oil-dimin'; 'small quantity of oil'
   ⟶ *zuwayt-at* 'oil-dimin-fem';
   a.   intensive: "an extremely small quantity of oil";
   b.   evaluative: "a beloved small quantity of oil";
   c.   unit reading: "a discrete small quantity of oil."

1.4.4 Gendered Augmentative

First, an augmentative is (internally) formed, then *-at* is affixed to it; it then functions as an intensive or an evaluative:

(13) *raaḥil* 'travelling, traveller' ⟶ *raḥḥaal* 'a big traveller'
   ⟶ *raḥḥaal-at* 'traveller + augment+ fem'
   a.   intensive: 'an extremely big traveller';
   b.   evaluative: 'an acknowledged big traveller.'

See also: *baaḥiṯ* 'researcher' ⟶ *baḥḥaaṯ-at* 'a great (famous) researcher'; *ʕallaam-at* 'a great (well-known) scholar,' *nammaam-at* 'an extreme gossiper,' etc.[3]

1.4.5 Gendered Event Units

As shown in Fassi Fehri (2005a), an event nominal acting as a cognate object can express a *kind event*, as in (14a), where it denotes that one or more dances have been performed, or a countable *event unit* (or instance), as in (14b):

(14) a. *raqaṣa raqṣ-an*
       danced dance-acc
       'He danced some dancing.'
    b. *raqaṣa   raqṣ-at-an;   raqṣ-at-ayn*
       danced   dance-unit-acc; dance-unit-dual
       'He danced a dance; two dances.'

See also: *qahqah-a qahqah-at-an* 'He laughed boisterously a burst of laughter'; *zaʕzaʕa zaʕzaʕ-at-an* 'He troubled a trouble,' etc. (see Fassi Fehri [1998–1999, 2005] on some properties of cognate kind and unit events).

1.4.6 Gendered Abstract Nouns or Concepts

Abstract nouns or concepts that name qualities, doctrines, sects, etc. also behave syntactically like feminine nPs, and they are affixed with the feminine marker:

(15) a. *suhuul-at-un   kabiir-at-un*
       easy-fem-nom big-fem-nom
       "A great easiness"
    b. *ʕuruub-at 'arabity*'; *zunuuj-at* 'negritude'; *muzuuǧ-at* 'berberity'; *fuḥuul-at* 'virility'; *nuʕuum-at* 'softness'; *buṭuul-at* 'championship'; *xušuun-at* 'roughness'; *nubuuʔ-at* 'prophecy'
    c. *naṣraniyy-at* 'christianity'; *buuḏiyy-at* 'buddhism'; *yahuudiyy-at* 'judaism'; *majuusiyy-at* 'zoroastrianism'; *ṭaaʔifiyy-at* 'communautarism'; *ʕunsuriyy-at* 'racism'; *ḥanbaliyy-at* 'hanbalism,' etc.

In most cases, these nouns are formed from an adjectival base to denote the name of the property, quality, or abstract concept.

1.5 A New Picture

In IE (Indo-European) studies, Brugmann (1897) observed that the same marker is employed for collectives, abstractions, and the feminine, which suggests questioning the "sexual content" of the feminine rather than

"feminizing" collectives and abstractions. Leiss (1994) reformulated Brug-mann's insight in terms of *perspectivization*, in the sense that the function of gender is to provide "different perspectives to represent a multitude of entities" (203).[4]

In the Arabic grammatical and philological tradition, regular descriptions of Gen connect feminine, collectives, abstractions, plurals, and intensives, hence resulting in "collective Gen," "intensive Gen," etc. I derive these connections through the architecture of quantity (# or Num), feminine (± fem), and size (± big or small). As for evaluation, it is especially included in the Arabic tradition for the diminutive, and only marginally for the augmentative. It will be extended here appropriately. On the whole, my program is to "reconcile" the three lines of thought described, and to integrate them in a formal approach.[5]

2 SINGULATIVITY

2.1 Essential Properties

The following list includes the most salient properties of the singulative:

(a) The singulative is a process by which a collective (and less frequently a mass noun) is turned into a single individual or unit.
(b) It is commonly marked via Gender (or the feminine) cross-linguistically (Arabic, Berber, Breton, Welsh, Somali, Hebrew, Russian, etc.; see Mathieu 2013).
(c) It triggers feminine singular agreement on its target.
(d) It has the interpretation of a singularity (not an inclusive plural).
(e) It can be dualized, pluralized, or counted by numerals.

2.2 Some Patterns

In (16), the feminine appears to individualize a mass noun:

(16) a. *xašab* 'wood' (mass) ⟶ *xašab-at* 'piece of wood'
      b. *šamʕ* 'wax' (mass) ⟶ *šamʕ-at* 'candle-unit'; 'a candle'

In (17a), the singulative is singular, and in (17b), it is dual:

(17) a. *ʔakal-tu*   *tamr-at-an*   (*tamr-an*)
          ate-I   date-unit-acc   (date-acc)
          'I ate a date' (dates; one or more dates).

    b. *ʔakal-tu   tamr-at-ayn*
       ate-I   date-unit-dual.acc
       'I ate two dates.'

In (18), it is a plural (strong exclusive):

(18) *ʔakal-tu   tamar-aat-in*
      ate-I   date-unit-plural-acc
      'I ate (many) dates.'

2.3 Structure

We can see from (17) and (18) that there is no complementary distribution between the individualizer (Div or Class) and Num (#), and the dual or the multiplying plural. I postulate (18a) as a structure of (18), in which the singulative (Cl) and the plural (Num) co-occur:[6]

(18a)   NumP

    Num   GenP   (= ClP or UnitP)

  tamar-aat Gen   nP

       -at   *tamr*
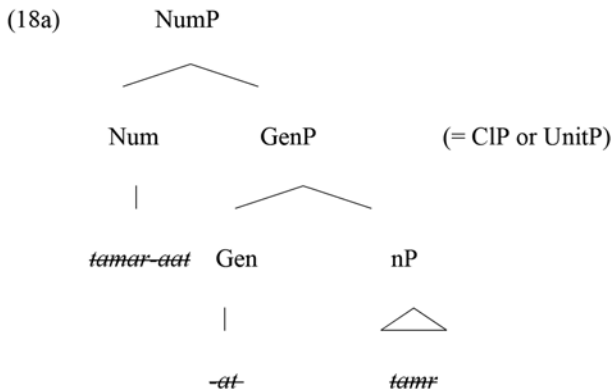
3 THE PLURATIVE

Contrary to the singulative, the *plurative* is only marginally mentioned in the literature, identified, or investigated. Few rather informal uses of this term are found in Africanist literature (see Dimmendaal [1983, 2000], Blench [2007], Mous [2008], and Treis [2014]), basically seeing it as the opposite process to the singulative. Discussing Hayward's (1984) observation that in the Cushitic language Arbore, many nouns have a general form (which is non-specific as to the singular/plural distinction), although they can be pluralized, as in:

(19) *kér* 'dog (s)' ⟶ *ker-ó* 'dogs'

Corbett (2000, 17, fn. 11) made the following comment: "If one uses 'singulative' consistently for singular forms which correspond to a more basic plural form, then it would be logical to use the term 'plurative' for plural forms which correspond to a more basic singular, as in *kér* 'dog' ~ *ker-ó* 'dogs' above, as suggested by Dimmendaal (1983: 224)."

Note, however, that *kér*, as pointed out by Corbett himself, is not a singular, but rather a general form. Compared to the singulative, then, the plurative can be seen as taking the opposite path, as schematized in (20):

(20) a. 'collective' ⟶ singulative
     b. plurative ⟵ 'collective'

3.1 A Disputed Terminology

In the Africanist literature, the plurative appears to be a process by which a strong or distributive plural can be derived from a base that is a general noun (see Mous 2008). The Arabic parallel of such a process is the plural of a collective, which is rather exclusive. Compare:

(21) a. *samak* 'fish' (collective) ⟶ *samak-at* 'a fish unit' (singulative)
     b. *samak* 'fish' (collective) ⟶ *ʔasmaak* 'many fish' ('plurative')
     c. *baqar* 'cows' ⟶ *ʔabqaar* 'many cows,' *šajar* 'trees' ⟶ *ʔašjaar* 'many trees,' etc.

Mous (p.c.) informed me that the plurative can in fact be formed from any base (including the singular). Its important property is that it triggers a "third" gender agreement (which takes the form of a plural (according to Mous 2012).

I claim that the Arabic plurative (as I construe it) provides the minimal closest plural counterpart of the singulative. As for the Africanist plurative, it is more complex, and further research is needed to see how it connects to Gender (or Class). The Arabic plurative (like the singulative) is typologically closer to (noun) Class and Gender than to Classifier, if the criterion is agreement. Unlike normal classifiers, the plurative triggers Gen/Class agreement.[7] Given this property, the plurative cannot be seen as a "plural" or Number, contrary to what Corbett states. It is closer to Gender in perspective. I concur then with Mous on this point, but more details will be given in chapter five.

3.2 Essential Properties

The most salient properties of the plurative include the following:

   a. The "plurative" (in the narrow Arabic sense) is distinct from normal
      plurals. It designates a process by which a collective (a singular, or a
      plural) nP is turned into a group unit (or a collection unit). The result is
      (normally) interpreted as an integrated whole.
   b. Morphologically, the plurative is marked by the same feminine suffix
      as the singulative (namely -*at*). It can be marked on the controller nP,
      or the target (verb or adjective), or both.
   c. Syntactically, it takes part in gender agreement. But contrary to normal
      gender agreement in which gender can be dropped in the VSO order (as
      opposed to SVO), plurative gender cannot be dropped.
   d. From the semantic point of view, the plurative may express a plu-
      rality, or more precisely a "perspective" on plurality, rather than
      semantic gender (or feminine). It controls reciprocity, or plural
      predication, etc.
   e. When the plurative nP participates in normal plural agreement, it "loses" its
      group meaning. Such a dual behavior, as manifested by polyvalued agree-
      ment, recalls that of ambiguous collectives (see subsection 3.4 below).
   f. The plurative is potentially countable and can undergo dualization or
      pluralization in relevant contexts.
   g. The plurative construed as instantiating a class/gender feature of some
      sort cannot be assimilated to the singulative, since it manifests various
      distinct properties.

3.3 Some Patterns

3.3.1 Professional Groups

The following examples instantiate the plurative as an expression of groups
or corps in Standard Arabic in (22), and Moroccan Arabic (where -*a* is used
as equivalent to -*at*) in (23):

(22) *ṣaydal-ii* 'pharmacist' ⟶ *ṣayaadil-at* 'the corps of pharmacists';
       duktuur 'doctor' ⟶ *dakaatir-at* 'doctors,' etc.
(23) a.   *xayyaaṭ* 'tailor' ⟶ *xayyaṭ-a* "tailor-fem,' 'tailors' (the corps of
          tailors)
       b.   *ṣeyyaad* 'hunter, fishman' ⟶ *ṣeyyaad-a* 'the group of hunters (or
          fishmen)' *šeffaar-a* 'thieves'; *nejjaar-a* 'carpenters'; *beyyaar-a* 'well-
          diggers'; *gebbaaṣ-a* 'whitewashers'; *gezzaar-a* 'butchers'; *ḥeṣṣaad-a* 'reap-
          ers, harvesters'; etc.

3.3.2 Ethnic or Regional Groups

Examples are provided for SA, then MA, respectively:

(24) *ʔafaariq-at* 'Africans'; *maraawin-at* 'Maronites'
(25) *jebl-ii* 'mountain-sing', 'an inhabitant of the mountain' ⟶ *jbal-a* 'inhabitants of the mountain'; *wejd-i* 'an inhabitant of Oujda' ⟶ *wjad-a* 'inhabitants of Oujda'; *sraġn-a* 'inhabitants of the Sraġn-a region'; *fwas-a* 'fassis,' *biḍaw-a* 'casablanceses,' etc.

3.3.3 Groups Based on Property Sharing

These are normally derived from adjectives or participles:

(26) a. *kaafir* 'unbeliever' ⟶ *kafar-at* 'group of unbelievers'; *saaḥir* 'magician' ⟶ *saḥar-at* 'magicians'; *xaaʔin* 'traitor' ⟶ *xawan-at* 'traitors'; *saadin* 'guard, servant' ⟶ *sadan-at* 'guards, servants,' etc.
b. *ʕabqarii* 'genius' ⟶ *ʕabaaqir-at* 'geniuses'; *ʕimlaaq* 'giant' ⟶ *ʕamaaliq-at* 'giants'

Morphologically, it is not important that pluratives (most often) use broken plural patterns as their base, but it is essential that they are gendered by the suffix *-at*. Syntactically and semantically, they exhibit two important properties:

- a. They trigger feminine singular agreement on the predicate.
- b. They are interpreted as an individualized collection (exhibiting a collective rather than a distributive behavior).

3.3.4 Collection Units

With feminine singular agreement, pluratives behave more like "kind/collective" nouns when the latter are read as collection units:

(27) a. *al-furs-u   wa-r-rum-u   štarak-at-aa   fii ḥarb-in ḍidd-a   l- ʕarab-i*
the-persians and-the-romans participated-fem-dual   in war-gen against the-arabs
'Persians and Romans participated together (as groups) in a war against Arabs.'
b. *štarak-uu*
participated-pl (masc) (distributive)
'Persians and Romans participated together in a war against Arabs.'

3.3.5 Broken Plurals

Broken plurals can also be made in the dual, or counted as collection units:[8]

(28) a. *jimaal-aan* 'camels-dual,' 'two collections of camels'
    b. *rijaal-aan*, 'men-dual,' 'two groups of men'

(29) a. *t̲alaat̲-at-u   rijaal-aat-in*
     three-fem-nom   men-pl. fem-gen
     'Three collections of men'
    b. *ʔalf-u   rijaal-in*
     thousand-nom men-gen
     'A thousand of (distinct) groups of men'

Likewise, pluratives can control a dual (or a plural) target:

(30) *al-muʕtazil-at-u   wa-l-ʔašʕariyy-at-u   tawaḥḥad-at-aa*
    fii haad̲aa
    the-Mutazilite-fem-nom and-the-Asharite-fem-nom unified-fem-dual
    in this
    'Mutazilites and Asharites have unified (their view) on this.'

The dualization of the plurative agreement suggests that pluratives are potentially countable (for more detail, see below, subsections 3.4 and 3.5).

3.3.6 Double Plurals

Plurals like *rijaal-aat, buyuut-aat*, seen as a plural of plural, can be interpreted as a plural of a collection, or as an evaluative plural:

(31) a. *buyuut-aat*
     house.pl-pl
      i. many many houses
      ii. many famous houses
    b. MA: *rjal* 'men'; *rejjaal-a* 'men-fem,' 'true (strong, brave) men'

3.3.7 MA Pluratives

Pluratives are also productive in MA. In addition to professional or ethnic groups, etc., exemplified above, MA has a subtle distinction between a broken plural and a plurative, which takes the plural as a base (in relevant contexts):

(32) a. *qard* 'monkey' ⟶ *qrud* '(many) monkeys' ⟶ *qrud-a* 'monkeys as a class of species'
    b. *muxx* 'brain' ⟶ *mxux* 'brains' ⟶ *mxux-a* '(brilliant) brains'

    c. *ḥenš* 'snake' ⟶ (? *ḥnuš* 'snakes') ⟶ *ḥnuš-a* 'snakes'
    d. *ʕjel* 'veal' ⟶ *ʕjul* 'veals' ⟶ *ʕjul-a* 'veals as a class'

In non-relevant cases, the two forms of plurals can be used interchangeably, typically when one form appears to be missing, as is apparently the case for the middle form in (32c).

3.3.8 Pluratives Are Distinct from Broken Plurals

It is clear from the patterns seen above that pluratives are a special kind of "plural," and they differ in many respects from normal broken plurals, and hence should not be confused with them (as has often been done in the literature).[9] Recall the following properties:

  (a) Morphologically, the plurative is formed via the suffix *-at*, and it can have various forms as its base of derivation, including broken plurals and collectives;
  (b) Semantically, it is interpreted as a group, in the relevant cases;
  (c) Syntactically, it controls a feminine singular agreement form;
  (d) Its feminine agreement is insensitive to the VSO/SVO word order alternation, and it cannot be dropped, unlike feminine agreement with broken plurals.
  (e) Plurativity is syntactically *anchored in discourse*, as we will see below, whereas broken plural formation is not so anchored.
  (f) Broken plural formation, being essentially morphological, can hardly be seen as syntactically conditioned (as is the plurative). For example, the broken plural NP does not trigger (or control) a particular type of agreement, as has been argued for the plurative. Even when a specific "meaning" is assumed as characteristic of the broken plural form (as "kind" or "inclusive") as opposed to a "strong" or "exclusive" meaning of the sound plural (as assumed by Mathieu 2014), such a contrast (even if true) does not correlate with any (syntactic or semantic) agreement contrast.

The confusion seems to arise because broken plurals (in addition to pluratives and collectives) do occur in plurative constructions (as in the examples [33] below, where the broken plural [in 33a] is used "pluratively," in parallel to its plurative kin in [33b]), whereas sound plurals are not usually used here in this context:

  (33) a. *t-aquulu   r-rijaal-u   haaḏaa*
         fem-say   the-men-nom this
         'Men (as a group) say this.'

   b. *t-aquulu   l-muʕtazil-at-u   haaḏaa*
      fem-say   the-mutazilite-f-nom   this
      'The mutazilites (as a group) say this.'

In fact, neither the noun form in the DP (sound, broken, or plurative) nor the gender agreement form (feminine singular) can be the sole determinant of the syntax-semantics involved. For example, the feminine singular agreement occurs with sound plural DPs when they abstract (in addition to occurring with non-human DPs, or pluratives, as we saw earlier):

(34) *hunaaka   tanawwuʕ-aat-un   kaṯiir-at-un   (* kaṯiir-aat-un)*
     there   diversity-fem.pl-nom   many-fem-nom   (* many-fem.pl-nom)
     'There are many diversities.'

In other words, just as a broken plural DP form does not impose a feminine singular agreement, a sound plural DP form does not impose a sound plural agreement. Moreover, the syntax and semantics of either broken or sound cannot be uniform, but rather constructional.[10]

3.4 The Semantics of Groups and Pluratives

Some theories of groups can account both for their atomic behavior and their sum potential (and/or ambiguity). These theories are extendable to pluratives, but the latter need to be more precisely situated on the atom/set scale.

3.4.1 Barker (1992)

Barker (1992) argues that groups are of a dual nature.

(a) Group as an *atom/individual* denotes an entity that has no internal part structure.
(b) Group as a *set* is at least partially determined by the properties of its members.

The group-atom differs, semantically and syntactically, from both plurals and conjunctions, contrary to the spread view (in Bennett [1974], Link [1983], and Landman [1989], who consider groups to be semantically like plurals and conjunctions). The analysis is confirmed by:

(a) uses of names of groups as rigid designators,
(b) parallels between group nouns and measure nouns, and
(c) the distribution of groups in dialects of English.

Among these salient syntactic properties are the following:

  (d) Groups can be pluralized (*commiittees, armies*);
  (e) They can be counted (*two committees*);
  (f) They can take an *of* phrase containing a plural complement (*an army of children, *a child; a table of wood/*woods*); see Barker (1992), 70–71, for detail.

3.4.2 Pearson (2011)

Pearson (2011) distinguishes two classes of groups: "committee groups" (ComG) and "collection groups" (ColG). As for ComG, they have the following properties:

  (a) They license both atomic and plural predication;
  (b) They permit plural agreement in British English and Canadian English;
  (c) They exhibit plural-like behavior in partitives.

As for ColG, they are distinct in the following properties:

  (a) They license only atomic predication;
  (b) They manifest singular agreement in all English dialects;
  (c) They behave like atoms in partitives.

The behavior of ComG is accounted for by treating them as denoting predicates of individual concepts (167). The proposal highlights a parallel between ComG and kind terms.

   In Pearson's terms, it is possible to think of group nouns like *furs* 'persians' or *ʕarab* 'arabs,' or group plurals like *masiiḥiyy-at*, *buuḏiyyy-at*, *muʕtazil-at* as sorts of ComG nouns with a double semantic/syntactic behavior, whereas some group nouns like *fariiq* 'team,' *ṣaḥb* 'companions,' *rakb* 'passengers' are only atomic (see detail and more differences in Fassi Fehri 2003–2004, 2012; see also chapter five). To illustrate, compare the two collectives: *naas* 'people,' and *šaʕb* 'people.' Although both expressions translate as 'people' in English, they have different translations in French: 'les gens' and 'le people,' respectively. The first collective behaves like a ComG in Pearson's terms, and the second like a ColG, essentially.

   A ComG *naas* does not control a masculine singular agreement; it is either "feminine singular" or "masculine plural," as the following contrasts illustrate:

  (35) a. *n-naaas   t-uṣallii*
           the-people-nom fem-pray
       b. *y-uṣall-uuna* 'pray-pl,'
       c. **yuṣallii* 'pray' (sing)

The same patterns are found for the other members of this class of groups, such as *furs, ʕarab, ruum* 'Romans,' etc. On the other hand, ColG like *šaʕb* can never be feminine, it is only masculine; moreover, it cannot even be used with a plural masculine:

(36) a. *š-šaʕb-u   y-uṣallii*
        the-people   3-pray (sing)
        'People pray.'   (French 'le peuple')
     b. **š-šaʕb-u   t-uṣallii*
                     fem-pray
     c. **? š-šaʕb-u   y-uṣall-uuna*
                     3-pray-pl

The same patterns apply to the other members of this class, such as *fariiq, ṣaḥb, rakb,* or *qawm* 'people, nation, folk.' Masculine singular is a clear indicator of purely atomic groups.
    In addition to the masculine singular property, the atomic group can be pluralized, as in (37), or counted, as in (38):

(37) a. *šaʕb* 'people' → *šuʕuub* 'peoples'
     b. *qawm* 'nation, folk' → *ʔaqwaam* 'nations, folks'
(38) a. *xamsat-u šuʕuub-in*
        five-nom peoples-gen
        'Five peoples'
     b. xamsat-u *ʔaqwaam-in*
        five-nom   nations/folks-gen
        'Five folks'

In these contexts, *šaʕb* is interpreted as group individual and behaves as if it were a singular particular individual. In contrast, *naas* does not seem to have similar pluralizing or counting properties. The plural form *ʔunaas* is not really a plural of *naas*. It is either its "synonym" (similar to the pair *ʕarab* and *ʔaʕraab*), meaning 'people' rather than 'peoples,' or it shifts to mean 'persons' or 'humans' (plural of *ʔinsii*). Likewise, when it is counted, it counts persons rather than peoples:

(39) *ḥaḍara   xamsat-u   ʔunaas-in*
     was.present   five-nom   persons-gen
     'Five persons were present.'

As for the plurative kin of *naas*—for example, *buuḍiyy-at*, although it can dualize or pluralize in conjunctions (see [30] for a case of dualization)—it does seem to resist both direct pluralization or dualization and counting. At any rate, and to the extent that (40) is acceptable, the numeral or the plural are applying to taxonomies (or collections) rather than individuals:[11]

(40) *ʔamaam-a-naa ṯalaaṯ-u   buuḍiyy-aat*
    face-us   three-nom buddhists-pl
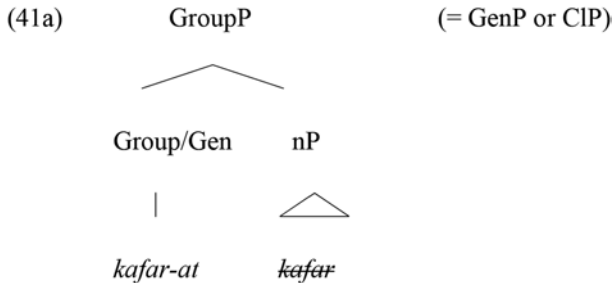   'We face three groups of Buddhists.'

3.5 Structure

Granted now that pluratives are not to be treated as atomic groups (or ColG), they ought to be semantically assimilated to ComG, conceived as collection units (or "particulars" in the perspective of the speaker; see subsection 5.3 below). They cannot be treated in syntax like "normal" plurals, since they trigger feminine singular agreement and do not behave like normal syntactic distributives. In terms of their structure, two options suggest themselves:
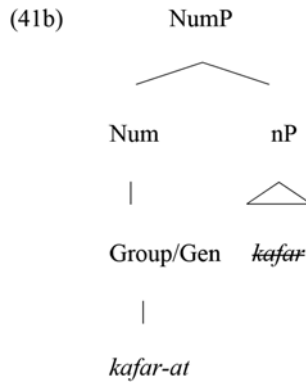
  a. Pluratives are "numbered" Gen (Cl);
  b. Pluratives are "gendered" Num.

The two options can be structurally represented for (41) as (41a) and (41b), respectively:

(41) *t-aḥtajj-u   l-kafar-at-u*
    fem-protest-nom   the-unbeliever-fem-nom
    'The unbelievers (as a group) protest.'

(41a)   GroupP   (= GenP or ClP)

        Group/Gen   nP

        kafar-at   ~~*kafar*~~

(41b)   NumP

          Num   nP

           |

        Group/Gen   ~~kafar~~

           |

         kafar-at

The two "hybrid" structures express the dual nature of the head involved. The plurative is not just Gen (or Class), since it cannot be interpreted as "female," or "singular." It is not just any Num, because although it is a plurality (as reflected, for example, by reciprocity and plural predication), it cannot be distributive (nor exclusive or inclusive), and it cannot control normal plural agreement. The two alternative structures mirror the dispute over the "third gender" in the Africanist literature on whether the plurative is an exponent of Gen (Mous), or of Num (Corbett 2000; see Tsegaye et al. 2015).[12]

4 GENDER ARCHITECTURE

To account for the various meanings of the feminine (or Gender), I depart from views in which Gender is confined to a dedicated syntactic position (be it GenP as in Picallo [1991], or nP as in Kramer [2014], among many others), in which it is interpreted essentially as a female/male.[13] Gen is rather distributed over the various layers of the nP/DP, in the spirit of Steriopolo and Wiltschko (2010) and Ritter (1993); see also Déchaine et al. (2014). Second, Gen has a different content/interpretation, depending on where it is merged in the structure, contra the unique sex (or animacy) view. Gen syntax and its meanings then turn out to be essentially *constructional*, contra lexicalist views. Furthermore, *five* (potentially) *distinct layers* (or sources) of Gen can be postulated (and motivated) in the grammatical nP/DP architecture: (a) conceptual Gen; (b) n Gen; (c) Cl Gen; (d) Num Gen; (e) discourse Gen.

4.1 Conceptual and n Gender

4.1.1 Nominalized (Abstract) nPs

Consider first cases of abstract feminine nouns, compared to their (gendered) bases:

(42) a.   *Ɂab* 'father' → *Ɂubuww-at* 'fatherhood'
 b.   *Ɂumm* 'mother' → *Ɂumuum-at* 'motherhood'
 c.   *rajul* 'man' → *rujuul-at* 'manliness'
(43) *ʕamm* 'paternal uncle' → *ʕamm-at* 'paternal aunt' → *ʕumuum-at* 'paternal auntness or uncleness'
(44) *xaal* 'maternal uncle' → *xaal-at* 'maternal aunt' → *xuɁuul-at* 'maternal auntness'

The gender complexity of these forms points to the existence of (at least) two distinct layers of Gen, needed for interpretation: one is *conceptually based* (i.e., a "father" is masculine, a "mother" is feminine, a "mother uncle or aunt" has two genders, and the same is true for a "father uncle or aunt").[14] Call the latter "lower" gender *conceptual Gen*. The upper morphological or grammatical gender (marked by *-at*) forms an *n* (entity or concept) from a property. Call it *n Gen*. The need for conceptual Gen has been pointed out by, for example, Kopke and Zubin (2010), who have argued that "much of the German grammatical gender is *conceptually* motivated in that certain semantic fields tend to be marked by some specific gender" (italics mine), despite "the widespread view among autonomist grammarians that . . . gender in German is most purely a grammatical [totally arbitrary] category, not motivated in any way by conceptual factors" (172). Various other motivations have also been more recently suggested by McConnell-Ginet (2015) for the equivalent "notional" gender, or by Mithun (2015) for "cultural" gender, among others.

4.1.2 Various Conceptual Sources of Female/Male Pairs

Sources of gender may be conceptually or "culturally" different (even in the same language), and derivations from these sources may lead to various results. Consider the following pairs of feminization:

(45) *rajul* 'man' → *mraɁ-at* 'woman'
(46) *qiṭṭ* 'he-cat' → *qiṭṭ-at* 'she-cat'
(47) *mruɁ* 'man, person' → *mraɁ-at* 'woman'
(48) *rajul* 'man' → *rajul-at* 'a property of a strong woman' (an adjective)

The first pair in (45) is conceptually/semantically the minimal pair to express the female/male human, although the two members of the pair do not share any common morpho-phonological base. In contrast, *mraʔ-at* and *mruʔ* in (47) are grammatically and morpho-phonologically related, although they are not the genuine counterpart of "man" and "woman" in English; rather, they mean "person." As for the (48) pair, it shows that although *rajul* can be made in the feminine, the only available feminine it can form is an adjective, not a noun.

Note that contrary to what happens in examples (37) to (39) above, where the feminine affix *-at* is a *categorizer*, or part of the categorizing *n* process, the morpheme in examples (46) to (48) can hardly be taken as a nominalizer. First, the "masculine" base must be already nominal or adjectival (or coerced to be so), as the contrast between (47) and (48) shows. If so, then the base of the derivation may be seen as providing a conceptual ground for forming a feminine (or a masculine) of an entity or a property. If gender is only taken as a feature of the category *n*, and no distinction is made between the contribution of the conceptual and that of the grammatical/functional gender, it is hard to see how such contrasts can be accounted for.

4.1.3 Various Conceptual Sources of Parenthood in Moroccan

In addition to expressing the concepts of "father" and "mother" by two phonologically unrelated roots (*bu* 'father' and *yemm* 'mother,' as strict counterparts of the SA pair in [45]), MA has equivalent expressions that relate to "parenthood" and share a common derivational base, yet every word appears to have its own semantics, which is not transparently compositional at first sight:

(49) a. *l-walid* 'the parent'; 'the father'
      b. *l-walid-a* 'the parent-fem'; 'the mother'
      c. *l-wald-in* 'the parent-dual'; 'the parents'

But although the two pairs of expressions are roughly equivalent, they are not interchangeable in all contexts. Differences are then traceable to their distinct conceptual sources.

4.1.4 The Placement of n Gen

Let assume that the suffix *-at* in (42) is a *categorizer* (or "derivational" n Gen), forming the abstract noun. Let us also take it to be a *head* feature of the functional category *n*, by virtue of contributing to its abstract (rather than concrete) nouniness, in addition to its interpretation as naming a property (rather than an object). Such a "category change" property is clearer in cases of (abstract) property nouns deriving from adjectives, as has been seen in example (15) above, repeated here as (50) for convenience:

(50) *suhuul-at-un   kabiir-at-un*
      easy-fem-nom   big-fem-nom
      'A great easiness'

I assume that Gen here is interpretable (rather than simply formal), contributing to name an abstract property.

   As for Gen in cases like (46) (i.e., the normal feminine), it may be in a different position. It cannot be seen as a categorizer since the derivation operates on what is already taken to be a noun, and the affix does not operate any "category change" or "mutation" here. Let us then take it to be a *modifier* feature.

   Other cases may be included in the categorizing case. Consider, for example, the following pair of words:

 (51) *maktab* 'office' → *maktab-at* 'library'

Although a (formal) derivational relation can be established between the two members of the pair, the semantics of the second member of the pair is in no way compositional (with respect to the first member). We can account for these properties by postulating that Gen is a categorizing head feature in this case (or derivational) since it contributes to shaping the content of the noun.

4.1.5 Where's Conceptual Gen?

Conceptual Gen in (42) (i.e., the gender of "father," which is presumably interpretable) is lower than Gen *n*. It can be found in some low position in the structure, either on roots or on some functional position lower than "lexical" categorizers (such as *n, a, v*, etc.).

4.2 Cl Gen and Num Gen

We have seen that there are many sources of the gender assigned to the noun, or of gender agreement, that cannot be confused. Recall the three following cases (among others):

(52) *l-qiṭṭ-at-u* 'the she-cat' (sex)
(53) *n-naḥl-at-u* 'the-bee-unit' (singulative, individuative)
(54) *s-saakin-at-u* 'the-inhabitants-group' (plurative)

The first construction instantiates a female derivation, where Gen acts presumably as a modifying feature on n. In (53) and (54), Gen establishes a specific part-whole relation (or a "mereology") in the individuative case, or a "perspectivization" of the atomistic structure in the plurative case. Call the gender in (53) a *Cl Gen* (classifier Gen, or Div Gen in Borer's terms), and the gender in (54) *Num Gen* (or # Gen in Borer's terms).

The three instances of gender are all interpretable on the noun phrase, but not in the same way. They can also be displaced on the predicate (be it verbal or adjectival) to provide feminine gender agreement. The first two cases can be pluralized, but (55) cannot be (unless it is found in conjunction):

(55) * *s-saakin-at-u*   *mutanawwiʕ-aat-un*
       the-inhabitants-group   various-fem-pl-nom
       Intended to mean: 'The inhabitants are diverse.'

This ban against pluralization can be understood once gender is taken to be a specific perspectivization of plurality. Informally, the idea is that the plural cannot be made as grouping and distributing (or multiplying) at the same time. The ban appears to recall somehow Borer's complementarity of Div and #, but it is in fact more reasonably justified on discourse grounds rather than in terms of the pure grammar of Div and #.

Observe that dualization or pluralization by conjunction is not excluded, as exemplified in (30) above. The following construction illustrates a conjunct dualization of groups:

(56) *l-kafar-at-u*   *wa-š-šiiʕat-u*   *ittafaq-at-aa*   *ʕalaa nabḏ-i*
       s-sunnat-i
       the-unbelievers   and-the-shiites   agreed-fem-dual   on   eradicating
       the-sunnites
       'The unbelievers and the shiites agreed on eradicating the sunnites.'

4.3 Discourse Gen

In most cases, plurative nouns (as well as some collectives) have a double behavior in controlling agreement.

 (a) They either control a specific plurative agreement (surfacing as "feminine" "singular"):

(57) *l-kafar-at-u*   *t-ufaawiḍ-u*   *l-muslim-iin*
       the-unbelievers (as a group)   fem-negotiate.with   the-muslims-pl.acc.
       'The unbelievers (as a group) negotiate with the muslims.'

 (b) They control a "normal" agreement in number and gender (where number can be plural and gender can be masculine):

(58) *l-kafar-at-u*   *y-ufaawiḍ-uuna*   *l-muslim-iin*
       the-unbeliever-fem-nom   3-negotiate.with-pl   the-muslims-pl.acc.
       'The unbelievers negotiate with the muslims.'

Two forms of agreement then occur on the predicate. The verb is either feminine "singular" (plausibly without any mark of number) or plural masculine (with values for both gender and number), depending on the interpretation of plurality (as a group, or as a sum). When the plurality is interpreted as a group, the gender of the group overrides the gender of singulars. In non-human plurals (as discussed above for the case of [7]), the same effect is observed (i.e., the gender of the plural overrides that of the singulars). But while polyvalued agreement alternations are found with human pluratives, giving rise to group or sum interpretations, no such option is found with non-human plurals.[15]

The group/sum alternation is discourse-oriented, depending on how the speaker views the DP—as a group unit or as a many plural. I assume that this meaning alternation is anchored in D. Call it *D Gen*. More motivation for the discursive/illocutionary orientation of Gen is provided by Evaluation, as we will see in subsection 5.3 below.

4.4 The "Hybrid" Plurative

As already explained above, the plurative appears to be neither a pure Gen, nor a pure Num (as in the Mous/Corbett dispute), but rather a sort of hybrid complex of both, along the lines indicated.

4.4.1 Some Properties

 (a) It is not (a low) Gen, as it cannot be interpreted semantically on the scale of sex, although it does formally behave like Gen in controlling feminine agreement.
 (b) Unlike the Gen feature in other contexts, the Gen feature here is not compatible with variation in Num values (being invariably in the form of the singular).
 (c) Unlike the "normal" Gen feature in other contexts, the Gen feature here cannot be dropped:

(59) *jaaʔa niswat-un mina l-madiinat-i*
came women   from the-city-gen
'Some women from the city came.'

(60) *qarrara-t   š-šiiʕat-u   nabḏ-a   s-sunnat-I*
decided-fem   the-shiites   eradicating the-sunnites
'The shiites decided to eradicate the sunnites' (group reading).

(61) *qarrara   š-šiiʕat-u   nabḏ-a   s-sunnat-i*
decided   the-shiites   eradicating the-sunnites
'The shiites decided to eradicate the sunnites' (no group reading).

Note that the feminine suffix has been dropped in (59), but not in (60), where a group reading is found. In (61), there is no gender agreement, and the only available reading of plurality there is the multiplying or distributive meaning, which is compatible only with normal plural agreement, but not with plurative.

4.4.2 Syntactic Plurality and Singularity

Plurative is an expression of syntactic plurality. It controls syntactic reciprocals:

(62) *š-šiiʕat-u   t-antaqidu   baʕḍ-a-haa   baʕḍ-an*
     the-shiites   fem-criticize   some-her   some-acc
     'The shiites criticize each other.'

It is used with plural predicates, unlike singulars:

(63) *takattal-at   š-šiiʕat-u   ḍidd-a   daaʕ-iš-acc*
     united-fem the-shiites against Daesh
     'The shiites made a coalition against Daesh (IS).'

Formally, however, the plurative can be treated as a singular. For example, the dual is used in the construction (56) above, to count the two groups.

   Furthermore, note that plurative agreement is limited to third person (or non-person). The following sequence from the Quran has a mixture of plurative (third-person) agreement and normal personal agreement:

(64) *qaal-at   l-ʔaʕraab-u   ʔaaman-naa qul lam t-uumin-uu*
     said-fem the-bedouin.Arabs believed-we say not 2-believe-pl
     (**ʔaaman-tu* 'believed-1'; **t-uumin-ii* '2-fem')
     'The (group of) Bedouin Arabs said: we became believers. They should
     say: we have not become (so), but [rather] we became muslims.'

In this construction, *ʔaʕraab* 'Bedouin Arabs' is related to (or "controls") the plurative agreement on the first verb, the first-person plural agreement on the second verb, and the second-person plural agreement on the third verb. This variation in agreement features indicates that the "displaced" features are not *stricto sensu* grammatically anchored (or controlled), but rather depend on illocutionary and deictic properties, and are presumably anchored in D and/or C.[16]

5 DIMINUTIVES, AUGMENTATIVES, AND EVALUATIVES

In this section, I analyze some patterns of modification (through gender) in relation to size (e.g., in the contexts of diminutives or augmentatives) or evaluation (appreciative, depreciative, endearing, etc.). As we will see, the occurrence of gender in a number of constructions is rather unexpected, and the syntactic location of its controller is rather uncommon, being in a highest position in the DP, or a highest position inside or outside the CP.

5.1 Diminutive Gen

Diminutive and augmentative morphemes in Arabic behave mostly as modifiers, denoting decrease/increase in size and/or expressive/evaluative meanings. They occasionally behave as heads (and individualizers), with a portioning that produces countable units, as has been established for some languages, but only when they are gendered.[17] It is then the feminine suffix that can be held responsible for this potential meaning, and for forming the category.
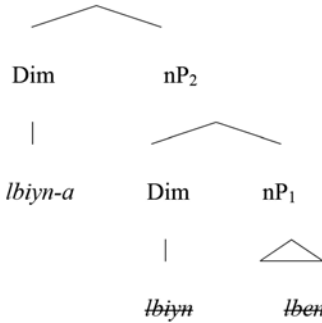
Three different meanings can be distinguished for the *-at* suffix and represented structurally: (a) ClP (or DivP in Borer's sense), (b) SizeP (or DimP, or AugmentP, as in Cinque [2014], among others), and EvalP (for the evaluative, as a category for endearing, pejorative, among other meanings). The following examples from Moroccan Arabic instantiate the multiple role of Gen in diminutive contexts:

(65) *lben* 'buttermilk' → *lbiyen* 'buttermilk-dim'; 'a small quantity of buttermilk' → *lbiyn-a* 'buttermilk-dim-fem';
  a.   intensive: 'a very small quantity of buttermilk';
  b.   evaluative: 'buttermilk-dimin'; 'an appreciated small quantity of buttermilk';
  c.   individualizing: 'a discrete small portion of buttermilk'
(66) *sukkar* 'sugar' → *skiker* 'sugar-dim' → *skikr-a* 'sugar-dim-fem'; with all three readings found for (65) above.
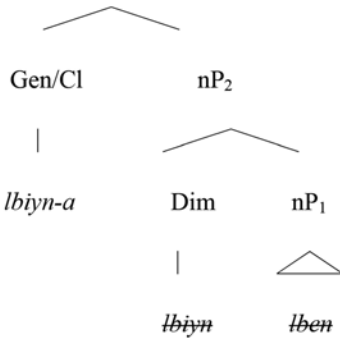
Two distinct structures can be proposed for the intensive (modifier) and the individualizer (head) readings of *lbin-a*, respectively:

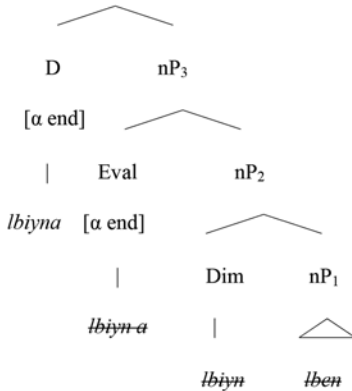(65a)   nP₃   (intensive modifier)

         Dim   nP₂

          | Dim   nP₁

      lbiyn-a |

                  lbiyn   *lben*

(65b)   GenP   (Gen classifier)

       Gen/Cl   nP₂

          | Dim   nP₁

      lbiyn-a |

                  lbiyn   *lben*

As for Eval (evaluative), I assume that it is placed inside the DP (as a sort of degree phrase), and interpreted in DP (or in CP, through DP, as a subjective expressive), as in (65c):

(65c)   DP   (evaluative diminutive modifier)

       D   nP₃

    [α end]   Eval   nP₂

      | [α end]   Dim   nP₁

    lbiyna | |

            lbiyn-a   *lbiyn*   *lben*

(end = endearing)

For the sake of simplicity, I will leave aside the details of the granularity of Eval, and the issue of whether more cartography is involved there.[18]

5.2 Augmentative Gen

Augmentatives can get intensive and evaluative readings through augmentative morphemes and Gender. I can think of no case where the augmentative is an individualizing head. In (67), a participle adjective undergoes both augmentative and Gender affixation, to yield either an intensive reading or an evaluative reading:

(67) *raaḥil* 'traveler' → *raḥḥaal* (traveler + augmentative 'big traveler') → *raḥḥaal-at* traveler + augmentative + gender; 'exhaustive augmentative; famous big traveler.'

The interpretation of (67) appears to fix a limit for the traveling, the *-at* being a sort of delimiter.

The same double process applies to a common noun in MA, producing similar meanings:

(68) *bent* 'girl' → *bennuut* (girl + augmentative 'a big girl') → *bennuut-a* (girl + augmentative + feminine; a. 'a very big girl,' b. 'a beloved (big) girl').
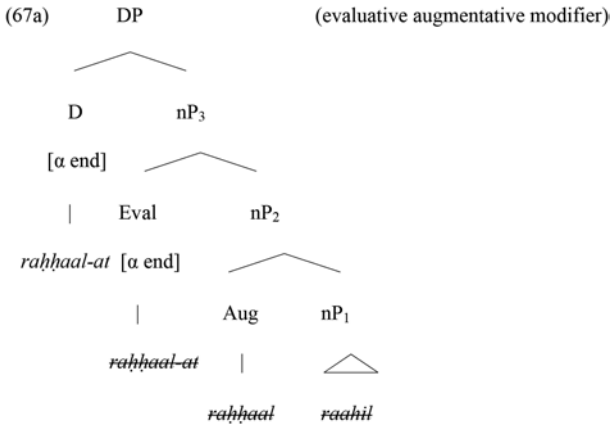
Likewise, similar results obtain with a proper name, typically as regards evaluation:

(69) *ḥmed* (simple proper name, Hmed) → *ḥammuud* (augmentative 'big Hmed') → *ḥammud-a* (augmentative + gender; 'a beloved Hammud')

Gender can also be affixed directly to the adjective, and it expresses intensiveness as well. The list given here is not exhaustive:

(70) a. *naabiġ* 'clever' → *naabiġ-at* 'clever-augm,' 'genius';
   b. *raawii* 'teller' → *rawiiyy-at* 'teller-augm,' 'a big teller; an acknowledged erudite'
   c. *nammaam-at* 'a big gossiper'
   d. *lumaz-at* 'very critical, cynical'

I assume that Eval here is not different from Eval in the diminutive case and should be represented in a strictly parallel way to (65c), although the meaning is 'appreciative,' 'acknowleged' (= knw), etc.:

(67a)   DP   (evaluative augmentative modifier)

$\qquad$ D   nP$_3$

$\qquad$ [α end]

| Eval   nP$_2$

raḥḥaal-at [α end]

| Aug   nP$_1$

~~*raḥḥaal-at*~~ |

~~*raḥḥaal*~~   ~~*raahil*~~

I return to the motivation of this structure later on in subsection 5.3. Note that Eval here is internal to the DP.

5.3 Evaluative Gen

In the previous two subsections, I analyzed cases where the evaluative Gen occurs in (is conditioned by) contexts of Size modification (be it diminutive or augmentative). I turn here to cases where Gen is typically found in contexts where no internal Size implication is involved. These cases are also appealing because they don't exhibit any multiple readings (such as intensive or individuative or sex). They are rather uniquely devoted to evaluation, with specific structural characteristics. Consider, for example, the following constructions (*end* for endearing):

(71) *yaa ʔab-at-i!*
     oh   father-end-mine
     'Oh my beloved father!'

(72) *waa ʔumm-at-aa-h!*
     oh   mother-end-his
     'Oh my beloved mother!'

(73) a.   *yaa wayl-at-i*
       oh   misery-fem-mine
       'Oh my terrible woe!'
     b.   *waa saʕd-at-i!* (MA)
       oh   chance-end-mine
       'Oh my great chance!'

In none of these expressions can the "feminized" noun be associated with a female, a singular, or an intensive interpretation. The only available

interpretation is evaluative (endearment or distress, etc.). What is even more appealing is that these "feminized" forms do not exist outside these illocutionary marked contexts. There is obviously no "female father" interpretation available in (71), or a "female mother" in (72); there is no "individuative" in (73), and no real "intensive" anywhere.

It is striking that the existence of this rather original expression and meaning of gender has hardly been acknowledged in the Arabic or orientalist literature, or provided any preliminary account as far as I can tell. For example, Wright (1971, 87–88) mentioned the constructions in (71) and (72) in the context of expressives, without indicating the content of *-at*, and he took them to be "peculiar forms"! He only stressed the fact that the possessive mark (*-iy* or *-y*, 'mine') had been "shortened" in the vocative. Likewise, Hämeen-Anttila (2000, 601) qualified the case of (71) as "obscure"! In the early Arabic grammatical tradition, the morpheme *-at* is seen as essentially fulfilling a morpho-phonological role, replacing the possessive mark (*-y*, 'mine'), or "compensating" (*taʕwiiḍ*) its absence.[19]

There is evidence that the evaluatives involved in this subsection, unlike those examined in subsections 5.1 and 5.2 above (which are arguably analyzed as DP internal or dependent), are rather clause-dependent, or interpreted in the CP. First, such a construction does not occur as a normal DP (e.g., in contexts where the sentence force is not crucial for interpretation), as in the following declarative constructions:

(74) a. *najaa ʔab-ii mina l- ġaraq-i*
      escaped father-mine from the-drowning-gen
      'My father escaped from drowning.'
    b. **najaa ʔab-at-i mina l-ġaraq-i*
      escaped father-end-mine from the-drowning-gen
    c. **naj-at ʔumm-at-aa-hu mina l-ġaraq-i*
      escaped mother-end-his from the-drowning-gen

The contrast between the ill-formedness of (74b and c) and the well-formedness of (71) and (72) seems to point to a DP/CP divide in the syntax/semantics of evaluatives. In the latter case, evaluatives must be anchored outside the DP, in the higher CP. Making use of similar metaphorical terms in the literature, I will call the former and the latter constructions *inner* and *outer evaluatives*, respectively.

What are the bases and motivations of such a divide, and how are outer evaluatives anchored in the CP? For the sake of concreteness, let us assume some cartographic representation of the CP à la Cinque/Rizzi/Moro, enriched with a speech act role cartography (SAP) à la Hill (2007, 2014), among others.[20] In the expanded CP cartography, vocatives (like those we are concerned with here) tend to be associated with a high functional projection

located in the CP, possibly above Force (as in Moro 2003). Hill (2007, 2014) proposed that they are rather associated with a SAP projected above the CP, in line with Speas and Tenny (2003). Leaving aside the issue of the precise placement of the vocative phrase (inside or outside) the CP, I will assume a structure of vocatives that is sensitive to the speaker/hearer hierarchization in the CP, as in Hill (2007, 2014).[21] Hill (2014, 207) distinguishes among speech acts between *speaker-oriented clause types* like exclamations (which convey the speaker's point of view about situations) and *hearer-oriented* ones like direct addresses (which convey the speaker's manipulation of the interlocutor). Since the structural placement of the speaker and the hearer is distinct, it is the lower segment of the SAP that is dedicated to (the merger of) the vocative. However, the existence of the upper segment in the SAP of the vocative is not superfluous, because the speaker's field may interact with the hearer's (direct address) field in speaker-oriented vocatives and other vocative contexts.

There is reason to take the gender in the vocative examined to be speaker-oriented and interpreted in the speaker field. First, the evaluative gender is exclusively interpreted as a modifier for the speaker, whereas the gender on the imperative verb (agreeing with the second-person hearer) is exclusively dedicated to the hearer (in the lower segment):

(75) *yaa ʔumm-at-aa-h   ṭmaʔinn-ii!*
     oh   mother-end-mine reassure-fem
     'Oh beloved mother, be reassured!'

Two genders are involved here: the endearing evaluative *-at* on the vocative DP expression, and the feminine *-ii* on the imperative verb. Let us assume that the gender realized in both cases is "displaced," or uninterpretable in situ. The lower Gender on the verb is interpretable higher on what is usually understood as a second person (hidden Pro) in the imperative (or alternatively on the second person of the hearer SPA role). As for the Gender on the vocative DP, it is not interpretable internal to the DP, as already established through the (74) contrasts; it is rather interpretable in the CP, in the speaker "field," as part of the speaker specification and subjectivity, etc. More research is obviously needed to make this picture more precise.

6 CONCLUSION

I hope I have shown that Gender is more central and active in the nP/ DP architecture, as well as in the (upper and parallel) CP structure than

has been thought so far. It is found in various layers, not essentially (or uniquely) n, and it employs many more features (like those of individuation, perspectivization of quantity, size, or evaluative modification), rather than just those of sex (or animacy). A unified integrating treatment of the various interpretable and uninterpretable features of Gender then becomes possible, relying on the various features and layers, typically in the model of grammar adopted. This broader and integrating account of Gender has relevant and broad consequences for both the typology and the theory of Gender, as well as for qualifying other interrelated categories (namely Number) and processes (such as Gender agreement, which turns to be a cover for various types, with different properties).[22] The chapter has focused on the description of some Arabic varieties, but there is a need, and a potential, no doubt, for the analysis to extend to many more languages.[23]

NOTES

1. I would like to thank Brill for granting me permission to reproduce this text, originally published as Fassi Fehri (2016) in *BJALL* 8, 154–99, with minor adaptations here. Part of this work was presented at many occasions, including at Paris VII University linglunch on February 2015, Qatar University Linguistic Gulf 5 Conference Keynote address in March 2015, the Linguistic Society of Morocco Workshop in April 2014, the Syntax Workshop of Arabic Varieties in Geneva in August 2015, and the SLE Conference in Leiden in September 2015. I would like to thank the audiences there and acknowledge helpful discussions, remarks, and comments by Bernard Fradin, Peter Hallman, Anna Maria Di Sciullo, Noam Chomsky, Sylvain Bromberger, David Pesetsky, Marten Mous, Frederic Hoyt, Shigeru Miyagama, Ur Shlonsky, Ahmad Rizwan, Noha al-Shorafa, Maathir Al-Rawii, Margherita Pallottino, Pascal Amisli, Danièle Godard, and the anonymous reviewers. The usual disclaimers apply.

2. Similar remarks apply to its kin, though distinct, animacy-based view (as in Dahl 2000, among others).

3. In fact, the *-at* can be seen as a delimiter of some sort (delimiting the summum of some quality) in the intensive case. But I will not expand on it here.

4. According to Unterbeck (2000), quantity (or quantification) is the feature that connects the two categories Num and Gen: Num expresses a multitude, and Gen different perspectives of multitudes. I adopt a perspectivization view of Gen below.

5. My purpose here is not to provide a large list of references on Gender in Arabic. Regarding Western sources, I refer to Ibrahim (1973) for an early synopsis of the traditions of thoughts, Hachimi (2011) for a good overview of the patterns and issues, in addition to Fleisch (1961), Roman (1990), and Wright (1971; originally written in German by Caspari in 1859, with many Arabic sources included), among others.

6. Ouwayda (2014), in line with Borer and Ouwayda (2010), although arguing that Num and Gen are separate categories in this sound plural case, maintains the

view that the plural there is a mere agreement marker (with a hidden numeral), in line with Krifka (1995). She further claims that these plurals do not occur in (normal) quantificational contexts. While the first point is well taken, following Krifka, the second point is questionable. As a matter of fact, there is enough evidence that does not corroborate such a view. Here are a variety of examples, where the strong form of the plural cannot be seen as a numeral:

   (i) *laa y-ajuuzu ʔaxḏ-u   šaʕar-aat-in   min-a l-liḥy-at-i*
       not 3-allow   taking-nom hair-fem.pl-gen from   the-beard-gen
       'It is not allowed to take hairs from the bear.' (adapted from Google, http://islamqa.info/ar/137251)

   (ii) *bayna-naa xilaaf-aat-un   kaṯiir-at-un*
        between-us discordance-fem.pl-nom   many-fem-nom
        'There are many discordances between us.'

   (iii) *fawqa l-qimatri   tufaaḥaat-un   ḥamraaʔ-u wa-ʔuxraa safraaʔ-u*
         on   the-shelf-gen apple-unit.pl-nom red-nom   and-other yellow-nom
         'On the shelf, there are red apples, and also yellow ones.'

   (iv) *štaray-tu   bidʕ-a   samak-aat-in*
        bought-I   few-acc   fish-unit.pl-gen
        'I bought few fishes.'

In Moroccan Arabic, an overt indefinite quantifier (*ši*) can be used freely with such forms:

   (v) *šri-t   ši   ḥut-at   ṭriy-at*
       bought-I some fish-unit.pl fresh-fem.pl
       'I bought some fresh fishes.'

   (vi) *š-bine-k   w-bin   ši   ʕyal-aat*
        what-between-you and-between some woman-fem.pl
        'Why are you looking for women?'

In fact, the diversity of the contexts in which the sound feminine plural occurs may lend credence to the view that it is the default form (see Alshboul et al. [2013] for discussion), although more research is needed to settle the issue.

7. See Seifart (2010) and references there for differentiating criteria; see also Crisma et al. (2011) for comparison between the different systems that set them apart, typically the classifier system found in Mandarin. But we will see in chapter five that the gender/classifier divide is not warranted.
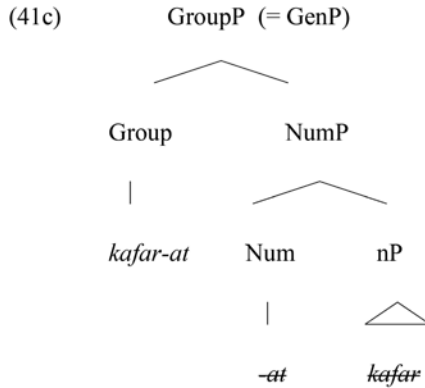
8. It is said that *jimaal-aat* 'collections of camels' manifests "six (6) plurals" or pluralizations (see Suyuutii [1998], 89). For counting collections, see Fassi Fehri ([2012], 308); Wright ([1971], 191); Ojeda ([1992], 322); Acquaviva ([2008], 211).

9. For this confusion, see Acquaviva (2008), after Zabbal (2002–2005), and the critique made in Fassi Fehri (2012, 302–303, fn. 10, 11).

10. See Roman (1990) and Fassi Fehri (2012, 302–303) for examples of sound plurals in a plurative construction. As for the contrasts between the broken-inclusive and the sound-exclusive correlations proposed by Mathieu (*ibid*) and Ouwayda (*ibid*), more investigation is needed to explain such a tendency in interpretation, which to my mind is not systematic.

11. It is possible that the non-felicity of combining the plurative with another plural results from conflicting perspectives in using both the plurative (as a "grouper") and the plural (as distributive).

12. Assuming that Gen provides a perspectivization of plurality in the plurative case, as I suggested earlier, then the structure of (41) cannot (41b) but must be (41c). One then postulates a more complex structure, in which Gen heads a GenP, which is higher than NumP, to stress the fact that the perspectivization requires a higher position as in (41c):

(41c)   GroupP (= GenP)

      Group   NumP

      | Num   nP

      kafar-at   Num   nP

                      | △

                    ~~-at~~   ~~kafar~~

I will maintain the current option of Gen being a feature, leaving other options for future investigation. Shlonsky (1989) was among earlier precursors of a cartographic decomposition view of phi-features in Hebrew, in which Gender is projected lower than Num, etc. See chapter five for a more refined structure of the plurative.

13. Among precursors of the view of gender as a part of the categorizing *n* process, see Kihm (2005), as well as Lowenstamm (2008).

14. Note that Arabic kinship terms are more specific than those in Germanic and Romance. In Arabic, there is no such kinship relation as "cousin," "uncle," "aunt," etc. Rather, each one of these relationships is situated with respect to the mother or the father (e.g., cousin from the mother or uncle from the father), and each has to be specified as female or male (e.g., female or male cousin), as the examples and their translations illustrate.

15. Note that non-human plural agreement, although sharing the form of "feminine singular" with plurative agreement, cannot be confused with the latter. First, there is no obligatory group perspectivization/interpretation with non-human plurality.

Second, gender can be (optionally) "dropped" in the VS order, indicating that the plural is "distributive-multiplying":

(i) *rajaʕ-at   l-kilaab-u*
   came.back-fem the-dogs-nom
   'The dogs came back.'

(ii) *rajaʕ-a   l-kilaab-u*
   came.back the-dogs-nom
   'The dogs came back.'

These two characteristics illustrate only some differences and do not exhaust the list.

16. Ouhalla (2013) presents an appealing attempt for implementing a unified treatment of the various patterns of Arabic agreement. Here I am taking the opposite direction and presenting more ramificational differences in Gen treatment. For more on Arabic agreement intricacies, see early work by, for example, Benmamoun (2000), Mohammad (2000), or even early Fassi Fehri (1984–1988a). The latter motivates both perspectivization and discourse-oriented control via Extended Coherence.

17. See Wiltschko (2008), de Belder (2008), Mathieu (2012), Steriopolo (2013), among others.

18. Cinque (2014) proposes a cartographic hierarchization of expressives, as (i):

(i) augmentative > pejorative > diminutive > endearment

Such an elaboration is beyond the scope of this contribution.

19. See, for example, Suyuutii (1998).

20. Following the path of Speas and Tenny (2003), among others. With regard to the "exploded CP" of Rizzi (1997, 2004), Moro (2003) proposed that vocatives be associated with a functional projection located above Force. But according to Hill (2007, 2014), vocatives are associated with RolePHEARER in the Speech Act Phrase (SAP), as in Speas and Tenny (2003). The latter is projected above the CP. On the other hand, Portner (2004) argues that vocatives (like subjects of imperatives) are specifiers of a functional head addressee, which is projected directly above IP. See Shlonsky (2006) for further elaboration on the structure of the CP.

21. According to Portner (2004), vocatives (like subjects of imperatives) are rather specifiers of a functional head, *Addr*, which is projected directly above IP. I leave aside for future research the precise motivation for the cartography assumed here.

22. The analysis finds its kin in the treatment of so-called allocutive agreement. In order to account for this phenomenon in Basque, Miyagawa (2012) also postulates a SAP that "dominates the standardly assumed left periphery (LP) of clauses, and which hosts the relevant pragmatic markers and vocative phrases." He assumes that the controller of agreement originates at C (as a second-person hearer), although the formal target is attached to an internal predicate. A similar (though partially distinct) treatment is applied to relevant patterns in Japanese. Note, in contrast, that the "controller" dealt with here is the Speaker.

23. The analysis postulated has been applied to SA and MA here and can be easily applied to Lebanese, as is transparently clear, at least in part, in Zabbal (2002–2005) and Ouwayda (2014), as well as other Northern Arabic dialects (Algerian and Tunisian), etc. Kossmann (2014) and Grandi (2015), among others, provide enough ingredients that indicate its easy applicability to Berber. Likewise, Di Garbo (2013) focuses on similar patterns of semantic gender diversity in African languages. This list of references, though promising, is far from being exhaustive. We hope to conduct extensive research on the topic in the near future to include more languages, with detailed variation.

Chapter 2

New and Multiple Roles of Gender

Classification, Individuation, Evaluation, and Typology

In this chapter, I expand the multifaceted view of Gen already established in chapter one, and I elaborate on the role it plays in building individuation, part-whole relations (or partitions), evaluation, etc.[1] The role of Arabic Gender cannot be limited to a derivational *n* feature, as is normally thought in the dominant view of Indo-European gender. Since Gender also assumes the role of a classifier (or unitizer), or since it does co-occur with (plural) Number in this role, there can be no viable typologies of distinct "classifier languages," "number languages," or "gender languages," as often assumed. In fact, these new roles extend to other languages as varied as Hebrew, Romance, and Berber, and even more languages, as discussed here. Clearly, the variation cannot be rigidly defined. The alternative I adopt is that the presence (absence, or possibly silence) of some functional category—or some distribution or meaning of it—is not necessarily parametrically specific to the system of classification or quantity/plurality of a language but is only limited to a particular construction or morphology (as is partially exemplified by some Arabic "silent" cases). The specificity of the various genders in Arabic, their interactions with individuation and Number, as well as the uses of various functional or semi-functional modes to express basically the same senses, point to the weaknesses of rigid typologies (or theories) of Gender that adopt the orthodox view (e.g., Corbett 1991; Kibort and Corbett 2008; or Kramer 2014). The multi-layered and polysemous alternative, which I adopt, is supported by significant contributions in the literature, including Derbyshire and Payne (1990), Seifart (2009), Luraghi (2011), and Acquaviva (2017), among others. It predicts and accounts appropriately for

the multidimensional (and micro-parametric) variation found in languages, or in the same language.

As already observed, and until very recently, many typologists and theoretical linguists have entertained a rather simplistic (and exclusive) view of Gender and its role in the grammar, despite its well-acknowledged complexity. Hence back to (at least) Grimm (1822) for Indo-European, or Caspari (1859) for Semitic, a widespread typology/theory sees Gen(der) as: (a) essentially a nominal class marking device, (b) semantically sex-based (e.g., Corbett 1991; Kibort and Corbett 2008) or animacy-based (Dahl 2000), in addition to (c) being reflected in gender agreement with sexed controllers (or goals; Kibort and Corbett 2008). But back to Brugmann (1897) for Indo-European, or Brockelmann (1910) for Semitic (among other sources), Gen (and typically the feminine) has been associated with diverse meanings, including *individuation*, *collectivity*, *abstractness*, *quantity*, *size*, etc. Old or new grammarians have added even more new meanings and structures, including qualitative *evaluation* ("depreciative," "affective," "endearing," etc.), *perspectivization* (of plurality, "attenuation," etc.), and *speech act role modification* or *performativity* in expressive contexts (as I showed in chapter one). This polysemy and the differentiated multitude of structures are not expected if Gen is only confined to the *n* (and "lexical") domain, construed as sex, and if gender agreement is limited to sexed configurations rather than appropriately distributed over various layers of the DP structure, or even the higher CP and Speech Act role cartography (as in Speas and Tenny 2003; Hill 2014), with productive non-sex interpretations and interrelations.

Overall, this chapter provides further bases and elaborations of a more *integrative* description of the *gender polysemy* and its various "unorthodox" syntax (such as that of ClP, GroupP, CP, or the even higher SAP). It is then established that Gen is potentially semantically *hyperonymic* (i.e., general enough to embrace more diverse and structurally organized and related meanings found cross-linguistically), with sex/animacy only a *hyponym* (or special) case. Inspired partly by Jurafsky's (1996) and Grandi's (2015) analysis of evaluative meanings, I attempt to provide a brief polysemic treatment and representation of this category.

The chapter is organized as follows. In section 1, I present reasons to think of Arabic as a "classifier language," in addition to being a "gender language" and a "number language." In section 2, I establish and investigate equivalent functional and semi-functional structures of classifier phrases. In section 3, I extend the multi-layered view to describe Berber, Hebrew, and Romance. In section 4, I discuss the inadequacies of typologies separating Gender and Classifier language systems based on some significant

proposals in the literature. In section 5, I address the issue of semantics-pragmatics and morpho-syntax interfaces, and I propose a representation of the Gen polysemy, in line with work on neural correlates of semantic ambiguity, offering behavioural and neurophysiological support for a single-entry model (in contrast to homonymic separate entries, as argued for in Beretta, Fiorentino, and Poeppel [2005]; Pylkkänen, Llinás, and Murphy [2006]; or Marantz [2005]). Throughout the chapter, I will be assuming a minimalist distributed-morphology model of grammar based on Chomsky (1995), Halle and Marantz (1993), Marantz (1997), and Harley (2014), among others.

1 ARABIC AS A "CLASSIFIER LANGUAGE"

Arabic is a "number" language, in the descriptive sense of having an elaborate (and compulsory) Number morpho-syntax (even more complex than that of Germanic or Romance; see chapter five). It is also a "gender language," as I established in chapter one. But despite these qualifications (which have been taken to be roughly "exclusive," as in Chierchia [1998], with respect to opposing Classifier to Number systems, or Dixon [1986], in opposing Gender to Classifier systems; see section 4 below for discussion), Arabic can also be seen as a "classifier language," in view of its uses of classification marking morphemes (or classifiers discussed in chapter one), or other mechanisms that parallel those found in well-known classifier languages (such as Chinese, Japanese, Thai, etc.). The most salient types of classifiers in these languages documented in the literature are (a) *sortal* classifiers, and (b) *mensural* (measure) classifiers.[2] Furthermore, sortal classifiers can be divided into *unit* classifiers and *group* classifiers (Lyons 1977; Aikhenvald 2000; Beckwith 2007; Fassi Fehri and Vinet 2008; and Gil 2012–2013, among others). As explained by Lyons (1977, 463; emphasis mine), a sortal classifier "individuates whatever it refers to in terms of the *kind of entity* that it is," while a mensural classifier "individuates in terms of *quantity*." Aikhenvald (2000, 115) further observes that "sortal classifiers categorize nouns in terms of their inherent properties such as animacy, shape, consistency . . . [whereas] mensural classifiers are used for measuring units of countable and mass nouns . . . [as] conditioned by two factors: the quantity, or measure, of an entity, and its physical properties (permanent or, more often, temporary ones)." Krifka (1989; 2013) and Scontras (2014) identify three distinct classes of quantizing expressions (or countables): (a) measure terms (e.g., *kilo, inch, pound*), (b) container nouns (e.g., *bottle, glass, box*), and (c) atomizers (e.g., *grain, piece*). These classes or classifier

types have Arabic counterparts, and they are expressed essentially via two lexico-functional modes: (a) *semi-lexical* nouns, or (b) plain *functors*, or functional constituents, namely Gen in the present case (see chapter five for more discussion).[3]

1.1 Arabic Unit Classifiers

Consider, for example, the fact that unit classifiers (for single entities) come in the form of semi-lexical (or semi-functional) nouns meaning *raas* 'head,' *faṣṣ* 'clove,' *qiṭʕat* 'piece,' *nafs* 'self,' etc., which are directly counted by the numeral, instead of counting the main noun denoting the object, as in normal numeral expressions:

(1) *ṯalaaṯ-at-u   ruʔuus-i   baqar-in*
    three-fem-nom heads-gen cows-gen
    'Three heads of cattle'
(2) *ṯalaaṯ-at-u   fuṣuuṣ-i   ṯawm-in*
    three-fem-nom cloves-gen garlic-gen
    'Three cloves of garlic'
(3) *ṯalaaṯ-u   qiṭaʕ-i   samak-in*
    three-nom pieces-gen fish-gen
    'Three pieces of fish; three fish'

In these constructions, the main noun (or nP) is uniformly in the morphological *genitive* case, regardless of the function of its DP host in the structure. Moreover, the genitive nP is *bare* (in the general or plural indefinite form), denoting kind or mass, but crucially not singular. Given that the genitive relation here is normally associated with the partitive preposition *min* (meaning 'part of' or 'from'), which manifests itself overtly in the analytic synonym counterpart, as in (4a) and (4b), the construction may reasonably be assimilated to a partitive (or pseudo-partitive) phrase:

(4) a. *ṯalaaṯ-at-u   ruʔuus-in min baqar-in*
       three-fem-nom heads-gen of   cows-gen
       'Three heads of cattle'
    b. *ṯalaaṯ-at-u fuṣuuṣ-i   min ṯawm-in*
       three-nom cloves-gen of   garlic-gen
       'Three cloves of garlic'

Note, however, that these alternating Arabic synthetic or analytic partitives/ genitives are closer to English pseudo-partitives than they are to partitives. I will point here only to some distinctive differences (for a preliminary description, see Fassi Fehri [1980–1981, 200–206]).

In true partitive structures, the whole-part relation is established through a definite DP, acting as a *whole*, and a quantificational nP, acting as a *part*. In pseudo-partitives, by contrast, the relation is not really about one nP being subpart of another, but rather about "measurement." The nP measured is not a full definite DP, but rather a *bare indefinite* mass or a plural count nP. Contrast (4) with (5), or the pair in (6):

(5) *štaray-tu t̲alaat̲-at-a   ruʔuus-in   mina l-baqar-i*
     bought-I three-fem-acc heads-gen of   the-cattle-gen
     'I bought three heads of the cattle.'

(6) a. *šarib-tu kaʔs-a   xamr-in*
        drank-I glass-acc wine-gen
        'I drank a glass of wine.'
    b. *šarib-tu kaʔs-an   mina l-xamr-i*
        drank-I glass-acc of   the-wine-gen
        'I drank a glass of wine.'

Whatever the list of these semi-lexical (or semi-functional) heads and constructions (which can be reasonably treated like their pseudo-partitive equivalents in English), they represent a *semi-lexical mode of classification* in Arabic, close to unit classifier constructions in non-disputably classifier languages such as Chinese.[4]

But Arabic has another mode for expressing unities, or unitization: it is the *functional mode* Gen. The feminine suffix *-at*, identified as a *singulative*, plays an individuative role and acts as a classifier, as Greenberg (1972) and others have observed (Fassi Fehri 2003–2004; Ojeda 1992; Zabbal 2002–2005; Mathieu 2012 and 2013). Feminine Gen morphology is then seen as an alternative mode of expression to the semi-functional head in the analytic pseudo-partitive constructions analysed above, and at the same time to the classifier in South Asian languages. The "indirect" noun-headed counting constructions in (1) to (3) above can then be replaced by "direct" counting noun constructions, where a functional Gen suffixes to the lower counted noun (which is plural through the long *-aa* affix):

(7) a. *t̲alaat̲-u   baqar-aa-t-in*
        three-nom   cows-pl-fem-gen
        'Three cows'
    b. *t̲alaat̲-u   t̲awm-aa-t-in*
        three-nom   garlic-pl-fem-gen
        'Three cloves of garlic'
    c. *t̲alaat̲-u   samak-aa-t-in*
        three-nom   fish-pl-fem-gen
        'Three fish'

In other terms, I claim that *-at* suffixed on the noun *baqar* in (7a) is basically playing the same role as the semi-lexical noun *raʔs* in (1). The two patterns are just two modes for expressing basically the same classified entity. As first pointed out by traditional Arabic grammarians (as early as the eighth century), the role of the suffix is to form a "unit" noun *ism waḥd-at* 'nomen unitatis' derived normally from a kind base (see Sibawayhi 1938; Suyuutii 1998, among others; also Wright 1971). This essential insight inspired most authors cited. But relating the two structures as two modes of classification is my own.

1.2 Group Classifiers

Group classifiers are similarly placed in genitive "pseudo-partitive" contexts like those exemplified above in (1) through (4). Thus the pseudo-genitive construct state in (8) is paralleled by the prepositional pseudo-partitives in (9) and (10):

  (8) *baaqat-u   ward-in*
       bunch-nom rose-gen
       'A bunch of roses'

  (9) *nafar-un   min ʔins-in*
       group-nom of   human-gen
       'A group of humans'

(10) a. *qaṭiiʕ-un   min ġanam-in*
         herd-nom of   sheep-gen
         'A herd of sheep'
     b. *baaqat-un min ward-in*
         bunch-nom of   rose-gen
         'A bunch of roses'

These constructions can be analysed in a way similar to that motivated for unitizers or singulatives above, basically with the same properties, except that the head of the construction comes from another list of "lexical" nouns used functionally (or semi-functional nouns), to express "group," "community," "collection," "band," "troop," "herd," "drove," "flock," or whatever term names a group entity. As is the case with singulative unitizers, the analytic equivalents of these group unitizers are used with the pseudo-partitive preposition *min* 'of, from, part of,' and as observed for the former, the nP complement of the preposition must be bare and indefinite, as in (9) and (10). Contrastively, the definite article (*l-*) is only found with the partitive:

(11) *štaray-tu baaqat-an   mina   l-ward-i*
      bought-I   bunch-acc   of   the-rose-gen
      'I bought a bunch of the roses.'

A "synthetic" alternative to the "analytic" group classification in functional morphology comes in the form of what I term the *plurative*. The latter has the same morphological form (the suffix *-at*) as the singulative, but it has a different syntax and semantics.[5] A straightforward instantiation of the morphological plurative as an alternative to the group classifier is provided in (12):

(12) a. *jamaaʕat-un min buuḏiyy-iina*
  group-nom of buddhist-pl.gen
  'A group of Buddhists'
  b. *l-buuḏiyy-at-u*
  the-buddhist-fem-nom
  'The Buddhists (as a community)'

1.3 Mensural Pseudo-Partitives

Contrary to sortal classification analysed above, mensural or measure constructions use only a semi-functional mode, and as far as I can tell, have no "direct" functional mode, and hence no direct interaction with Gen. I provide only one example here for the sake of illustration (and I return to these forms of expressions in chapter five):

(13) *štaray-tu ritl-ay-ni min ʕasal-in*
  bought-I pounds-dual-indef of honey-gen
  'I bought two pounds of honey.'

2 FUNCTIONAL AND SEMI-FUNCTIONAL STRUCTURES

In this section, I provide two equivalent structures for expressing classifier constructions in the wide sense used in the section above. The first one involves a partitive or pseudo-partitive phrase—call it a *semi-functional (pseudo-)partitive*. The second one involves Gender as a functional category—call it *functional Gen*.

2.1 The Semi-Functional Pseudo-Partitive

Starting at least with Selkirk (1977), it was undisputedly assumed that the partitive and the pseudo-partitive constructions represent two distinct syntactic structures, the partitive consisting of two separate DPs. Thus a partitive like (5) has basically the structure in (14):

(14)

```
                           DP
                  ┌─────────┴─────────┐
                  D              NmrP            (or #P)
                  │         ┌──────┴──────┐
                  Ø        Nmr            nP
                           │         ┌─────┴─────┐
                        talaaṯat  n            PP
                                  │       ┌─────┴─────┐
                                ruʔuus    P          DP
                                          │      ┌────┴────┐
                                        mina     D        nP
                                                 │      ╱────╲
                                                 l-      baqar
```
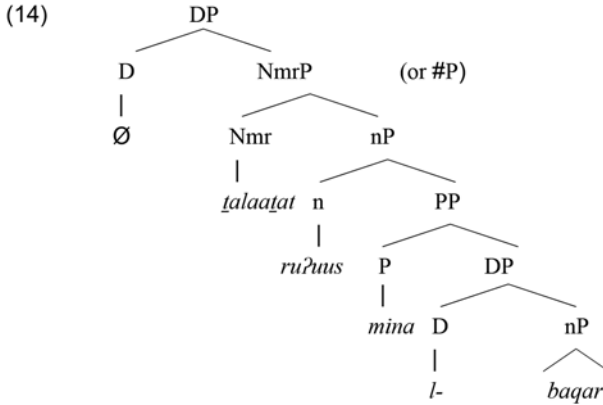
(The numeral is generated under NmrP, instead of #P in Borer [2005]. I have simplified the structure and processes involved and omitted the Move process by which n ends up in D. See Longobardi 2001 and Fassi Fehri 1999 for detail.)

In contrast, a mono-phrasal pseudo-partitive analysis of classifier phrases involved in (4) is more plausible. Thus, inspired by Stickney (2009) and Keenan (2013), I propose that the structure of construction (4b) is basically as follows (Unit is used as the measure head of the pseudo-partitive; FP or the pseudo-PP replaces the PP of the partitive containing a DP):

(15)

```
                         DP
                ┌─────────┴─────────┐
                D              NmrP
                │         ┌──────┴──────┐
                Ø        Nmr          UnitP          (or ClP)
                         │       ┌──────┴──────┐
                      talaaṯat  Unit           FP       (or pseudo-PP)
                                 │        ┌─────┴─────┐
                              fuṣuuṣ      F          nP
                                          │       ╱────╲
                                        mina       ṯawm
```
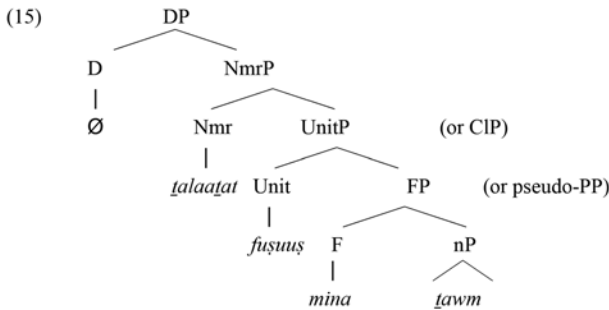
(I disregard here the internal structure of the plural "heads," as well as that of the nP "garlic"; UnitP is equivalent to Borer's DivP.)

This structure differs substantially from its partitive counterpart in (14). Instead of a fully nominal or lexical ("measure") nP, the unitizer phrase

UnitP (or the more general measurement MP of Keenan 2013 or Scontras 2014) contains what would have been the "part" and the "whole" in the partitive structure. Its Unit head is functional or semi-functional, and the fully lexical PP in (14) is paralleled by a functional phrase FP here (or a pseudo-PP), which in turn contains only a bare nP instead of a DP. These differences are supposed to take care of the semi-functional nature of the classifier phrase.

Consider now the case of pseudo-partitive group classifiers in constructions like (8). Their structure is similar to that of (15) in being a pseudo-partitive structure, although it is presumably headed by Group, as follows:

(16)

```
                    DP
                 ／    ＼
              D          NmrP
              |        ／    ＼
              Ø     Nmr       GroupP
                     |      ／    ＼
                     Ø   Group      FP
                          |       ／  ＼
                       baaqat    F      nP
                                 |      ／＼
                                min    ward-in
```
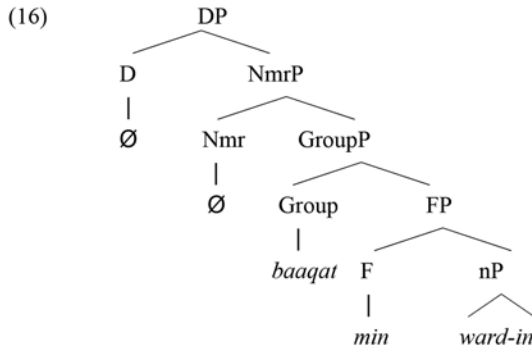
(I disregard the internal structure of *baaqat* 'bunch,' as well as that of the nP *ward* 'flowers.')

These classifiers group a set of individuals to form an atomic group phrase, the atomic phrase being singular here, in the absence of plural morphology or appropriate numeral phrase (e.g., "three").

2.2 Functional Singulatives and Pluratives

Consider now what would be the parallels of (15) and (16) in terms of functional morpho-syntax. The functional parallel to the semi-functional (15) is the singulative construction. As for the functional parallel to the semi-functional (16), the plurative appears to be the best candidate, as I have suggested elsewhere, and will explain below.

Let us look first at the singulative structure and how it mirrors that of the semi-functional pseudo-partitive. Equivalent to *fuṣuuṣ min ṯawm-in* 'cloves of garlic' in (4b) is *ṯawm-aat* in (7b), formed via a functional "feminine" morphology (and pluralized via vowel lengthening). Its plausible structure is as in (17):

(17)

```
                        DP
                      /    \
              D          NmrP
              |        /      \
              Ø     Nmr        NumP              (for Number phrase)
                     |        /    \
                   ṯalaaṯ   Num     UnitP        (or ClP)
                            |       /    \
                      ṯawm-aaṯ   Unit      nP
                                  |        /\
                              ṯawm-aṯ    ṯawm
```
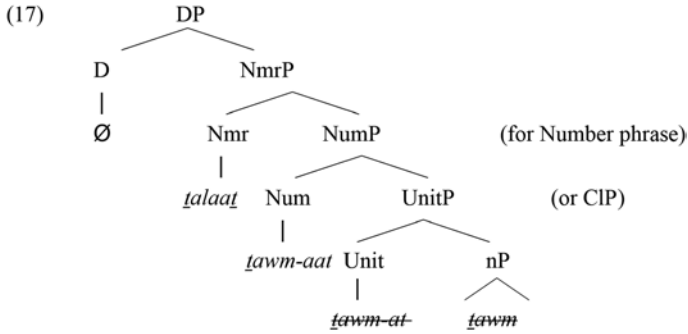
(I leave aside other functional details and represent the plural form as Unit, for the sake of simplification; for a more fine-grained structure, see Ouwayda 2014.)

Let us turn now to the case of groups, which are also formed via Gen morphology, and which I have termed pluratives. I will not take (16) as a base of the derivation, because the atomic entity formed from *ward* is the singulative *ward-at*, rather than the plurative. The result means a 'unit' of flowers, rather than a 'bunch' of flowers. Thus a general (or kind) noun like *ward* does not appear to be an appropriate base for forming a functional group. I will then look at cases that are well-formed pluratives, the formation of which could parallel that of (17). Observe that pluratives can be formed from singulatives themselves, as explained through the derivation in (18):

(18) *majuus* 'magians' ⟶ *majuus-ii* 'magian-unit'; 'a magian' ⟶ *majuus-iy-at* 'magian-group'; 'magians as a group; as a community.'

As indicated in the following construction, the plurative agrees in "feminine," the plurative form of agreement:

(19) *l-majuusiy-at-u*   *ittafaq-at*   *ʕalaa haaḏaa*
     the-magian-group-nom agreed-fem   on   this
     'The magians (as a community) agreed on this.'

Two forms of pluralities are possible to mean 'magians,' and both are derived from the singular/singulative *majuus-ii*. The "normal" plural is the sound plural *majuusiyy-uu-na*, formed by suffixing the long vowel *-uu* to the singulative *majuus-ii*. But a plurative is formed via suffixing *-at*. The latter morpheme, I assume, contributes a group meaning, as indicated in (20). Thus for (19), with the relevant reading, a plausible structure is as follows:

(20)

```
                        DP
                      /    \
                    D      GroupP
                    |      /      \
             l-majuus-iy-at  Group      UnitP        (or ClP)
                            |        /      \
                     majuus-iy-at  Unit      nP
                                  |        /\
                              majuus-ii   majuus
```
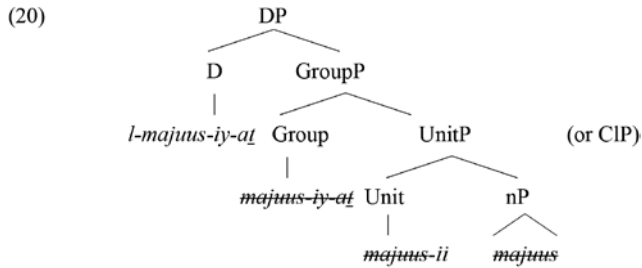
If so, then the plurative can select singulars or singulatives as its derivational base. It can also select plurals, but typically not kind (or general) nP. Singulars, singulatives, and plurals have the common property of being already "classified" (unitized or "quantized"; see Krifka 1989 and 1995; Borer 2005), but crucially not kinds (or masses). Then the structure (20) is built on two classifiers, or two unitizers, one over the other on the same nP, although with distinct meaning contributions—the lower building a singularity, and the upper a plurality. Group Gen is then higher in the structure than Unit Gen, or Plural (when seen as a unitizer or divider). More complexities and varieties of pluratives are analysed in chapter five. What is important to note at this point is that there is a strict parallel between the singulative functional structure in (17) and the semi-functional structure of the classifier construction in (15). Likewise, there is a strict parallel between the semifunctional structure of the group phrase in (16) and the functional structure of the plurative in (20), although the latter appears to be more complex.

3 CROSS-LINGUISTIC EXTENSIONS

In this section, I do not intend to describe the vast number of gendered languages that instantiate similar patterns and correlations to those of Arabic varieties, but only give some samples for the sake of comparison from Berber (Afroasiatic), Hebrew (Semitic), and Romance.

3.1 Berber

Berber has a two-gender opposition, expressing natural gender, abstracts, units, size, and expressive evaluation, and it interacts with "enunciation" (Mettouchi 1999). The morpheme *-t* (occurring as a reduplicating discontinuous morpheme, or "circumfix") provides the formal means to express these various meanings, which compete for the same slot on the noun, without any

possibility of being added to each other (being in "complementary distribu-tion"; Kossman 2014), while the augmentative is expressed via a form of (uncommon) "substractive" morphology (Grandi 2015). In the descriptions provided, there are systematic relationships between gender forms and mean-ing forms (e.g., between feminine and diminutive, or between masculine and augmentative). There are also expressions of endearment, contempt, "in rela-tion to the speaker," etc.

   First, *-t* expresses *sex* for animates:

(21) a. *agyul* 'donkey' ⟶ *t-agyul-t* 'she-donkey'
      b. *aganduz* 'veal' ⟶ *t-aganduz-t* 'heifer' (Kabyle; Mettouchi 1999)
(22) a. *arba* 'male child' ⟶ *t-arba-t* 'female child' (Ayt Seghrouchen; Kossman 2014)
      b. *afrux* 'boy' ⟶ *t-afrux-t* 'girl'
      c. *afunas* 'ox' ⟶ *t-afunas-t* 'cow' (Laoust 1921; Grandi 2015)

Second, *unity* nouns are formed by the feminine:

(23) a. *nnamus* 'mosquitoes' ⟶ *ṯanamusṯ* 'a single mosquito'
      b. *l-mašmaš* 'apricots' ⟶ *ṯamšmašṯ* 'a single apricot'

Third, a *quantitative diminutive* is expressed by the feminine:

(24) a. *afus* 'hand' ⟶ *ṯ-fus-tt* 'little hand'; *afus* ⟶ *t-afus-t*
      b. *t-aherdan-t* 'small lizard' (also 'female lizard')
      c. *t-aslem-t* 'small fish' (Kossman 2014; Grandi 2015)
      d. *lkursi* 'chair' ⟶ *ṯakursitt* 'little chair'
      e. *muka* 'owl' ⟶ *ṯamukatt* 'little owl' (Kossman 2014)

Fourth, *abstract* nouns can be formed as feminine, expressing qualities, pro-fessions, names of languages, etc.:

(25) a. *aryaz* (m) 'man' ⟶ *ṯaryazṯ* 'manliness (courage)'
      b. *aslmaṯi* (m) 'fisherman' ⟶ *ṯaslmaṯiṯ* (f) 'profession of fisherman'
      c. *ašəlḥi* 'Berber' ⟶ *ṯašəlḥiṯ* 'Berber language' (Kossman 2014)

As for *augmentative*, it is said to be expressed by the "masculine":

(26) a. *t-a-bhir-t* 'garden' ⟶ *a-bhir* 'big garden'
      b. *ṯamṣaṭṭ* 'thigh' ⟶ *amṣaḍ* 'very big thigh' (Kossman 2014)
      c. *amuka* 'big owl'

Abdel-Massih observes that "certain feminine nouns give augmentatives by a process that is the reverse of diminutive formation," and hence, only feminine nouns can be augmentativized (-*t* if present is then "deleted" in "a typologically unusual instance of subtractive morphology," as Grandi [2015, 10] puts it). As for masculine nouns, they can only be diminutivized. A triple of normal, singulative, and augmentative is given in the following example:

(27) *lḥumṣ* 'chick peas' ⟶ *ṯaḥumṣtt* 'one chick pea' ⟶ *aḥumṣ* 'big individual chick pea'

As for *evaluative* endearment and contempt, Mettouchi (1999, 219) observes that "both diminutives and augmentatives can be reinterpreted as depreciative," or else appreciative. Hence it is apparently possible to depreciate/appreciate from the masculine to the feminine, or vice versa, as in (28) and (29), respectively:

(28) *argaz* 'man' ⟶ *t-argaz-t* 'mannish female'
(29) *tamtut* 'woman' ⟶ *amtu* 'a wimp woman'

Endearment is also expressed via the diminutive feminine, as in (30):

(30) *baba* 'my father' ⟶ *ṯababatt* 'little father'; 'endeared father' (Kossman 2014; second translation mine)

As for the *expressive performative* (in my terms), I have found what appears to be one of instantiation of it in an example brought up by Kossman (2014), where the feminine establishes a relation (of low age), in relation to the speaker:

(31) *ʕəmm-i* 'my paternal uncle' ⟶ *ṯ-aʕəmmi-tt* 'paternal uncle (younger than the speaker)'

3.2 Hebrew

Early Semitic had a common feminine marker -*at*, which distributed in all branches of Semitic before its split into East and West Semitic (Hasselbach 2014, and references cited there). When compared to Akkadian, Classical Arabic, and Géez, Hebrew appears to have a short list of meanings. The feminine suffix -*a* appears to be the most productive, compared to other morphemes (including -*t* or its variants -*et*, -*at*, *ot*, etc.). Here are patterns of semantic diversity.

Female sex can be expressed by *-a* or *-it*:

(32) a. *more* 'teacher' ⟶ *mor-a* 'teacher-fem'
   b. *kélev* 'dog' ⟶ *kalv-a* 'she-dog'
(33) *tabaḥ* 'cook' ⟶ *tabaḥ-it* 'female cook'

The feminine can mark abstracts:

(34) *neqam-a* 'vengeance'

It forms singulatives:

(35) *oni* 'fleet' ⟶ *oniyy-a* 'a ship'

The "collective" can be marked by the feminine, and the unit singular unmarked, just as the Arabic plurative:[6]

(36) a. *daag* 'a fish' ⟶ *dagg-a* 'fish (as a collection)'
   b. *yoseb-et* 'inhabitants as a group, population'

3.3 Romance

De la Grasserie (1904) notes that gender as a sex appears only very late in the historical grammatical hierarchical strata associated with gender; in fact, it is in the last one. But languages like Bantu have non-hierarchical multiple genders. In a second stage from this state, there is development of a hierarchical animate/inanimate opposition rather than sex. In a third stage, sex is allotted to nouns, even without reason, although construed by subjectivity, and interlocution (226–27). It is then "big/small," "important/less important," "strong/weak," etc., or rather an opposition of "wide, vague, or generic" (for the feminine) and "specific, precise" for the masculine. There is also a tendency to feminize nouns in languages that have no neuter, "which is in the middle."

   As an illustration, Kahane and Kahane (1949, 135) observe that "in the Romance languages the *feminine* form of a noun may have an *augmentative* value in relation to the corresponding masculine" (e.g., *sacca* 'large sack,' compared to *saccu* 'sack'). Thus the augmentative feminine can be seen in the following examples (among many others they provide):

(37) a. *kavana* 'big basket' (*kavan* 'basket')
   b. *kortella* 'large kitchen knife' (*kortello* 'knife')
   c. *pavela* 'large butterfly' (*pavel* 'small butterfly')

By gender change, diminutive or intensive is expressed:

(38) a. *padellina* 'small frying pan' ⟶ *padellino* 'very small frying pan'
    b. *trombettina* 'small trumpet' ⟶ *trombettino* 'very small trumpet'
    c. *barchina* 'small bark' ⟶ *barchino* 'tiny hunting boat'
    d. *cassetta* 'drawer' ⟶ *cassetto* 'small drawer'

In a similar vein, Bergen (1980) argues that there are various semantic uses of gender in Spanish, including natural sex, unitization, small or large size, etc., built on the feminine suffix *-a*:

(39) a. *gato* 'cat' ⟶ *gat-a* 'female cat' (sex)
    b. *Rafael* ⟶ *Rafael-a* (female proper name)
(40) *aceituno* 'olive tree' ⟶ *aceituna* 'olive'
(41) *barco* 'ship' ⟶ *barca* 'small ship' (diminutive)
(42) *panero* 'basket' ⟶ *panera* 'large basket' (augmentative)

This cross-linguistic gender polysemy supports the multi-layered approach adopted here.[7]

4 TYPOLOGICAL ELABORATIONS

It was established earlier that a number of gender meanings are constructed or composed in syntax at various levels of structures and cannot be taken as inherent or specific to nouns or to the category *n* (as in, e.g., Corbett 1991; Lowenstamm 2008; or Kramer 2014, among others). Thus, although the locus of the Gen feature appears to be more common on nominal Root or *n*, its location can in fact be higher, in Cl, Num, or D levels (e.g., it is on determiners in French *le*, *la*; or German *die*, *der*, *das*). It will be shown to be on Q (quantifier), or Nmr (numeral) in chapters three and four. Not being confined to nouns, it can occur also on eventive nouns, verbs, or adjectives, be it "displaced" or not. Moreover, the features involved vary from sex to various forms of individuation to evaluation, etc., depending on where gender is attached and interpreted. There are obviously interpretable and formal (or non-interpretable) Gen features. There is also an issue regarding whether it makes sense to postulate the existence of a separate Gen category (which projects as GenP), which would be the locus of (some of) the meanings discussed (in parallel to the Num category for number), or whether there is no such syntactic category, its features being usually thought of as characteristic of nouns (or more precisely *n*). The issue is complex and will be left for

future research, but I will assume for the sake of concreteness the possibility of projecting GenP, and that the "mobility" of Gen—that is, the fact that it occurs on multiple layers of the DP (or clausal) structure—is parallel with the mobility of the Num feature (as we will see in chapter five), without precluding projecting it as an independent category. The following pre-theoretical discussion is useful to clarify some issues of nominal classification, and the roles played by Gender—which extends to individuation, a role normally played by classifiers—or Number (as will be examined in more detail in chapter five), in addition to evaluation or performativity (already explained in chapter one). It focuses not only on what Gender is, but also on inadequate nominal classifications of languages. The alternative is a "universalist" view according to which all languages access the essential features of classification, individuation, and atomization (see chapter five for a fine picture).

4.1 Empirical Flaws in the Classifier/Gender Divide

What is gender, as distinct from classifier? Gender, noun class, and classifier (of various sorts) have been traditionally taken as different typological means to divide up the noun lexicon into distinct classes. But the most opposed systems of nominal classification are gender and classifier systems, and the most important criterion is formal, namely agreement: genders are *agreement classes*, classifiers are not. "Genders, understood as classes of nouns within a language which are 'reflected in the behaviour of associated words' . . . , are *agreement classes*" (my italics; Kibort and Corbett [2008, 4]). Thus the core manifestation (or existence or criterion) of a gender system is gender Agree. "It is taken as the *definitional characteristic of gender* [my italics] that some constituent outside the noun itself must *agree* in gender with the noun" (Kibort and Corbett 2008). By contrast, a classifier system is characterized negatively by the absence of agreement, in addition to other positive parameters or properties, such as the existence of numeral or other classifier types (Seifart 2009). To illustrate, gender systems of Indo-European, French, Italian, or German offered obvious contrasts with the numeral classifiers of the better-known Sino-Tibetan languages. But as descriptions of more and more languages have become available, the traditional opposition has lost its empirical validity.

Indeed, more and more languages described have been shown to use *both* gender and classifier systems, or different classifier type systems, one (or more) of which are close to gender systems. In their important contribution on noun classification in Amazonian languages, Derbyshire and Payne (1990), for example, have drawn early attention to the fact that a single language can have more than one classifier type system, including systems that are similar to gender systems, and possibly integrated in one system or

more. The Amazonian classifier languages described can hardly be labelled discretely in one of the four types described by Allan (1977). Unlike Indo-European genders, these classifiers are not devoid of content (or semantically empty), but gender systems can be included as subtypes of concordial classifier systems (244), which constitute closed grammatical systems, are morphologically affixes or clitics, syntactically agreement classes, and limited in their inventory (up to twenty). The systems actively interact with each other, and they fulfil various functions. What the study shows, then, is that there is a wide diversity of mechanisms and types that are needed to account for variation, and that behaviours of (some) classifiers may come close to those of genders.

Seifart's (2009) analysis of the Amazonian Miraña equally shows that "forms that look like classifiers and behave like classifiers in some constructions can be involved in morphosyntactically constrained and semantically redundant agreement marking in other constructions" (380), thus making the Miraña classification system a mixed system of classifiers and genders. Seifart notes that "current approaches to the typology of nominal classification focus on establishing relatively few and broad universal types of classification systems, each defined by a relatively small number of morpho-syntactic criteria." Chief among those is the agreement criterion. But "a more promising approach is to shift the focus away from the broad types defined by relatively few characteristics towards a larger number of more detailed characteristics, each corresponding to one parameter in a multidimensional typology." In this line, he is following a number of recent typological approaches, which acknowledge that "linguistic diversity is captured by large sets of fine-grained variables, not by grand type notions" (Bickel 2007, 245). This must be so because "Miraña does not enter into these networks of correlating parameters, but it does appear to have something resembling numeral classifiers as defined by other parameters, namely the individuating function and the prominence of shape in the semantic profile, which is typical of numeral classifiers," hence providing "an example of two partially intersecting clusters of parameters: one is the correlation of shape semantics with individuation (displayed by Miraña, and also by Mandarin Chinese), the other is the cluster of 'narrowly defined numeral classifiers.'" Furthermore, and what is "the most striking fact about Miraña is that its class markers perform derivational and agreement functions to the same extent . . . the derivational function, where the use of class markers is semantically based, and where class markers make a semantic contribution to the resulting noun phrase and may individuate it, is so reminiscent of classifiers, while the morphosyntactically constrained and semantically redundant agreement function is the hallmark of noun classes" (Bickel 2007, 377–79).[8] The result, then, is a more "hybrid" gender-classifier (or rather a multiple classifier) system, and the need for a fine-grained

multidimensional typology, or equivalently a micro-parametric approach to variation (as in Kayne 2005a–b; see chapter four and references there).

From the point of view of Arabic, it was clear from the start that Gender is expressing individuation (or partition) in a number of cases, one of the central functions usually allotted to (numeral) classifiers, and that this "classifier" is triggering gender agreement like other genders. In a sense, the marker *-at* is functioning *both* as a gender in the Indo-European sense, and as a classifier in the Sino-Tibetan sense. In loose terms, it behaves syntactically like gender, and semantically like a classifier. But semantically also, the classifier marker is contributing individuation, whereas the gender marker contributes sex. Furthermore, the gender marker has more senses that cannot be reduced to individuation and classification only, as shown in chapter one (see also section 5 below).[9]

4.2 In Need of a Micro-Parametric Model of Gender

The model of variation for gender defended by Seifart and Bickel is similar in spirit to the one I am assuming. The model I adopt assumes the existence of different features for Gender, and it assumes a multi-layered cartography of Gender. Such a model is also needed if we take into account the various functions of Gender. At least three of these functions are worth having in mind here: (a) a derivational function, (b) a classification function, and (c) a reference-tacking function.

The "derivational" or categorizing function of Gender has been implicit or explicit in treatments that make Gender "part of n," or a sort of nominalizer. Gender as a grammatical category is generally taken to be a grammatical reflex of noun categorization (see Picallo [2008] and Lowenstamm [2008], among others) or an intrinsic property of the noun (Corbett 1991). Luraghi (2011) observes that "the rise of the feminine gender in PIE is strictly connected with derivational morphology . . . a derivational suffix which served the function of building abstract nouns (mostly deverbal action nouns)," although Acquaviva (2017, 22), along the constructional model I adopted, conjectures that "the nominal projection line of DP includes features morphologically realized in terms of gender values (controllers for agreement)."

Luraghi (2011) assumes two essential functions of Gender in Indo-European, which are of different origins: *classification* (the basic function of classifiers) and *reference tracking* (through agreement or case, an anaphoric function of classifiers). She argues that these two functions are hierarchized, as *low* and *high* gender. Moreover, she notes after Dahl (2000, 113) that "it is a mistake to think of gender systems as systems for classifying things: to the extent that they do so it is secondary to their function to make it easier to keep track of links between constituents" (3), and "the sex parameter is different

from the animacy parameter, as it reflects referential sex, while the animacy parameter reflects a variety of other grammatical features, such as individuation." Furthermore, "different origins of gender systems put an emphasis on either function: gender deriving from classifiers has classification as its primary function, while gender arising from differential case marking, as in PIE, is primarily motivated by discourse."

5 SEMANTICS, PRAGMATICS, AND SYNTAX INTERFACES

5.1 Semantics, Discourse, and Peculiarities

Grandi and Körtvélyessy (2015), building on previous work by Dressler and Jurafsky in particular, argue for various semantic and pragmatic interpretations formally dependent on the peculiarities of language-specific evaluative word-formation strategies (including affixation, gender shift, compounding, reduplication, etc.). Cross-linguistically, evaluative constructions can express either (a) descriptive/quantitative or (b) qualitative/expressive evaluation. In the case of (a), the description relies on real/objective properties (of objects, persons, actions, etc.), which are measured with respect to a standard/ default value, and seen as a deviation with respect to the norm (culturally or socially determined). In the case of (b), the evaluation is subjective, concerned with personal feelings or opinions. For example, *cagnolino* in Italian can objectively describe a small dog, and *cagnone* a big one, in relation to a standardly sized one, using objective dimensional parameters. But if someone calls his Great Dane *cagnolino*, she/he would be expressing her/his affection toward it, or feelings, that depend crucially on pragmatics or discourse factors. But although the semantic-formal correlation is often unpredictable, there are numerous instances of regular morphological qualitative evaluation (e.g., Slovak *mam-isko* 'mother-augment' expresses a pejorative, whereas *mam-ička* 'mother-diminutive' expresses an affectionate evaluative; see also Cinque 2014).

   Wierzbicka (1989) proposes considering the evaluative functions as instantiations of typological or universal prototypes, based on semantic primitives: the quantitative small/big, and the qualitative good/bad. Jurafsky (1996) offers an in-depth view of the polysemy of diminutives and their semantic complexities via a "radial model" (inspired by Lakoff's radial category). According to him, the central (semantic) category of the diminutive is "child." Other diminutive senses come about through a process of *semantic change*, which uses various important mechanisms, including the *creation of metaphors*, *bleaching*, and the *conventionalization of inference*.

In Körtvélyessy's (2014) model of evaluative formation, the semantic pragmatic functions of quantitative and qualitative evaluation are reflected in the form of two alternative paths of evaluative formation. The semantics of evaluation takes evaluative constructions as part of a continuum of quantity (under or above the default) value, or a "supercategory" including other categories such as Plurality, or Aktionsart, with concepts of multiplicity, iterativity, distributiveness, attenuation, etc., which are of a quantitative nature.[10]

5.2 Polysemous Gender and Predictions

The polysemic analysis of Gen, its multi-layered distributed architecture, and its distributed model morphology adopted in this work concur to provide an integrative view of regularities, correlations, and patterns found in Arabic varieties, as well as other languages. The variety of meanings and morpho-syntactic features or categories are interrelated and often regularly interfaced, rather than accidental. With regard to meanings, it is possible to see Gen as a semantic "supercategory" or *hyperonym* of Quantity (or Quality), with a hierarchization (or a tree geometry) in which a *hyponym* Gen would be sex, taking into account historical stages of gender evolutions, various gender origins, as well language-specific semantic and formal gender uses. In particular, the SAP level (discussed in chapter one) is presumably the best locus to take into account subjective perspectives of the speaker. Providing a global model of Gen at this stage is far beyond the scope of this work, although such a model is possible to construct, typically based on empirical formal/semantic/pragmatic regular correlations. It is conceivable to correlate one (or more, feminine) Gen morpheme(s) to these various meanings and layers, to avoid an unmotivated exclusion of numerous meanings and configurations in which Gen is found.[11]

NOTES

1. This Chapter is a partial reproduction of Fassi Fehri 2016b, recently published as Fassi Fehri 2018, as well as section 1 of Fassi Fehri 2016c. I would like to thank Michelle Sheehan and Laura Bailey, as well as two reviewers of the volume, for suggestive comments and helpful editorial improvements, and Language Science Press in Berlin for allowing open access reproduction.

2. Cheng et al. (2013) distinguish two types: sortal and non-sortal classifiers. In the following numeral constructions from Mandarin Chinese, the classifier is sortal in (i), and non-sortal in (ii) and (iii). Numerals must be preceded by classifiers:

(i) *sān　　zhī　　　bǐ*
　　three　cl-branch　pen
　　'Three pens'

(ii) *liǎng   xiāng   shū*
   two   box   book
   'Two boxes of books'

(iii) *yī   qún   rén*
    one group person
    'One group of people'

Classifiers can also appear with (counted) nouns without the numeral, in what are called "bare cl-n" combinations, as in (iv):

(iv*) wǒ mǎi-le   běn shū*
    I   buy-perf cl   book
    'I bought a book.' (one single book)

See also Fassi Fehri (2016b/2018 and 2016c) for detail and comparison with Arabic.

3. This section revises and adapts section 1 of Fassi Fehri 2016c.

4. It is worth emphasizing that the construct state (or so-called synthetic genitive) alternates with a periphrastic (or analytic) genitive to express partitivity (or pseudo-partitivity) in Arabic. Clearly, partitivity in its various forms is playing an important role in expressing classification through various modes of partition (see Déchaine 2017 for diverse cross-linguistic instantiations). See also chapter four on the roles of partitivity in Arabic.

5. Group constructions in Arabic have been notably described by Fassi Fehri (1980–1981; 1984–88a; 2003–2004), Ojeda (1992), and Zabbal (2002–2005). The term "plurative," as already explained in chapter one, is the most appropriate to designate this classifier form (and agreement marker), being the exact parallel to the singulative. This terminology is different from that originally proposed by Dimmendaal (1983) and adopted in Africanist literature, where it designates a sort of plural of collectives, which Mous (2008, 2012) takes (disputably) to be Gender rather than Number.

6. See Hasselbach (2014, 329), and relevant references cited there.

7. In fact, since the publication of this text in 2016 (as part of Fassi 2016b–c), more relevant work appeared on Italian and its dialects, providing a serious base for rethinking the nature of Gender in this language (and more generally in Romance) more profoundly along the analysis adopted, as argued convincingly by Manzini and Savoia (2016) and Acquaviva (2017).

8. See, for example, Carstens (1991, 2008) on Bantu noun classes, and for more elaboration, Carstens (2010).

9. Only very recently, and in a similar vein, Corbett and Fedden (2016, 496) conceded that "a simple opposition between gender and classifiers no longer makes sense . . . first, many items labelled 'classifiers' share significant properties with gender; and second, the phenomena treated as classifiers do not form a coherent grouping." See also Fedden and Corbett (2017, 496) for confirming the view that the divide has no empirical or theoretical content.

10. See Körtvélyessy (2014) for detail, and the relevant references there.

11. The Distributed morphology model is precisely designed to represent such complex and hierarchical semantic morpholo-syntactic mappings. Properties of traditional lexical terms are actually distributed across separate lists in the model, each of which is relevant only to a subset of functions of the traditional lexicon. Syntactic primitives (functional or contentful) are ± interpretable feature bundles, and Vocabulary Items pronounce terminal nodes in context only late in the derivation (given their "Late insertion" property). See Halle and Marantz (1993) and Harley (2014), among others, for detail.

Numeral Roots, Categories, and Gender Variation

Numerals as linguistic expressions of numbers appear to be very complex, often heterogeneous, or squishy. But it has been proposed that their computation or derivation (as well as that of numbers) is basically simple, provided we make appropriate use of Merge (Chomsky 2008; Watanabe 2017; presumably in association with Agree). But in fact more complexity is required to build their structure, once we realize that they involve silent nPs, classifiers, SET, number, or even more complex structure, if we include coordination, addition, multiplication, or whatever other operations (Kayne 2003, 2016; Zabbal 2006). Furthermore, distinct structures are involved in *counting objects* and *counting numbers*, as will be shown, in addition to mediating functions of appropriate sorts (Krifka 1989, 1995; Rothstein 2013; Scha 1981; Scontras 2014; Ouwayda 2014, among others), including Gen(der) as analysed here.

Arabic and Semitic numerals are of particular relevance because they manifest a significant range of complexities and variation that can help clarify, once appropriately described, a number of issues in the general structure of numerals. Gen distribution, in particular, is one of the most characteristic and puzzling problems to be solved. For example, why do we need to count numbers in the "feminine" in many Arabic varieties, or why is a number like "3" obligatorily "feminized" in counting numbers, while such a mark is (or can be) omitted when "3" counts objects? What is the nature of "Gender polarity" in Semitic, and is it effective in the latter context, but not in others? Why is the Gen distribution (and function) distinct in ordinals and cardinals? How essential is Gen in characterizing "collective" Slavic numerals?

Taking into account various previous work and insights (Selkirk 1977; Jackendoff 1977; Hurford 1975, 1987; Kayne 2005a–b; Rutkowski 2002, 2007; Ionin and Matushansky 2006; Corver and Zwarts 2006; Rothstein

2017, among others), and given the wide category variation and complexity involved, plus the semi-lexical and squishy status of numerals (not to mention heterogeneity), I assume that numerals have no pre-established "lexical" or "functional" category (be it *n*, *a*, *q*, *d*, or *v*). It is more plausible to think of numerals as born in the computation first as *acategorial roots*. Roots presumably associate first with a *general numerosity sense* (say n), and they are later compositionally "molded" with various categories, positions, and inflections, to derive specific senses (e.g., *single terms*, *cardinals*, *ordinals*, etc.). These various senses and uses are reasonably built by known computational operations such as Merge and Agree, producing various classes or categories, and acquiring various numerous meanings.

This chapter first identifies three kinds of Semitic numerals (*c-numerals*, *n-numerals*, and *o-numerals*) which are associated with three distinct behaviours of Gen (*c-Gen*, *n-Gen*, and *o-Gen*). Second, it describes how salient *numeral senses* can be compositionally built within a *root-category* model of syntax (Marantz 2001, 2005; Borer 2005; Harley 2014, etc.). Third, it discusses how the *Gender polarity* effect and its variation in Semitic numerals can be adequately accounted for. The variation is seen basically as *micro-parametric*, once the locus of variation in the grammar is viewed as (i) the lexicon of morpho-syntactic features, (ii) the vocabulary properties at PF (pronounced or silent; Kayne 2005b; Cinque 1999, 2016; Rizzi and Cinque 2016), but eventually it is seen as *macro-parametric* as well once it is associated with (iii) "purely grammatical" features (Baker 2008b; Longobardi 2003; Longobardi and Guardiano 2009; Roberts and Holmberg 2010). The Slavic *Gen collective* and Gen polarity is discussed in the latter context. On the whole, this chapter is an investigation of how (language) numerosity is built in the grammar, and how Gen contributes to *numeral complexity* as a mediating function.

I will be making use of two essential claims. The first one is, as I have explained, that numerals are first "born" as linguistic expressions of *number*, of type *n*, designed for *counting* or "*cardinalizing*." Their (general) numerosity sense is at the *Root*, √, and their other senses are compositionally derived, through categorization (*n*, *a*, *v*, *p*, etc.) and other combinations (namely with Gen and Num). This claim is original, although it partially converges with Zabbal (2005, 2006). The second claim is that Gen is basically a sort of classifier, or a *mode of expressing quantity* (rather than "sex"/"animacy"). Singulatives, pluratives, paucals expressed by Gen act as *quantity classifiers* (being individuative, group, set, partition, whole, etc.). Convergences on this view are found in recent work by Fassi Fehri (2003–2004, 2016a–c), Manzini and Savoia (2016), Acquaviva (2017), Arsenijević (2016), and Mathieu (2013), among others.

1 NUMEROSITY IN THE ROOT-CATEGORY MODEL

Three main reasons militate in favour of using a root-category model for deriving numerals: (a) they are *polycategorial*, (b) *polysemou*s, and (c) "*specific*."

Often analysed as nouns or adjectives (Hurford 1975; Greenberg 1978; Kayne 2003; Ionin and Matushansky 2006; Zweig 2006; Stavrou and Terzi 2011, etc.), numerals in fact *exhaust* (almost) the whole inventory of "lexical" or "functional" categories (i.e., *p*, *v*, *adverb*, *q*, *d*, etc.) (Selkirk 1977; Jackendoff 1977; Barwise and Cooper 1981; Corver and Zwarts 2006, etc.). They are *polycategorial*, rather than confined to a particular category from which they are derived.

Second, numerals exhibit various senses (*cardinals*, *ordinals*, *nominal*, *fractions*, etc.) (Zabbal 2005, 2006; Wiese 2003; Rothstein 2013, 2017, among others), but they share some *common numerosity core*. Consider the derived words in (1) and (2), from Standard Arabic, which illustrate various uses of numerals:

(1) a. *ṯalaaṯ* 'three' (<u>cardinal</u>);
    b. *ṯaaliṯ* 'third' (<u>ordinal</u>);
    c. *ṯalaaṯ-at* 'three' (natural number, <u>n-term</u>);
    d. *ṯuluṯ* 'a third' (<u>fraction</u>);
(2) a. *ṯaaluuṯ* 'triad,' 'trinity,' etc. (<u>noun</u>);
    b. *ṯulaaṯ-a* 'by three' (<u>distributive adverb</u>)
    c. *muṯallaṯ* 'triangle, triangular, tripled' (<u>deverbal adjective</u> or <u>noun</u>), etc.

In (1), the root *ṯlṯ* appears to be representing the common numeral base, with cardinality "3" as its general meaning of "three-ness, three-some." The infixal vowel pattern (as well as the prefix in 2b) is providing categorical information (*n*, *a*, *adv*), but also specification of the derivative sense dealt with (*ordinal*, *fraction*, *cardinal*, etc.). In order to derive these various combinations and senses, I postulate as a common base a (acategorial) numeral root, then additional senses are combined with the sense of the root base first through categorization, and further through other processes applying after categorization. I see no plausible alternative that dispenses with the acategorial base, starting, for example, with a semantically unspecified root, and coming up with the numerosity sense only at the categorization level.

To add to variation in expressing numerosity, consider the constructions in (3), which illustrate some of the verbal uses:

(3) a. *ʔ-aṯlaṯa*   *l-qawm-u*
          become-three.past the-people-nom
          'The people became three' (<u>inchoative intransitive verb</u>)
     b. *ṯallaṯa*   *r-rajul-u*   *l-ʔamr-a*
          three.gem.past the-man-nom the-matter-acc
          'The man made the act three times'; 'the man tripled the matter,
   multiplied it by three.' (<u>causative recursive verb</u>)

In (3), the verbal forms IV and II may be thought to have a "nominal" *n*
source, and the morphological form contributes category specification as *v*, and
information about aditicity and aspect (as in Hale and Keyser's 2002 L-syntax;
Fassi Fehri 2012). Here again, I see no plausible way to derive the verbal
numeral from another categorial source (say a nominal) other than *v* itself.

Third, numerals exhibit *specific* behaviour when they are associated with
"derivational" or "inflectional" properties (number, gender, definiteness,
case), or enter *agreement* or *case* relations, as goals or probes, etc. (Rutkowski
2002, 2007; Miechowicz-Mathiasen and Dziubala-Szrejbroska 2012; Caha
2015; Fassi Fehri 1980–1981). This is manifested in Arabic by specific
Gen (and Num) behaviour, as we will see in section 2.

This wide range of diverse properties is hardly derivable through an analy-
sis which assumes that numerals are either nouns or adjectives from the start,
or have quasi-similar inflectional structure. That solution is too coarse, as
well as inadequate. In contrast, in the root-category hypothesis, (a) the root
of the numeral is acategorial, (b) the ("lexical") categorization is quasi-open,
and (c) the "extending" inflection categories have their specifics. The hypoth-
esis makes room for the observed wide variations, including the widespread
impression that numeral nPs/DPs are "squishy," "heterogeneous," or "too
complex," in addition to enabling us to understand why some numerals can
only be "feminine," while others can have all genders.

2 Cardinals Counting Objects or Counting Numbers

When they count *objects*, cardinals are constituents of a numeral construction
in which the cardinal is the head of the phrase, and the counted nP functions
as its complement (usually in a construct state, CS). Call it a cardinal nP con-
struction, *CnPC* for short. The constructions in (4) exemplify CnpCs in which
the counted nP is overt (observe the presence/absence of the "feminine"
affix):

(4) a. *ṯalaaṯ-at-u*   *ʔawlaad-in* *jaaʔ-uu*
          three-fem-nom   boys-gen   came-pl
          'Three boys came.'

    b. *ṯalaaṯ-u*   *banaat-in*   *jiʔ-na*   (* *jaaʔ-uu*)
       three-nom   girls-gen   came-fem.pl
       'Three girls came.'

In these constructions, the cardinal is counting *objects*, and the verb agrees with the nP rather than the cardinal. Evidence for this statement comes from the fact that the verb is feminine in (b), while it is masculine in (a). Note also that the variation of the cardinal in gender between (a) and (b) depends on the Gen of the counted nP (which "agrees" in the nP by "reversing" the value of its gender, the so-called "Gender polarity" in Semitic, examined below).

In (5), no counted nP surfaces, but arguments can be provided that an nP is there in the structure, although silent, hence the construction is also a CnPC:

  (5) a. *ṯalaaṯ-at-un*   *jaaʔ-uu* (* *jiʔ-na*)
          three-fem-nom   came-pl
          'Three males came.'
       b. *ṯalaaṯ-un*   *jiʔ-na*   (* *jaaʔ-uu*)
          three-nom   came-fem.pl
          'Three females came.'

I assume then that the silent CnPC in (5) has (a) the same structure as (4), (b) has the meaning of counting objects, and (c) the agreement on the verb there is controlled by the features of the implicit nP (rather by those of the cardinal).

But there is reason to think, however, that the construction in (6), in which the numeral designates number, has no silent nP, hence its structure is not identical to that of (4). It is rather a truly *bare* cardinal construction (CC), with no covert nP, contrary to that of (4) or (5):

  (6) *ṯalaaṯ-at-un*   *t-usawii*   *ʔiṯnayni*   *zaʔid*   *waaḥid*
      (* *ṯalaaṯ-un* * *y-usawii*)
      three-fem-nom   fem-equals two-dual-acc plus   one
      'Three equals two plus one.'

The interpretation here is that the cardinal is counting numbers rather than objects. Call it a *n-term* (or number term). One discriminating behaviour between the bare CC in (6) and the CnPC in (4) and (5) is the nature of agreement found on the predicate. Whereas the agreement in the CnPC can be plural and either feminine or masculine (depending on the features of the counted nP), the agreement in the bare CC (6) is uniformly feminine (it is singular by default Number). Moreover, there is reason to think that the feminine is the "Gen of the numeral" rather than that of any hidden nP around, as

I will explain below. Note that the use of the ungendered form in this context is excluded, as the starred form in parentheses indicates.

2.1 N-Terms Must Be "Gendered"

N-numerals (or terms) are used in counting sequences to designate or *count numbers*, not objects. Their interpretation does not depend on any (overt or silent) nP. They are bare, of type *n*, and they behave like proper names. In Semitic, they are typically distinguished by their Gen. In Arabic varieties, they are formed by suffixing a Gen mark (identical to the feminine *-at*, *a*, or *i*, depending on the variety) obligatorily. In a counting sequence, the only form that can be used is the feminine form. The list of numerals in a counting sequence in (7) is from Standard Arabic (feminine in bold):

(7) *ṯalaaṯ-**at*** 'three,' *ʔarbaʕ-**at*** 'four,' *xams-**at*** 'five,' *sitt-**at***, *sabʕ-**at*** 'seven,'
      *ṯ-amaaniy-**at*** 'eight,' *tisʕ-**at*** 'nine,' *ʕ-ašr-**at*** 'ten'

Its non-feminized (or bare) counterpart in (8) is not appropriate for this use:

(8) * *ṯalaaṯ* 'tree,' * *ʔarbaʕ* 'four,' * *xams* 'five,' . . .

In most (if not all) Arabic colloquials, the situation is the same. Only the marked suffixed form of the cardinal is accepted, the unsuffixed is not. Compare (9a) and (10a) from Lebanese Arabic (LA), or (9b) and (10b) from Moroccan Arabic (MA), for instance (*i* or *a* are feminine markers in bold):

(9) a. LA: *tlat-**i***, *arbaʕ-**i***, *xams-**i***, . . .
      b. MA: *sett-**a***, *sabʕ-**a***, *temny-**a***, . . .
(10) a. LA: * *tlat*, * *arbaʕ*, * *xams*, . . .
      b. MA: * *sett*, * *sabʕ*, . . .

The "feminine" forms in (9) are the only ones available in counting sequences, the ones in (10) are excluded in this context, but possible in the context of counting objects (as we will see below).

2.2 N-Terms Are Feminine Controllers

In the agreement configuration in (6), the n-term is marked as *feminine* (and singular by default), whereas the verb is marked with a feminine prefix. In other words, the verb *agrees* in gender with the numeral (rather than any potentially hidden *n*). But even in cases where the n-term has no overt feminine marker, or it is a complex numeral, with a different gender on each

member of the numeral, it still controls a feminine (singular) on the predicate, as in (11) and (12), respectively:

(12) *ʕišr-uuna* **t**-uktab-u *'20' bi-l-xaṭṭ-i* *l-maġrib-ii, wa* '٢٠'
bi-l-mašriq-ii
twenty-nom fem-writes '20' with-the-script the-Maghribi and '٢٠'
with-the-Mashriqi
'Twenty writes as "20" in the Maghribi (western) script, and as "٢٠" in the Mashriqi (eastern) script.'

(13) *arbaʕ-**at**-a ʕašar-a **hiya** sabʕ-**at**-un maḍruub-**at**-un fii iṯnayni*
four-fem-acc ten-acc she 7 multiplied-fem-nom by 2
'Fourteen is 7 multiplied by 2.'

In (12), the subject "20" has no mark of the feminine, yet it controls a feminine gender on the verb (or the verb agrees with it as such), the masculine there being excluded. In (13), the complex numeral combines two distinct genders, yet the predicate is uniformly feminine. Although more research is needed to explain how gender agreement operates here, it is conceivable to assume that the n-term (whatever its internal structure) is taken to be a sort of "group," and that groups of this sort are seen as "feminine" (see chapters four and five for more about the source of "feminization" in these structures).

This state of affairs contrasts significantly with the situation found in the CnPC counterparts. In the latter, the agreement on the predicate can be *masculine plural*, or *feminine plural*, as in (4) or (5), depending on the phi-features of the nP rather than those of the numeral. In fact, the agreement on the predicate depends on the features of the whole DP, as found in the following constructions:

(14) *ʕišr-uuna rajul-an jaaʔ-**uu** (*jaaʔ-at)*
twenty man-acc came-m.pl. (* came-fem)
'Twenty men came.'

(15) *ʔarbaʕ-a ʕašr-**at**-a mraʔ-**at**-an jiʔ-**na** (*jaaʔ-at)*
four-acc ten-fem-acc woman-fem-acc came-fem.pl. (* came-fem)
'Fourteen women came.'

In these two counting object constructions, there are different genders; one of them at least is a feminine, yet the gender agreement crucially depends on the gender of the noun, hence the masculine predicate in (14), because the noun is masculine, and the feminine predicate in (15), because the noun is feminine.

Note finally that the controller of the agreement cannot be a hidden NUMBER in (12) or (13), as in Kayne (2003), since the latter (i.e., *ʕadad* 'number') is

masculine, whereas the predicate there is feminine. The following construction illustrates gender agreement with "number," in contrast to what happens in the examples mentioned:

(16) *l-ʕadad-u*   *ʕišr-uuna qabil-un (*-at-un) li-l-qism-at-i*
     ʕalaa xamsa-at-in
     the-number-nom 20   able-nom (* fem)   to-the-division-gen
     by   5
     'The number 20 is dividable by 5.'

2.3 N-Terms Are "Classified"

Why, then, are n-terms feminine in Arabic varieties? What is the nature of the Gen form here? There is no reason to think of it as sex or animacy, just as there is no reason to think of it as formal or arbitrary, given the complexity of genders involved in the examples discussed above. I propose that gender here is a sort of *group* (or set) *classifier.* A number of considerations motivate this move, in which Gen is taken to have semantic content rather than being arbitrary or formal.

Quantities, measures, sets are feminine or constructed with a feminine marker in Arabic (or more generally Semitic). The list includes words such as: *kaṯr-at* 'many, multitude, abundance,' *qill-at* 'few, paucity, rareness,' *majmuuʕ-at* 'set-fem,' *ʕidd-at* 'number-fem, several,' etc.). It includes also paucal expressions, which are feminine, or pluratives. In these expressions, the feminine can be seen as contributing some semantics of classification, that of being "group," "set," or modification "paucity," etc. In more simple terms, the feminine is a classifier, in the same sense that it is a classifier with pluratives (as discussed in chapter one). Suppose this is so—that is, suppose the feminine is a classifier of quantities, measures, numerals, or degrees. Then a number of significant gender contrasts can be explained. I will give only few examples below to illustrate (for more detail, see chapter five).

Consider again some agreement properties of the plurative, which can be viewed as a prototype of the group classifiers. As previously observed, when a feminine plurative marker is assigned to nouns, two forms of agreement can be manifested on the agreeing predicate: (a) a feminine (singular), as in (17), which is a true plurative agreement, or (b) a normal plural agreement, as plural masculine, in (18):

(17) *l-xawan-**at**-u*   *kaṯur-**at***
     the-traitor-fem-nom   multiplied-fem
     'Traitors (as a group) became numerous.'

(18) *l-xawan-at-u   kaṯur-uu*
     the-traitor-fem-nom   multiplied-pl (masc)
     'Traitors became numerous.'

In parallel, I assume that some quantifiers like *kaṯr-**at*** 'many, multitude, abundance,' *qill-**at*** 'few, paucity, rareness,' etc., are also classified in a similar way, via the feminine, and they exhibit the same double behaviour, as in the following contrasts:

(19) *qill-**at**-un   mina r-rijaal-i   ḥaḍar-at*
     few-fem-nom   of   the-men-gen   was.present-fem
     'Few of the men (as a group) were present.'
(20) *qill-**at**-un   mina r-rijaal-i   ḥaḍar-uu*
     few-fem-nom   of   the-men-gen   was.present-pl
     'Few of the men were present.'

Note that this double behaviour vis-à-vis agreement, coupled with differentiation in interpretation (namely the "group" interpretation), akin to these sorts of group expressions, is not available for quasi-synonymous expressions in which no feminine is assigned, such as *kaṯiir* 'many,' or *qaliil* 'few,' etc. Thus the feminine counterpart (22) of the masculine (21) is excluded:

(21) *qaliil-un   mina r-rijaal-i   ḥaḍar-uu*
     few-nom   of   the-men-gen   was.present-pl
     'Few of the men were present.'
(22) * *qaliil-un   mina r-rijaal-i   ḥaḍar-at*
     few-nom   of   the-men-gen   was.present-fem
     Intended to mean: 'Few of the men (as a group) were present.'

Likewise, the quantifier numeral *biḍʕ* 'few' behaves similarly to normal numerals in that it exhibits Gen polarity, as shown by the following contrasts, replicating those found in (4) above:

(23) a. *štaray-tu   biḍʕ-**at**-a kutub-in*
        bought-I   few-acc   books-gen
        'I bought few books.'
     b. *štaray-tu   biḍʕ-a   baqar-a**at**-in*
        bought-I   few-acc   cows-pl.fem-gen
        'I bought few cows.'

The "polar" or "reverse" Gen behaviour in the quantifier construction mirrors that found in the numeral CnPC. The behaviour of plurative or group classifiers in (17) or (19) replicates that of n-terms in (6) or (12).

2.4 The "Counting" Verb for Numbers Selects Only Classified Numerals"

The verb "count" in English is ambiguous between counting objects and counting numbers (Rothstein 2013), as exemplified in (24):

(24) a. I counted thirteen (*things*, *books*).
    b. I counted (up) to thirteen (*things).

Moreover, its ambiguity in French is manifested in the distinctive use of the clitic "en":

(25) a. J' *(**en**)   ai   compté treize
      I of-them have   counted thirteen
      'I have counted thirteen (of them).'
    b. J' (*en)   ai   compté jusqu'à treize
      I of-them have counted up to   thirteen
      'I have counted up to thirteen.'

In Arabic, the distinction is captured via the use of the "ungendered" vs. the (overtly) gendered cardinal. Only the gendered cardinal is accepted with the verb counting numbers. The constructions (26) exemplify counting (silent) objects, whereas (27) is dedicated to counting numbers:

(26) a. ʕadad-tu   *t̲alaat̲-an*   (CnPC; object reading only)
      counted-I   three-acc
      'I counted three (females).'
    b. ʕadad-tu   *t̲alaat̲-**at**-an*   (CnPC; object reading)
      counted-I   three-acc
      'I counted three (males).'
(27) ʕadad-tu ḥattaa *t̲alaat̲-at-an*   (bare CC; number reading; * boys;
    **t̲alaat̲-an*)
    counted-I until   three-fem-acc
    'I counted up to three.'

2.5 Definiteness Marking

Counting object expressions differ from counting numbers in terms of the content of (in)definiteness marking. With n-terms, definiteness is

'*expletive*' (or vacuous), as in (28), just like it is with proper names, as in (29):

(28) a. *ṯalaaṯ-**at**-un*   **t**-*usawii*   *2+1*   (* *ṯalaaṯ-un*)
     three-fem-nom fem-equals 2+1
     '3 equals 2 + 1.'

    b. *t-ṯalaaṯ-**at**-u*   **t**-*usawii*   *2+1*   (* *t-ṯalaaṯ-u*)
     three-fem-nom fem-equals 2+1
     '3 equals 2 + 1.'

(29) a. *l-ʔazraq-u*   *mutaġayyib-un*
     the-Azraq-nom   absent-nom
     'Lazraq is absent.'

    b. *zayd-un*   *mutaġayyib-un*
     Zayd-nom   absent-nom
     'Zayd is absent.'

In contrast, (in)definiteness with the CnPC (counting objects) is "semantic" (anaphoric, deictic, indefinite), as is the case with (in)definite descriptions. Compare (30) with (28):

(30) a. *xams-u-n*   *daxal-na*   *l-qaaʕat-a*
     five-nom   entered-fem.pl the-room-acc
     'Five females entered the room.'

    b. *l-xams-u*   *daxal-na*   *l-qaaʕat-a*
     the-five-nom entered-fem.pl the-room-acc
     'The five females entered the room.'

2.6 Cardinal Structures

The differences discussed earlier between expressions counting objects (with the noun complement being overt or silent) and those counting numbers translate naturally into distinct structures. I will first start with the structure of the bare cardinal in (28), which, unlike other numeral constructions, does not involve other external constituents like nouns, adjectives, or quantifiers. In a functional sequence like (31), which represents an ordering hierarchy of the constituents of a nominal spine (proposed in Fassi Fehri [1999] or Cinque [1999]) for normal noun phrases, the sequence does not project NumP (or #P), nor any node that corresponds to GenP that we are in need of:

(31) D > Q > Ord > Card > A* > N

GenP, or its flavour GroupP (or ClP) is then not included in the sequence, and neither is √P. So in order to account for the complex structure of

numerals, we need to refine the functional sequence for n-term expressions like those in (28) by integrating in (31) the following functional sequence

(32) Gen > n > √

NumP or #P are also omitted here but can be projected (see chapter five). What is important is that NumP is kept separate from Ord or Card, which I eventually subsume under the projection NmrP (numeral phrase). I hope to be able to give a plausible sketch of how derivation proceeds for bare cardinals like (28), leaving open the possibility of ordering these elements in various orders.

Starting from "below," a numeral root √ is merged first in the numeral structure, presumably providing some numeral sense (say "thirdness"). Then the root is categorized as *n*, to become an n-term (naming cardinality), or as *a* (adjective), to become an ordinal, etc. The derivation continues by moving *n* to *Gen* (a classifier), which is a group. Being assigned a group feature, Gen can now control feminine agreement, as exemplified there. For ordinal adjectives, Gen is an unvalued feminine (associated with adjectives). Then the n-term has unvalued Def features, which is valued in D. In view of the alternations of definiteness in (30), I assume that these "bare" numerals are DPs, more like proper names (with an expletive article). This structure also parallels that of quantifier phrases or QPs (discussed in chapter four), which are dominated by DPs. The internal structure of the bare numeral is as in (33):[1]

(33)

```
              DP
            /    \
          D      GenP        (= GroupP)
                /    \
              Gen     nP
               |     /   \
              -at   n     √
                    |     |
                  ṯalaṯ  ṯlt ('3')
```
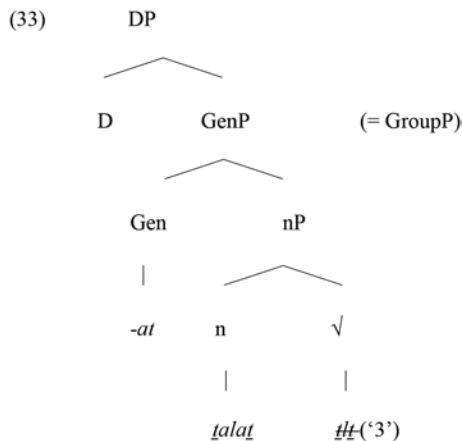
Likewise, in the bare CC (34), a "plural" internal Num is interpreted as "ten," and an external Num surfaces as singular on the predicate (by default), as in the structure (35):

(34) *ṯalaaṯ-uu-na   muštaqq-at-un   min   ṯalaaṯ-at-in*
three-pl-nom   derived-fem-nom from   three-gen
'Thirty is derived from three.'

(35)

```
              DP
            /    \
          D       GenP   (= GroupP)
                 /    \
               Gen     nP
                      /   \
                     n      √
                   /   \    |
                 Num     n   ṯlṯ ('3')
                  |      |
                 -uu    ṯalaaṯ
```
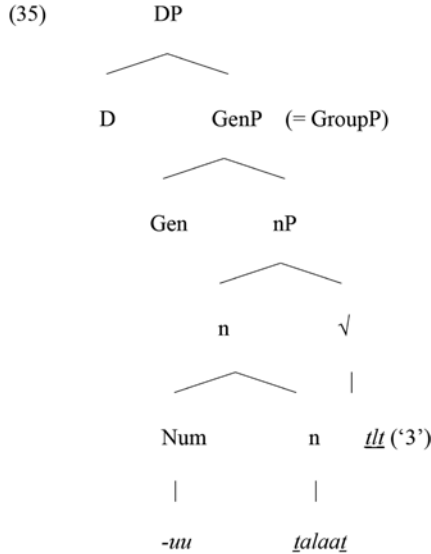
   This example is brought up as just one instance of the complex internal structure of numerals, which involves not only Gen, but also Num. I will not discuss these complexities here. Suffice it to say that these decades are formed by internal pluralization of units, although this process is basically "lexical" and cannot be accessed by syntax.

3 CARDINALS IN CNPC

As mentioned above, cardinals in CnPC count objects, denoted by their nP complement, which is a necessary component of their syntax-semantics. They are characterized by the so-called *Gen(der) polarity* (or "incongruent") agreement (Hetzron 1967; Lecarme 2002; among others) in a CS (construct state) configuration. In addition to these two characteristics, a third essential property of c-numerals is that a predicate constructed with them typically agrees in Gen (and Num) with the nP/DP (overt or silent) rather than with the cardinal itself. These salient properties of cardinal numerals for objects are further explained in this section.

3.1 The Counted nP Is an Essential Component of the CnPC

The cardinal in the CnPC is essentially found in three distinct structures, with distinct derivations.[2] First, it is a head of a construct state (CS):

(36) *talaaṯ-**at**-u*   *ʔawlaad-in*
      three-fem-nom   children.pl-gen
      'Three children'
(37) *talaaṯ-u*   *baqar-aa-t-in*
      three-nom   cows-pl-fem-gen
      'Three cows'

Second, it can head a partitive structure:

(38) *štaray-tu*   *talaaṯ-an*   *mina l-baqar-i*
      bought-I   three-acc   of   the-cattle-gen
      'I bought three (heads) of cattle.'

Third, it can be a post-nominal modifier of the nP:

(39) *l-ʔawlaad-u*   *t-talaaṯ-**at**-u*
      the-children.pl.-nom   the-three-fem-nom
      'The three children'
(40) *l-baqar-aa-t-u*   *t-talaaṯ-u*
      the-cows-pl-fem-gen   the-three-nom
      'The three cows'

Note that all the constructions, and in whatever order, observe the Gen polarity.

3.2 CnPC Structures

Consider now the structure of the CnPC in (37), represented in a simplified (and tentative) form by the tree (41):

(41)   DP

        D   CardP   (or NmrP)

        |
        Ø   Card   nP

            |
        talaaṯ   *baqar-aa-t-*in
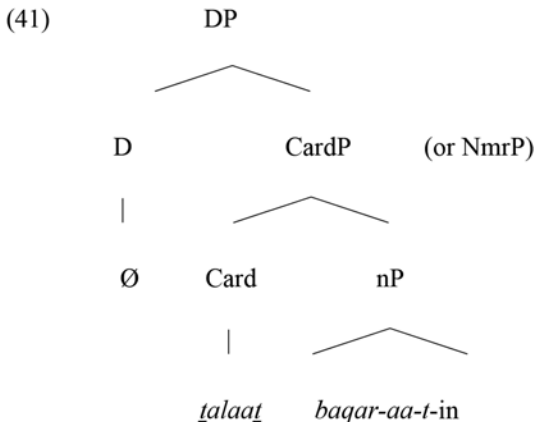
I assume that the cardinal (Card) or numeral (Nmr) is the head of the nominal structure, rather than the noun n (or nP), which is a complement, as motivated by structural case. It is the cardinal, and not the counted nominal, that receives (the external) structural case, as we can see in (35) and (36). The nominal constituent receives an "internal" case, often genitive, as a complement. I put the numeral under Card for the sake of simplifying the tree. But in fact Card, or CardP, has a more granular structure that includes the nP found in (28), in addition to GenP, which projects the classifier. The detailed representation of all these components and their articulation is feasible, but their motivation will take too much space here (see chapter five for more precision).

Contrasting with the numeral CS in (37) is the partitive in (38), the structure of which is represented in a simplified form in (42). Here too, the structure is simplified and tentative:

(42)

```
                    DP
            _____/_____
           /                  \
          D                   NmrP     (= CardP)
          |              _____/_____
                        /              \
          Ø            Nmr             PP
                        |         _____/\_____
                                 /            \
                    talaaṭ     mina l-baqar-i
```
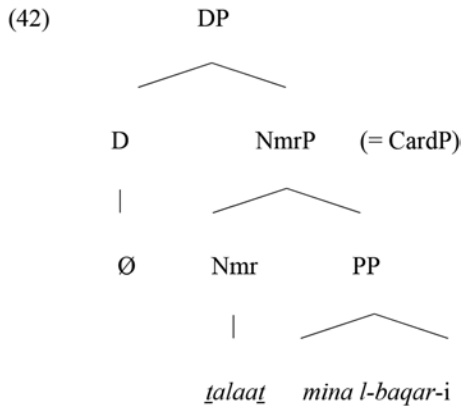
3.3 Gender Polarity

Gen polarity has been conceived by Halle (1994) as a *Gender switch* rule, the formulation of which I simplify in (43):

(43) $[\alpha\text{Fem}] \longrightarrow [-\alpha\text{Fem}]$ / in env. $[X, \_] + \ldots$, etc.

The rule basically inputs a feminine value and inverses its value (from positive to negative, or from negative to positive) in some environment to be defined. But observe first that no motivation has been (or can be) provided for its "gender switch" character, as an alternative to simply having, for example, an unpronounced (or zero) constituent in the unmarked (or ungendered) case (which is taken to be masculine by the author). Second, the rule does not

specify the environments of its applicability (i.e., how would it apply, for example, to complex numerals like 14 or 18, in n-numeral or c-numeral contexts, etc.; see Horesh [2003] for similar criticisms).

I will propose, instead of thinking of this distribution as a sort of (late) gender switch, that the so-called Gender polarity is best seen as non-pronunciation of one member of the Gen configuration. The non-pronounceability is in conformity with the descriptive generalization in (44), and the (tentative) rule (45):

(44) *One pronounced Gen*
      In a nominal construct (or compound), only one Gen is pronounced.
(45) *Unpronounced Gen rule*
      [+ fem] $\longrightarrow$ [Ø] / in env. {_ nP [+ fem]; _ Card [+ fem]}
      (i.e., in front of the nominal CnPC [24], or in front of the complex cardinal [13])

The generalization and the rule receive primary support from the behaviour of Gen in CS like (27) and (28). In (28), the nP is [+ fem], and the cardinal "loses" its gender by rule (41). In (27), the nP has no feminine, and the rule does not apply, and hence the cardinal surfaces as feminine.

The rule also regulates the situation of complex numerals in both SA and dialectal Arabic (DA) n-numeral constructions. In all these varieties, I assume that only one member of the numeral constructions can be gendered at PF. Consider the SA complex numerals of (46), produced in a counting sequence:

(46) *ʔarbaʕ-**at**-a ʕašar, xams-**at**-a ʕašar,   sittat-**at**-a ʕašar, . . .*

The rule applies also here. The unit is gendered, while the decade is not. Likewise, in dialectal Arabic MA (47), the feminine (*-t-*) is compounded on the unit first, then the expression for the decade is attached:

(47) *rbaʕ-**t**-aš,   xams-**t**-aš,   set-**t**-aš,   sbʕ-**t**-aš, tmn-**t**-aš, . . .*
      14, 15, 16, 17, 18, etc.

Similar configurations are found in almost all other Arabic dialects (including Lebanese, Syrian, Egyptian, Iraqi, Yemeni, Jordanian, Saudi, etc.).

In the complex CnPC (13) above, Gen reduction/deletion applies to the complex cardinal, but it does not extend to the whole nP. This suggests that the rule is strictly local, as formulated in (41), and it applies to the first Card when contained in a CnPC. In bare CC, the first member remains untouched, and the rule applies only to the second member.

The unpronounced Gen view (rather than Gen switch) receives further motivation from DA. In colloquial varieties, there is no feminine agreement in Gen between the Card and the counted nP, and no variation in Gen along this dimension. Rather, the relevant dimension or parameter is whether the two constituents are found in a sort of CS or compound nP, as in MA (48), or whether the numeral is in a "free state" (FS), be it pre-nominal or post-nominal, as in MA (49a and b), respectively (*a* for the "feminine" suffix):

(48) *sett   wlad, bnat,   iyyam*
     six   boys, girls, days
(49) a. *sett-**a**   d-l-ewlad,   d-l-ebnat*
        six-fem of-the-boys, of-the-girls
        Six boys, girls
    b. *l-ewlad, l-ebnat,   l-ayyam   s-sett-**a***
       the-boys the-girls the-days   the-six-fem
       'The six boys, girls, days'

A similar situation is found in LA, where the CS cardinal in (46a) is ungendered, whereas the FS cardinal in (46b) is gendered:[3]

(50) a. *xams wlaad, banaat, liir-aat*
      five boys, girls, pounds
    b. *wlaad, banaat, lir-aat xams-**i***
      Five boys, girls, pounds

What the contrasts in (48) to (50) show is that the occurrence of Gen on the cardinal (if one is to call it such, rather than "classifier") is not sensitive to the female/male specification of the nP (which does not matter), but rather to its local distribution inside the CnPC. In a CS distribution, where the cardinal is prenominal and strictly adjacent to the counted nP, Gen on the numeral is absent, or rather pronounced as Ø. But when no adjacency holds between the cardinal and the counted noun, as in (49) or (50b), Gen is overtly realized.

Note also that when a hidden nP is postulated in the colloquials, and the agreement with the external modifier of predicate is feminine, the only possible controller (or "goal") of the agreement is the silent nP, rather than the cardinal, which is invariably "feminine." Thus in MA (51), for example, the variation in Gen on the adjectives cannot find its source in the Gen on the cardinal, but rather in the hidden nP (or the gender/number features associated with it), and this is why (52b), in which the verb agrees with the cardinal, is excluded:

(51) a. *sett-**a***   dkiyy-in
          six-fem   clever-pl (masc)
          'Six clever (males)'
     b. *sett-**a***   dkiyy-aat
          six-fem   clever-pl-fem
          'Six clever (females)'
(52) a. *sett-**a***   ja-w
          six-fem   came-pl
          'Six persons (male or female) came.'
     b. * *sett-**a***   ja-t
          six-fem   came-fem

The essential idea behind our treatment, then, is to unify the treatment of the contrasts in DA with those in SA, namely those in (3) and (4). Rather than thinking of the SA contrasts as arising from an agreement in phi-features between the cardinal and the counted nP, I am postulating that no agreement in the strict sense occurs there. It is only a context where the cardinal may lose its Gen feature, despite appearances, and although SA and DA appear to be different in that the former has a cardinal noun Gen concord (or polarity) rule, while DA does not, it appears more plausible to think that no polarity rule is involved, and only a very local PF rule of Gen "deletion," or non-pronounceability, applies to all varieties. As for differences between varieties, this needs more research and elaboration.[4]

3.4 Hebrew

Hebrew conforms to the general picture given for Arabic varieties, although there are some micro-variational differences. For example, Hebrew also exhibits the Gen polarity, as in the CS cardinals in (53):

(53) a. *šaloš   jelad-ot*
          three   child-fem.pl
          'Three girls'
     b. *šloš-**a***   jelad-im*
          three-fem   child-pl   (masc)
          'Three boys'

In (53a), the cardinal is ungendered with the feminine counted noun, while it is gendered in (53b) with the ungendered noun. Hebrew in this case behaves like a number of Semitic languages (including Somali, described by Lecarme [2002]). But instead of using gendered (or feminized) forms of numerals in counting sequences, Modern Hebrew opts for using ungendered forms

(presumably unlike the case in Classical Hebrew). Hence, only the forms in (54) are appropriately used in counting sequences, whereas the forms in (55) are not used in this context:

(54) *šaloš, arba, xameš, šeš, šev-a, šmone, teš-a*
three, four, five, six, seven, eight, nine

(55) *šloš-**a**, arba'-**a**, xameš-**a**, siš-**a**, šiv'-**a**, šmon-**a**, tiš'-**a***
three-fem, four-fem, five-fem, six-fem, seven-fem, eight-fem, nine-fem

More or less flexibility is found in FS (free state) constructions, depending on whether the language is written or spoken, classical or new. But the system seems to have preserved the core of the Semitic system found in SA, and it evolved like Arabic colloquials in CS and FS distributions, though it introduced more deletion of the classifier in sequence counting.[5]

3.5 Other Languages

Hurford (2001) observes that some languages make morphological distinctions between what he calls *attributive* and *counting* numerals. He provides the instances in (49):

(56) a. Hungarian 2: *ke ´t* (for objects), *ketto* (for numbers)
b. German 1: *ein*, *eine*, etc. *eins*; 2: *zwei*, *zwo*
c. Maltese 2: *zewg*, *tnejn*
d. Chinese 2: *liang*, *erh*
e. Basque 2: *bi*, *biga*

4 ORDINALS

Ordinals behave essentially like adjective modifiers, and the feminine affix is a probe rather than a goal, valued through the Gen value found on the counted nP.

4.1 Agreement in Phi-Features Like Adjectives

The adjective character of ordinals is not disputed, and when Gen (or Num) is found on an ordinal, it is not part of its numerosity (or n character), but just part of its Agree formal features. Like adjectives, ordinals agree with the head noun (or nP) in Gen, Num, Definiteness, and Case. And like other constituents in the DP, ordinals are subject to the DP ordering hierarchy in (57a), the MIO (Mirror Image Order) generalization (57b) applying to post-nominal

constituents, whereas normal attribute adjectives (grouped by the star *) are subject to the ordering hierarchy in (57c). These descriptive statements were originally proposed by Fassi Fehri (1999) for Arabic, inspired by Cinque (1999); see also Shlonsky (2004) on Hebrew:

(57) a. Q > Dem > Ord > Card > A* > N
      b. the hierarchy (a) is respected post-nominally in a Mirror Image Order.
      c. A*: quality> size> shape> color > provenance

    Cardinals, by contrast, do not Agree in Num or Gen with the nP, generally.
    Ordinals have the form of an adjective (the form of a subject participle), while cardinals have the form of nouns or *masdars* (CaaCiC *ṭaaliṭ* 'third' vs. CaCaaC *ṭalaaṭ* 'three'). As an illustration, consider (58) from MA, in which a post-nominal ordinal agrees in Gen with the head noun:

(58) a. *ṭaleb-**a**   talet-**a***
      student-fem   third-fem
      'A third female student'
    b. *ṭaleb   ṭaleṭ*
      student   third
      'A third (male) student'

    In SA, on the other hand, the post-nominal ordinal in (59a) agrees in Gen and case, whereas the pre-nominal ordinal in (59b) agrees in Gen, but not in case, being in a CS configuration with the ranked nP:

(59) a. *ṭaalib-**at**-un   ṭaaliṭ-**at**-un*
      student-fem-nom   third-fem-nom
      'A third female student'
    b. *ṭaaliṭ-u   ṭaalib-**at**-in*
      third-nom   student-fem-gen
      'The third female student'

    As for the post-nominal ordinal, it agrees in SA (60) in number (plural), in addition to Gen, case, and definiteness:

(60) *ṭ-ṭaalib-**aat**-u   ṭ-ṭaaliṭ-**aat**-u*
    the-student-fem.pl-nom   the-third-fem.pl-nom
    'The third female students'

    These properties and others make ordinals clearly adjectival and significantly different from cardinals in their structure. Specifically, Gen is not

playing the same role in ordinals that it plays in cardinals, being a formal feature on the former and a classifier interpretable feature on cardinals. Other differences between the two Gens follow from the difference in status.

4.2 A Distinct Behaviour of Complex Ordinals vs. Complex Cardinals

With complex ordinals, both members of the complex numeral agree in Gen (and Num):

(61) *r-rajul-u   t̲-t̲aalit̲-a   ʕašar-a*
    the-man-nom   the-third-acc   ten-acc
    'The thirteenth man'

(62) *l-marʔat-u   t̲-t̲aalit̲-**at**-a   ʕašr-**at**-a*
    the-woman-nom   the-third-fem-acc   ten-fem-acc
    'The thirteenth woman'

In (62), contrary to (61), you can witness the presence of the feminine mark on both members of the complex ordinal, and there is no value reversal or switch. The situation is completely different with complex cardinals in (63) and (64), in which only one member "agrees," but it "agrees" only in conformity with (44):

(63) *t̲alaat̲-**at**-a   ʕašar-a   rajul-an*
    three-fem-acc   ten-acc   man-acc
    'Thirteen men'

(64) *xams-a   ʕašr-**at**-a   ʔumm-an*
    five-acc   ten-fem-acc   mother-acc
    'Fifteen mothers'

This important difference in distribution of Gen in ordinal and cardinal expressions is presumably due to the nature of the Gen involved. While the distribution of the two overt marks of genders in ordinals is just a standard case of gender agreement, the noun bearing the value feature of gender, and the adjective its unvalued feature, the reason behind the non-overtness (or absence) of the mark of Gen is more difficult to determine, although we have identified it just as absence of pronunciation. This means that there is no agreement there in the strong sense, by which a gender value of one member is replicated on the other member. If we think of it as "agreement" in some non-standard sense, it is just a form of "complementary distribution" of the two realizations rather than value matching.[6] The situation in (59) and (64) is expected, given that the upper gender (on the unit member) is externally controlled (within the DP), as is the Gen of normal adjectives, according to

the rule (45), and hence unpronounced. The lower feminine is distributed just as in Arabic (37), or Hebrew (53).

4.3 Structure of Ordinals

As an illustration of the structure of ordinals, consider the construction (59a) above, in which the ordinal is post-nominal. Keeping in mind the bases of order and placement in the Arabic nominal DP, argued for in Fassi Fehri (1999), I propose a simple structure of this construction in (65):

(65)

```
                          DP
                    ┌──────────┐
                    D          nP
                    |      ┌────────┐
                    Ø   ṭaalib-at   OrdP        (or NmrP)
                      (valued) [+Fem]  ┌───────┐
                                      Ord      √
                                       |       |
                                    ṭaaliṯ-at  ṯlṯ ('3')
                                  (unvalued) [+Fem]
```
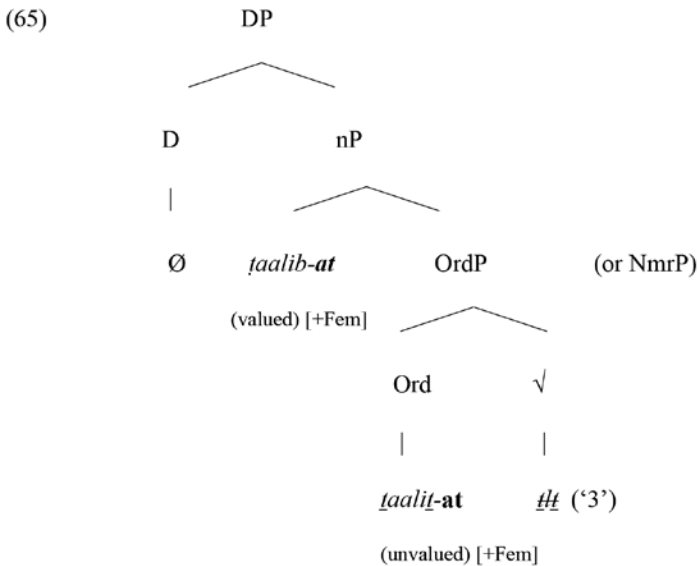
Here, Gen is represented as a feature on the gendered noun, which is valued on it, and unvalued on the ordinal adjective. Gender Agree (in addition to Num Agree) then applies in a normal way, unlike what happens with cardinals.

5 SLAVIC AND THE GRAMMAR OF COUNTING

The triple taxonomy of numerals has its manifestations in Slavic. O-numerals are more "adjectival" than c-numerals. Ordinals normally agree in Gen, whereas cardinals do so only marginally. N-numerals are found with their own characteristic Gen (although not so productively). Moreover, distinctions of collective numerals are based on Gen values.

5.1 The Triple Taxonomy

In Polish, non-virile unmarked forms are used (in contrast with o-numerals and c-numerals; Wagiel 2014; also p.c.):

(66) *jeden* 'one,' *dwa* 'two,' *trzy* 'three,' *cztery* 'four,' *pięć* 'five,' etc.

In Czech, the feminine (marked) forms of "1" and "2" are strongly preferred in the counting sequence (Gen not being transparent with high numerals):

(67) *jedna* 'one.fem,' *dvě* 'two.fem,' . . .

This micro-variation in Gen distribution between Czech and Polish recalls that found in Semitic between Arabic and Hebrew varieties, respectively.[7]

What is more productive, though, in Slavic is the use of Gen to distinguish three kinds of so-called "collective numerals." The latter offer a fine-grained taxonomy of c-numerals, based on the value of Gen: (a) neutral, (b) fem, and (c) variable. The examples are from the Bosnian-Serbo-Croatian variety (Kim 2009; Lučić 2015), but comparable contrasts can be found in Polish or Russian:

(68) *collective numerals*: neutral Gen (singular)
     dvoje djece 'two children'; *troje ljudi* 'three people'; *troje teladi* 'three calves'; *petero putnika* 'five travellers'
(69) *numerical adjectives:* variable Gen (exclusively plural)
     dvoji,-a,-e 'two,' *troji,-a,-e* 'three,' *peteri,-a,-o* 'five';
     dvoje čarape 'two pairs of socks'; *troji svatovi* 'three groups of wedding guests';
     petora vrata 'five doors'; groups: *svatovi* 'wedding guests';
(70) *numerical nouns*: feminine (singular, ending in *-ica*)
     dvojica braće 'two brothers'; *trojica igrača* 'three players'; *petorica putnika* 'five travellers.'

The triple taxonomy as qualified is based on category features. But a more elaborated classification can be based on the properties of Gen itself.[8]

5.2 Number and Numeral Complexity

Chomsky (2008) assumes a set-theoretic view of natural number and proposes to implement its discrete infinity via Merge. Watanabe (2017) provides a concrete detailed implementation of Chomsky's view, which is worth pursuing but has to be refined.

In Watanabe (2017), number computation operates basically as in (71):

(71) 1 = {one}, 2 = {one, {one}}, 3 = {one, {one, {one}}}, etc.

Lexical information takes the form in (72):

(72) a. set-theoretic conception (meaning)
           1 = {i}, 2 = {i,{i}}, 3 = {i,{i,{i}}}
      b. actual counting sequence (phonology)
           1 = one, 2 = one, two, 3 = one, two, three

Linearization is captured by *deletion*, as in (73):

(73) a. ~~one~~, two
      b. ~~one, two~~, three
      c. ~~one, two, three~~, four

Kayne (2016, 12) observes that a "smooth generation . . . via Merge . . . is not appropriate for the language faculty, . . . not for numerals . . . associated with nouns or noun phrases. . . . [They] never involve direct merger of numeral and noun." The room for Gen in numerals as a "mediator" is to be found in this more complex view.[9]

6 CONCLUSION

In this chapter, I have shown that derivations of counting numbers and counting objects are complex and distinct, and that Gen and Num peculiarities of numerals in Semitic and Slavic varieties suggest much further elaboration of numeral grammar that just smooth Merge of Numbers. This is why "3" in Semitic is 3-GROUP, or 3-SET, and collective "3" in Slavic has more internal peculiar makeups of GROUP.

On the whole, the chapter has provided a sketch of the design of the grammar of numerals, based on a root-syntax model. It has focused on the important role played by Gen, namely in shaping the numeral taxonomy. In Semitic, n-numerals (counting numbers), c-numerals (counting objects), and o-numerals (ranking objects) have distinct n-Gen, c-Gen, and o-Gen manifestations. In Slavic, a triple taxonomy based on Gen distinctions is also found, although it is more salient with collective numerals than it is with normal numerals. As for Gen polarity, which appears to be characteristic of Semitic (compared to Romance, Germanic, or Slavic, where it is not found), it has been suggested that it is better formulated as a rule

of pronunciation, rather than a switch gender rule. Such a characteristic of Semitic, expressed namely by the limitation in (44), has the flavour of being "macro-parametric."

NOTES

1. Alternatively, there is double Gen projection (or "stacked" Gen) involved there, because presumably it is not the internal Gen of the cardinal that controls the agreement on the predicate, but rather an external Gen of the whole nP, which is feminine, and which does not depend directly on the internal Gen of the cardinal. This multiple layer hypothesis of Gen has been motivated in Fassi Fehri (2016a–b).

2. See Fassi Fehri (1999, 2016a–c), Borer (1999), Shlonsky (2004, 2012), and Sichel (2002) for various issues surrounding the nominal architecture of the Semitic DP. See also Longobardi (2001) and Siloni (2001).

3. For more detail on these pairs in LA, see Cowan (1972). Similar pairs are found in Modern Hebrew; see Bolozky and Haydar (1986). My numerous informants of a number of colloquial Arabic varieties, including Maghribi (Western) and Machriqi (Eastern) dialects told me that the same generalization holds there.

4. Clearly, (44) and (45) are in need of more refinement and contextual specification. Being formulated as PF rules, they seem to be contradicted by examples like that in (i), in which both members of the numeral phrase appear to realize Gen:

(i) *sitt-**at**-u*   *tawaqquʕ-aat-in*   *(?? sitt-u)*
    six-fem-nom   expectation-pl-gen
'Six expectations'

As a blind application of the rule in (45), we expect the ungendered form (in parentheses) to be the more appropriate to use here, contrary to what we find. One can save the rule by making this feminine distinct from other feminine. It seems to be part of the plural morpheme rather than a plural + feminine, as in the case of *tuffaaḥ-aat*, apple-fem-pl, 'apples.' By contrast, *tawaqquʕ-aat* cannot be so decomposed. See also more details in fn. 7 below, including the conditions of this deletion, which can be taken as a form of syntactic haplology.

5. This is a tendency and a simplified picture, because facts are often either disputed or less homogeneous. There is also some fuzziness in describing how the complex numeral system distributes gender realization. For more detail, see Horesh (2003) and Gonen (2015), among others.

6. Rather than agreement here, we may think of this complementary distribution as a form of syntactic haplology, in which repetition of identical morphemes in a specified context triggers a "deletion" of one of the two ("offending") morphemes found close to each other in a local environment. See Neeleman and van de Koot (2006) on Syntactic Haplology as a strategy to avoid repetition of identical morphemes, with identity understood in terms of phonological form rather than strict identity. That makes room for treating the classifier and the gender here as identical, although they do not have the same status in the grammar.

7. Caha (2015) tackles the intricacies of case variation in Czech numerals by implementing its semi-lexicality through (a) complex lexical entries that combine their lexical (n) parts and their functional (numeral) parts, and (b) combined processes of (case) agreement and ellipsis, which are the blocks of "case attraction." But he does not deal with variation in Gender.

8. Indeed, Arsenijević (2016) very recently argued that Gen is a grammaticalized classifier in Serbo-Croatian, and its role in numerals is to specify the type of partition of atomic structures.

9. With *one*, there is a classifier, and the necessary presence of *single/only* (pronounced or silent). "With 2–4, coordinate structures are involved. With 5 on up, silent SET is necessarily present, in addition to whatever structure is required to express addition and multiplication and powers of the numerical base" (Kayne 2016).

Chapter 4

Quantifier Phrases, Their Features, Types, and Partitions

Arabic Quantifiers raise a number of descriptive, comparative, and theoretical issues that are only partially touched upon in the current modern linguistic literature, and they are hardly dealt with in their vastness and diversity. My purpose here is first to provide some firm and minimal descriptive base of the grammar of the Arabic quantifiers, which investigates some of the most salient dimensions of their morpho-syntax, interfaced with semantics, based on their distribution, category, features, and scope construal. Second, I will show how the inflectional ingredients in the extensions of the quantifier (including Definiteness, Number, and Gender, in addition to Case and Agreement) and its dependents (specifically its complement or specifier) contribute to build the various specific interpretations of Arabic quantifiers, including their scope. In other words, the essential focus will be on how Q (or QP) with other functional elements in the DP cartography (or architecture) are constructed and (compositionally) interpreted. The study will hopefully contribute to provide a much broader view of the relevant internal syntax of quantifiers cross-linguistically, including the "lexical" vs. "syntactic" quantifier variation (instantiated by English vs. Arabic Qs).

From the start, English and Arabic appear to be very different (as is French). *All books*, *some man, some men* have no real, exact counterparts in Arabic. They differ in the overuse in Arabic of the *definite* marker in all of these constructions, in appealing to *case* (genitive or other cases), and in distinct uses of *plural* on the nP complement. Regarding the list of vocabulary items or inventory, English uses three quantifier vocabulary items (*all*, *each*, and *every*), where Arabic uses only one, *kull*. But despite this difference in the quantifier inventory, and the more elaborate use in Arabic of overt functional

markers or features to build equivalent meanings, I hope to be able to show that Arabic and English have essentially the same quantifier structures, contrary to appearances. To enlarge the range of cross-linguistic variation, one would hope to arrive at a picture in which English, Arabic, and Salish have similar structures although using various grammatical devices or strategies to arrive at similar results or meanings.[1]

It has been pointed out by Beghelli and Stowell (1997; hereafter BS) and Szabolcsi (1997a, 2010) that Q types, and their differences in scopal properties or interpretations, can be handled through distinct syntactic features, and feature checking theory is the right mechanism to handle what is at stake in quantifier positions or interpretations. Hence, given some feature F on Q, say [± dist] (for distributive), that feature is checked in relation to a Spec, in which a Dist QP is found. The Dist complement (or Dist "share") also plays a crucial role in the Dist configuration. The Dist feature is used as a Q-specific feature for Q typing, since only some Qs can be distributive. Other authors have proposed that other features of Qs are needed to decompose Q-words.[2] I will concentrate the discussion on the [±definite] and [±singular] features, in addition to [± distributive] and [± partitive]. This chapter assumes the Probe-Goal theory of Agree for regulating internal and external features of Q and its complement and contributes to clarify which of these features are assigned to Q and which to its complement (or restriction). In particular, Q is shown to have basically no phi features, and agreement in gender and number are (normally) triggered by its complement. In particular, the role of a hidden *n* (equivalent to the overt "one," *waḥiid*, which is variable in gender and number) is shown to be behind gender and number variation rather the Q *kull*. It is also shown that the various patterns of QP structures (construct states [CS], quasi bare QPs, and partitives or peuso-partitives) are amenable to a general form of partitivity, or PartP structure.

1 POLYFUNCTIONAL *KULL,* PART/WHOLE QUANTIFIERS, AND FEATURES

1.1 Distributive and Non-Distributive Uses

Consider the universal quantifier *kull*, the most studied quantifier in the literature about quantifiers in Arabic (and Hebrew). Most scholars have concentrated their efforts on describing its properties as a *collective* universal Q, a counterpart of English *all*, and only a few have addressed its (ambiguous) *distributive* character, as a counterpart of English *every*. The collective/distributive contrasts in *kull* uses can be illustrated by the following pair of constructions:

(1) *ʔakala kull-u ṭ-ṭullab-i dajaajat-ayni*
ate all-nom the-students-gen chicken-dual.acc
'All the students ate two chicken.'

(2) *ʔakala kull-u ṭ-aalib-in dajaajat-ayni*
ate every-nom student-gen chicken-dual.acc
'Every student ate two chicken.'

In (1), the totality (collection, or sum) of the students may have eaten only two chickens in total, which means that the universal Q scopes over the indefinite in object position, or the students may have eaten more than two, if at least one student ate two chickens separately, while other students ate another two (or more). The former interpretation is not possible in (2). If the total number of students is three, then the natural interpretation of (2) is that six chickens have been eaten. I will associate temporarily (*strong) distributivity* with Q in (2), which can be seen as the *distributor* (or distributor-key in the distributive configuration), because only there is the distributive interpretation obligatory, and a hidden adjective *different* may modify the *distributive share*, the object DP (although see below for more clarification and refinement). On the other hand, Q in (1) does not force this reading. It is basically non-distributive or *collective*, or only weakly distributive. Other tests and properties can establish this essential distinction of quantifiers (see below). But while the distinction in English appears to be encoded lexically on separate vocabulary words (*all*, *every*, and *each*), it is driven in Arabic by distinct syntax, given that there is only one word *kull*. I will return below to this variation.

1.2 Grammatical and Lexical Uses of Q Words

Note that *kull*, as a noun, means "whole," and as such does not have any of the grammatical (or functional) properties of quantifying Qs to be discussed, including scope and distributive meaning. Such a lexical use is illustrated in the following construction:

(3) *l-mašruuʕ-u kull-un laa y-atajazzaʔu*
the-project-nom whole-nom not 3-divide
'The project is an indivisible whole.'

When talking about wholes and parts, the counterpart of the noun *kull* is *juzʔ* ("part, portion"), as in (4):

(4) *juzʔun mina l-mašruuʕ-i jaahiz-un*
part-nom of the-project-gen ready-nom
'A part of the project is ready.'

Contrary to *kull*, *juzʔ* is not used as a grammaticalized quantifier. Instead, it is rather *baʕḍ* that is used, an item that also means "part," or "portion," and which represents the existential counterpart of the English *some*. For example, the existential Q in (5) is expressed by *baʕḍ*, in parallel to the universal Q in (1), and not by *juzʔ* (although the two words are synonymous in their lexical uses):

(5) *ʔakala baʕḍ-u   ṭ-ṭullaab-i   dajaajat-ayni   (* juzʔ-u ṭ-ṭullab-i)*
    ate   part-nom the-students-gen chicken-dual.acc
    'Some of the students have eaten two chicken.'

These distributions and properties, in addition to others (as will be explained throughout the chapter) make the Q word semi-lexical (or semi-functional) (i.e., part of the functional lexicon rather than part of the content lexicon [or the lexicon of concept words]). Moreover, due to their semi-functionality, Qs like *kull* or *jamiiʕ* "all" do not inflect—for example, for phi features, gender, or number—like normal nouns do (as I will show below), nor can they qualify as (nominal) *roots*, from which various categories can be formed (verb, adjective, etc.), as usually happens with nominal roots.[3]

1.3 (In)definiteness and Number

There are grammatical features of Q, or its quantified nP/DP complement, that condition each use. For example, Gil (1995) claims that it is the singular morphology (or morpho-syntax) of the quantifier expression (in the Hebrew *kol*) that is crucial for building distributivity. But Fassi Fehri (1999) argues that it is *(in)definiteness* that is more relevant (in Arabic). He then provides examples of distributives with dual and plural indefinite nPs, in addition to singular ones like (2), as in the following constructions:

(6) *y-aqifu kull-a   mitr-ayni*
    3-stop   every-acc meter-dual.acc
    'He stops every two meters.'
(7) *y-aʔtii kull-a   ṯalaṯat-i ʔasaabiiʕ-a*
    3-come every-acc three-gen weeks-gen
    'He comes every three weeks.'
(8) *n-aštaġilu fii kull-u   ʔayyaaam-in muʔadd-aa ʕan-haa*
    we-work in every-nom days-gen   paid   on-them
    'We work on all paid days.'

For both authors and others (see, e.g., Hallman 2016), however, it is understood that the inflectional features Def and/or Num on Q or its nP/

DP complement are playing an important role in "composing" the interpretation. I will return later in this section to make the role of each of these features in the composition precise.[4]

1.4 When *Kull* Is Equivalent to *Each*

In addition to being equivalent to *all* and *every* in English, *kull* also expresses the meaning of *each*. None of the descriptions I came across raises the question whether *kull* in Arabic (or *kol* in Hebrew) can be the equivalent of *each*, the most distributive quantifier in English. I will show that it is, and that there is, in fact, a constructed counterpart of *each* for *kull*. It comes through a *partitive* structure, as illustrated in the following constructions:

(9) *kull-un   min-naa waaʕin bi-haaḏaa*
     each-nom of-us   aware   of-this
     'Each of us is aware of this.'
(10) *kull-un   min Zayd-in wa-Aḥmad-a,   wa-Hind-in   waaʕ-uuna*
     bi-haaḏaa
     each-nom of   Zayd-gen and-Ahmad-gen and-Hind-gen aware-pl.nom
     of-this
     'Each of Zayd, Aḥmad, and Hind are aware of this.'
(11) *kull-un   mina n-nuzalaaʔ-i   waaʕin bi-haaḏaa*
     each-nom of   the-inhabitants-gen   aware   of-this
     'Each of the inhabitants is Zayd aware of this.'

In these constructions, which are all *overt partitives*, the complement of the preposition is definite (being a pronoun, a proper name, or a definite noun phrase). Such a definiteness restriction is known to apply to partitives (being akin to the Partitive Constraint).[5]

In Stowell (2013), five major syntactic environments of *each* are identified (abstracting away from its occurrence in the reciprocal form, *each other*). These distinct varieties include: *determiner each* in (12), *partitive each* in (13), *pronominal each* in (14), *floated each* in (15), and *binominal each* in (16):

(12) *Each* boy has read three books.
(13) *Each* of the boys has read three books.
(14) The boys are very proud of themselves. *Each* has read three books.
(15) The boys have *each* read three books.
(16) The boys have read three books *each*.

Of these five varieties, three are worth comparing to Arabic *each*, expressed through a variety of *kull*, other cases being expressed by various

other means, including the use of *waaḥid* 'one.'[6,7] Floating and pronominal *kull*$_{ea}$ are exemplified in (17) and (18), respectively, whereas the partitive has already been illustratred through (9) to (11) above:[8]

(17) a. *ṣṭaffa   l-ʔawlaad-u   kull-un   (min-hum) fii s-saaḥati*
             lined.up   the-children-nom each-nom (of-them)   in the-yard-gen
             'The children lined up each in the yard.'
       b. *l-ʔawlaad-u   y-aḥmilu kull-un   ḥaqiibat-an*
             the-children-nom   3-carry   each-nom   bag-acc
             'The children are each carrying a bag.'
(18) *l-ʔawlaad-u   ṣṭaff-uu   fii   s-saaḥat-i.*
        the-children-nom   lined.up-pl   in   the-yard-gen
        kull-un   (min-hum)   y-aḥmilu ḥaqiibat-an
        each-nom   (of-them)   3-carry   bag-acc
        'The children lined up in the yard. Each (of them) carries a bag.'

In fact, even these varieties lend themselves to a unified analysis, being all derivable from a partitive structure, with the prepositional complement Part DP (or PartP for short) being hidden in some cases. The structure of *kull* with its complement is roughly as follows (tentative):

(19) $_{DP}$[Q $_{PartP}$[Part DP]]

In other terms, I assume that the QP interpretation of the Arabic *each* in the above constructions, say *kull*$_{ea}$, in contrast to the *all* interpretation in (1), derives from a partitive structure of an appropriate sort, while presumably that of *kull*$_{al}$ does not necessarily do so. As a matter of fact, suppose that *kull* is a functional head that denotes either a "whole" or a "part" in a part-whole relation articulated in a PartP configuration. *Part* licenses two arguments, the whole (DP) and the part (DP), two related sets. Thus, although *kull*$_{ea}$ and *kull*$_{al}$ are homophonous, they do not license the same structures, and their differences are driven from these distinct structures. If so, then the same reasoning will apply to *kull*$_{ev}$ (as 'every'), which should be able to give rise to a third distinct structure. As we will see, the (in)definite feature, in addition to the number (singular or plural) feature, is playing an important role in singling out the relevant structure for *kull*$_{ev}$.

1.5 The Universal/Existential Dimension

An essential garden-variety distinction in quantifiers is that made between the universal ∀, represented in English by three Q vocabulary items (*all*,

every, and *each*) and a unique item in Arabic (*kull*), and the existential ∃, represented by *some* in English although with no totally exact counterpart in Arabic. Consider the following examples (from McCawley 1981, 102):

(20) a. Some man admires Hitler.
     b. Some men admire Hitler.

It is quite impossible to get the same meaning or its exact counterpart in Arabic via the closest candidate to *some*, namely *baʕḍ*. The return of the translation of *some* in (21) has different properties from those found in (20), typically when we consider the properties of the quantifying DP expression:

(21) a. *baʕḍ-u*   *r-rijaal-i*   *muʕjab-un*   *bi-Hitler*
        some-nom   the-men-gen   admiring-nom   with-Hitler
        'Some man admires Hitler.'
     b. *baʕḍ-u*   *r-rijaal-i*   *muʕjab-uuna*   *bi-Hitler*
        some-nom   the-men-gen   admiring-pl.nom   with-Hitler
        'Some men admire Hitler.'

English and Arabic share the property that the predicate agrees in Number with the subject, depending on whether it is singular or plural. But they differ in two important respects, regarding the properties of the Q complement. In English, it is uniformly indefinite, and it varies only in Number. In Arabic, it is uniformly *definite*, and it is invariably *plural* in both structures. These contrasts suggest at first sight that the value of the definite feature does not play an important role in characterizing the structure, since it can be indefinite in one language and definite in the other. On the other hand, the number feature is not discriminative either, since both singular and plural values are found in English in both constructions, depending on interpretation, and only plural is found in Arabic in both constructions. At any rate, *baʕḍ* appears to be different from *some*, at least in terms of the characteristics of its complement (its uniform plural and definite features).

To solve the problem, we have to examine more closely how the two features under discussion operate in these structures, beyond superficial appearances. We then need to answer the following questions:

(a) Regarding Number, what is the source of its variation on the predicate in the two constructions?
(b) Regarding definiteness, how can the Arabic QP be interpreted as existential or indefinite, and close to its English counterpart, although its complement DP is always definite? Is it conceivable to think of a complement structure of Q there as being indefinite as well?

With respect to question (a), the answer for English could be that the value of number on the predicate is transmitted from the complement of Q (by whatever mechanism). Such an answer is apparently not valid for Arabic, given the uniformity of Number in both constructions. Some other source must then be found to be the Goal (or controller). It could be Q itself, or some hidden *n*, which is a complement of Q. If Q or some hidden *n* (in the complement of Q) is marked as singular, then it can control the singular agreement on the predicate in (21a). As for (21b), its plural can find its source in the complement (as a sort of "semantic" rather than syntactic agreement), but also in some hidden *n*. If so—that is, if there is a hidden *n* that takes care of singularity and plurality contrast in (21)—what is the potential source of indefiniteness of the "part" constituent needed, although the complement DP is definite in both cases? That is question (b).

With respect to question (b), it is possible that the QP as a whole is not definite after all, and there is no inheritance of definiteness from its complement in the CS. Such an analysis would have the advantage of making the two quantifying structures equally indefinite in both Arabic and English. As a matter of fact, suppose that the structure of the QCS in (21) is in fact a partitive structure, the internal architecture of which is (22a) rather than (22b), a repetition of (19) above:

(22) a. $_{DP}[_{QP}\,[Q\,_{nP}\,[n\,_{PartP}[Part\,DP]]$
     b. $_{DP}[Q\,_{PartP}[Part\,DP]]$

In (22a), a hidden *n* is assumed to be heading the nP complement of Q, which contains also PartP as its complement. Moreover, there is a DP complement of Part. In this plausibly standard partitive structure, two DPs are involved, and they are providing two sources for the (in)definite feature. Then Q or its *n* correlate can be indefinite there, despite the definiteness of the lower DP. This makes the structure of (21) exactly parallel to that of the overt partitive structure, as illustrated by (23):

(23) a. *baʕḍ-un   mina r-rijaal-i   muʕjab-un   bi-Hitler*
        some-nom of   the-men-gen admiring-nom with-Hitler
        'Some of the men admires Hitler.'
     b. *baʕḍ-un   mina r-rijaal-i   muʕjab-uuna   bi-Hitler*
        some-nom of   the-men-gen admiring-pl.nom with-Hitler
        'Some of the men admire Hitler.'

Furthermore, the analysis provides a potential solution for the source of Number on the predicate Probe: *n* (or nP) may now project its own Number, which is freely specified, but it may get valued (presumably in Num or D)

depending on the Q interpretation. This is in fact the reason why (22a) is to be preferred over (22b). Since there is reason to think that Q does not inflect for Number (as we will see below), it is natural that *n* be the source of the Number feature needed rather than Q.[9] If this is so, then the constructions of (21) turn out to have interpretations that are close or similar to those of (20), due to presumably similar structures that crucially induce indefiniteness. The structure (22a) may not be an option across the board for all QCS expressions (at first sight, at least), and further examination and elaboration are needed, as we will see in the next subsections.[10]

1.6 The Relevance of (In)definiteness

Let us turn now to cases where the Q involved in the CS is a universal. Consider the following contrasting sentences:

(24) ṣṭaffa   kull-u   l-ʔawlaad-i   fii   s-saaḥat-i
     lined.up   all-nom   the-children-gen   in   the-yard-gen
     'All the children lined up in the yard.'

(25) ṣṭaffa   kull-un   mina   l-ʔawlaad-i   fii   s-saaḥati
     lined.up   each-nom   of   the-children-gen   in   the-yard-gen
     'Each of the children lined up in the yard.'

The two sentences appear to be semantically equivalent, although they are not. Syntactically, the QP is a CS in (24) but an overt partitive structure in (25), a PartP. Since CSs can also be interpreted as partitive, as we have seen for the existential Qs above, is there a reason not to attribute a partitive structure to (24) as well, more or less like that of (25), or even more closely to that of (21), as in (22a)? Note that the genitive case in the CS is ambiguous in marking either a possessive or a partitive. Recall also that I assumed in chapter three that numeral CSs can also be treated as equivalent to partitives (or pseudo-partitives).

Observe, however, that the constructions in (24) and (25) differ in two important respects. First, *kull*$_{al}$ is the only available interpretation for (24), while *kull*$_{ea}$ is the only available interpretation for (25). It is conceivable that the difference in meaning between the two constructions is related (at least partially) to the contrast in (in)definiteness found there: whereas the QP in (25) is (necessarily) indefinite, that in (24) is definite. This suggests that the Q head in (24) may have inherited definiteness (from its complement) in the CS configuration (as is normally possible in a number of other CS cases).[11]

To see even more clearly that the definite feature is the most determinate for the *all/each* interpretation, consider quasi-bare Qs like the following:

(26) *l-kull-u   y-uġannii*
    the-all-nom   3-sing
    'All are singing.'

(27) *(n-naasu)   kull-un   y-uġannii*
    (the-people)   each-nom   3-sing
    '(The people) each is singing.'

The constructions represent a minimal contrast in terms of (in)definiteness. In (26), in which *kull* is definite, the only interpretation is *all*, the whole; it cannot have the *each* interpretation. In (27), the construction *kull* has only the *each* interpretation, and it is important to observe that $kull_{ea}$ can only be indefinite. The importance of the definite feature in bringing up the relevant *all* interpretation in (26), in addition to the fact that *kull* in the CS in (24) can have only such an interpretation, strongly suggests that *kull* there has "inherited" definiteness from the overtly definite DP complement. If so, the essential feature of the contrast between the universal collective and distributive Q is definiteness rather than Number (or singular). Recall also the distributives in constructions (6) to (8) above, which are non-singular. Likewise, the collective universal QP expression can also be contrasted with the existential QP in terms of Definiteness, if both are partitives with two DP constituents, and the upper DP is definite with the universal collective and indefinite with the existential.[12,13]

1.7 Number and Phi-Features

Back to the collective/distributive contrast, we can observe that the *all* vs. *each* interpretation is also associated with a distinct behaviour with respect to Number and phi-features. For example, the singular agreement on the predicate in (26) has a plural alternate in (28):

(28) *l-kull-u   y-uġan-uu-na*
    the-all-nom   3-sing-pl-ind
    'All are singing.'

But a plural predicate is not an option for the distributive, hence the ungrammaticality of (29), the plural alternate to (27):

(29) * *(n-naasu)   kull-un   y-uġan-uu-na*
    (the-people)   each-nom   3-sing-pl-ind
    '*(The people) each are happy.'

The alternation in agreement between (26) and (28) is known to be akin to groups, where the group DP controls either singular or plural

agreement. By contrast, the indefinite *kull* does not permit the plural/singular alternation on the predicate, as the ungrammaticality of (29) indicates. Why is it, then, that *al-kull* (behaving like a group) can trigger either a singular or a plural agreement on the predicate, while *kull-un* is limited to the singular?

In order to understand how agreement is licensed in some of these structures but not others, we need to be precise about the contribution of each constituent of the QP expression in terms of phi-features. The constituents I have in mind are: Q, n, and the nP/DP complement in the PartP, in addition to the upper DP. It can be shown that each of these components can affect the kind of agreement involved. It is then only by clarifying the contribution of each that we can reach an adequate analysis of the contrasts.

Contrasting with (26) and (28) above, the construction (30), in which the predicate is feminine (singular), is ungrammatical:

(30) * *l-kull-u   t-uġannii*
     the-all-nom   fem-sing
   '*All (female) is singing.'

In other words, *kull* (in its 'whole' meaning) behaves like masculine groups, but not like feminine groups or pluratives (which are felicitous in this context).

Observe also that the feminine plural is felicitous, as in the construction (31), when the there is a (overt) plural nP complement:

(31) *kull-u   l-fatayaat-i   y-uġann-iina*
    all-nom the-girls-gen 3-sing-fem.pl
   'All the girls are singing.'

Likewise, in the case of the indefinite, while the unfloating QP with a feminine plural predicate in (32) gives rise to a grammatical construction, the floating indefinite in (33) is ungrammatical:

(32) *kull-u   fatayaat-in y-uġann-iina   mujtahidaat-un*
    every-nom   girls-gen   3-sing-fem.pl hard-working-fem.pl-nom
   'All singing girls are hard workers.'

(33) * *l-fatayaat-u   kull-un   (min-hunna) y-uġann-iina*
     the-girls-nom each-nom (of-them)   3-sing-fem.pl
   But a singular feminine is acceptable in such a configuration:

(34) *l-fatayaat-u   kull-un   (min-hunna) t-uġannii*
    the-girls-nom each-nom (of-them)   fem-sing
   'The girls each (of them) sings.'

These contrasts suggest the following descriptive statements. The Q *kull* is singular and "masculine" (by default, or ungendered). It acquires a group status only when definite. The feature feminine cannot be attributable to Q. Whenever it is there on the predicate, as in (32) or (34), its controller is to be found in the DP complement, or the hidden n, but not in Q. Such an environment is not found in (30), hence its ungrammaticality. The feminine arises in (34) presumably as a feature of the hidden *n* (which can be made overt in the form of *waaḥid-at* 'one-fem,' or *fataat* 'girl,' as a higher copy of the lower 'girls'), which controls the agreement. In (30), such a hidden *n* cannot be postulated (due to the group/collective meaning, and its ungendered "masculine" nature), hence the construction is ruled out.

Furthermore, the fact that the agreement in the floating case is limited to the singular and cannot be plural (as the ungrammaticality of [33] indicates) can be explained if there is (a hidden) *n* there, and it is singular (by default), due its (strongly) distributive meaning. By contrast, the feminine predicate in (32) is modifying the plural noun, rather than Q, hence no problem arises with respect to the controller of agreement. If so, then there is reason to think that *kull* has no phi features (or has default values of masculine and singular), the quantifier *kull-un* keeping these values intact, due its distributive nature, and the quantifier *al-kull* becoming collective (or group) through definiteness, and hence acquiring the possibility of becoming plural, while having no possibility to access the status of feminine.[14]

Summarizing, we can say that [±definite] and [±singular], in addition to [± distributive] and [± partitive] are the relevant features (or feature values) that contribute to the makeup or composition of the appropriate functional (and structural) configurations behind the different *kull* varieties or patterns of interpretations.

1.8 Other Uses of Qs

The *all* and *every* uses of *kull* are usually exemplified through construct state structures (or QCSs), while the *each* use is associated with prepositional partitive structures (QPartP). But other structures are available, and when properly analysed, provide reason to think that quantifiers are not determiners per se (if determiners originate in D), but only move to D when necessary. Q in (26) is definite, whereas Q in (27) is indefinite. It is important to realise the vastness of quantifier expressions, and the specificity of each one, which realizes a distinct syntax (and/or morphology) and may yield to a distinct interpretation (or semantics). This chapter aims to gather a significant amount of variation, which lends support to the thesis that no (universal) uniformity

of Q behaviour is tenable. Rather, the Q behaviour is essentially governed by what appears to be proper to the quantifier (the "lexical" part of Q, or rather its lexical tree or configuration). One important facet of Q specific variation is the various nominal, adjectival, and adverbial flavours of quantification examined in the next section. The subsection on Q float is also of particular interest, because it not only revisits the already described patterns in the literature (stranding and adnominal Q-floats), but adds a new pattern, namely adverbial Q-float, and suggests ways to rethink the properties of Q-float in new terms. Section 3 is devoted to discussing how gendered Qs are analysed, and what role Gender can play in Q interpretation. Likewise, the role of Number is also examined.

2 VARIETIES OF QPS AND THEIR STRUCTURES

In this section, I identify some major varieties (or patterns) of Q constructions, including QCSs, bare QPs, and overt partitive QPs, which form the major patterns of determiner QPs, or *D-QPs* (in Partee's [1987, 1995] terminology). Other patterns belonging to *A-QPs* are illustrated, including adverbial QPs, adjectival QPs, adnominal modifiers, etc. It is shown that partitive structure (or PartP) plays an important role in unifying most (if not all) D-QPs.

2.1 Partitive QPs

A number of QPs with a DP "restriction" in CSs or bare QPs can be shown to have a partitive structure. Contrary to some analyses proposed in the literature, the P of the partitive is not empty. It denotes *part* and enables us to distinguish partitives from possessives. P can be overt or covert. P can also alternate with morphological genitive case in CSs, which, when "contentful," is either "possessive" (a Poss as in Fassi Fehri [1993], or Pposs) or "partitive" (with the relation Part, or Ppart). P and Case are equivalent marks of this contentful relation or dependency. The postulation of a hidden *n* is also motivated for (some) partitive structures.

Partitives are normally analysed as binominal constructions, with two nominal heads (Rutkowski 2007, Stickney 2009, after Jackendoff 1977, Selkirk 1977, and Koptjevskaja-Tamm 2001, among others). Here I am first interested in quantifier partitives, QPartPs, the structure of which is given in (22a) above, and repeated here in the form of (35), applied to the QP expression in (21):

(35)

```
                    KP
                  /    \
                K        QP
                |      /    \
             baʕḍ-u  Q       nP
                     |      /    \
                   baʕḍ-u  n      PartP
                           |     /    \
                           Ø   Part    DP
                                      /    \
                                   r-rijaal-i
```
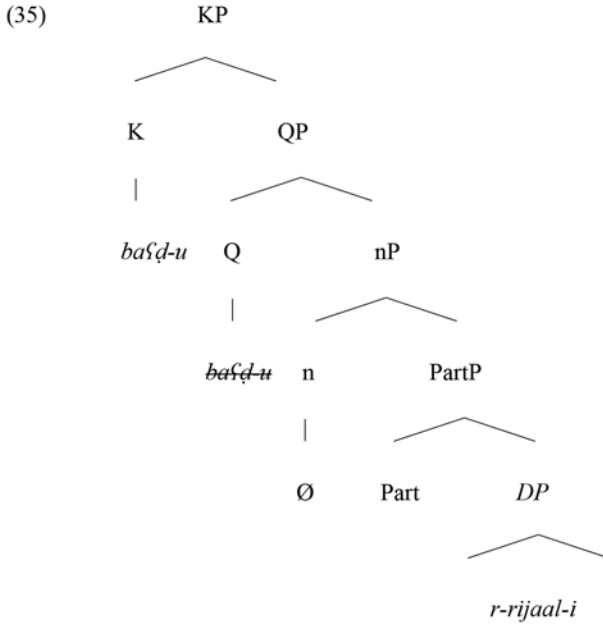
(KP is a projection of the abstract Kase Phrase)

Semantically, partitives are expressions denoting a set (or subset) that is part of another set (or superset). I assume that the preposition is denoting the *part of* relation. The latter relation is stated in Barker (1998) as follows, building on work by Ladusaw (1982) and Hoeksema (1984):[15]

(36) $\llbracket of\ \text{PART} \rrbracket = \lambda x \lambda P \lambda y\ [P(y) \wedge y \leq y]$

The semantics of "part of," I assume, is associated with the partitive preposition. The advantage of this contentful analysis of P is that it provides a rather straightful account of differences between uses and meanings of the partitive *min*, compared to that of the possessive *li* 'to, of,' much in line with Barker's (1998) and Zamparelli's (1998) analysis of partitives and possessives in English. By contrast, Kayne (2005b) analyses the *of* P in partitives as a (formal) K marker, equivalent to accusative Case in other contexts. However, his analysis cannot be naturally extended to Arabic, in which two prepositions are used for two distinct semantics. The morphological genitive K in Arabic is used ambiguously for both senses, but distinct structures contribute to disambiguation. It may be that partitive K or *min* P alternate in expressing Part (just as genitive K and *li* P is expressing Poss), but I see no reason to treat P as only formal in both cases. See section 4 below for more discussion.[16]

Partitives are often contrasted with superficially similar structures called pseudo-partitives, which are thought of as differing from them both in terms of syntax (as in, e.g., Selkirk [1977]; to be compared to the unified analysis of Jackendoff [1968]), and semantics (the pseudo-partitives "referring to an amount of some substance, rather than to a part/subset of a superset" (Rutkowski 2007, 238–40). Differences between partitives and pseudo-partitives is observable in many natural languages. Regarding their syntax (see, e.g., Koptjevskaja-Tamm 2001; Stickney 2004), Swedish, Dutch, and German (contrary to English) use no preposition in the nominal complement of the pseudo-partitive (examples from Rutkowski 2007):

(37) Dutch:
    a. *een doos van uw   heerlijke koekjes*   (partitive)
       a   box of   your delicious cookies
       'A box of your delicious cookies'
    b. *een doos   koekjes*   (pseudo-partitive)
       a   box (of) cookies
       'A box of cookies'

In languages such as Russian (as well as Finnish and Armenian), the case marking of the complement in the pseudo-partitive construction is different from that of the complement in the partitive construction:[17]

(38) Russian:
    a. *čaška   ètogo   vkusnogo   čaja*   (partitive)
       cup.nom this.gen good.gen   tea.gen
       'A cup of this good tea'
    b. *čaška   čaju*   (pseudo-partitive)
       cup.nom tea.part
       'A cup of tea'

More importantly, however, partitives differ from pseudo-partitives in that the former must contain a *definite* complement, while the latter have *indefinite* complements, as we have already seen in chapter three, in connection with numeral constructions. For Qs, the difference is observable in the following contrasting pair:

(39) *labit̲-naa   baʕḍ-a   l-yawm-i*
    stayed-we part-acc the-day-gen
    'We stayed some part of the day.'
(40) *labit̲-naa   baʕḍ-a   yawm-in*
    stayed-we part-acc day-gen
    'We stayed a part of day.'

The definite difference has also been observed in English. The following pair of constructions illustrates the contrast (Stickney 2007):

 (41) a box of those chocolates
 (42) a box of chocolates

   This state of affairs is reminiscent of the so-called Partitive Constraint. Furthermore, the two constructions differ significantly in their syntax. "The partitive is a head complement structure, with one DP inside another. The pseudo-partitive is a single nominal projection. What is a noun in the partitive is a measure phrase in the pseudo-partitive, and what is a preposition in the partitive is a functional projection in the pseudo-partitive" (Stickney 2007, 406). Differences are also found in many other syntactic areas (including extraposition, fronting *of*, and adjectival modification). As for semantics, the partitive is seen as representing a measured proportion of a discourse-relevant set (hence the definiteness or specificity of its complement), whereas the pseudo-partitive is often conceived as a single nominal projection that represents a single entity (Alexiadou, Haegeman, and Stavrou 2007; Stickney 2009). What is the first NP and the PP in the partitive are Measure Phrase (MP) and FP in the pseudo-partitive (Alexiadou, Haegeman, and Stavrou 2007; Stickney 2009; also Stickney et al. 2013). The structures of the constructions (39) and (40) can then be basically represented as parallel to those of the constructions (43) and (44), given in (45) and (46), respectively (recall also the structures of partitive and pseudo-partitive numerals given in chapter three):[18]

 (43) *kull-u   talaat-at-i   kuʔuus-in   mina l-xamr-i*
        every-nom   three-fem-gen   glasses-gen   of   the-wine-gen
        'Every three glasses of the wine'
 (44) *kull-u   kuʔuus-in   mina   xamr-in*
        every-nom   glasses-gen   of   wine-gen
        'Every glasses of wine'

Note that the QP here is higher than NmrP (where the numeral is based). Evidence for this hierarchization comes, for example, from the order in (43) and its (inverse) MIO (mirror image order), originally argued for in Fassi Fehri (1999). MP (or UnitP) is a classifier phrase, ClP (that is parallel to DivP in Borer [2005]). It is also equivalent to PartP, as conceived here (see also Arsenijević 2006). As for the partitive QP, it is just as in the structure of (35), except that the QP is introduced in the right place—that is, higher than NmrP, as in the structure (45). Important differences between the two QP structures are then taken into account, in parallel to those between normal partitives and pseudo-partitives, most notably the definiteness vs. indefiniteness of the

(45)

```
                    DP
                   /   \
                  D     QP
                  |    /  \
                  Ø   Q      NmrP        (= #P in Borer 2005)
                      |     /    \
                   kull-u  Nmr     nP
                           |     /    \
                        talaat-at  n     PP
                                   |   /    \
                                kuʔuus  P      DP
                                        |   /    \
                                       min  D      nP
                                            |    /    \
                                            l-    xamri
```

(46)

```
                    DP
                   /   \
                  D     QP
                  |    /  \
                  Ø   Q      NmrP
                      |     /    \
                   kull-u  Nmr     MP        (or UnitP; instead of PartP)
                           |     /    \
                          Ø     M      KP     (KP; instead of PP)
                                |    /    \
                             kuʔuus  K      nP
                                     |      △
                                    min    xamrin
```
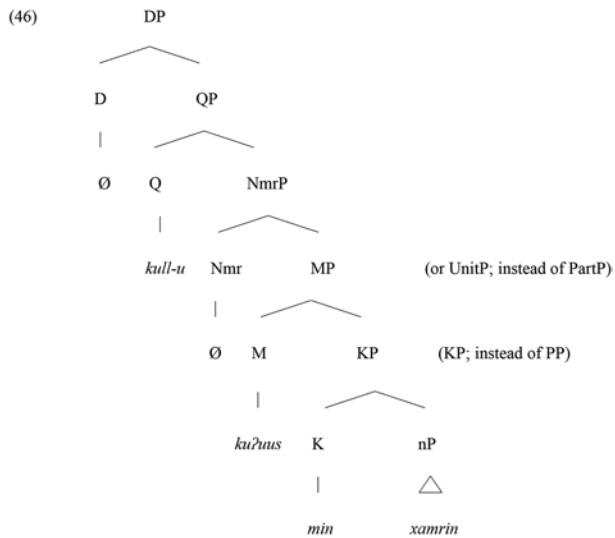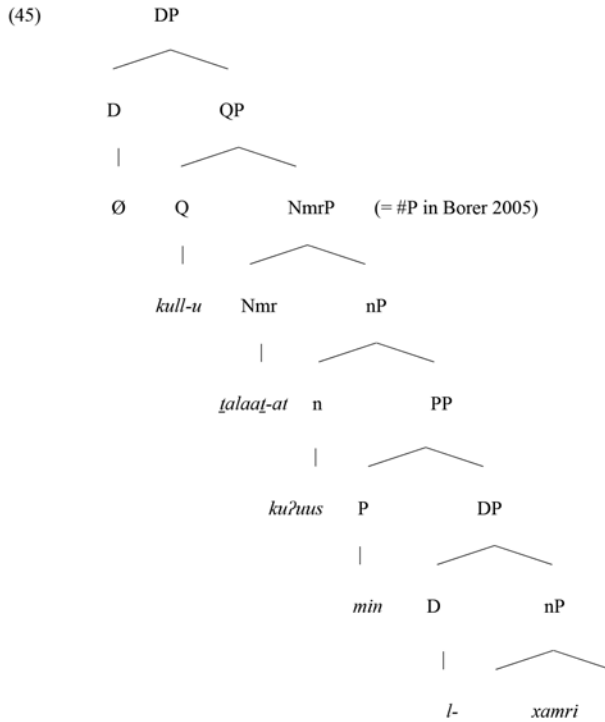
complement (translated as DP vs. nP), and lexical vs. semi-lexical status (translated as PP vs. KP and n vs. M or Unit).

Greer (2015) argues for a more radical partitivity, in which all D-quantifiers are partitive. Likewise, Arsenijević (2006) proposes a much wider-ranging notion of partitivity, arising through "a partitive phrase (PartP) as a part of the general functional sequence in the nominal domain." These forms of generalizing partitivity are worth exploring (as I did partially in this chapter), but for the sake of concrete implementation, I will keep using the more conservative partitive/pseudo-partitive dichotomy (along Selkirk's and Stickney's lines), as well as indefinite nP/DP structures, as distinct from the former structures, when needed. Suffice it to establish at this stage how the partitive and pseudo-partitive structures, given in (45) and (46), can extend efficiently to QCSs, bare CSs, as well as floating Qs.

2.2 Construct State QPs

Despite the abundant literature on CS in Arabic and Hebrew, it remains rather poor with regard to interfacing syntax with semantics.[19] One essential (though rather neglected) dimension of the syntax-semantics of CSs stems from the central distinction between possessives and partitives (as observed above), which are at first sight superficially indistinguishable. Crucially, though, QCSs are not interpreted as possessive but only as partitive.

Consider the following CS constructions:

(47) *daar-u   r-rajul-i*
       house-nom   the-man-gen
       'The man's house'
(48) xaatam-u   ḏ-ḏahab-i
       ring-nom   the-gold-gen
       'The ring of gold'
(49) *ṣiyaam-u   yawm-i   l-ʕiid-i*
       fasting-nom day-gen   the-feast-gen
       'The fasting of the day of the feast'

Clearly, these constructions instantiate different semantic relations between the head and the complement of the CS, pointing to the ambiguity of the morphological genitive. In (47) it is possessive, in (48) it is partitive, and in (49) it is temporal. Evidence for these distinct meanings (and constructions) comes also from their alternating free state equivalents or paraphrases (FS), where a distinct preposition (instead of case) is used to express each meaning, *li* 'to, of,' *min* 'part-of, from,' *fii* 'at,' respectively, as shown by their paraphrases in (50):

(50) a. *d-daaru   li-r-rajul-i*
        the-house   to-the-man
    b. *l-xaatam-u   mina   ḏ-ḏahab-i*
        the-ring   from   the-gold
    c. *ṣ-ṣiyaam-u   fii   yawm-i l-ʕiid-i*
        the fasting   in   the day of the-feast

These prepositions are not interchangeable. But what is important for our discussion is that QCSs in (1) and (5) above can only alternate (or be glossed) with the partitive *min*, to the exclusion of the possessive *li* (in addition to other prepositions), as in the following FS counterparts:

(51) *Ɂakala   l-kull-u   mina   ṭ-ṭullaab-i   dajaaj-at-ayni*
      ate   the-all-nom   from   the-students-gen   chicken-dual.acc
      'All of the students ate two chicken.'
(52) *Ɂakala   baʕḍ-un   mina   ṭ-ṭullab-i   dajaaj-at-ayni*
      ate   some-nom   from   the-students-gen   chicken-dual.acc
      'Some of the students ate two chicken.'

In other terms, *kull* and *baʕḍ* are solely confined to the semantics akin to (36) above, which applies equally to both (51) and (52), but not to other CS constructions.[20]

   Another aspect of differentiation with normal CSs concerns the inflectional peculiarities of QCSs, compared to other nominal "normal" CSs. For example, Ns heading nominal CSs, like other nouns in Arabic, normally inflect internally for Gender and Number, and they trigger agreement for such features on the predicate, as shown in (53), but most nominal Qs never do (cf. *kull*, *baʕḍ*):

(53) *fatayaat-u   r-rabiiʕ-i   nabiih-aat-un*
      girls-nom   the-spring-gen   clever-fem.pl-nom
      'The spring girls are clever.'

As a matter of fact, whatever features show up in agreement configurations where Q is found are attributable to the nominal complement rather than to Q, as argued above. It is reasonable to think that the latter does not inflect for these features:

(54) *kull-u   fataat-in   nabiih-at-un*
      every-nom   girl-gen   clever-fem-nom
      'Every girl is clever.'
(55) *kull-u   fatay-aat-in   ṣaġiir-aat-in   nabiih-aat-un*
      every-nom   girl-fem.pl-gen   young-fem.pl-gen   clever-fem.pl-nom
      'All young girls are clever.'

The same behaviour can be observed with *baʕḍ*. Suppose that the head Q is masculine singular (by default), as usually assumed by traditional grammar, then Q by itself cannot be held responsible for agreement variation in (54) and (55).

This situation is in net contrast with that found in normal nominal CSs. There, agreement in phi features on the predicate is (normally) dictated by the features of the nominal head, rather than by those of the complement:

(56) *bayt-u   l-fatay-aat-i   l-jamiil-u*
      house-nom   girl-fem.pl-gen   the-nice-nom
      'The nice house of the girls'

(57) *fatay-aat-u   r-rabiiʕ-i   n-nabiih-aat-u*
      girl-fem.pl-nom   the-spring-gen   the-clever-fem.pl-nom
      'The clever spring girls'

(58) *saqaṭa   bayt-u   l-fatay-aat-i*
      fell   house-nom   the-girl-fem.pl-gen
      'The house of the girls has fallen.'

(59) *kull-u   l-fatayaat-i   saqaṭ-na*
      all-nom   the-girl-fem.pl-gen   fell-fem.pl
      'All the girls have fallen.'

(60) * *kull-u   l-fatayaat-i   saqaṭa*
        all-nom   the-girl-fem.pl-gen   fell

There are cases where Qs appear to inflect internally for Gender. Such is the case with *biḍʕ* 'few,' which appears to inflect according to the gender of its complement:

(61) *biḍʕ-u   fatay-aat-in*
      few-nom   girl-fem.pl-gen
      'Few girls'

(62) *biḍʕ-at-u   fityaan-in*
      few-fem-nom   boys-gen
      'Few boys'

However, this gender is of a different nature from the normal gender on nouns, as we will see below. It is not *sex* gender. It is rather a gender for group or unitization (see chapter three). It is not part of the phi features. As a matter of fact, the feature matching between the head noun and the complement is governed by the Gender polarity constraint rather than by standard Agree (of the probe-goal type).

A third aspect of differentiation that is of particular importance is the syntax of adjective modifiers and their placement in the QP construction

compared to normal DPs. For example, Qs are not compatible with prenominal adjectives (in the appropriate reading):

(63) * *muxtalif-u*   *kull-i*   *l-mayad-iin-i*
      various-nom   all-gen   the-fields-gen

(64) * *ṣiġaar-u*   *baʕḍ-i*   *l-ʕuquul-i*
      small.pl   some-gen   the-brains-gen

If these adjectives are generated pre-nominally from the start in a Q position (with a quantifier or degree flavour), then they will be competing with *kull* or other Qs. Clearly, their status is distinct from that of post-nominal (attributive) adjectives, as amply demonstrated in Fassi Fehri (1999).[21]

    A fourth aspect of differentiation concerns the way in which possessives are assigned genitive case and partitives are assigned an identically morphological case, although the two cases can be argued to be distinct. It is a matter of general consensus among Arabists and semiticists that the genitive of possessives is assigned under Agree in some high position in the structure. If we follow Fassi Fehri (1993), it is assigned in Spec PossP to the possessor (under government by a higher functional head, presumably D, hence the interaction with the definite feature located in D). I replaced here PossP by DP for the sake of simplicity. Thus, presumably the basic configuration of the possessive CS, contrary to that of the partitive CS given in (35) above, is as follows (I have omitted some nodes for simplification):

(65)
```
                         KP
                        /  \
                       K    DP
                       |   /  \
                   daar-u Spec D  D'/nP
                            |    /  \
                        r-rajul-i Spec n   n
                                    |       |
                                 r-rajul-i  daar-u
```
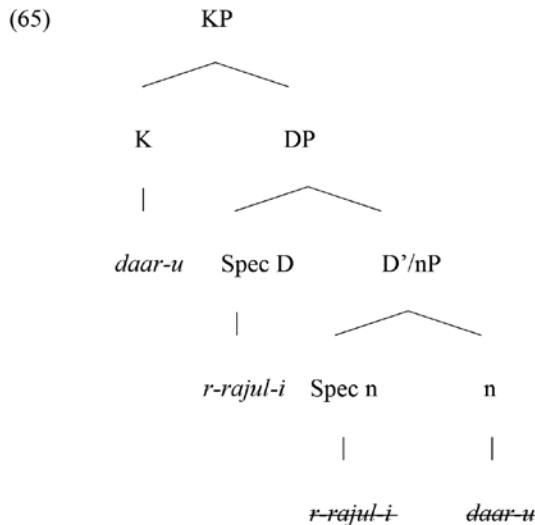
Then the possessive genitive is normally found higher in the functional projection of DP/KP, compared to the partitive genitive, which is found lower.

2.3 Arabic Bare Qs as Heads of DPs/KPs

Starting from early work by Fassi Fehri (1978, 1980–1981, 1989), it has been argued that "Arabic quantifiers are *heads* of the NPs they quantify . . . [and] they behave in every respect like a nominal head . . . [in that] they receive case, bear definite or indefinite articles, head genitive constructions, etc." (Fassi Fehri 1993, 179–80). The last properties are illustrated by the following constructions (Fassi Fehri 1993):

(66) *jaaʔ-a 1-kull-u*
     came the-all-nom
     'Everyone came.'
(67) *ʕaad-a   kull-un   ʔilaa manzil-i-hi*
     came.back each-nom to   house-gen-his
     'Each came back to his house.'
(68) *jaaʔ-a kull-u   1-ʔawlaad-i*
     came all-nom the-children-gen
     'All the children came.'

"Unlike quantifiers in French, which seem to be adjoined to NPs (like adverbs adjoin to VPs), Arabic Qs are heads." They head their own QP projection at the base and move to heads of DPs (or KPs) by Spell out. Assuming a QP projection where Q originates, then Q moves to D, and further to K. If Q has an unvalued Def feature, then it is valued in D, in agreement with the DP genitive, which moves to Spec D to value its genitive feature (due to the absence of an overt preposition there). Q also values its nominative feature in K. The DP/KP structure for (68) is then as in (69), and strictly parallel to (65), the partitive distinction aside (I have dispensed with the nP present in (45) for the sake of simplification):
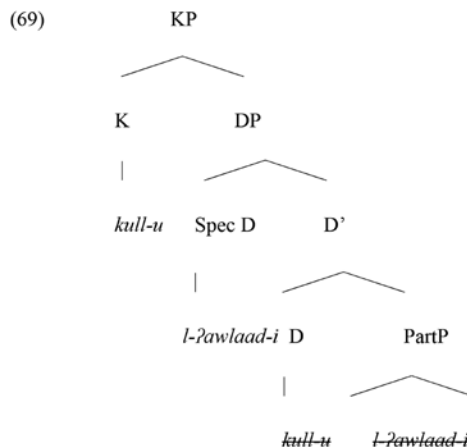
As for the quasi-bare (66), I will also assume that the complement of Q is presumably a hidden (or empty) partitive structure, which is parallel to that of (69). Its structure is then as follows:

(70)

```
                    KP
                   /    \
                  K      DP
                  |     /    \
              l-kull-u  D      QP
                        |     /    \
                    l-kull-u  Q      PartP
                              |       /\
                          l-kull-u
```
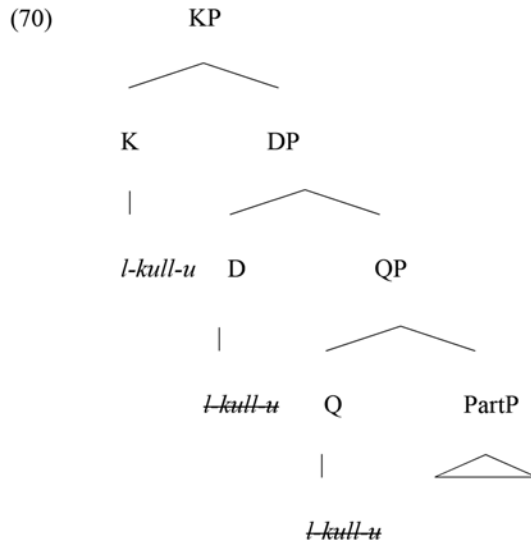
Assuming that a Probe-Goal Agree motivates Move and enables the unvalued features of Q to be valued, then the structures in (69) and (70) would be minimal as internal structures of D-QPs when they are CSs or bare. The functional sequence of the structure can then involve three projections: Q, D, and K. Moreover, as argued earlier, a (hidden) *n* can also be involved in the complement of Q, as observed above. With regard to their semantics, namely the implication of two sets in a part-whole relation, it seems reasonable to assume that bare QPs like (66) head hidden partitives and that the QPartP structure seen in (69) is extendable to the bare QPs, as in (70).

If so, then nominal quantifier structures must accommodate both a K projection (K for case) and a D projection (for definiteness, among other features), and partitive structures, including *n* and *Part*. Equivalently, a fissioned DP (as in Fassi Fehri [1999]) is headed by D2 and D1, and case is located in D2, whereas definiteness is in D1. In Fassi Fehri (1993), there is a PossP projection (equivalent to Gen/Agr in Abney [1987]). Then genitive is assigned by D to Spec Poss there. In partitives, Part assigns partitive to its complement. Q, Nmr, or Num are among other proposed heads, and these heads are potential landing sites for N. In Borer (2005), the Q *every* is in #P; in Ritter (1991), Q is in NumP. But this conflicts with the fact that Q and Numeral can be generated in sequence (see [45] above). In Fassi Fehri (1999), adjectives have

D in their extensions (are DPs). More discussion is needed to clarify some of these issues and technicalities. Part of the discussion will be postponed until chapter five, where the syntactic structure of Number is discussed. Until then, I will keep assuming the architecture I have assumed, namely that Q projects as such, heading its own QP projection (and leaving aside competing alternatives—that is, # or Num—for further discussion there).

The analysis proposed provides further support to the more general view of CS, bare, and Part QP constructions as potentially similar (as also argued for in chapter three for numerals). There is also room for differences. For example, Definite inheritance has been shown not to be operative in all CS QPs. In some of them, Q inherits definiteness, as is the case with *kull*; in others, it does not, as is the case with *baʕḍ*.[22,23]

2.4 Q-Float

It has been observed that Arabic Qs exhibit the behaviour of Q-float. Fassi Fehri (1993, 74) observed that Arabic quantifiers "may also appear post-nominally, in a position where (adjectival) *modifiers* will normally appear. In this case, they obligatorily carry a pronominal affix coindexed with the head noun, as illustrated by (71) [= his (181)]:

(71) a. *ṣum-tu   kull-a   š-šahr-i*
         fasted-I   all-acc   the-month-gen
         I fasted the whole month.
     b. *ṣum-tu   š-šahr-a   kull-a-hu*
         fasted-I   the-month-acc   all-acc-it
         I fasted the whole month.

In (71a), the quantifier is heading the NP, while it is a modifier in (71b)." What is important is that the early work on this topic on Arabic distinguishes the two positions of Qs as *heads* of the QP (contained in the DP) and as adnominal *modifiers*. Consider now the following sentences (also from Fassi Fehri [1993], his [182]):

(72) a. *qaraʔa n-naas-u   kull-u-hum   r-risaalat-a*
         read   the-people-nom   all-nom-them   the-letter-ace
         'All the people read the letter.'
     b. *n-naas-u   kull-u-hum   qaraʔ-uu   r-risaalat-a*
         the-people-nom   all-nom-them   read-pl   the-letter-acc
         'All the people read the letter.'

c. *n-naas-u   qaraʔ-uu kull-u-hum   r-risaalat-a*
the-people-nom   read-pl   all-nom-them the-letter-acc
'All the people read the letter.'

"In (72a), the QP modifier is adjacent to the subject NP, and presumably both occur in their D-structure position, i.e. in Spec of VP. In (72b), both the NP modified and the QP modifier have raised to form an SVO structure. But QP floats in (72c)." It is then argued that it is "unlikely that the NP subject there has raised from a modified-modifier configuration." When an NP is modified by an adjective, for example, the former cannot be extracted alone, leaving behind the modifiee, as illustrated by the following contrast (Fassi Fehri 1993):

(73) a. *jaaʔ-a   1-walad-u   1-jamiil-u*
came   the-boy-nom the-pretty-nom
'The pretty boy came.'
b. * *1-walad-u   jaaʔ-a   1-jamiil-u*
the-boy-nom   came   the-pretty-nom

Note that (73b) superficially parallels (72c) in that in both cases the modifiee appears to be *stranded*. The ungrammaticality of (73b), however, indicates that extracting the modified NP, while stranding the modifier, is not possible. "It suggests that the QP in (72c) is a subject base generated there, presumably in Spec of VP, while the preverbal NP (functioning as a subject of AGRP, and licensing rich agreement on the verb) may have originated there." The QP that occupies the thematic subject position in the base contains "an incorporated pronoun which is coindexed with the preverbal NP. If this is true, then the position of the QP indicates that the verb has raised to I (over the subject), although the NP preverbal subject may have been base generated in a pre-inflectional position" (Fassi Fehri 1993).[24]

Recall that the literature on similar structures in English or French (originating with the seminal work of Kayne [1975]) has assumed alternative derivations, which make them derivationally related or unrelated. The so-called *stranding hypothesis* (SH) proposed by Sportiche (1988) takes them to derive from one source, related by Move. The so-called adverbial hypothesis (AdvH) takes the floating case to be a case of adverbial adjunction (often to VP, and unrelated to the D-quantifier; see early work by Dowty and Brodie [1984] and Williams [1994], among others). Bobaljik (2003) and Bošković (2004) raised serious doubts about generalizing SH to adverbial cases. As indicated above, Fassi Fehri (1993) and Benmamoun (1999), have argued for two unrelated

structures in Arabic, but Shlonsky proposed an SH for Hebrew. Keeping the essence of my original proposal (and also Benmamoun's), in which each construction has its own "base-generated" derivational source, my purpose here is to enrich the patterns of the so-called Q-float so far discussed by looking at some new patterns gone unnoticed (as far as I can tell). First, when looking at cases of modifier adjunct QPs, the literature has limited itself to cases where Q carries an anaphoric clitic in a CS construction (as in [69] or [72] above), but it has overlooked both bare QPs and partitive PPs that can float (as explained above). The existence of such constructions makes it difficult to think of the presence of the anaphoric clitic there (or its absence when hidden) as a manifestation of Agree (i.e., the claim that in Q-float constructions, the stranded Q left behind must agree with the moving NP, a claim that represents the most significant part of Shlonsky's [1991] argument in favour of SH). As a matter of fact, the postulation of an Agree dependency there has no base, and correlatively the SH is of no use for Arabic. Neither Agree nor Move can be supported in the cases under consideration. Moreover, there are cases of clearly adverbial QPs, which appear to Q-float, and for which no SH à la Sportiche or Shlonsky can be supported, given that they have an adverbial rather than argumental status and they carry no pronominal clitic.[25]

Consider the collective Q *jamiiʕ* 'all, together' in Arabic. It can float in two forms: one carrying the clitic form (like *kull*), as in (74a), and one without a clitic, as in (75). In (74b), it is placed in the head position:

(74) a. *ltaqayt-u   bi-ṭ-ṭullaab-i   jamiiʕ-i-him*
      met-I   with-the-students-gen   all-gen-them
      'I met with all the students.'
  b. *ltaqayt-u   bi-jamiiʕ-i   ṭ-ṭullaab-i*
      met-I   with-all-gen   the-students-gen
      'I met with all the students.'
(75) *ltaqayt-u   bi-ṭ-ṭullab-i   jamiiʕ-an*
     met-I   with-the-students-gen   all-acc
     'I met with the students all.'

Note first that the two relevant uses of Q have different cases. In (74a), Q has a dependent case, a *modifier* case, which matches that of the head nominal in the DP. In (75), however, the case there is neither that of a modifier nor that of an argument (like that of 74b). Rather, it is an *adverbial* case, a morphological "accusative," which is independently assigned to adverbs (see subsection 2.5 for more detail). Because the source of case of the Q in (74a) is internal to the DP, let us take this form of case to be an indication that Q is a *modifier* (like adjectives and other modifiers, the case of which is inherited or copied from the head nominal). By contrast, the case of Q in (75) cannot be thought

of as internal to the DP. Moreover, the Q itself is not internal to the DP presumably because the latter does not license adverbs internally. If so, then we expect that the adverb, contrary to the modifier, would "float" wherever adverbs float. Modifiers do not have the same flexibility as adverbs. Consider the following distinct structures of the adnominal (74a) and the adverbial (75), respectively (76) and (77) below:

(76)

```
                    TP
              ┌──────┴──────┐
              T            vP
              │        ┌────┴────┐
          ltaqay-tu    v        VP
                       │    ┌────┴────┐
                   ltaqay-tu V       PP
                             │   ┌────┴────┐
                             P        DP
                             │   ┌────┴────┐
                            bi-  DP       QP
                                 │    ┌───┴───┐
                             ṭṭullaab-i   jamiiʕ-i-him
```

(77)

```
                    TP
              ┌──────┴──────┐
              T            vP
              │        ┌────┴────┐
          ltaqay-tu    v        VP
                       │    ┌────┴────┐
                   ltaqay-tu VP      QP
                          ┌───┴───┐ ┌──┴──┐
                          V      PP  jamiiʕ-an
                             ┌────┴────┐
                             P        DP
                             │    ┌───┴───┐
                            bi-  ṭṭullaab-i
```
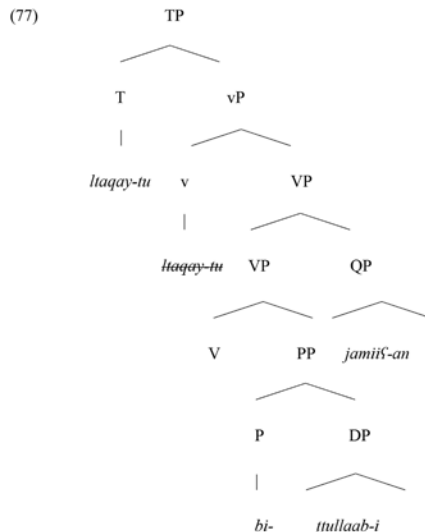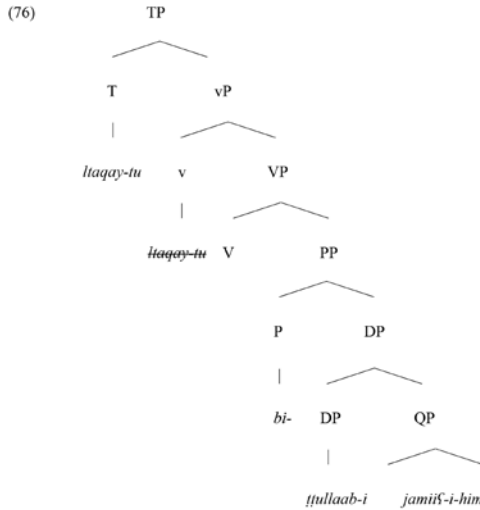
Floating quantifiers like those in (76) are *adnominal* D-QPs—that is, part of the nominal structure in the DP (agreeing in case and bearing an anaphoric pronominal clitic). In (77), they are accusative *adverbials*, externally adjoined to the VP, and receiving "accusative" case (with no case agreement and no anaphoric clitic). Internally, floating Qs can be indefinite *bare modifiers*, contrasting with the pronominal CS modifiers both in terms of their syntax and their semantics (compare the two adverbial QPs in [75] and [71a] above). Observe also that floating QPs differ semantically, some of them being interpreted as collective, and others being interpreted as distributive. All in all, *three* structures (rather than two) are independently motivated for floating Qs with three different positions: (a) headed Q structure, (b) adnominal modifier Q, and (c) adverbial Q. These patterns are used in turn as bare QPs, CSQPs, and partitive QPs.[26]

2.5 Adverbial, Prepositional, and Adjectival QPs

As I have shown, QPs, apart from occurring in argumental or adnominal DP positions, can be used adverbially. In such uses, they are (normally) marked as "accusative," a case that marks adverbs, as exemplified in (78) to (81):

(78) *Ɂ-atamaššaa   kull-a   yamn-in*
     I-walk   every-acc day-gen
     'I walk every day.'

(79) *Ɂ-atamaššaa   baʕḍ-a   l-Ɂawqaat-i*
     I-walk   some-acc   the-times-gen
     'I walk some times.'

(80) *y-aḥduṯu   haaḏaa   kull-a   marrat-in*
     3-happen   this   every-acc time-gen
     'This happens every time.'

(81) *y-aḥduṯu   haaḏaa kull-a   Ɂarbaʕ-i   marr-aat-in*
     3-happen   this   every-acc four-gen   time-pl.fem-gen
     'This happens every four times.'

Alternatively, a preposition can head the adverbial circumstant, marking the QP with a genitive, in another mode of adverbial marking:

(82) *y-aḥduṯu   haaḏaa fii kull-i   makaan-in*
     3-happen   this   in   every-gen place-gen
     'This happens in every place.'

Another form of adverbial quantification is via *reduplication* of the temporal adverbial in the form of a nominal indefinite, as in (83), or a PP, as in (84):

(83) *y-aḥduṯu   haaḏaa marrat-an marrat-an*
     3-happen this   time-acc   time-acc
     'This happens from time to time.'

(84) *y-aḥduṯu   haaḏaa min fiinat-in   ʔilaa fiinaat-in   (or ʔilaa ʔuxraa)*
     3-happen this   from period-gen to   period-gen (or to another)
     'This happens from period to period.'

Note the existence of a number of Q adverbs that have no nominal comple-
ments (contrary to *kull* or *baʕḍ*). The list includes *jamiiʕ-an*, *kaaff-at-an*,
rumm-at-an, among other instances.

(85) *naḥnu maʕniyy-uuna   jamiiʕ-an, kaaff-at-an, rumm-at-an*
     we   concerned-pl.nom all-acc
     'We are all concerned.'

These accusative adverbials, which are *bare*, also have an alternate that is
headed by a preposition ("conative") *bi-*, which obligatorily takes a pronomi-
nal anaphoric clitic:

(86) *š-šhaʕb-u   bi-rummat-i-hi   maʕniyy-un*
     The-people in-entirety-gen-his concerned-nom
     'The people as a whole are concerned.'

   Quantifiers also have adjectival sources, which essentially take two forms:
(a) normal adjectives include *kaṯiir* 'many, much,' *qaliil* 'few, little,' and
(b) elative (comparative or superlative) adjectives, including *ʔakṯar* 'more,
most,' *ʔaqall* 'less (than),' *ʔaġlab* 'most,' etc. (see Fassi Fehri 1978). First,
Q uses can be distinguished from adjectival uses by inflection (or phi fea-
tures). Adjectives inflect for Gender and Number, while these features are
absent in Q uses. Thus, while *qaliil* has a Q use in (87) and (88), it has an
adjectival use in (90), and it is ungrammatical in (89), being neither Q nor an
appropriately inflected adjective:

(87) *qaliil-un   mina l-fatayaat-i   y-ataḥajjab-na*
     few-nom of   the-girl.fem.pl-gen 3-veil-fem.pl
     'Few of the girls are veiled.'

(88) *l-fatayaat-u   y-ataḥajjab-na qaliil-an*
     the-girl.fem.pl-gen 3-veil-fem.pl   little-acc
     'The girls are veiled a little bit.'

(89) * *qaliil-at-un   min l-fatayaat-i   y-ataḥajjab-na*
     few-fem-nom   of   the-girl.fem.pl-gen 3-veil-fem.pl

(90) *fatayaat-un   qaliil-aat-un   y-ataḥajjab-na*
　　 girl.fem.pl-nom few-fem.pl-nom 3-veil-fem.pl
　　 'Few girls are veiled.'

Second, while the Q is initial in the partitive structure and receives its own structural case, the adverbial receives accusative, and the adjectival is *post-nominal*, receiving a dependent *modifier case*, as shown in the examples above.

　　Q can also head a CS, while the adjective cannot, as we see in comparing the grammaticality of the elative QP *ʔakt̲ar* 'most' in (91) to the ungrammaticality of the adjective *ʔajmaʕ* 'entire, all' in (92):

(91) *ʔakt̲ar-u   š-šaʕb-i   faqiir-un*
　　 most-nom   the-people-gen   poor-nom
　　 'Most of the people are poor.'
(92) * *ʔajmaʕ-u š-šaʕb-i   faqiir-un*   (*jamiiʕ* OK)
　　　 all-nom   the-people-gen   poor-nom

Note that *jamiiʕ* is fine in the context of (92), being a Q and not an adjectice. In the other direction, *ʔajmaʕ* (or its feminine *jamʕaaʔ*) can appear as a post-nominal adjective, but *ʔakt̲ar* cannot, hence the contrasts:

(93) *š-šaʕb-u   ʔajmaʕ-u   faqiir-un*
　　 the-people-gen   entire-nom poor-nom
　　 'All the people are poor.'
(94) * *š-šaʕb-u   ʔakt̲ar-u   faqiir-un*
　　　 the-people-gen   most-nom   poor-nom
(95) *ṭ-ṭabaqaat-u   jamʕaaʔ-u   faqiir-at-un*
　　 the-classes   all.fem--nom   poor-fem-nom
　　 'All classes are poor.'
(96) * *ṭ-ṭabaqaat-u   ʔakt̲ar-u   faqiir-at-un*
　　　 the-classes   most-nom   poor-fem--nom

The word *ʔajmaʕ* has, then, an exclusive adjectival behaviour since it cannot appear pre-nominally (as does Q), and it agrees in gender and number post-nominally, contrary to Q *ʔakt̲ar*.

　　Note also that most of these D-Qs also have the property of being used as A-Qs, but pure adjectives like *ʔajmaʕ* cannot be used as adverbs:

(97) *waqaf-naa   ʔakt̲ar-a,   *ʔajmaʕ-a*
　　 stopped-we more-acc,   all-acc
　　 'We stopped more.'

What these contrasts suggest is that the Q use and the adjectival use of the same vocabulary is felicitous only with the appropriate functional structure, including the categorial specification, which is characteristic of some lexical items, but not others.[27]

3 GENDER, PHI FEATURES, AND AGREEMENT

3.1 Gendered Quantifiers and Unitization

Words like *kaaff-at-an* 'all,' *ʕaamm-at-an* 'in general,' *xaṣṣ-at-an* 'in particular,' *rumm-at-an* 'in all,' express the meanings of "unitized," "grouped," togetherness, generality, particularity, totality, applying to portions, parts, or wholes of sets. These Qs, which are morphologically feminine, are not synchronically composed from an independent base and a functional feminine marker, although their origin suggests they have an adjective base (e.g., *ʕaamm*, *xaṣṣ*) and have become collective pluratives (see chapter two for detail). This formation of Q as a group of pluratives (whether in syntax or in the lexicon) points to the role of Gender here as marking "unity" of the collection.

When these morphemes are used as Qs, they can occur in pre-nominal or post-nominal positions, or they can float either as adnominal modifiers or as adverbial Qs. In (85) above, they occur as adverbial QP. In (98), they occur as pre-nominal in a CS:

(98) *kaaffat-u n-naas-i   waaʕ-uuna*
     all-nom   the-people-gen conscious-pl.nom
     'All the people are conscious.'

Regarding their case, adverbial QPs can be marked as accusative, or as a complement in a prepositional phrase, hence the following alternations:

(99) *ʕaalaja l-mawḍuuʕ-a rummat-an*
     treated   the-subject   integrality-acc
     'He treated the subject in its integrality.'
(100) *ʕaalaja l-mawḍuuʕ-a bi-rummat-i-hi*
     treated   the-subject   in-integrality-gen-his
     'He treated the subject in its ingretality.'

Qs then inflect obligatory for case, and only in some cases for Gender or Number. The agreement of a Q expression with an external predicate in phi-features is often governed by the features of the nP complement (or restrictor), rather than those of Q. In a few cases, however, it is governed by Q features.

One sort of gender agreement of an unusual sort is the one constrained by the so-called Gender polarity, already found with numerals and analysed in chapter three. This sort of gender agreement is typically found with *biḍʕ* 'few,' as in the following examples:

(101) *ltaqaa biḍʕ-a   fatayaat-in*
     met   few-acc girl.fem.pl-gen
     'He met few girls.'

(102) *ltaqaa biḍʕ-at-a   fityaan-in*
     met   few-fem-acc boy.pl-gen
     'He met few boys.'

The "polar" matching between the value of the Q and that of the nominal complement appears to be reversed. Whenever the gender of the nominal complement is feminine, there is a sort of "anti-congruence" in that the Q has a masculine mark (the default one), and vice versa. I have analysed this sort of gender matching as a result of a complementary distribution in Gender marking in chapter three. Basically, Gender is marked on only one member of the QP construction: either on Q or nP, but not both. It is a sort of classifier that occurs on only one member of the CS construction. The analysis proposed for Gender distribution in the numeral construction can be extended to *biḍʕ*.

Standard agreement of Qs with their nominal complements is found in only one case, the case of the dual *kilaa* 'both' and its feminine *kilt-aa* 'both-feminine.' These Qs are exemplified in (103) and (104):

(103) *ltaqaa   kil-aa   l-walad-ayni*
     met   every-dual the-boy-dual.gen
     'Both of the two boys met.'

(104) *ltaq-at   kil-t-aa   l-fataat-ayni*
     met-fem   every-fem-dual   the-girl-dual.gen
     'Both of the (two) girls met.'

These quantifiers can be decomposed in a base *kil*, meaning basically *every*, a feminine morpheme -*t*-, and a dual morpheme *aa*. The Q is in construct state relation with its nominal complement, and it agrees with it in number and gender.

Note that *kil-aa* can float post-nominally, in which case it behaves like adnominal QPs and requires a pronominal clitic, as in the following constructions:

(105) *ltaqaa   l-walad-aani   kil-aa-hum-aa*
     met   the-boy-dual.nom both-them-dual
     'The two boys both met.'

(106) *ltaq-at   l-fataat-aani   kil-t-aa-hum-aa*
        met-fem the-girl-dual.nom   both-fem-them-dual
        'The two girls both met.'

The agreement of the Q is standard. I will return to the cumulation of the agreement marker and the pronominal clitic below.

3.2 Case

As we saw above, the case of Q depends on its position in the structure. When it heads the nominal projection, say in KP, it receives a structural case if it is in argument position, say as subject, object, complement of preposition, etc. When it is adverbial, it is marked as accusative. When it is an adnominal modifier, it has a dependent case. The complement of Q is normally in the partitive-genitive, and the complement does not have to move higher to Spec D to get its case, as shown in (35) above. Alternatively, it is possible that the partitive moves higher, given that the inheritance of the definite value seems to have occurred there as an effect of moving the partitive to Spec D, as in (69).

3.3 Individuation, Number, and Agreement

One of the claimed advantages of SH as adopted by Shlonsky is that the original position of the moved element (or its trace) is manifested by its realization as a pronominal clitic, taken to be an agreement marker. If so, then Q should agree in Gen, Num, and Pers, as in the following example:

(107) *Ɂantum   kull-ukum   masɁuul-uuna*
        you.pl.masc all-nom-you.pl.masc responsible-pl.masc.nom.
        'You (males) are all responsible.'

But is there a reason to think that Q has all these phi features, including Pers? This is unlikely to be the case since, as I have shown, *kull* normally has no phi features. Furthermore, Pers is not normally implicated in Agree when it comes to modification in nominal structures. These considerations provide enough basis to abandon the agreement hypothesis.

   The case of *kilaa* and *kiltaa* above, where an agreement marker is found in a pre-nominal position in (103) and (104), and the agreement marker is followed by a pro-nominal clitic in floating adnominal constructions (105) and (106), make it even more difficult to think of the two markers as driven by Agree. In fact, the clitic is a true pronoun (though anaphoric), and the *aa/ataa* are genuine agreement markers. If both markers were Agree markers,

they would be expected to be competing for the same position. The prediction is not borne out, since they occur in sequence.

4 FURTHER SEMANTIC-SYNTAX INTERACTIONS AND EXTENSIONS

In this section, I discuss some leading proposals in the literature on quantifier treatment. I also examine further issues related to distributivity, universality, and interaction with negation in various quantifier environments.

4.1 Distributivity

As already observed, the phenomenon of distributivity and its diagnosis (or more generally the collective vs. distributive dimension) have been notably used in the literature to distinguish the various uses and behaviours associated with the phonologically distinct English words *each*, *every*, and *all*, or their interpretations along the distributive/collective dimension, in addition to their scope with respect to other operators or quantifiers, such as negation. It is our descriptive task to show how the unique Arabic Q *kull*, when placed in different constructions and with different feature values, complies with similar diagnoses and tests of differentiation and brings up parallel interpretations and scope interactions.

As mentioned by Partee (1995) and Gil (1995), among many others, there is a vast cross-linguistic variation in marking distributivity. According to Partee, English *each* and Czech *kaidy,* whether they occur as determiners or in other positions, always indicate distributivity (are distributive keys). As determiners, they combine universality and distributivity. English numerals are unmarked for distributivity, but Latin has a separate series of *distributive numerals* marking distributed share. Georgian uses *reduplication* on many categories to mark distributivity, and although quantification and distributivity can each occur without the other, there appear to be some interestingly strong generalizations that can be made about their combined expression (Partee 1995, 563–64).

One important insight in characterizing distributive relations is Choe's (1987) distinction between the *distributive key* and the *distributed share*, which applies, for example, to the children and the apples in (108) and (109), respectively:

(108) Each child received one apple.
(109) The children received one apple each.

Beghelli and Stowell (1997) make crucial use of this distinction in their system of quantifier interpretation and scope construal, based on a novel use of the feature checking mechanism (or "valuation" in the new terminology). The distributive feature, [± dist], associated with a functional head, must be valued (under Spec-Head Agree) along the lines of [Wh] and [Neg] features. A central (and also innovative) aspect of their syntax of quantifier scope is the recognition of various major classes of QPs, or QP types, associated with dedicated (and hierarchized) positions in the clause architecture. Whereas some QP types take scope in their Case positions (remaining in situ at LF), other QP types must move to distinct LF scope positions (reserved for them). Moreover, there are further distinctions among QP types that must undergo Move to the designated LF scope position. In addition to WhQPs and Neg QPs, three other major classes are distinguished:[28]

(a) Distributive Universal QPs (DistQPs), most notably including *every* and *each*, to which a [+dist] feature value is assigned;

(b) Counting QPs (CntQPs), which semantically count or denote individuals, have very local scope (essentially in situ), and resist specific interpretations;

(c) group denoting QPs (GrQPs)—for example, indefinite QPs headed by *a*, *some*, *several* (bare or numeral QPs like *one student*, *three students*, and definite QPs like *the students*). They denote *groups*, including plural individuals, and are easily construed as taking wide scope within their clause. This capacity derives from their ability to introduce group referents and support collective interpretations in contexts where DistQPs require a distributive construal. They can also have very local scope (hence behaving like CntQPs).

DistQPs bear an intrinsic (strong) feature of distributivity marked as [+dist] that must be checked. Hence [+dist] QPs must appear in the Spec DistP (at PF or LF) in order for their [Dist] feature to be valued. The Q head bearing [+dist] selects as its complement a functional category containing the QP corresponding to the distributed Share. This functional category, labelled ShareP, requires an existentially quantified indefinite GrQP (the distributed Share) to occur in its Spec position, just as [+Neg] or [+Wh] in the head of a function projection requires NegQPs or WhQPs to occur in their Spec positions. When a DistQP takes distributive scope over an indefinite GrQP, the indefinite moves to Spec of ShareP at LF. When there is no overt indefinite, the GrQP can force a distributive event construal by having a covert Q over events move to the Spec of ShareP. The functional architecture assumed for the clause is the following:[29]

(110)   RefP

                   GrP   CP

                      WhQP   TP

                          CtQP   DistP

                              DistQP ShareQ

                                  GrQP   NegP

                                      NegQP vP

                                          CtQP   VP
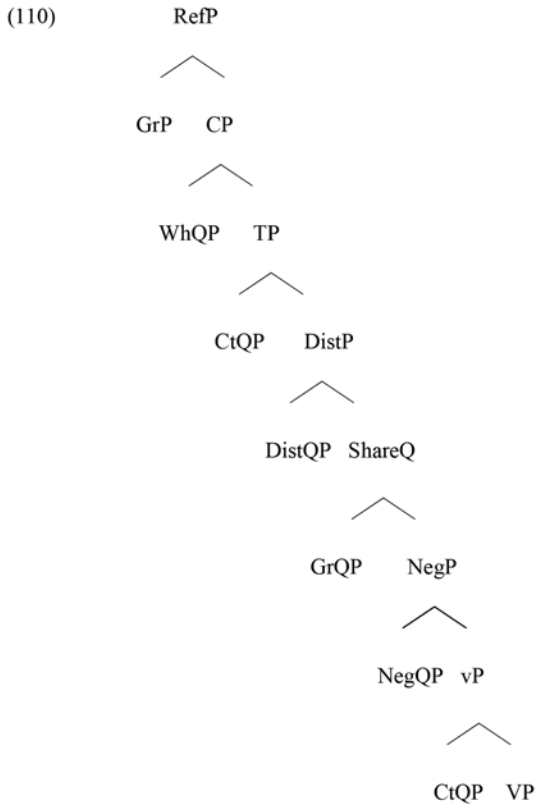
Thus a chain of syntactic dependencies captures the strong distributive nature of DistQPs, which, according to BS, has the characteristic diagnostic properties listed in (111):

(111) *Strong Distributivity*
    a. DistQPs headed by *each/every* are strong distributors;
    b. Strong distributivity is obligatory;
    c. Strong distributivity can arise under an inverse scope construal (e.g., where the distributee is in Spec of TP and the distributor is in Spec of vP).[30]

To illustrate how the system works, consider the following examples provided by BS:

(112) a. Every boy visited Mary at six o'clock.
     b. The pope looked at each member of his flock.
     c. Each boy read two books about India.
     d. A (different) boy read every book.

In every case, the DistQP headed by *each* or *every* must move to Spec of DistP, where its [+dist] feature is checked. This requires the presence of an active Dist head. The latter selects a ShareP with a Share head that licenses (and requires) an existential QP in Spec of ShareP, by the familiar feature-checking mechanism.[31]

4.1.1 The "Different" Test

An interesting difference between DistQPs and other QP types emerges when considering structures involving singular indefinite QPs modified by the adjective *different.* The latter functions as an unambiguous marker of a true *distributed share* status. Only QPs headed by *every* or *each* can enforce a distributive reading when they take scope over a *different* nP, as in the following contrasting examples:

(113) Every boy read a different book.
(114) Each (of the) boy(s) read a different book.
(115) a. * All the boys read a different book.
     b. * Five boys read a different book.

Arabic *kull_{ea}* and *kull_{ev}* exhibit similar contrasts with *kull_{al}*, together with using definite or indefinite DPs, as observed in section 1 above. The grammaticality of (116) and (117) with distributive QPs contrasts with the ungrammaticality of (118) in the relevant reading:

(116) *qaraʔa   kull-u   ṭaalib-in   kitaab-an muxtalif-an*
     read   every-nom student-gen book-acc   different-acc
     'Every student read a different book.'
(117) *qaraʔa kull-un   kitaab-an muxtalif-an*
     read   each-nom book-acc different-acc
     'Each (of them) read a different book.'
(118) a. * *qaraʔa kull-u   ṭ-ṭullaab-i   kitaab-an muxtalif-an*
       read   all-nom the-student-gen book-acc   different-acc
     b. * *qaraʔa xams-at-u ṭullaab-in   kitaab-an muxtalif-an*
       read   five-nom students-gen book-acc   different-acc

4.1.2 Inverse Scope

DistQPs differ from GrQPs with respect to *inverse scope* construals. Thus while DistQP objects headed by *kull$_{ea}$* or *kull$_{ev}$* in (116) assume the distributor function, other QP-types, including GrQPs headed by *all*, do not:

(119) a. *qaraʔa ṭaalib-un   (muxtalif-un)   kull-a   kitaab-in*
      read   student-nom (different-nom) every-acc book-gen
      'A (different) boy read every book.'
    b. *qaraʔa ṭaalib-un   (muxtalif-un)   kull-an   mina l-kutub-i*
       read   student-nom (different-nom) each-acc of   the-books-gen
       'A (different) boy read each of the books.'
(120) a. * *qaraʔa ṭaalib-un   (muxtalif-un)   kull-a   l-kutub-i*
      read   student-nom (different-nom) all-acc the-books-gen
    b. * *qaraʔa ṭaalib-in   (muxtalif-un)   xamsat-a kutub-in*
      read   student-nom (different-nom) five-acc   books-gen

In (120), the subject GrQPs cannot be construed as distributed shares, and *different* must be understood to mean "different from some other boy mentioned previously in the discourse," whereas in (119), the subject can be so construed, and *different* can be understood to differentiate among the referents of the distributed share.[32]

4.2 Distributive *Kull$_{ea}$* and Universal *Kull$_{ev}$*

Despite similarities, *each* and *every* can be argued to be significantly different from the perspective of the distributive/collective dimension, and so are *kull$_{ea}$* and *kull$_{ev}$*, despite their homophony. Indeed, and according to Beghelli and Stowell, if English *each* DistQPs can be shown to be "well-behaved from the perspective of [distributivity] theory," *every* DistQPs seem "to behave more like GrQPs headed by *all*" (i.e., as only weakly distributive). I will use here a number of tests to differentiate the two Arabic *kull*, adopting and adapting similar tests used by BS for English.[33]

4.2.1 Q-Float

First, *kull$_{ea}$*, unlike *kull$_{ev}$*, manifests a *Q-float* behaviour, which provides unambiguous distributive construal for sentences with GrQP subjects (where a collective construal would otherwise be possible). In such cases, *each* arguably occupies the Spec of DistP position. The following contrasts illustrate the variation in the ability of the three types of Qs to allow Q-float, in addition to the result in terms of distributivity. Thus corresponding to the non-floating *kull$_{al}$* in (1), *kull$_{ea}$* in (11), and *kull$_{ev}$* in (2) above, only the first two Qs provide

a Q float alternative, as shown in (121) and (122), respectively, whereas (123), the parallel to (2), is ungrammatical:

(121) *ṭ-ṭullab-u   ʔakal-uu kull-u-hum   dajaajat-ayni*
     the-students-nom ate-pl   all-nom-them chicken-dual.acc
     'The students have all eaten ate two chicken.'

(122) *n-nuzalaaʔ-u   kull-un   (min-hum)   waaʕin bi-haaḏaa*
     the-inhabitants-nom each-nom (of-them)   aware   of-this
     'The inhabitants are each aware of this.'

(123) * *ʔakala ṭ-aalib-un   kull-un   dajaajat-ayni*
      ate   student-gen every-nom   chicken-dual.acc
     (Intended to mean: 'Every student ate two chicken').

Thus *kull$_{ev}$*, in contrast to the other two types, does not permit Q-float. Moreover, only *kull$_{ea}$* permits Q-float with a (strongly) distributive interpretation, whereas *kull$_{ea}$* has only a collective reading when floating.

4.2.2 Adverb and Degree Modification

A second difference between *kull$_{ea}$* and *kull$_{ev}$* is manifest in modification by adverbs like *taqriib-an* 'approximately, almost,' which can qualify any quantifier (or numeral) designating a fixed quantity at the end point of a scale. It is compatible with the universal *kull$_{al}$* and *kull$_{ev}$*, but it cannot combine with *kull$_{ea}$*:

(124) a. *ṭaalib-un   waaḥid-un ʔakala kull-a t-tuffaaḥaat-i*
       taqriib-an
       student-nom one-nom   ate   all-acc the-apples-gen
       approximately-acc
       'One student ate almost all the apples.'

      b. *ṭalib-un   waaḥid-un ʔakala kull-a   tuffaaḥat-in*
       taqriib-an
       student-nom one-nom   ate   every-acc apple-gen
       approximately-acc
       'One student ate almost every apple.'

(125) * *ṭalib-un   waaḥid-un ʔakala kull-an   mina t-tuffaaḥaat-i*
     taqriib-an
     student-nom single-nom ate   each-acc of   the-apples-gen
     approximately-acc

These contrasts indicate that *all* and *every*, but not *each*, can designate the end point of a scale (here the full set of apples), hence the ungrammaticality of (125).

4.2.3 Negative Laysa Modification

There is also a difference between the two groups of quantifiers with respect to modification by the negative *laysa*. The latter can combine with a variety of proportional quantifiers, including *ʔaqall* 'less than' and *ʔaktar* 'more than,' or with *kull*$_{al}$ or *kull*$_{ev}$. It cannot combine with *kull*$_{ea}$:

(126) a. *laysa ʔaqall-a min ʕishriina laaʕib-an šaarak-uu*
　　　　　not　　less-acc than twenty　　player-acc participated-pl
　　　　　'No less than twenty players participated.'
　　　 b. *laysa kull-u　　　laaʕib-in　　šaaraka*
　　　　　not　　every-nom player-gen participated
　　　　　'Not every player participated.'
　　　 c. *laysa kull-u　　l-laʕib-iina　　　　šaarak-uu*
　　　　　not　　all-nom the-players-pl.gen participated-pl
　　　　　'Not all players participated.'
(127) * *laysa kull-un　　mina l-laʕib-iina　　　　šaaraka*
　　　　　not　　each-nom of　　the-player-pl.gen participated
　　 * 'Not each of the players participated.'

The fact that the test groups *kull*$_{ev}$ with *kull*$_{al}$ rather than with *kull*$_{ea}$ suggests that *kull*$_{ev}$ (like *every* in English) has the core function of pure universality that *kull*$_{ea}$ lacks. It is then reasonable to think of *kull*$_{ev}$ as essentially a universal quantifier, whereas *kull*$_{ea}$ is essentially distributive.

4.2.4 Collective Universal Construal

It then becomes natural to observe that collective universal construals of DistQPs are possible with *kull*$_{ev}$, but not with *kull*$_{ea}$, as in the following contrasts:

(128) a. *rafaʕa l-kaʔs-a　　kull-u　　　laaʕib-in*
　　　　　raised the-cup-acc every-nom player-gen
　　　　　'Every player raised the cup.'
　　　 b. *rafaʕa l-kaʔs-a　　　kull-u　　l-laaʕib-iina*
　　　　　raised　the-cup-acc all-nom the-player-pl.gen
　　　　　'All the players raised the cup.'
(129) *rafaʕa l-kaʔs-a　　　kull-un　　mina l-laaʕib-iina*
　　　　(non-collective only)
　　　　raised　the-cup-acc each-nom of　　the-player-pl.gen
　　　　'Each of the players raised the cup.'

Although DistQPs headed by *kull*$_{ev}$, like those headed by *kull*$_{ea}$, normally force a distributive construal, as we saw above, this requirement seems to

be relaxed in contexts such as (128). The distinction between $kull_{ev}$ and $kull_{ea}$ suggests that, in at least in some contexts, $kull_{ev}$ can serve as a non-distributive universal quantifier. This is not so with $kull_{ea}$, which does not make room for the collective use, being only (strongly) distributive.

4.2.5 Generic Kull$_{ev}$

Some $kull_{ev}$ phrases can be construed generically, whereas $kull_{ea}$ expressions cannot be so construed:

(130) *kull-u   kalb-in   la-hu   ḏayl-un*
      every-nom dog-gen   to-him   tail-nom
      'Every dog has a tail.'
(131) *kull-un   mina l-kilaab-i   la-hu   ḏayl-un*   (non-generic only)
      each-nom   of   the-dogs-gen to-him   tail-nom
      'Each of the dogs has a tail.'

Example (130) is a claim about dogs in general, whereas (131) is about a particular set of dogs (previously mentioned in the discourse).[34] Thus $kull_{ev}$, unlike $kull_{ea}$, can make room for the generic use. It corroborates the fact that (at least in some contexts) $kull_{ev}$ can serve as a non-distributive universal quantifier. It is then basically a universal quantifier and only a weak ditributor. By contrast, $kull_{ea}$ is a strong distributor, in line with the specifications in (111) observed above.

4.3 Negation and DistQP

Scope interactions of Neg and the three forms of *kull* also provide bases for differentiating them, although they provide a less clear base for distinguishing the position of Neg with respect to DistQP. The structure in (110) above suggests, if we follow Beghelli and Stowell's logic, that we should expect DistQP to uniformly take scope over NegQP, since DistP (or its Spec, the target scope position of DistQP) asymmetrically c-commands NegP (or its Spec, the target scope position of NegQP). But the facts about DistQP and NegQP scope interactions are much more complex. On the one hand, $kull_{ea}$ Dist behaves differently from $kull_{ev}$ Dist. On the other hand, DistQP subjects behave differently from DistQP objects. I will limit myself here to investigating structures involving clausal negation. Before that, I would like to examine distinct behaviours of Negators with respect to *exhaustivity*.

4.3.1 Neg and Exhaustivity

To the above difficulties that arise for English as well as Arabic, as I will show, an additional difficulty arises in Arabic, due to the uncertain NegP placement,

or rather its *mobility*. Negative head markers in Arabic are of various types, but they can arguably be placed above TP (at least in some constructions), as represented in (132) (contrary to the structure provided for English in [110] above, where NegP is above VP and below TP):

(132) NegP

Neg   TP

T   VP
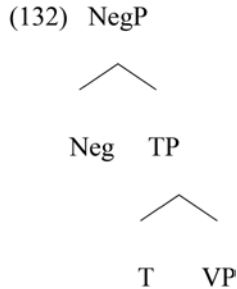
As shown in Fassi Fehri (1993), one type of Neg behaves just like a *modal* and is placed higher than the tensed verb, which heads a TP (or a MoodP). For example, Neg *lan*, a modal for future tense, selects necessarily a VS(O) structure, where the verb is initial (and marked with a subjunctive Mood):

(133) *lan   y-aʔtiy-a   r-rajul-u*
        not.fut 3-come-subj the man-nom
        'The man will not come.'

Note that a SVO structure after *lan* is excluded (by selection requirements).
    Another type of Neg is somehow "neutral" (with respect to selection). It can occur preceding verbal or nominal expressions, in VS(O) or SV(O). For example, the neutral *maa* can occur in both contexts in (134) and (135), contrary to *lam*:

(134) *maa ʔataa ʕumar-u*
        not   came Omar-nom
        'Omar did not come.'
(135) *maa ʕumar-u   ʔataa*
        not   Omar-nom came
        'It is not Omar who came.'

If the subject in (135) has moved to some higher A' position (TopP or FocP), then it is conceivable to think of *maa* in (135) as placed higher than TP and the projection where the moving subject is placed (FocP or TopP), at the low left periphery in the CP, compared to *maa* in (134), which is placed exactly

above TP. We will see that these distinct placements of *maa* lead to some significant consequences. My purpose here is not to detail the characteristic properties of each type of Neg, but only to show that Neg can be placed higher than TP and that the interaction of their scope or interpretation with that of QP can help us in detecting some distinctive properties of the three forms of *kull*.[35]

Consider the case of *exhaustivity* in the interpretation of the QP in the above constructions, having in mind the two Neg types (the neutral *maa* and the modal *lam*) when they occur in front of VS(O) structures:

(136) *maa   ʔataa   kull-u   r-rijaal-i*
        not   came   all-nom   the-men-gen ʔ
        'Not all the men came.'
(137) *lam   y-aʔti   kull-u   r-rijaal-i*
        not.past   3-come   all-nom   the-men-gen
        'Not all the men came.'

Other differences aside, the two Neg constructions have quasi-identical readings in which Neg scopes over the universal Q (Neg > Q) and the negation of the subject is *non-exhaustive* (or partial). In order to get the exhaustive reading, Q must scope over Neg. But note that this is possible with *lam* in (138)—by placing the quantifier subject higher than Neg (i.e., Q > Neg)—but impossible with *maa* in (139):

(138) *kull-u   r-rijaal-i   lam   y-aʔt-uu*
        all-nom   the-men-gen   not.past   3-come-pl
        'All the men did not come.'
(139) * *kull-u   r-rijaal-i   maa   ʔata-w*
          all-nom   the-men-gen   not   came-pl

The fact that exhaustivity is possible with *lam* (or its variants), but not with *maa*, appears to depend essentially on the Q > Neg order. Thus if the subject raises to a preverbal position, but keeps being under Neg, the construction is still non-exhaustive:

(140) *maa kull-u   r-rijaal-i   ʔata-w*
        not   all-nom   the-men-gen   came-pl
        'Not all the men came.'

If exhaustivity is structural (and presumably associated with a focused DP placed higher in the structure, along the lines of Kiss [2010]), and if *maa* is an "intervener," preventing the DP from reaching that position, unlike *lam*,

then the contrasts can be explained. Basically, we are dealing with a structure like the following:

(141) $_{CP}$ [[C $_{ExhFocP}$[[$_{Neg\,P}$ [Neg *maa/lam*$_{TP}$ [*Umar-u*$_j$ T *ʔataa*$_i$] $_{vP}$ [[$_{DP}$ $e_{j]\,vP}$ [v [e_i]]]]]]]

Note that the case of exaustivity raises the possibility of *kull*$_{al}$ scoping over Neg (from a high position), and precludes the possibility of Neg scoping over that position (while staying below at surface structure), hence the ungrammaticality of (139). The fact that it is so can possibly be traced back to the strict locality of QR (see Cecchetto [2004] as well as Fox [2002] for discussion). Let us assume, instead, that the two negators differ in terms of marking with respect to some exhaustive feature, [± exh]. If *lam* can be [+exh], while *maa* is [-exh], and the QP has to move to its Spec (to value its exh feature), then (138) is licensed by Agree (under Spec Head), and (139) is banned. Since the QP is presumably in relatively high position (in an exh FocP, as argued in Kiss [2010]), then the solution based on the strict locality of QR appears to be questionable. When *maa* is placed higher than TP (or ModP), in the lowest part of the CP, then the universal quantifier cannot QR over *maa*, due to the failure of Agree rather than to any locality limitation on the rule application.[36,37]

4.3.2 NegP and Dist QPs

As mentioned, the structure in (110) above suggests, if we follow Beghelli and Stowell's logic, that we should expect Dist QPs to uniformly take scope over NegQP, since DistP (asymmetrically) c-commands NegP. But far from scoping comfortably above negation, Dist QPs seem to be awkward or ungrammatical in most cases in English. Similar contrasts obtain in Arabic. Here are some examples. In (142), the subject is placed before Neg, and in (143), the object is placed after Neg:

(142) a. ?? *kull-u   tilmiiḏ-in lam y-uġaadir*
             every-nom   pupil-gen not 3-quit
        'Every pupil didn't quit.'
       b. * *kull-un   mina t-talaamiiḏ-i lam y-uġaadir*
             each-nom   of   the-pupils-gen not   3-quit
(143) a. ?? *ʔaḥmad-u   lam y-aqraʔ kull-a   kitaab-in*
             Ahmad-nom not 3-read   every-acc   book-gen
        'Ahmad didn't read every book.'
       b. ?? *ʔaḥmad-u   lam y-aqraʔ kull-an   mina l-kutub-i*
             Ahmad-nom not 3-read   each-acc of   the-books-gen
        'Ahmad didn't read each of the books.'

Given Beghelli and Stowell's checking theory of DistQP licensing, the DistQP should be forced to move to the Spec of DistP, activating Dist and its complement ShareP. But there is no existential (or overt indefinite) QP available in any of these examples to (move and) occupy the Spec of ShareP, and hence to satisfy the checking requirements of its head. Moreover, if there is an event variable, it is bound by Neg. The theory then predicts that all of these examples are excluded, and the prediction is borne out in every case.

   The behaviour of *kull$_{ea}$* and *kull$_{ev}$* contrasts significantly with that of *kull$_{al}$* in these contexts. When the DistQPs are replaced by the universal *kull$_{al}$*, the results are fully grammatical:

(144) a. *kull-u   t-talaamiiḏ-i   lam y-uġaadir-uu*
         each-nom the-pupils-gen not   3-quit-pl
         'All the pupils did not quit.'
     b. *Ɂaḥmad-u   lam y-aqraɁ kull-a   l-kutub-i*
         Ahmad-nom   not 3-read   all-acc   the-books-gen
         'Ahmad did not read all the-books.'

These examples seem to behave like the examples involving scopal interactions between indefinite GrQPs and negation that were discussed. The subject GrQPs must scope over negation, while the objects are scopally ambiguous. These examples can thus be assimilated to the treatment of GrQPs given earlier. The difference in behaviour between *each/every* and *all* can be accounted for by assigning QPs headed by *kull$_{al}$* to the type of GrQPs. Note that the Spec of ShareP position is not available to these universal (only QPs that are capable of referential variation may occur there—that is, indefinites and definites containing free variables). Treating *kull$_{al}$* as the head of a GrQP also fits with its ability to occur as the subject of collective predicates.

To recapitulate, *kull$_{ea}$* is a true distributive QP, while *kull$_{ev}$* is not. The latter exhibits quantificational variability, its set variable can be bound by Neg or Gen operators, and its distributivity is optional, compared to that of *kull$_{ea}$*, which is obligatory. These differences can be accounted for through the various featural specifications of *kull*. Both *kull$_{ea}$* and *kull$_{ev}$* can access Spec DistP (being indefinite), but *kull$_{al}$* cannot (because it is definite).[38] When endowed with a [+dist] feature, *kull$_{ev}$* must move to Spec of DistP to check its feature. On the other hand, *kull$_{ea}$* is always endowed with the [+dist] feature. Recall that *kull$_{ev}$* moves to Spec of DistP only when their set variable is not bound by a lower operator (such as negation, which is the closest binder).

   So far, so good for a theory that would derive the differences between the three homophonous vocabulary items from their featural differences.

But presumably there are featural redundancies that one would hope to dispense with in a more elaborated theory of Q features, which I am not able to provide at this stage. There are also competing analyses, one of the most important of which I will review briefly in the next subsection.

4.3 QPs as Superlatives

Based on similarities between the universal quantifier *kull* 'every/all' and superlatives, Hallman (2016) develops an analysis of the meaning of the Arabic universal quantifier *kull* 'every/all' as a superlative term (extending treatments of the English proportional quantifier *most*, *ʔakṯar* in Arabic, along the lines of, for example, Gawron [1995], Hackl [2009], and Teodorescu [2009]). Building on the crucial claim in these treatments, namely that *most students* describes a plurality of students more numerous than any other plurality of students, the author claims that the salient difference between Arabic *kull* 'every/all' and *ʔakṯar* 'most' is whether or not the pluralities they compare in terms of cardinality are allowed to overlap. The possibility of overlap in the comparison of cardinality gives *kull* its universal character. The difference between *kull*'s strongly distributive meaning analogous to *every* and its weakly distributive meaning analogous to *all* is argued to be the result of a type-shifting mechanism (1). The author establishes similarities between superlatives of quality, superlatives of quantity, and *kull* 'every/all' in Arabic, and fleshes out the semantic underpinnings of these similarities. His analysis traces the similarities to the status of all three constructions as *superlatives*. Quality and quantity superlatives both contain the superlative morpheme *ʔaCCaC*, while *kull* denotes a variation on the meaning of *ʔaCCaC* that gives it its universal force. Like *ʔaCCaC*, *kull* occurs with a definite dependent nominal in combination with a partitive operator "part" and a degree relation deriving the *measure* (meas) involved. Since "part" is incompatible with a predicate denoting bare indefinite, *ʔaCCaC* cannot combine with an indefinite dependent nominal. But *kull* may be lifted to a predicate of sets, which, in combination with lifted derivatives of "meas" and "part," may occur with a bare singular dependent nominal. Lifting turns *kull* + indefinite singular into a predicate of sets, the semantic type that Szabolcsi (1997a) links to strong distributivity. This explains why *kull* + indefinite singular is strongly distributive, while *kull* + definite plural fails to license strong distributivity. The context is not compatible with lifting in the latter case. The proposal, then, is that what appears to be a universal quantifier is actually a superlative term (Hallman 2016, 27).[39]

Hallman's appealing analysis is certainly worth exploring, given the number of similarities with superlatives he came up with. It is beyond the scope of this chapter at this stage to provide a detailed comparison between his

analysis and mine. Few observations, though, may guide more deep comparison. First, Hallman's analysis deals basically only with two meanings of *kull* that I have dealt with: *kull$_{al}$* and *kull$_{ev}$*. It does not deal with *kull$_{ea}$*, the most distributive *kull*. Second, he construes the difference (through a "lifting" or "shifting" semantic type mechanism) as (essentially) *semantic* rather than *syntactic* (as well as semantic), as I have done. Third, *kull$_{ea}$*, which is strongly distributive, does in fact have a *definite* complement obligatorily, as a form of manifestation of the Partitive Constraint, and the complement of *kull$_{ev}$* is not necessarily singular, as I have shown. This strongly suggests that singularity and indefiniteness may not be automatically discriminative, although they are presumably relevant for coming up with (strong) distributivity. I suspect that only elaborate syntactic structures can come up with the right answer. Given that I have confined strong distributivity to *kull$_{ea}$* in (overt or hidden) partitive structures (or PartP), and that *kull$_{ev}$* constructions are not (naturally) analysable as true partitives (they are CSs that do not manifest any natural partitive FS, or they are pseudo-partitive at best), it is reasonable to think that appropriate distincions of the three patterns of Qs and their interpretations have sources in their syntactic bases.

5 SUMMARY AND CONCLUSION

In sum, I have shown that quantifier expressions that are determiners (or DPs) are basically endowed with a [± def] feature, a [± sing] (Num) feature, a [± dist] feature, and in some cases a [± unit] feature (for group Qs; see chapter five). These features project on Q or its complement nP and can be valued via a Probe-Goal Agree, along the lines of Chomsky's (1995) original proposal, making use of standard functional hierarchical structures. Gender can manifest itself namely as [± fem] or [± unit]. The [± unit] Gen matching found in QP (misnamed as "agreement") is subject to the Gen polarity constraint, whereas the [± fem] is governed by Probe-Goal Agree. Q types, being semi-lexical, differ as to how some of these features (or others) receive distinct specifications and interpretations.

Starting with the basic taxonomy of quantifying expressions into D-Qs and A-Qs (as originally found in Partee [1987]), I have identified a trilogy of Dist-Qs patterns, uses, and meanings, which are associated with the quantifier *kull*: the *kull$_{al}$* type, the *kull$_{ea}$* type, and the *kull$_{ev}$* type. These types differ both syntactically and semantically, and are found in three forms of constructions: CS, PartP, and bare (or pseudo-bare) QPs. It is possible that they are all analysable as forms of (more abstract) PartP structures, but they differ in detail. While the *kull$_{al}$* expression is a PartP where the two members (the whole and the part) are definite, *kull$_{ea}$* is a PartP where only the second

member is definite, while the first is indefinite. As for the *kull*$_{ev}$ QP construction, it can be shown that both its Q and its complement are indefinite. If *kull*$_{ev}$ is analysed as PartP, then it has a pseudo-partitive structure rather than a true partitive structure. Regarding semantics, the collective/distributive dimension (implemented in terms of the feature [± dist]) singles out the first type of Q, *kull*$_{al}$ (the "collective" negative member, or [− dist]), from the positive member, *kull*$_{ea}$ (or [+ dist]). As for *kull*$_{ev}$, it has presumably no specified value of the feature, being [± dist]. Morpho-syntactically, Q$_{al}$ is marked as [+ def], to express maximization, which makes it apply to the collection as a whole, while Q$_{ea}$ and Q$_{ev}$ are indefinite, making them apply only to a member (or a part) of the whole set. However, it has been shown that Q$_{ea}$ and Q$_{ev}$ differ in terms of the nominal complement they select. While Q$_{ea}$ selects a clearly partitive complement, containing a definite DP, Q$_{ev}$ selects only an indefinite NP (or DP), a pseudo-partitive complement. In a nutshell, the descriptions of the three QP expressions (when taking into account the properties of Q and those of the nP/DP complement [nP for short here]) should contain at least the following ingredients:[40]

(145) *kull*$_{al}$ QP
    a. Q: [− dist], [+ def]
    b. nP: [+ def]
(146) *kull*$_{ea}$ QP
    a. Q: [+ dist], [− def]
    b. nP: [+ def]
(147) *kull*$_{ev}$ QP
    a. Q: [± dist], [− def]
    b. nP: [− def]
    c. nP denotes a set if Q is [+ dist]
    d. nP denotes individuals if Q is [− dist]

NOTES

    1. For Salish quantification, see Jelinek (1995) and Matthewson (2013), among others.
    2. For example, De Clercq (2017) proposed Num, Div, Neg, Q (which are arranged hierarchically in a functional sequence (i.e., <Num, Div, Neg, Q>). It is then assumed that differences between languages are the result of the size and organisation of lexically stored trees (which target these features). I am proposing a more precise and refined articulation of features here.

3. The form of *kull*, which is "nominal," differs, for example, from that of *jamiiʕ* ("all") which is rather "adjectival" and does not have, like *kull*, "every" or "each" meanings. The Q *jamiiʕ*, unlike *kull*, can be used as a bare adverbial, as in (i):

(i) *xaraja*   *n-naas-u*   *jamiiʕ-an* (* *kull-an*)
    went.out   the-people-nom   all-acc
    'All the people went out.'

Being nominal like *juzʔ, kull* can serve as a base for deriving the adjective; *kull-ii* ("universal, entire") is just like *juzʔ-ii* ("partial"). The adjective then provides a base for forming adverbs like *kull-iyy-an* ("universally, totally"), *juzʔiyy-an* ("partially"), etc. Note that *jamiiʕ* does not form attributive adjectives like * *jamiiʕ-iyy* or the complex adverb * *jamiiʕ-iyy-an*. See below for more differences.

4. For an early discussion of the primary relevance of definiteness and number features for Q interpretation along the collective/distributive dimension, see Fassi Fehri (1998–1999) and Jahfa (1998) for different results; see also Al-Mabxuut (2009).

5. The "Partitive Constraint," first proposed by Jackendoff (1977), and Selkirk (1977), "implies that the embedded noun phrase within a partitive must be definite, i.e. it must contain a definite article, a demonstrative, or a possessssive" (de Hoop 1998, 179). Other semantic and pragmatic limitations are also attributed to this constraint, which I will not discuss here in detail (see de Hoop [1998] for an overview and other references, as well as Ionin, Matushansky, and Ruys [2006] for a more recent discussion).

6. Reciprocals are expressed through reduplication of *baʕḍ* 'some,' or by *l-waaḥid l-ʔaaxar* 'the-one the-other,' which are interchangeable in many contexts, though not all. They are exemplified in the following constructions:

(i) *ntaqada*   *r-rijaal-u*   *baʕḍ-un*   *baʕḍ-an*
    criticized the-men-nom   some-nom   some-acc
    'The men criticized each other.'
(ii) *ntaqada*   *r-rijaal-u*   *l-waaḥid-u*   *l-ʔaaxar-a*
    criticized   the-men-nom the-one-nom   the-other-acc
    'The men criticized each other.'

7. Binominal *each* has a dative *li-l-waaḥid* 'for-the-one' counterpart:

(i) *ʔakal-uu* *dajaajat-ayni*   *li-l-waaḥid-i*
    ate-they chicken-dual.acc   for-the-one-gen
    'They ate two chickens each.'
    Note that *li-l-baʕḍ* 'for-some' is not an option here:
(ii) *ʔakal-uu dajaajat-yni* * *li-l-baʕḍi*
                                for the-some

8. As for the "determiner," it is potentially ambiguous between *every* and *each*, and it needs additional structure (or morphology) to disambiguate, as is explained below.

9. Note that Number is not the only reason to postulate a hidden *n* in the structure. In other contexts, it can be filled by the numeral *waaḥid* 'one,' or by the nominal *fard* 'individual,' *šaxṣ* 'person.'

10. Peter Hallman pointed out to me that the discussion of the properties of *baʕḍ* in (21) recalls that of prenominal (usually superlative) adjectives (e.g., *ʔaḥsan-u l-madaaris-i*, which stands for either 'a group of schools' that are the best, or just the one single best school). Then *baʕḍ* appears to function similarly. This carries over to English in the phrase *the best of the schools* (not *the best schools*, which must be plural). So if *the best of the schools* is the short expression for 'the best one(s) of the schools' (which is singular with 'one' and plural with 'ones'), this 'one(s)' would be equivalent to the *n* head I posit, strikingly supporting the analysis in (22a). Thanks to Peter for pointing out this parallel with English. See also Fassi Fehri (2007) for discussion of the structures of these superlatives.

11. I leave aside the question whether it *must*, as has been assumed in a number of proposals. In adjectival or (some) event constructs, it is not possible to assume obligatory definite inheritance. For relevant discussion in Arabic, see Fassi Fehri (1993, 1999), Mohammad (2000), Benmamoun (2000). For Hebrew, see Siloni (2001), Borer (1999), Shlonsky (2004), Sichel (2002).

12. The similarity of Arabic and English structures can now be translated by assuming partitive structures for both (as in Greer 2015) or assuming distinct routes to indefiniteness, although the partitive is the essential one (Arsenijević 2006). See section 4 below for more discussion.

13. It is tempting to think that, in this context, *kull* means "the whole," and this interpretation can be forced by making it definite or maximal. When indefinite, *kull* cannot mean the entire whole, but literally just "part of the whole." *Al-kull* is D-Q, where Q is a "whole," while *kull-un* is Q-Part-DP. A refinement is possible as follows: *al-kull* is D (Max $\forall$) of parts, and *kull-un* is D (sm $\exists$) part of parts. The refinement would attempt to derive the whole/part readings involved constructionally, assuming that *kull* is potentially ambiguous between these two readings, and that its disambiguation is achieved through the value assigned to (in)definiteness. For more elaborate discussion of the part-whole relationships, see Moltmann (1997), Hallman (2016), and Champollion (2017), among many others, as well as chapter five.

14. This differentiation in behaviour of groups with respect to "acquisition" of plurality or feminine can be traced to their semantics, as explained in chapters four and five. While groups in general are rather freely used as singular or plural, due to their semantic (or conceptual) ambiguity, there is no free use of them as feminine (or masculine). The gender feature normally distinguishes some groups from others, arbitrarily in some cases (see, e.g., the pair *fariiq-firq-at*, which both mean 'team'), but on a grammatical systematic base (e.g., in the case of pluratives).

15. See Hoeksema's (1984) (34a), p. 698. I will neglect his reformulation in (34b), repeated in (i) here, in which the only difference is the use of '<' instead of '≤,' which is supposed to account for proper partitivity (explained and justified there):

(i) [[*of* PART]] = $\lambda x \lambda P \lambda y[P(y) \wedge y < x]$

Hallman (2016) assumes that "a covert partitive operator is hidden . . . which derives a predicate that holds of parts of the denotation of the definite noun phrase,"

defined in his formulaton (13), after Link (1983), Krifka (1989, 1998), and others (p. 6):

(ii) $\llbracket \text{part} \rrbracket = \lambda y \lambda x \ [x \sqsubseteq y]$

Ionin, Matushansky, and Ruys (2006) give an equivalent formulation, based on Barker (1998), while also omitting the proper partitivity limitation. I will simply ignore proper partitivity here. Moreover, I will assume no covert part operator.

16. Watanabe (2013) argues on the basis of agreement facts in Japanese that a covert version of "part" is present in "partitive constructions [which] involve duplication of the NP portion of the whole in the higher region," observing that Zamparelli "attributes the part-whole relation to the semantic contribution of *of*, but there is no obstacle to positing a covert version of *part* in his analysis" (10). In fact, Watanabe's analysis is guided by Chierchia's (1997), in which a covert version of *part* does all the syntactic and semantic work. While copying may be involved in a number of processes leading to the derivation of (some) partitives, I see no reason at this point to postulate the existence of a hidden noun "part" as a component of the partitive structure in Arabic.

17. Rutkowski (2007) also observes that in languages like Lithuanian, the partitive and pseudo-partitive constructions differ in word order:

  (i) *pieno*   *stiklinė*   (partitive)
     milk.gen   glass.nom
     'A glass for milk/a glass of milk'
(ii) *stiklinė*   *pieno*   (pseudo-partitive)
     glass.nom   milk.gen
     'A glass of milk (amount)'

In Stickney (2009), it is thought that all these differences can be explained by assuming that the first noun in the pseudo-partitive is a measure element, heading a functional Measure Phrase (MP), which is in the extension of the NP.

18. To make things explicit, I have used the overt preposition in the structure, instead of the CS example. But as I suggest below, both constructions have the same prepositional structure, even though P can be hidden in the case of the CS.

19. A significant number of studies have concentrated their efforts on dealing with morphological or phonological aspects of the CS (see, e.g., Siloni [2001] and Borer [1999] for Hebrew and Benmamoun [2000] for Arabic rather than syntactico-semantic aspects [see Fassi Fehri 1993, 1999; Bardeas 2008 for Arabic]).

20. Hallman's (2016) results concur with the view of the author from the perspective of semantics. In addition, I am proposing a syntactic base here, which easily translates the convergence of the semantics of the universal and the existential. For more discussion, see section 4 below.

21. For example, they are not subject to the robust MIO generalization (first proposed by Fassi Fehri [1999] for Arabic, and extended by Shlonsky [2004] to Hebrew and some other Arabic dialects), contrary to post-nominal adjectives. As a matter of fact, a number of hidden aspects of these structures can be made explicit by contrasting real Qs with adjectives of similar source expressing quantity. For example,

adjectives such as *ʔajmaʕ* contrast with the Q *jamiiʕ* in that they cannot appear pre-nominally, and they agree in gender and number with the nP modified:

(i) *n-naas-u*   *ʔajmaʕ-uu-na*
   the people   entire-pl.nom
   'The entire people'

(ii) *al-bašariyyat-u*   *jamʕaaʔ-u*
   the-humanity-nom   entire-nom
   'The entire humanity'

(iii) *jamiiʕ-u*   *n-naas-i*
   all-nom   the-people-gen
   'All the people'

(iv) * *ʔajmaʕ-u*   *n*-naas-i
    entire-nom the-people-gen

(v) * *al-bašariyy-at-u*   *jamiiʕ-at-un*
    the-humanity-gen   all-fem-nom

Acquiring a Q status (or flavour) then seems to be tight to losing the ability to Agree (in terms of phi-features), and also the characteristic positioning of adjectives (including the ability to comply with the MIO generalization). See Fassi Fehri (1999), Amiri (2008), and Bardeas (2008) for more properties of pre-nominal adjectives compared to post-nominal ones. For their Q or Deg (degree) flavour, see Hallman (2016).

22. Various analyses of CS have been proposed in the literature, with CS essentially driven by N-to-D movement, plus other XP movements, on a case-by-case construction. Shlonsky (2004) proposes a roll-up XP movement, originally dismissed by Fassi Fehri (1999). The issue is too complex to be sorted out here. For a documented and well-updated view of the topic (and a quite reasonable synthesis), see Shlonsky (2012). See also Sichel (2002).

23. Ritter (1991) extends the DP analysis to propose that in Modern Hebrew CSs, D does not select NP directly as its complement. It rather selects another functional head, which she labels NumP (Number Phrase). This projection replaces a more general projection found in Abney (1987) labelled Agr. I will discuss this proposal in chapter five, show that the argument for Number based on the CS is very weak, and reject it. Instead, I will provide a new motivation for the postulation of a Num projection on different bases. See also Bardeas (2010, 48) for more criticism of NumP.

24. Benmamoun (1999) has also argued for two distinct derivations of the head Q and the modifier Q, the latter QP taken to be an adnominal adjunct to NP. He conjectures, on "the basis of evidence from reconstruction, case, and agreement that the two patterns are radically different. In the Q-NP pattern, Q is indeed the *head* of a QP projection that contains the NP. In the NP-Q pattern, however, Q heads a QP adjunct that *modifies* the NP and in some cases the VP" (621, italics mine).

25. Shlonsky (1991) argues that the Hebrew data discussed "support rather strongly the fundamental insight of Sportiche (1988), namely that Quantifier Float consists of moving an NP (DP) subject leftward, from a D-structure VP-internal position, leaving behind the quantifier. Leftward movement undergone by the subject over

the quantifier proceeds through the specifier of QP, of which the quantifier is a head. The basic claim is illustrated in (i), where an empty category appears to the left of Q:

(i) [NP]i ... [QP [e]i Q [e]i]   (p. 159)

As he states in footnote 1, he "deals only with collective *kol*," but he does not deal with the fact that "*kol* can also have the interpretation of 'every' and 'each,' as in *kolgever ohev xatul* ('every/each man loves a cat'). In these latter uses, *kol* must be followed by an indefinite singular noun." His analysis is then incomplete. Moreover, as we have seen, the complement of distributive *kull* is not necessarily singular. It can be dual or plural, as in examples (6) to (8).

26. Note that Arabic traditional grammars treat adnominal QPs as *tawkiid* 'corroborators, reinforcers' of the noun, a specific class of modifiers, which must be anaphorically related to the noun, hence the pronominal clitic, whereas those in (75) are treated as *ḍarf* 'adverb.' See, for example, Astarabaadii's (1979) discussion (vol. 2, 328–42).

27. Other uses of *kull* as adverbial include some idiomatic-like uses: *ʕalaa kull-in*, on every (case), 'at any rate'; *kulla-maa*, every-what, 'whenever,' etc.

28. Beghelli and Stowell (1997) claim that they propose a hybrid theory of scope, incorporating aspects of both May's (1985) theory, which holds that all QPs undergo LF movement to their scope positions, and Hornstein's (1995) theory, which holds that quantifier scope is based strictly on chains formed by the movement of QPs to their Case positions. Beghelli and Stowell's theory differs from theirs, however, in assuming that only *certain* types of QPs undergo QR to a (non-Case) scope position, unlike May's (for whom *all* QPs undergo QR at LF), or Hornstein's (for whom *none* of them do). It is fundamentally sensitive to the inherent semantic type of the QP involved. Indeed, certain QP types must undergo LF movement from their Case positions, whereas others do not. Second, Beghelli and Stowell's theory provides targeted scope positions for each QP type that does move (78).

29. I have changed the original AgrSP with TP, and AgrOP with vP, for the sake of partial updating.

30. Beghelli and Stowell argue that properties (a) and (b) follow from the mechanism of feature-checking, and property (c) follows from the fact that Spec of DistP and Spec of ShareP are possible LF landing sites for DistQPs and indefinite GQPs.

31. The Beghelli and Stowell checking system needs to be updated and refined to make it compatible with the Probe-Goal theory of Agree. This is done when analysing Arabic examples. But Beghelli and Stowell's system has been kept intact when illustrated by English examples for the sake of understanding how it works as it is.

32. Beghelli and Stowell (1997). Also Kamp and Reyle (1993), Ruys (1993), and references cited there. Items like *a different N* also have an anaphoric reading: "an N which is not identical to the one mentioned before." This reading is irrelevant for the contrasts examined.

33. Beghelli and Stowell designate the second type of distributivity they refer to as *weak distributivity* (or pseudo-distributivity), with the following essential characteristics (their [27]):

(i) *Weak Distributivity*

   a. Plural definite and indefinite GQPs, including QPs headed by *all*, are weak
     distributors.
   b. Weak distributivity is optional.
   c. Weak distributivity cannot arise under an inverse scope construal (e.g., where
     the distributee is in Spec of TP and the distributor is in Spec of vP).

Property (c) suggests that weak distributivity does not make use of distributor movement to a targeted scope position such as Spec of DistP per se; otherwise, we would expect that any QP type that can trigger it should be able to do so regardless of where it originates within the clause (94).

34. In a similar vein, Gil (1992), citing the paradigm in (i) and (ii), observes that *each* DistQPs pattern with *definite* GrQPs (in Beghelli and Stowell's terms), whereas *every* DistQPs pattern with generically construed GrQPs headed by *all:*

 (i) a. Every language has over twenty color words.
    b. All languages have over twenty color words.
    c. ? Each language has over twenty color words.
    d. ? The languages have over twenty color words.
(ii) a. ? Every language has over twenty color words.
    b. ? All languages have over twenty color words.
    c. Each language has over twenty color words.
    d. The languages have over twenty color words.

Gil accounts for this by attributing to *each* a feature [+Definite], which *every* is supposed to lack: "while for *every*, the domain of quantification is free, for *each* it is contextually determined" (20; Beghelli and Stowell 1997, 100). For the relevance of the [±Def] feature, see section 1 above.

35. These properties correlate typically with the original duality of the Arabic Neg structure argued for in Fassi Fehri (1993). See also Shlonsky (1997) for Hebrew. Note that a Neg duality is also found in Zanuttini (1997), though not entirely identical to the one here. Ouhalla (1993) and Benmamoun (2000) take Neg in Arabic to be uniformly lower than T, with Neg movement to T (or to its Spec). Ouhalla (1997) more recently proposed to treat *maa* as a sort of Foc marker. Their early analyses do not take into account the various distributional properties discussed in Fassi Fehri (1993), nor do they take into account the Neg and universal quantifier scope interactions discussed here. Preverbal Neg in Romance shares some properties with *maa*, but not with other negators. Significantly, preverbal Neg does not appear to be higher than the subject of predication in Romance, though such is the case in Arabic. On *laysa* properties in particular, see Al-Horais (2009).

36. In Fassi Fehri (2005b), two different types of Neg are differentiated with respect to the pred(icative) feature, as in (i):

   (i) a. *maa* : [± Pred]
     b. *laa* : [− Pred]

The author then entertains the possibility that two distinct Neg positions are involved, one above T2 and the other above T1 (assuming that there are two

hierachized projections of T). The discussion above also points to the relevance of an [± exh] (exhaustive) feature.

37. Shlonsky's (1997) analysis of (i) (i.e., his 24b) is arguably consistent with the peripheral nature of the other negation element, as is the case below:

(i) 'eyn   Dan kotev   mixtavim
    NEG Dan writes(BEN-MS) letters
    'Dan does not write letters.'

38. Note that the singularity requirement (as proposed by Beghelli and Stowell) cannot do the job. Singularity is most often true of the complement of *kullev*, but certainly not of the complement of *kull$_{ea}$*. Even in English *each of the students*, this condition does not hold. As regards (in)definiteness of the complement, it also plays a role in Arabic in distinguishing *kull$_{ev}$*, the complement of which must be indefinite, from *kull$_{ea}$*, the complement of which is (or must be) definite. More research is needed to see how variation between the two languages can be set up in terms of the definite feature and the singular feature.

39. The author notes that "the parallels between *ʔakt̲ar* and *most* on one hand, and those between lifted and unlifted *kull*, and *every* and *all* respectively, suggest that the analysis of *kull* as a superlative may extend to English *every/all*, a conjecture I must leave for another occasion" (Hallman 2016).

40. See chapter five for refinement of this description.

Chapter 5

Number, Individuation, Atoms, and Unities

In this chapter, I present a description of the most salient properties of the Arabic Number system based on a new theory of Number. The Arabic inventory of modes of expressing Number is very rich, and Number meanings are found at various levels of the nominal structure, rather than at a singular dedicated position or place. One facet of grammatical Number is that it includes singular and plural (in addition to dual). A second and important facet is that it also includes singulatives and pluratives. The phenomenon of singulatives is fairly known in Semitic and Celtic, and has received fairly good treatment in the grammars of these languages. The plurative is a novelty of this study; it is not established as a number/individuation notion yet, nor has it received any particular attention or appropriate treatment (apart from a few contributions from the author and for some Africanists). A big part of this chapter is dedicated to showing why singulativity and plurativity, as distinct notions from singularity and plurality, must be integrated into the theory of Number, given their wider cross-linguistic manifestations (though they appear limited to some "exotic" languages, such as Arabic or Welsh). A third facet of Number is not canonical like the first two. It includes its application to masses, or measuring the amount of plurality in "paucal" plural or "plural of abundance" (or "plural of plural") from normal plurals, "lexical" plurals, etc.

The chapter will focus primarily on the two first facets of grammatical Number. Most available theories of Number have concentrated their efforts on the first facet of Number. The grammatical models of Number available have been dealing essentially with what I designate as the *atomic* charateristic (or function) of Number. Numberable expressions (or "count" nPs) are then thought to be atomic, whereas non-numerable ("mass" nPs) are atomless (or disputably unstable atoms). I will show, however, that these models or theories have to be enriched to integrate the second facet or charateristic of

Number by integrating what I call its *unity* property (or function). The chapter illustrates how both atomic and unity features are necessary to describe essential Number properties. Because the two characteristics interact, pluralities and singularities are shown not to be equal in being unities (or not), and singulatives, pluratives, or groups are more adequately analysed in a grammar that makes room for *unity* in addition to *atomicity*.

By making use of two features (instead of one), [± atom] and [± unit], it becomes possible to refine the concept of "dividing reference" (Quine 1960; Krifka 1989, 1995; Borer 2005; Fassi Fehri 2003–2004). Combinations of these features are associated with nominal projections in syntax and derive the various classes of numberable or non-numberable expressions. I assume the essential architecture of the DM model, or equivalently the exo-skeletal model of Borer (2005, 2013), as enriched by Acquaviva (2016, 2017). Nouns are first born in the derivation as root concepts or kinds. Then they are endowed with a pre-number structure that distinguishes atoms from non-atoms (or masses). It is at this level that the intuition of "natural" atoms can be situated. Nominals are perceived as having shape, integrity, boundedness, discreteness, etc. This early stage of grammar is presumably the first level to be relevant for dividing reference, to perceive early individuals (or objects) as distinct by their physical autonomy or discreteness, or as wholes that are bounded in space or exhibiting "integrity," preventing them from being further divided. As wholes, *apple* and *dog* can be perceived as atomic. Individual nouns like *apple* and *dog* (in most, if not all, languages) are *ones* in a sense that non-individual (or "dividual") *water* is not, being organized as such in nature and by convention (in grammar) as integral wholes, in contrast to *water*, a substance mass that is neither whole nor integral in the relevant sense. It is this sort of wholeness or integrity that we designate as "atomic." I claim that the kind individual and the instance individual *n* has a Number (or atomic) lattice (concurring namely with Harbour [2014] and Acquaviva [2017a, 2017b]).

Now, *dog* and *apple* individual nouns may appear to be alike in the English grammar, or even in the Arabic one, since both are singulars, but in fact they are not. Although both can be taken as atomic, only *kalb* 'dog' can count as a conventional unit in Arabic, but *tuffaaḥ* 'apple/apples' cannot. Hence *singular*, as a morpho-syntactic property, does not necessarily correspond to a *semantic* singular (= 1). It is equivalent to "1" only in the case of *dog*. We can say in this case that *kalb* has a cardinality 1, but *tuffaaḥ* does not, although both are (formally) singulars. The intuitive idea is that some singulars, although appearing to be "one" by their absence of Number marking and their singular agreement, only become "one" (of cardinality 1, in the sense of numerable or countable) when they qualify as "unity" (or unit) through some extra morphology. The "collective" one *tuffaaḥ* is not "one 1" in this sense (hence its hypothesized mass-like character)—only *tuffaaḥ-at* is. On the other

hand, *groups* are often seen as atomic because they are countable, although they are not atomic in the previous sense of being "one," because they normally refer to more than one object. A group noun like *fariiq* 'team' does not denote any discrete or single object (or individual). It is then more appropriate to see it as a "unity" of the persons implicated in its denotation. In these cases and others, what seems to be counted is not an atom, as I describe it (i.e., an integral object), but rather a unit (or unity), although this notion is often fused (or confused) under the term "atom."[1] Evidence for the distinctness of atoms and unities in the grammar comes, for example, from the fact that projecting a unity in the form of a singulative above *n* can lead to a distinct agreement from projecting a (normal) singular (a projection of "atom"). Likewise, projecting a unity in the form of a plurative gives rise to a different agreement from projecting a plural (also a projection of "atom").

This issue concerning the number and individuation feature inventory is necessarily complemented by the issue of the Number category (or categories) and its syntactic projections, their labels, and their number. Two observations are worth pointing out here. First, although a feature does not necessarily license an autonomous projection, there is evidence that suggests that two projections, rather than one, are needed to take care of dividing reference: atomP and unitP, with unitP higher than atomP (in a number of cases). Second, a feature of a category is not necessarily found in a fixed slot in the cartographic sequence but may project at distinct levels. As for labels of the categories, they are different from one author to another. For the sake of clarity, I propose to use the (more or less) standard labels rootP, nP, ClP, NumP, DP to identify the projections in the nominal spine, before replacing them with more novel labels like atomP and unitP (which splits Borer's DivP), or #P (instead of NumP).

A third issue in this chapter concerns mass. Because mass is often assumed to be numberless (and hence the binary system above is not normally relevant to its characterization), and since there are forms of pluralization and counting of masses in Arabic and cross-linguistically, sections 2 and 3 include analyses of some masses that are associated with individuation and number features. Converging descriptions of natural mass phenomena now point to the fact that masses can not only pluralize (or be counted in the right context), but also that they can be partitioned or classified (in the right context as well). Empirical evidence points, then, to the necessity of rethinking the domain of Number and indivuation in syntactic terms such that it can include both traditional count and mass nouns, along proper lines. The solution (to be discussed) is not a unification of the two domains as being both atomic, along Chierchia's (1998a–b, 2010) work, and more recently Acquaviva's (2017a, 2017b). I will claim that the two domains are separate, mass being atomless (since they do not pluralize in the sense that objects do), but their unitization

(rather than atomization) is possible. Some instances of mass singulatives, as well as mass plurals, are analysed to give an idea how the model differentiates mass from count.

The chapter in organized as follows. In section 1, various ingredients of the Arabic nominal Number system are discussed, with the aim of situating the Arabic system cross-linguistically. In section 2, I describe the essential syntax of its features and projections, their motivation, and their mobility. Section 3 is dedicated to a discussion of the various critiques and proposals found in the literature that provide bases for motivating the approach of plurality and individuation adopted. Section 4 extends the system to quantifiers. Section 5 concludes.

1 AT THE ORIGIN OF NUMBER

One simple and traditional way to approach grammatical Number is to associate it with cardinality. Thus singular is 1, dual is 2, and plural is more than 1, or more than 2. But the picture is obviously more complex. There are many singulars and many plurals, there are collectives "in between" being singulars and plurals, and as a matter of fact, there are many collectives.

1.1 Varieties of Singulars

Singular is semantically ONE, in the simple case, and morphologically unmarked (or Ø), in the simple case, compared to plural. But when looking at the behaviour of singulars (or non-plurals) in nominal and clausal syntax, or in numeral, quantifier, or partitive expressions, distinct singularities can be observed, which differ in their semantics and their morpho-syntax. At least four singulars can be distinguished: (a) a "normal" singular denoting an individual (object, or count) noun, (b) a single mass noun (compared to plural masses), (c) a single "collective" noun, and (d) a singulative (count) noun.

Consider the following grammaticality contrasts from Moroccan Arabic (MA), due to uses of four distinct singulars in (partitive) numeral contexts (sgv stands for singulative):

(1) a. *jeb-t*   *tlata d-l-ḥut*
        brought-I   three of-the-fish
        'I brought three fish.'
    b. * *jeb-t*   *tlata   d-z-zit*
          brought-I   three of-the-oil
(2) a. * *jeb-t*   *tlata   d-l-ferruj*
          brought-I   three   of-the-cock

    b. * *jeb-t*   *tlata*   *d-l-ḥut-a*
       brought-I three of-the-fish-sgv

The partitive numeral construction is the normal strategy to count in MA with low numerals, whereas high numerals use a direct counting strategy (without preposition). All nominals in these constructions stand for morphological singulars, although their denotations or semantics are different. The noun is a "collective" in (1a), a mass (or substance) in (1b), an individual singular in (2a), and a singulative in (2b). Only the nominal in (1a) is "numerable" or "countable" in these contexts, while the others resist countability. Both (2a) and (2b) are excluded, presumably because a semantic singular is not admittible in this context (only a plural is). So if the noun is pluralized, as shown in (3), the structure becomes acceptable:

  (3) a. *jeb-t*   *tlata*   *d-l-frarej*
        brought-I three of-the-cocks
        'I brought three cocks.'
      b. *jebt*   *tlata*   *d-l-ḥut-a-t*
        brought-I three of-the-fish-sgv.pl
        'I brought three fishes.'

Therefore, a (formal) plural agreement is required with low numerals (singv is an abbreviation for singulative).

What is more important, however, for our purpose here, is the contrast between (1a) and (1b). Thus, in partitive counting, a "collective" nominal (which is semantically plural but morphologically singular) is accepted, while a pure mass (or substance) is excluded. If the reason for excluding (2a) and (2b), and accepting (3a) and (3b), is a requirement that the complement nominal of the partitive be plural, then the acceptance of (1a) seems to suggest that what is required for acceptability is just any plural (not necessarily a morphosyntactic one), including the "semantic" collective. Given that the collective count as "plural" in this sense, although it is morphologically singular, the grammaticality of the three cases can be unified through the semantic plurality requirement.

Consider now the case of "direct" counting—that is, of using the numeral with a noun complement directly, without the mediation of a partitive preposition, as in (4) and (5):

  (4) a. * *jeb-t*   *tlatiin ḥut*
        brought-I thirty fish
      b. * *jeb-t*   *tlatiin zit*
        brought-I   thirty oil

(5) a. *jeb-t   tlatin ferruj* (* *frarej*)
        brought-I   thirty cock   cocks
        'I brought thirty cocks.'
    b. *jeb-t   tlatin ḥut-a*   (* *hut-a-t*)
        brought-I thirty fish-sgv   fishes
        'I brought thirty fishes.'

Direct counting is available with higher numerals in MA (in addition to the "indirect" partitive counting exemplified above). What is striking here is that only (5a) and (5b) are accepted, while (4a) is excluded, on a par with (4b). It can be argued that these singulars are both semantically singular, in the sense that they denote individual objects, and that they are morpho-syntactically singular, a requirement in this context. Note that a plural nominal (or agreement) with the numeral is excluded there (as indicated by the starred plurals in parentheses).

   The ungrammaticality of (4b) is expected, given that it is also excluded in indirect counting. But that of (4a) needs explanation, because indirect counting is possible in this case. The intuition is basically that direct counting requires a singulative, as in (5b), rather than a collective. Substance mass is excluded across the board from counting. These behaviours can be accounted for only if we distinguish individual mass (or mass object) from substance mass, or treat collectives as "weakly individualized" compared to substances (which are not) in addition to clearly individualized singulatives (as in [2b] or [5b]). Note that similar judgements are found in SA for these constructions (to which we return), as well as in other Arabic dialects (as far as I can tell).

   Let us then look closely at the equivalent of (4a) and (4b) in SA. Suppose both object and substance masses are treated as "kinds" in a general sense, so that their use in (6), meaning "kind of," is expected:

(6) a. *ṯalaaṯiina ḥuut-an*
        thirty   fish-acc
        'Thirty kinds of fish'
    b. *ṯalaaṯiina zayt-an*
        thirty   oil-acc
        'Thirty kinds of oil'

In these structures, counting is possible, provided it only targets the kind (or subkind) reading, not the instance (or object) reading. It is only by using the singulative singular that counting the instances (or units) is possible for *ḥuut*, hence (7a). Such a possibility is not readily open for *zayt*, hence the ungrammaticality of (7b):

(7) a. *ṯalaaṯiina ḥuut-at-an*
          thirty   fish-sgv-acc
          'Thirty fishes (units of fish)'
     b. *ṯalaaṯiina *zayt-at-an*
          thirty   oil-sgv-acc

This difference in grammatical status suggests that we need to separate kinds into two classes. First, there are *individual kinds*, which have "natural" (or conventional) particulars or instances, as evidenced by the fact that they produce a singulative form without problem, as in (7a) (or just "kind" for short, in the sense of Carlson [1977a–b], Ojeda [1992], and Fassi Fehri [2003–2004], among others), and *mass kinds* (or just "mass" for short), which do not normally provide instances or singulatives. If both nominals were treated alike as mass (and/or non-count) by the grammar, as is often done in the literature, we would expect both constructions in (7) to be ungrammatical, contrary to fact. If so, we end up motivating four distinct descriptive classes of singulars: (a) kind singular, (b) mass singular, (c) individual singular, and (d) individual singulative.

1.2 Singulatives

Singulatives are morphologically marked to count units or instances, compared to (general) kinds. Normally singulatives are formed from individual kinds, but not from mass kinds, as illustrated by the contrast in (7). But there are some singulatives that appear to be formed from pure masses. In (8), *xašab-at-an* can be seen as an instantiation of the more general *xašab*, and *laḥm-at-an* as the instantiation of *laḥm*, which are then counted as instances rather than kinds:

(8) a. *ṯalaaṯiina xašab-at-an*
          thirty   fish-fem-acc
          'Thirty fishes (units of fish)'
     b. *ṯalaaṯiina laḥm-at-an*
          thirty   meet-fem-acc
          'Thirty pieces of meat'

It then looks as if the singulative can be derived at least from some substances, and that mass nominals benefit in an equal manner from singulative formation, dividing up and atomizing the "stuff" (Wright 1971; Fassi Fehri 2003–2004, 2005; Acquaviva 2015). But there is reason to doubt the possibility of generalizing such "abrupt" conversion of stuff into countable units. On the one hand, the partition does not produce the same result: in one case,

the outcome is a unit or instance of the kind, and the singulative functions as a *unitizer*; on the other hand, the outcome has a "piece of" meaning and can be seen somehow as a *packager*.[2] The difference in productivity between the two classes of singulatives, and the fact that substance liquids resist packaging with singulatives remains to be explained (thus impossible **zayt-at* has many kinds: **maaʔ-at* 'water-portion,' **laban-at* 'milk-portion,' etc., suggesting that the dimension of "shape" is important in felicity, unlike "volume," etc.).[3]

Another related and suggestive observation is that collectives like *dajaaj* 'chicken,' *samak* 'fish,' *ḥamaam* 'pigeon,' etc. do not produce a "mass" singulative like the ones in (8). If you say *dajaaj-at*, *samak-at*, *ḥamaam-at*, *šajar-at*, etc., it only means the integral object, never "piece of it," despite the fact that it is possible to massify these nouns to obtain a substance (or "meat") reading, as is the case in (9):

(9) *ʔakal-tu   ḥamaam-an*
     ate-I   pigeon-acc
     'I have eaten (meat of) pigeon.'

This suggests that the massification of the collective in (9) is rather derived than given for free by the grammar. Such an operation requires using a particular (hidden) operator, the so-called *universal grinder*.[4] In MA, for example, the use of suffix *-i* (as different from *-a,* used for the individual singulative) is required to obtain the substance interpretation:

(10) a. *bger* 'cows' > *begr-a* 'cow-unit,' 'a cow'; *bger* > *begr-i* 'cow-mass,'
        'cow meat'
     b. *ʕanz* 'goats' > *ʕanz-i* 'goat meat'

The existence of a grammatical massification in these constructions, which build a substance mass from what appears to be a collective (individual) form suggests that the two nominals for mass and individual are not equally borne as mass, given that the grammar does not treat their bases as equal.

A similar objection to treating both masses and collectives as of equal mass-like origin comes from extending the system to eventualities. Process nominals, conceived as kind events, form singulatives productively, as units or instances of the kind, through the same morphology *-at*, but state nominals, which are conceived as masses, have no state units (see Fassi Fehri [2005a] for detail):

(11) *raqaṣ-tu   raqṣ-at-an*
      danced-I   dancing-unit-acc
      'I danced a dance.'

(12) * *ḥazin-tu*   *ḥazn-at-an*
         saddened-I   saddening-unit-acc

The exclusion of states from forming singulatives is parallel to that of the exclusion of forming singulatives from masses.

1.3 Plurality Variation, Plurals, and Pluratives

Plurality of nominals take various morphological forms. These forms are often grouped into two descriptive major classes: (a) sound plurals (which are suffixal, or external to the stem), and (b) broken plurals (which are infixal, or internal to the stem). To these two forms, we first hastened to add a third: the plurative, which is often neglected (or marginalised) in describing plural morphology. But even if we include this third class of plurals, the description is still in need of more elaboration, to include plurals of plurals, plurals of collectives, plurals of singulatives, plurals of masses, etc.

Let us focus on the plurative first. Indeed, the plurative is a third morphological class of the plural, because unlike the sound plural, which is marked by a suffixed long vowel *-ii* (or *-uu* in SA), it takes a suffix *-at* in SA (or *-a* in MA), and unlike the broken plural, it is not infixal. Examples (13) and (14) illustrate the three morphological forms for SA and MA, respectively:

(13) SA
     a. *najjaar* 'carpenter' > *najjaar-uuna* 'carpenter-pl.nom,' 'carpenters'
     b. *najjaar* 'carpenter' > *najjaar-at* 'carpenter-fem,' 'carpenters as a group'
     c. *rajul* 'man' > *rijaal* 'men'
(14) MA
     a. *ḥaddad* 'black-smith' > *ḥaddad-iin* 'black-smiths'
     b. *ḥaddad* > *ḥaddad-a* 'black-smiths'
     c. *kelb* 'dog' > *klab* 'dogs'

Both the sound plural and the plurative are "sound," in the sense that they involve only concatenative morphology (through) suffixation, as is the case here, whereas the broken plural involves infixation. But the plurative differs from the sound plural (and also the broken plural) on other, more complex grounds. For example, the plurative can input a (broken) plural, as in (15a) from SA, or a collective, as in (15b):

(15) a. *baraber* 'berbers' > *baraber-at* 'berbers as a community'
     b. *kafar* 'unbelievers' > *kafar-at* 'unbelievers as a group'

Such entries are not possible for normal sound plurals (**baraber-uuna*, **kafar-uuna*), nor for broken plurals.

   The plurative can be taken as a real form of plural morphology because it can be reflected in syntactic agreement with predicates through "normal" plural agreement with the verb, as in (16), where both the plurative nominal and the sound plural nominal equally agree with the verb through the "normal" plural mark *-uu*:

(16) a. *l-majuus-iy-uuna*   *qaal-uu* *haaḏaa*
          The-magian-unit-pl.nom said-pl   this
          'The magians said this.'
     b. *l-majuus-iy-at-u*   *qaal-uu* *haaḏaa*
          The-magian-unit-fem-nom said-pl   this
          'The magians (as a group) said this.'

However, the plurative nP/dP is equally used with plurative agreement:

(17) *l-majuus-iy-at-u*   *qaal-at* *haaḏaa*
       The-magian-unit-fem-nom   said-fem this
       'The magians (as a group) said this.'

The two distinct interpretations of (16b) and (17) depend on the "perspectivization" of the plural. The subject argument is seen in (16b) as denoting a plural of indivuals participating in a potentially distributive predicate, whereas in (17), the subject is seen as a (collective) unity, and the verb is performing a grouped action. There is then strong evidence from morphology, syntax, and semantics for adding the plurative to the list of plural morphologies, taking into account its distinct morphology, its possibly distinct syntax, and its distinct semantics. Other plurals are also found, with more complex structures, as we will see below.

1.4 Collective and Group Varieties

Nouns like *samak* 'fish' or *dajaaj* 'chicken,' previously discussed, have been termed "collectives" in some Western grammars (e.g., Wright [1971]; Greenberg [1972]), although they are seen as "nouns of genus" (*jins*) in Arabic traditional grammars (see Sibawayhi 1938; Astarabaadii 1979), because they name (individual) kinds (Fassi Fehri 2003–2004). But the term "collective" is confusing, because it is used to cover various classes of nouns, which exhibit importantly distinct semantic and syntactic properties. Below, I propose to keep apart: (a) *groups*, which are directly countable (and hence normally seen as atomic); (b) the above collectives, which I rename as *general nouns*,

exhibiting some individual (or atomic) properties, including the possibility of providing instances (or particulars) or being "indirectly" counted; and (c) *fake mass* collectives, like *furniture* or *clothing*, which conceptually and perceptually have object-involving interpretation, but grammatically provide no instances.[5]

1.4.1 Counting Groups

Counting can be described as the determination of "discrete" or "discontinuous" quantity. The contrast between discrete and continuous quantity is not directly ontological, but rather grammatical. As often pointed out, the non-ontological nature of the distinction is striking in view of "doublets." For example, "clothes," "boots," and "shoes" are count, but their cognate collectives "clothing" and "footwear" are non-count (Chierchia 1998a, 1998b). And although "clothing" represents continuous quantity, and "clothes" discrete quantity, to say that "there is clothing here or there" appears equivalent to saying that "there are clothes here or there."

In terms of grammar, however, there are at least three varieties of collectives, in view of their behavior with respect to the count/non-count distinction. Consider first a class of (directly) countable collectives, which are better termed *groups*, often conceived as atomic (but better re-conceived as "unities," as discussed in sections 2 and 3), as exemplified by (18):

(18) *jtamaʕ-at   l-firqat-u*
       met-fem   the-team-nom
       'The team met.'

Among the most salient properties of these groups, I list the following:[6]

 (a) They are (directly) countable and can be constructed as a nominal complement of the numeral heading the numeral phrase (NmrP):

(19) *jtamaʕa-t ṯalaaṯ-u   firaq-in*
       met-fem   three-nom   teams-gem
       'Three teams met.'

 (b) In terms of Number, they are grammatically singular, and they can undergo (sum) pluralization, like other singularities:

(20) *jtamaʕa-t firqat-un,   firaq-un*
       met-fem   team-mon   teams-nom
       'A team met; (some) teams met.'

(c) Groups behave unambiguously with reciprocal verbs, illustrating their "atomic" nature. Compare the only collective interpretation of (21a) to the (possible) distributive interpretation of (21b), in addition to the non-felicitous reciprocity in (21c):

(21) a. *haaḏihi l-firaq-u   t-antaqidu   baʕḍa-haa baʕḍ-an*
       these   the-teams-nom fem-criticize   some-her   some-acc
       'These teams criticize each other.'
    b. *ʔaʕḍaʔ-u   l-firaq-i   y-antaqid-uu-na   baʕḍa-hum baʕḍ-an*
       members-nom the-teams-gen 3-criticize-pl-indic some-them some-acc
       'The members of the teams criticize each other.'
    c. *?? l-firqat-u   t-antaqidu   baʕḍa-haa baʕḍ-an*
          the-team-nom fem-criticize some-her   some-acc
       'The team criticizes each other.'

(d) Compared to general nouns like *samak*, which have the *singulative* property—that is, the ability to provide the singular unit (or particular) instance—group nouns do not exhbit such a behavior; that is, they do not access grammatically or derivationally their parts or singularities, as is indicated by the ill-formedness of the following derivation from *fariiq* (also meaning "team"):

(22) * *fariiq-at-un*
        team-unit-nom
     Intended to mean: 'a member of a team'

(e) Group nouns like these are often termed "lexical groups." They are taken by traditional grammar as "plurality nouns" (*ism jamʕ* 'a noun for plurality') naming a group entity, which is not a sum of any parts. Nouns of this sort carry only formal/conventional Gender, which is arbitrarily variable (as masculine or feminine). Thus *firqat* 'team' and *lajnat* 'committee' are feminine groups, whereas *fariiq* 'team, group' is masculine. In this respect, they contrast with 'syntactic groups' (discussed below), which can carry only a semantic/collective gender, uniformly marked as feminine/collective (see below, examples [24] and [25]). Because they do not have proper parts, they have been analysed as *atoms* (see Barker [1992] and chapter three for detail), but they are better thought of as unities (see section 2).

1.4.2 General Nouns

Consider now another class of collectives, those I have termed "general nouns."[7] As seen above, they have the following properties:

(a) they are countable, but only indirectly;
(b) they denote one or more discrete atomic entities;
(c) they serve as a base to derive singulatives (i.e., they are derivationally related to their "atomic" singularities, or concrete instantiations, for which they provide a base of derivation).
(d) general nouns can be modified by size or shape adjectives, unlike mass nouns.

The general noun is not a (grammatical) plural, although it is often perceived as a plural (recall, for example, the meaning of *samak*, *baqar*, etc.), and it behaves like a semantic (or notional) plural in that it occurs with predicates requiring plural objects or discrete instances as complements. In (23), the general noun *samak* is "counted," and in (24), it binds a reciprocal expression:

(23) *ʕadadtu   s-samak-a   fa-wajad-tu   ʕišriina*
     counted-I the-fish-acc then-found-I   twenty
     'I counted the fish, and found twenty.'
(24) *s-samaku   yaʔkulu baʕḍ-u-hu   baʕḍ-an*
     the-fish-nom   eats   some-nom-his some-acc
     'The fish eats each other.'

Note that there is no morpho-syntactic derivation that relates the singular form to the general one, and this is why the general form is denied to be derivative from the singular (i.e., it can't be a "plural of the singular"). Constrast the direction of the derivation in (25), from the singular to the plural, with that of (26), from the general to the singular:

(25) a. *qary-at* 'village' ⟶ *quraa* 'villages'
     b. *ġurf-at* 'room' ⟶ *ġuraf* 'rooms'
(26) a. *samak* 'fish' ⟶ *samak-at* 'fish-unit'
     b. *samak-at* * ⟶ *samak*

The general-single pair may even be derivationally unrelated, as illustrated in (27):

(27) a. *rakb* 'one or more riders'; *raakib* 'rider'
     b. *ṣaḥb* 'one or more companions'; *ṣaaḥib* 'companion'

The collective member, being a plural in its denotation, can control plural agreement (in addition to singular agreement), as the contrast in (28) indicates:

(28) a. *r-rakb-u*   *ʕaad-uu*
       the-riders-nom   came.back-pl (masc)
       'The riders came back.'
    b. *r-rakb-u*   *ʕaada*
       the-riders-nom   came.back (sing masc)
       'The riders came back.'

This hybrid agreement property is akin to groups.

1.4.3 Fake Mass Nouns

The third important class of so-called collectives, unlike the previous two, is clearly non-count or non-atomic. It includes nouns like *furniture*, *footwear*, and *clothing* (or their Arabic counterparts), whose denotation may involve discrete objects. I will not discuss the detailed properties of this class, and will come back to properties of masses in subsection 4.2 below. Suffice it to say now that these non-substance masses are (a) not indirectly or directly countable, and (b) not pluralizable (as denoting discrete objects), as the following constructions illustrate:

(29) * *ʕadad-tu*   *ṯalaaṯ-at-an*   *mina l-ʔaṯaaṯ-i*
      counted-I   three-fem-acc   of   the-furniture-gen
    Intended to mean: 'I counted three (pieces) of the furniture.'
(30) *ʕadad-tu*   *ṯalaaṯ-at-a*   *libaas-aat-in*
    counted-I   three-fem-acc   clothing-pl.fem-gen
    'I counted three kinds of clothings.'

The ungrammaticality of (29) contrasts with the grammaticality of (1a) or (23) above, in which this context of counting yields felicitous results with general nouns. The kind interpretation of (30), and the exclusion of the object interpretation (that is, "three clothes") is on a par with that of (6) above, and it confirms the mass-like character of these nouns, in a striking contrast with that of general nouns, treated misleadingly—I think—as their equivalent.

    The three classes discussed are then either (a) atomic groups, (b) "atomistic" (or weakly individualized) general nouns, or (c) non-atomic (atomless or mass) collectives. They are all seen as somehow internally plural, since their denotations involve (one or) more than one discrete object. But whatever makes them plural/collective (in the intended sense) is traditionally seen as *lexical* rather than grammatical or syntactic. In contrast to these lexical collectives or plurals, there is evidence for the existence of a fourth class of collectives, which can reasonably be taken as formed in the syntax. Call them syntactic groups or pluratives.

1.4.4 Syntactic Groups

To assess the syntactic nature of group formation, consider the following subject-verb agreement contrast:

(31) a. *l-falaasifat-u   y-aquul-uu-na haaḏaa*
        the-philosophers 3-say-pl-ind   this
        'Philosophers say this.'
     b. *l-falaasifat-u   t-aquul-u   haaḏaa*
        the-philosophers   fem-say   this
        'Philosophers (as a group) say this.'

In (31a), the verb agrees with the broken plural of "philosophers" in (plural) number and (masculine) gender, and the interpretation can be a SUM of individuals, taken distributively, cumulatively, or collectively. In (31b), on the other hand, the verb appears to carry what looks like a feminine singular agreement marker, in fact the plurative marker. In this context, the interpretation of the sentence is coerced to be limited to the collective reading, and the plural DP to function as a collective subject. As a matter of fact, a similar behavior can be observed with non-pluralized forms of DP collectives, such as *naas*:

(32) a. *n-naas-u   t-uṣallii   li-rabb-i-haa*
        the-people-nom   fem-pray for-god-gen-her
        'People (as a group) pray for their God.'
     b. *n-naas-u   y-uṣall-uu-na li-rabb-i-him*
        the-people-nom 3-pray-pl-ind   for-god-gen-their
        'People pray for their God.'

In these constructions, the nominal *naas* controls either the collective or the plural marker on the verb and should be interpreted accordingly (in contrast with the lexical collective *fariiq* above, which cannot manifest these alternations).

   It is striking that syntactic groups (or pluratives) exhibit ambiguity with reciprocals, unlike lexical groups. Thus the interpretation of (33) contrasts with that of (21c) or (1a) above:

(33) *l-majuusiy-at-u   t-antaqidu   baʕda-haa baʕḍ-an*
     the-magian-fem-nom   fem-criticize   some-her   some-acc
     'The magians (as a group) criticize each other.'

To recapitulate, syntactic groups or pluratives have the following salient properties, which set them apart from the previous three classes of collectives:

(a)   they control a uniformly plurative marker;

(b)   they may be formed from an already plural nominal;

(c)   they exhibit ambiguity with reciprocals.

Rather than taking groups to be atoms (or atomP, like normal singulars are), as I have done in previous chapters, it is more appropriate now to think of them as unities, or UnitP (marked with a [+unit] feature, their atomic feature being presumably underspecified). Then groups can be formed at a classifier level, as unitP (which then accounts for their countability as unities), or they can be formed over the Num level, as UnitP, accounting for the perspectivisation of the plural. I understand underspecification as being absence of valuation rather than absence of the feature. I also assume that nouns underspecified for atomicity are (weak) plurals by default. By contrast, mass is not specified for the feature atom. General nouns like *samak* are atomistic at a first stage, but they are not units. Moreover, syntactic groups differ from lexical groups depending on whether their unity is "basic"—that is, acquired low in the nominal structure—or whether it is formed higher, over a syntactic plurality (i.e., atom P). I will return to some of these details below (see Fassi Fehri 2012, chapers five and eleven, for more detail).[8]

2 THE NUMBER ARCHITECTURE

In order to see how Number projects in the grammar of nominals, we need to see how nominal derivation proceeds at various levels, where the Number projection is placed in this structure, and what features it contributes to distinguish the various nominals. Since Number applies basically to atoms (objects) or units, and only under specific conditions to masses (which are normally both non-countable and non-numerable), I will only focus on the former kind of entities, limiting myself to provide only some contrasts with pure masses (or substances). I will provide first an overview of a plausible number of stages in the derivation of some plural and singular nouns, having in mind the varieties we discussed, and motivate the projections assumed. Second, I qualify the roles of the two features I propose for accounting of numberability and countability of the entities found in numbered and counted structures.

2.1 How Many Syntactic Projections Are There?

I assume that a nominal derivation starts with a root. This root stage (modelled as a syntactic projection, or P) should not be devoid of any content, and would include a conceptual base (reflecting part of the content of a traditional

semitic root, but not all of it) that can serve for various pre-categorial (syntactic) derivations. For example, we can assume that an abstract (semantico-syntactic) form *klb* is pre-categorial, and that such root denotes a concept DOG, which is abstact but not totally free of any semantic specification. This form then undergoes preliminary operations before it becomes an *n*, *kalb*. Alternatively, a root is "just a purely differential index with no conceptual content" (Harley 2014, Acquaviva 2016), and *n* stands for a noun concept, naming an entity type *e* (there being no pre-existing elements of content labelled by roots). Recall, for example, that I have assumed in chapter two that Gender (as a mark of "nouniness") can be located at the [√]√P (rootP) level, or higher at the nP level, in order to account for double-gendered nouns like *ʔubbuww-at* 'fatherhood.' I assume that it is the root √ that identifies the basic entity type, and that the categorized root [√]n is "severing" it to a more specific meaning (by the defining syntactic context, namely nP). Recall that in traditional Semitic analyses, nouns, verbs, and adjectives derive from the "same root" (associated with some abstract form and meaning). For example, the root *klb* with the general abstract sense KLB (i.e., whatever abstract "dogness" means) can not only serve to name the "dog animal" *kalb*, which has a general and a particular nominal meaning DOG (as type or token), but can also construct the verb *kaliba*, literally "dogged" (but meaning "to be affected by a particular disease from dogs, or seized by hydrophobia, or raging") or the adjective *kaliib*, literally "doggy" (but meaning "affected with rabies, raging," etc.), or the more complex verb *ta-kaalaba* 'to be behaving inappropriately like a dog, to dogfight,' or its deverbal *takaalub* 'engaging in a nasty action,' etc. On the one hand, there is no way to derive the common core meaning of these variously categorized words directly from the nominal sense (pointing to the entity, with its shape, integrity, etc.), and if it were the case that it is the noun (or any other category) that is naming the concept KALB, and the other words name separate properties or events not significantly related to the noun "dog," then the core sense of these words would be lost, presumably at the cost of not adequately accounting for some traits of the speaker lexical competence. Anyway, whatever the answer to this complex issue about the forms and roles of (lexical) roots in the grammar, and differences in situating where the concept is exactly located in the nominal spine, root and n projections are commonly assumed, and it is between these two levels that the aspects of nominality we are in need of are defined.[9]

What comes after the root is the nominal category, that is [√]$_n$ formation, and then higher levels where "dividing reference" and partitioning are operated to make nPs numberable or countable. I assume that there are two stages or routes to division or partition: *atomicity*, projecting as atomP, and *unicity*, projecting as unitP. I assume nouns like *kalb* 'dog' and *samak* 'fish,' on one hand, and *zayt* 'oil,' on the other hand, denote *kinds*, but that the former

pair of nouns denoting kind individuals have more structure than the last noun denoting kind mass. It is reasonable to think of this individuality as an "atomicity" of some kind (with concrete natural atomicity at the core), and to identify it with an atomP projection in syntax, whereas masses lack such projection (because these are "atomless"). That is, both *kalb* and *samak* are "universal" or kind individuals, although *kalb* can also serve as an instance (or a particular), which is directly countable, while *samak* cannot. The two entities are then distinct with respect to their ability to directly denote singles (or semantic singulars) in Arabic, although you do not perceive their distinctness in English. In the case of *samak*, the introduction of another level of individuality is needed to make it a single or countable or a unit. We call unit or *unity*, a necessary component in the structure for these "collectives" to become directly countable. If the nP projects unity, or unitP, then the right entity needed for counting is built to achieve the right result. The idea is then that at a first stage both singulars project atomP, and at a second stage, unitP is projected to form the unit *samak-at*. The two singulars *kalb* and *samak-at* are not equal because they do not have the same derivational history, nor do they have the same individuating source.

Available accounts of countability (as far as I can tell) do not normally provide a mechanism to differentiate the two kinds of singulars (in Arabic or other languages that have various grammatical ways to differentiate them), since they assume that both are born as masses and continue to be masses until they are divided on equal bases (say in DivP). But since I distinguish these nominals from pure mass *zayt* at an early stage of individuality (the former being atomic, while the latter is not), this analysis would not be appropriate. To give an example of a competing analysis to mine, Acquaviva's style derivation first assumes that these sorts of nouns in any language would start as mass in the derivation, without differentiation. There is (basically) no way to distinguish *dog* and *oil* at an early stage (although see some refinements in section 3). Second (and as a consequence), there is no way to provide a distinct treatment to *fish* and *dog* (in the languages that differentiate them—for example, singulative languages) to account for their distinct routes to construct singulars.[10] Appealingly, he seems to postulate three stages for dividing reference: (a) mereological structure (introducing a lattice of undescribed elements or sums), (b) dimensional structure (qualifying at first stage the members of the partition along "space" or "dimension"), and (c) atomic structure (presumably, adding further qualifications to the members of the partition). Only the atomic (c) structure is relevant to countability, while the dimensional (b) is relevant to some modification options as early precursors of some "light" individuality (not clearly defined). The syntactic mereological level is notated as $[[\sqrt{}]_n]_P\Sigma$, where "PΣ" stands for "property of sums" or "properties," and

does not discriminate masses compared to individuals, a sum being (a) any atom or set of atoms, or also (b) any sum in an atomless mereology. If $[\ \sqrt{\ }\ ]_n$ identifies an entity of type e, the categorized $[[\ \sqrt{\ }\ ]_n]_P\Sigma$ represents the property of being that entity type, with no restriction on what entity it might be. At the $P\Sigma$ level, then, every noun has the interpretation of a mass noun like *water*, denoting all things that are true of the property P and all sums of those things—that is, *P; as a result, P = *P (Acquaviva 2016, 221–222). I return in section 3 to more precisions and comparison with close or competing analyses.[11]

2.2 More on Atomic and Unit Features

Two features are central to the Number system I am proposing, as shown earlier: the *atom* feature and the *unit* feature. Let the system of valuation be bivalent (i.e., with both positive and negative value specifications). I claim that these two features are necessary and point to distinct facets of Number. The basic idea is that Number information is not just about atomicity; it is also about unity. Both contribute somehow to "dividing reference" in the sense of Quine (1960) and intersect with Div in Borer (2005), although my system is less "coarse." Moreover, pre-conditions for numbering or counting do not seem to be limited to "dividing" (in the etymological sense, or "scattering"); they are also about "unitizing" (or gluing/sticking things together to make an integral unit or a whole). Not only are individuals born or built in the grammar as atoms (or the bottom parts of "division"), but they can also be built as units, or unities (possibly assembling individual atoms to form a unit or unity, or "refining" a potential sum, to build a unit from it). The two grammatical notions, which are associated with two distinct dimensions or pespectives, are implicated in numbering and counting. Atomicity, as I define it, is dedicated to conceptual integrity (or "what is holding the thing together from the start," discreteness, shape, size). Unit/unity essentially creates units, either by packaging stuff to make a unit (with an autonomous shape, boundaries, etc.), or by eventually taking many objects or individuals and assembling them together to create a new entity or unit, which may (or may not) have the same name as that of the parts. Although the two notions are close and intersect (and they are often subsumed under either division or atomicity), they can be shown to play distinct roles in the grammar and semantics of Number. If pluratives and singulatives are unitizers rather than atomizers, as I claim, and if groups are unities rather than atoms, then at least some affinities of the number systems of langu ages can be accounted for, based on grammatical evidence.

Consider now how the system based on the two features functions. Nouns as *n* may be endowed with part structure or atomicity [± atomic] as part of their conceptual meaning at L-syntax. Conceptually, nouns may (naturally)

denote either individual or atomic kinds, or non-individual (or dividual) mass substances, at the borders of a scale of individuation. This first level of individuality, distinguishing *samak* from *zayt*, can be accessed by indirect counting of the individuals, their modification, their access by the verb *count*, etc., as shown above. Later on, *samak* or *zayt* may access another level of individuality, the one I call unity, which would make these nouns directly countable. In a minimalist grammar, an atomic *n* like *samak,* when affixed with *-at*, can bear an unvalued feature [uv unit], which is valued at unitP (having the valued member of the feature), by Probe-Goal Agree. In this context, UnitP can be thought of as providing a second stage of individuality for nouns like *samak*. This stage can be accessed through the valued feature unit on the head of the projection unitP in syntax, with which the *n* agrees.

It is normally assumed that Number provides a second level of atomicity, which is used in syntax. This level is distinct from the first one, since it introduces a different use of atomicity (or individuation). Suppose that both the plural and the singular nouns *dog* and *dogs* are endowed with the atomic feature at the first stage, then their atomicity appears to be "refined" (or confirmed) through the positive or negative value of the atomic feature made available at Number (basically [+atom] or [−atom]), which is now associated (in the absence of a cardinal) with cardinality, basically "one" (= 1), or "one than one" (> 1). Thus *dog* may bear an unvalued atom feature, which is then valued or interpreted as + or − when it fuses at atomP (in NumP) with either plural or singular (the high inflections being marked as either –atom or +atom, respectively). If the plural of the singulative is a plural of unities (rather than atomicities), then unitP, marked as unvalued atom, is valued at the higher atomP.

In this system, the two routes to second-level individuality (the level relevant for direct counting) are parallel, though they are not identical. This parallelism gives the impression that both Plural and Classifier can be seen as classifiers (and in CD), although they are differentiated in a subtle way, even when both are contributing to individuation. Both are conceived as DivPs in the general sense—that is, dividing undivided (mass) stuff—and both notions of dividables (or individuals) have been seen as equivalent to countables. But, as we will see, the undivided stuff remains undivided in some sense, although it can become countable. It is the second stage of atomicity (once two stages of individuality are acknowleged as distinct) that is most critical for the coarse DivP view. The entities that enter the derivation to be singularized or pluralized are already directly countable. Here, there is no possible confusion of the role of the plural (or the singular). It is at the second level of atomicity that countables are built. At this level, there is only a "ranking" of cardinality, such as "one" or "more than one." The singulative provides the unit for

counting, and the plural marks the cardinality. Thus, although counting *dogs* and counting *ducks* are not different in English, they take different routes in Arabic *kalb* and *baṭṭ-at*, the routes of atomicity and unity, respectively. English has no grammatical way to make it via a unity route, at least not in the descriptions of the language available so far.[12]

Let us return to unity. Recall that "pure" mass, as conceived here, is devoid of any individuality features (being pure "dividuals")—that is, devoid of atom and unit features at the base (by hypothesis) in the normal case ("hybrid" cases aside). But mass can build a unity in the syntax by various devices, including the *universal packager* (a special form of the unitizer). Suppose mass nouns, like other nouns, can get an unvalued unit feature freely. The noun would then value its unit feature at unitP. The felicity of the outcome depends on whether the semantics, pragmatics, and conventions of the language allow such forms of unity for specific nouns (or classes of nouns). Once these requirements are met, the singulative formation from mass becomes possible. What it does is introduce some (accepted) criteria for a substance to be packaged somehow, or to be "held together" and "separate" from others. But although a 'wood unit' *xašab-at*, as in (9) above, is now as countable as *samak-at* or *baṭṭ-at*, it is unlike the latter in that you can take parts of it and still count it as a wood-unit/piece (for the purposes of naming), but a *baṭṭ-at* would cease to be a duck anymore if (significant) parts of it were taken off, etc. In this sense, we are more entitled to say that we have "shaped" or "made" a wood-unit, but we have not "shaped" or "made" a duck-animal, which is already shaped in "nature," but also by convention in the grammar.

What distinguishes masses (or dividuals) like *wood* from individuals like *duck* is, I claim, the atomic feature (or base), in my sense. Masses become unities in some sense, but they cannot become atoms. This is partly because they are not naturally atomic, but also because they can resist stage 2 of atomic syntax. Masses have no real singulars or plurals that can be built directly from their "lexical" base. It is only when they form singulatives (or, more generally, units) that masses can form plurals or singulars. When they are marked as plurals, they denote either subkinds, or bigger quantities or amounts. None of these plurals involve direct atomicity (or direct unity). Hence masses are (naturally and conventionally) uncountable (as in Jespersen [1924]).[13]

Unity can also be found at various levels. For singulatives, unity is unvalued on *n*, and valued at UnitP. For pluratives, which may take as input an already atomic (including plural) nP (valued as + or −), heads have an unvalued unity feature, searching for a valued unity in the head of unitP. Syntactic groups may be conceived as essentially unities of sums. Plurality in groups should mark them as [−atomic] in category syntax (and possibly lower "in

the lexicon"), a specification that may or may not be accessed in syntax (via plural agreement, plural predication, reciprocity, etc.). Groups can then be neutral or general vis-à-vis atomicity, more or less like individual "collectives" can be neutral vis-à-vis unity. Some groups are grammatical unities; they are marked as such in their morpho-syntax, hence enabling them to value their unity feature. Others are not. Thus *naas* 'people' is syntactically a unity, and hence can trigger plurative agreement, but *šaʕb* 'people, nation' cannot. In MA, *šeffar-a* 'thief-fem' is a group or a plural, depending on syntax and perspective. These scales of atomicity and unity can vary from a lexical item (or vocabulary) to another, or from one syntactic structure to another. But groups are fundamentally unities at a top level, and plural at a low level. They are countable as units essentially, but they may be atoms or non-atoms for the purpose of agreement. Groups as units "in the lexicon" differ from units at syntactic structure. The latter are marked as unvalued units, which have to value their feature at unitP. Lexical groups do not have to. Note that we are dealing with distinct cases of units or unities. In the singulative case, there is no plurality in the base of derivation. In the plurative case, there is a (low or high) plurality built in lexically or syntactically. The group and the individual collective, which are both basic (or "lexical"), appear then to differ in that groups are units that are vaguely atomic, while collectives are atomic and vaguely units.

Kinds (or sorts) are assumed to be atomic because they designate or provide particulars (or instances) that can be *numbered* (i.e., enumerated as "one" or "more") or *counted* (i.e., providing units that can be assigned some cardinality). Masses have no particulars that can have an identity or integrity, to be numbered or counted. The first class seen as kind individuals can be said to be atomic. They name integrated wholes that are self-connected (Lowe 2009, 55; Meirav 2003; Grimm 2012a–b). Masses are not individuals in any sense, and hence are not atomic. This first level of individuation enables (weakly) numerable nominals like *samak* to participate in plural predication, reciprocity, and indirect counting. Dividuals are not numberable or countable in any degree or level. The numberability of individuals of the sort discussed can be "refined" (or "severed") as a "unity" (through the singulative, as in Ojeda [1992]). The unity created here can be seen as different from the unity "scattered" or "partitioned" in the mass case, which is somehow "already there" in the number lattice. When I pronounce the sentence (34), no speaker can interpret it as meaning the "meat" of the fish:

(34) *fii n-nahr-i   samak-un*
     in the-river-gen   fish-nom
     'There are fishes in the river.'

The available (and natural) interpretation is that there is some indeterminate number of fish-animals. No mass interpretation is imagined. By contrast, in (35), no "portioned or packaged oil" interpretation is available; only the substance reading is:

(35) *fii n-nahr-i   zayt-un*
    in the-river-gen   oil-nom
    'There is oil in the river.'

The unity of mass is not "naturally" available here, there being no natural instances of *oil*. Here, I basically concur with Locke's view, as explained in Lowe (2009, 56), that number is a property of objects, or individuals, as distinct from dividuals.

2.3 Specified and Underspecified Atomicity

This subsection is devoted to a preliminary picture of how the atomic feature is distributed or attributed to numbered nouns, not taking into account precise syntactic differences and hierarchies. I distinguish three specifications of atomicity: (a) specified as positive, [+ atom], (b) specified as negative, [− atom], and (c) underspecified, [± atom]. The concept of "atom" is taken as model specific, and the model is that of Link (1983), given here in a simple illustration.

    Consider the domain of atoms, organized in an atomic join semi-lattice, as in (36):[14]

(36) a. {a, b, c}
        {a, b} {a, c} {a, b}
        a b c
    b. i. {a, b} ≤ {a, b, c}
        ii. a ≤ {a, b}
        iii. a ∪ b = {a,b}

I take the denotation of a simple singular like *kalb* (or eventually the singulative *samak-at*, leaving aside the subtle differences between the two), marked as [+atom], to be associated with the bottom line of the lattice, as in (37):

(37) singular *kalb*, *samak-at*
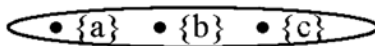
By constrat, a "strong" plural (> 1) like *ʔasmaak* or *samak-aat* 'fishes' (leaving aside their subtle differences), marked as [– atom] denotes only the two upper parts of the lattice, as represented in (38):

(38) plural *ʔasmaak*, *samak-aat*
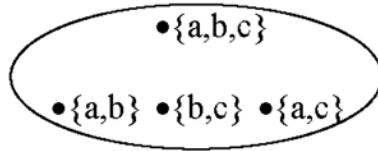
As for general nouns like *samak*, I concur here with Ojeda (1992), Rullmann and You (2006), as well as Zabbal (2002–2005), in taking the denotation of the general noun to be the complete atomic join semi-lattice, as represented in (39):

(39) general *samak*
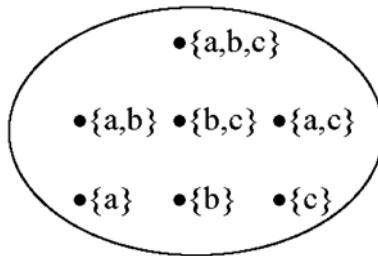
If this is so, we can see that the interpretation of the general noun extends to both the singular and the plural (and eventually the dual) parts of the lattice. Thus, while the single or plural value of atomicity/countability is specific, that of the general is underspecified and notated as [± atom].

In Fassi Fehri (2012), general nouns are argued to lack both (specified) Number and (specified) classification. A species of classifier marking in Arabic is the singulative affix (which derives atomic singularities or unities from general forms). It is striking that Arabic singulative forms and classifier phrases in a language like Mandarin behave in a similar way, in that they do not allow a general (or weak) reading of the classifier:

(40) *hal la-ka   tuffaaḥ-at-un?*
    Q   to-you   apple-unit-nom
    'Do you have an apple?'

(41) *zuotian   wo mai le   ben shu*
    yesterday I   buy ASP Cl   book
    'Yesterday, I bought a book.'

As far as I can tell, Arabic (40) has only a singularity or unit interpretation, and no general interpretation of the nP is available. Likewise, Mandarin (41) is equally restricted to talking about a single book rather than "one or more."

   Rullman and You (2006) assume that Mandarin bare nouns like those in (42) have general (unspecified) Number, and their denotation is as (39):

(42) *zuotian   wo mai le   shu*
    yesterday I   buy ASP book
    'Yesterday, I bought one or more books.'

They argue that general Number is not ambiguous between a singular and a plural reading, but rather unambiguous with a single meaning that can be paraphrased by means of a circumlocution such as "one or more books." Its underspecification as [± atom], as I have proposed, is then supported.[15]

2.4 Classes of Singulars and Plurals

We are now able to see how the new system of features derives the natural classes of Number, how they cross-classify or subsume the more traditional divisions of singularities and pluralities, including singulatives (sgv) and pluratives (plv). The basic classes are marked as follows:

(43)

	+ *atom*	− *atom*
+*unit*	sgv	plv
- *unit*	sing	pl

There are a number of advantages to this classification. We can now clearly see that we have two forms of singulars (marked as [+atom]) and two forms of plurals (marked as as [−atom]). Depending on whether or not they are

unities, plurals and singulars can be one class (that of unities), or they are "perpectivized" as unities, but they can also be one class of entities that are not unities. The two distinct morphological forms of singulars or plurals are (often) interchangeable in uses, or they are complementary, depending on the intention (or perspective) of the speaker and how he construes them, in contrast. Formally, unities are associated with feminines in Arabic, making room for interaction with Gender, as amply explained in chapters two and three, hence the interaction of Gender and Classifier. In Arabic, the masculine does not make a clear case for an interaction with Classifier, although such an interaction has been reported for other languages.[16]

2.5 A Sketch of the General Architecture

Building on previous chapters, I propose a hierarchical architecture of the DP as in (47). I assume that the (various) number features can be associated with any of these categories at the various levels, although a Number projection (NumP here, but possibly #P, as in Sauerland [2003] or Borer [2005]). Needless to say, this is only an approximate and sketchy structure that can reduced or expanded to more or fewer categories, depending on models (for a more detailed proposal, see Rizzi and Cinque [2016]; for motivation of the NumP projection, see, for example, Alexiadou, Haegeman, and Stavrou [2007], among others).

(44)   DP
           ╱╲
             QP
               ╱╲
                 NmrP
                    ╱╲
                      NumP/#P
                          ╱╲
                            UnitP/ClP
                                 ╱╲
                                   AtomP/nP
                                        ╱╲
                                          RootP
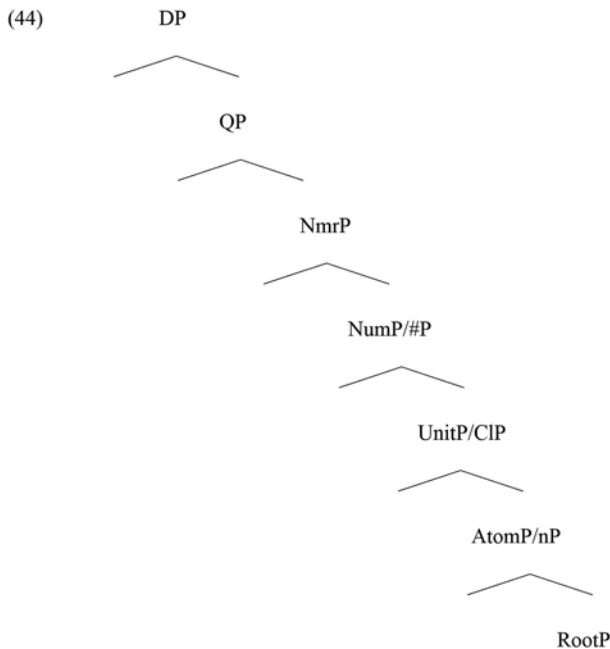
Nmr for Numeral, Num for Number, Cl for Classifier. DivP of Borer is split into UnitP and AtomP. See section 4 for further discussion.

3 CONVERGING OR COMPETING ANALYSES

In this section, I will try to synthesize the results of various studies that have served as a foundational base of empirical and theoretical bases for the analysis I proposed for individuation and Number. Needless to say, these are just samples, and I do not pretend to have paid justice to most relevant studies of the topic.

3.1 Krifka's Countability of Atoms and "Natural" Units

In his critique of Chierchia's (1998a–b) explanation of the ungrammaticality of **Dog is barking* as due to the fact that "the meaning of *dog* is a property, and properties cannot fill the argument slots of verbal predicates due to a type mismatch," Krifka (2004, 13–14) proposes an alternative in line with Krifka (1989, 1995), according to which count nouns have a *number argument* n, while mass nouns lack such an argument. The latter can be specified by a number word. Their semantic formulas in (52) represent this difference:

(45) a. $dog = \lambda w \lambda n \lambda x [\text{DOG}(w)(n)(x)]$, = DOG, type $\langle s, \langle n, \langle e, t \rangle \rangle \rangle$
    b. $gold = \lambda w \lambda x [\text{GOLD}(w)(x)]$, = GOLD, type $\langle s, \langle e, t \rangle \rangle$

Thus, count nouns denote "extensive measure functions," like *gallon* or *mile*, relating a given entity to maximally one number. Moreover, they are additive, in the sense that if x is a sum individual consisting of n dogs, and y is a sum individual consisting of m dogs, and x and y do not overlap, then their sum $(x \oplus y)$ is a sum individual consisting of n+m dogs.

(46) a. If DOG $(w)(n)(x)$ and DOG$(w)(m)(x)$, then n = m.
    b. If DOG $(w)(n)(x)$, DOG$(w)(m)(y)$ and x, y do not overlap, $\neg \exists z [z \leq x \wedge z \leq y])$, then DOG$(w)(n+m)(x \oplus y)$.

The number arguments can be filled by number words. The difference in the grammatical number of the noun (in English) is a matter of syntactic *agreement* with the number word.

NPs consisting of count nouns with a specified number argument denote quantized predicates. If the NP *seven cats* refers to an entity x, then it cannot apply to proper parts of x, or to individuals that have x as a proper part. This is so because count nouns express measure functions. With mass nouns,

quantized predicates can only be built with explicit measure functions, such
as *gallon*. Because classifier languages like Chinese don't have count nouns,
they rely only on measure constructions. The classifier is a measure function
that may be interpreted either as a measure of the number of *atoms* of an
entity, as in (47a), or as a measure characteristic of the meaning of the *head
noun*, called a "Natural Unit" (NU) in Krifka (1995), as in (47b):

(47)   san ben shu 'three CL book'
    a. $\lambda w\lambda x[\text{ATOM }(w)(3)(x) \wedge \text{BOOK}(w)(x)]$ (measure of number of atoms)
    b. $\lambda w\lambda x[[\text{NU(BOOK)}](w)(3)(x) \wedge \text{BOOK}(w)(x)]$ (measure of head noun,
    NU)

Thus Krifka's theory of countability makes essential use of a *number argu-
ment* in count nouns that functions as a measure and that counts *atoms* or
(natural) *units*.

As for the treatment of grammatical number, he observes that in addition
to the *agreement plural*, which shows up in forms like *two dogs*, English also
has a *semantic plural*, found in bare plural NPs. In the absence of number
words, plural morphology does the job, creating a property. The number
argument is then either specified as greater than 1 (the exclusive plural), or
left unspecified.

Other languages may have a *semantic singular* that specifies the number
argument of the NP with the number 1. In Czech, both bare singulars and bare
plurals are found. These languages have a singular operator SG (see [48]),
where SG operates on the noun stem *ps*, resulting in the singular form *pes*:

(48)   *sˇtekal pes*.   *sˇtekal-i psi*
       barked   dog   barked-PL dogs
       'A dog was barking.'   'Dogs were barking.'

3.2 Grimm, Indivual Scale, and Connectedness

Grimm (2012b, 99) observes that Borer's account of nominal structure (or its
kins) suffers in particular from its ill-founded empirical basis. First, it is not
established that all nominals can be born as mass, nor is it established that
count and mass can be made available for all nouns by (universal) grinding
or packaging (Pelletier 1979, 2012). Second, it is not the case that in all lan-
guages nouns are equally mass at the start. Not recognizing the constraints on
nominal flexibility leads to several missed generalizations.

Grimm (2012b, 102) lists a class of nouns in English that resist grinding
flexibility, including group nouns (*committee*, *team*, *flotilla*), abstract shapes
(*triangle*, *square*, *line*, *point*), units of measurement (*hour*, *mile*, *second*, *day*),

nouns of negative space (*hole*, *mouth*), or event nouns (*trick*, *act*, *arrival*, *blink*, *smile*, *run*). As for resisting packaging, he provides examples of functional aggregates (*furniture*, *change*, *foliage*, *mail*) and granular aggregates (*sand*, *foliage*, *barley*, *dirt*).

Accounts that deny intrinsic countability make a typological prediction, namely that nouns in all languages behave like Chinese. But even in Chinese, countability differences are manifested in several ways. First, as shown by Yi (2009), there are several classifiers in Chinese that combine only with what appear to be countable nouns, including the general classifier *ge* (which he takes as approximating the term individual), as well as the classifier counterparts to terms such as *pair* or *dozen*. Second, the distributive quantifier *geh* 'each,' as exemplified in (49) (Yi 2009, 221), is only licit with countable nouns:

(49) *Niu (dou) geh you   changchu he duanchu*
    cow (all) each have strength   and shortcoming
    'Each cow has strengths and shortcomings.'

Third, the constrative behaviour of size adjectives (which distinguish countable and non-countable nouns in English, as in Bunt [1985]) is also applicable in Chinese. The size adjectives *da* 'big' or *xiao* 'small' are only applicable to countable nouns, and infelicity arises for the Chinese equivalents of "big water," just as in English. Hence, classifier languages do not lend support to hypothesizing that all nouns are uniformly born as uncountable. Rather, different classes of nouns vis-à-vis countability are detectable.[17]

Grimm's work not only argues for the necessity of distinguishing objects from masses at an early stage of individuality before (or without) counting, but he also argues for the necessity of taking into account the distinction between plurals and "aggregates" or collectives in languages like Welsh, which also have singulatives. In order to account for the two properties of individuation that emerged ("being a whole object" and "habitually coming together"), he proposes enriching classical mereology with topologically relevant relations (Grimm 2012b, p. 159).

Grimm observes that traditional logical tools, namely set theory and predicate logic, assume that singular entities or individuals are predefined, and because of this, it is difficult to integrate nouns designating, for instance, liquids. The model treats individuals in the world which are *water* in the same fashion as it treats individuals in the world which are *dogs*. In order to develop a framework in which substances and plural entities are given equal standing as singular entities, the most widely adopted view is to model plural and non-countable terms using mereology, the theory of parthood. Mereology has figured in analyses of the countable/non-countable distinction, and

Quine (1960) set the standard for using mereological concepts as a way to approach it, including, in particular, his conception of non-countable nouns as "scattered individuals."

In the early days of mereology, "individual" had a technical meaning, simply designating what the lowest logical type used in the system represents. An individual does not necessarily have any boundaries, "an individual is simply a segment of the world of experience, and its boundaries may be complex to any degree" (Goodman 1951, 42). It can be any section of the world, or combinations thereof. The lexical core of a mereological theory is provided by a treatment of the "part-of" relationship (which, consensually, must be reflexive, antisymmetric, and transitive).

Extensions proposed by Grimm amount (informally) to the following. First, the distinction between objects and substances should be represented. The evidence presented indicates that there is a foundational distinction in countability between entities viewed as coming in "minimal units" as opposed to those not coming as such. Another important distinction is between plurals and aggregates (i.e., sums that correspond to plural individuals "boys," and sums that correspond to aggregates "ants"). Given the central role that aggregates play in certain grammatical number systems, the account should be able to distinguish the two types of entities, in view of the primary motivations for adding topological relations. This is achieved through recognizing *self-connected* entities, individuals that cannot be divided into two separate parts.[18]

Grammatical number categorization then reflects different degrees of individuation associated with nominal descriptions. First, countability is not a binary distinction, although some languages may only have two primary grammatical number categories (countable and non-countable). Rather, countability is a scalar phenomenon. Second, a noun's countability status is not purely a grammatical fact, but is based in individuation properties associated with the entity being described. It is necessary to enrich standard mereological frameworks with topological relations to properly model different countability types.[19]

The empirical core that motivates the move are those grammatical number systems that possess three or more grammatical number categories. The examination of languages with a collective/singulative class (such as Welsh, Turkana, Maltese, Dagaare) provides a different perspective on what underlies countability than does typical data from an investigation of, say, English. These languages recognize aggregates as qualitatively different from singular entities or non-countable nouns, but this variation should be constrained by the scale of individuation: grammatical number categories must be based in coherent

combinations of individuation types. The relation between grammatical number categories and entities in the world is not direct, but mediated by how entities in the world are construed in terms of individuation properties (as having a regular shape or being spatially contiguous with other entities of the same type). If two nouns describe the same set of objects (e.g., *leaves* and *foliage*), this does not indicate arbitrariness of countability classification, but rather different perspectives of the entity type (Grimm 2012b, 159).Whole objects may be characterized in terms of *maximally strongly self-connected* individuals, he proposes, and the notion of *coming together* through various connectedness relations.[20] This imposes a shift in perspective from a mereological view to a mereo-topological view. Moreover, many grammatical number systems make distinctions that are related, but not identical to, collective/singulative classes. Italian disposes of an irregular plural *-a* that applies to a lexically restricted set of nouns—for example, *braccia* 'arms'—contrasting with the regularly inflected plural *bracci*, which designates 'arms of objects' (Acquaviva 2008, or more recently Manzini and Savoia 2016, and Acquaviva 2016).

My approach follows Grimm's lines in denying a uniform mass base for all nouns from the start, distinguishing various stages of individuality, and integrating mereological and topological notions through atomicity and unity.

3.3 Meirav's Unities (Sums and Wholes)

Meirav's (2003) work on unities is no less inspiring. Meirav observes that a neglected dimension in the nature of wholes is the "different *ways* in which parts, irrespective of their individual characters and of the relations between them, can compose a whole." He targets in particular "collective nouns," which include words such as "group," "collection," "class," "herd," "flock," etc., and which illustrate his conception of *wholes*, needed in mereology (along with parts). Their distinctive characteristic is that "their meaning seems to combine the features of *being many* and *being one* in a peculiar way. . . . Although a whole's having many parts is analogous to a set's having many members," we tend to treat a whole as "one thing, in spite of the fact that it has many parts, in a way that we do not tend to treat [it as] a set" (33). He then distinguishes a *collection*, which is identical to the entities of which it is the collection, from a *unity* (in his sense), which is distinct from the entities that underlie it, and argues that unities are monadic, whereas collections are not. "Unities are wholes more loosely determined by their parts than collections or indeed sums" (49).

The notion of an individual, according to to Meirav, seems to involve: (a) the idea of an entity that is *separate* from other entities, and (b) the idea of an entity that is in some sense *one*. But these ideas are vague and need precise clarification. One of the senses of "being one" applies to entities that are

prima facie concrete individuals, which can be described as having a "unity." This sense should not be confused with a second one that Meirav focuses on, namely that "a comprising entity possesses unity . . . means that the entities it comprises are closely *held together*." It is also "a rather vague notion," "which has, nevertheless, quite a strong intuitive appeal." Here "unity" is used to describe a "*type* of entities" rather an entity that is constitutive of being an individual in the first sense. He then proposes to distinguish unity (the first sense) from Unity (the second sense; Meirav 2003, 57–58).

The theory aims at distinguishing between sums and Unities as two kinds of wholes. Moreover, the ambiguity of a Unity as a comprising entity is due to: (a) its being "one" (or one entity), (b) its being "many" (and not just "one"), Plato's conjecture. Plato contrasts the notion of a comprising entity that is identical to the entities it comprises (taken together) with that of a comprising entity that is not identical to the entities it comprises. Obviously, it is absurd to count "horses" and report the result as "both one and many" (Meirav 2003, 60).

The claim that an entity is "one" may mean that the entity is unified, or possesses the feature of unity, and for a comprising entity to possess unity is to comprise entities that are *integrally* related to one another, a relation that constitutes the unity of a new entity. The unity is then "some single form, produced out of them [i.e., the entities it comprises], having its own single nature—something different from [them]." If a comprising entity is not unified, it will not be an individual but rather a collection, a kind of plurality.

With the characteristics described, a unity can be said to be *monadic*, and an entity y is one "if and only if for all $n \geq 2$, and for all $x_1, x_2, \ldots x_n$ (all distinct from one another), y is not identical to $x_1, x_2, \ldots x_n$ (taken together). In particular, if y comprises the *xs,* and y is one in this sense, then it is not identical to the *xs*" (Meirav 2003, 68). Sums, as conceived of in classical mereology, are non-monadic. The theory of Unities offers an alternative conception of a monadic comprising entity.

Two important relations between wholes and their parts must be distinguished. First, in a *distributive* relation, the relation *is a part of* the whole. Second, in a *collective* relation, the relation consisting in the parts—considered *together*—bearing the relation, *makes up* the whole. Standard collective whole-parts relation is none other than the relation *is a sum of*—the assumption that wholes are coextensively determined—in which y is a whole that corresponds to the xs only if y is a sum of those xs, but a Unity is an entity that may well be a whole that corresponds to the xs without being a sum of the xs. A Unity therefore is a whole that is *not* fundamentally a sum (Meirav 2003, 211).

In the analysis I adopted, the two senses of unities (or units) are unified to account for the properties of singulatives, pluratives, and groups.

3.4 Wiese's Conceptual and Morpho-Syntactic Collectives

In order to characterise collectives as a nominal class, apart from plurals and mass nouns, and as playing an important role in what Wiese (2012) calls "transnumeral" languages like Mandarin or Persian (compared to numeral languages like English), Wiese argues that mass/count distinctions have to be defined on two levels: the syntactic and the conceptual levels. Following Prasada (1996), a distinction of substances and objects at a conceptual level is adopted: nouns differ as to whether their referents are conceptualised as (more or less) homogeneous substances, or as (sets of) distinct objects. When "transnumeral number markers" on collectives are used, they (a) are syntactically "optional," (b) serve as modifiers rather than heads, and (c) semantically indicate emphasis on a small or large amount, a "restriction" rather than a cardinality quantification as "one" (singular) or "more than one" (plural), involved with "numerals." The constructions (53) to (55) provide illustrations of transnumeral plural marking on collectives from Persian, Mandarin, and Hungarian, respectively (simplifying or adaptating some of Wiese's translations and transcriptions, 62–63):

(50) a. *mehmaan*
　　　guest
　　　'A guest; guests'

　　 b. *mehmaan.haa*
　　　 guest-pl
　　　'A lot of guests; all kinds of guests'

(51) a. *háizi*
　　　child
　　　'A child; children'

　　 b. *háizi.men*
　　　child-pl
　　　'Many children'

(52) a. *cigaretta*
　　　cigarette
　　　'A cigarette; cigarettes'

　　 b. *cigarett-ák*
　　　cigarette-pl
　　　'Several cigarettes; scattered cigarettes'

The construction (53b) illustrates her transnumeral "singular marking for collectives" (my singulative) in Persian:[21]

(53) a. *ketaab mixaanam*
　　　book   read.1sing
　　　'I am reading a book; doing some reading.'

b. *ketaab.ii   mixaanam*
   book-sing   read.1sing
   'I am reading one book, a particular book.'

Leaving aside the details of the analysis, Wiese (2012, 72) proposes essentially different semantics for masses, collectives, and plurals (or objects) as follows:

(54) Mass nominals *(beef)*: εx (BEEF (x))
(55) Collectives *(cattle)*: εu ∀x (x ∈ u → cow (x))
(56) Plural nominals *(cows)*: εu ∃V (∀x (x ∈ u → COW(x)) ∧ |V(u)| > 1)
      (a cow): εu ∃V (∀x (x ∈ u → cow (x)) ∧ |V(u)| = 1)

(The epsilon-operator *ε* is used for the representation of indefinite terms, "V" stands for an individuation function, and "|V(u)|" is the cardinality of an individuated set "u").

   In Wiese's account, semantic representations for both collectives and plural nouns have an *internal structure* that identifies individual elements. They involve a set *u* consisting of elements "x" that satisfy a certain predicate (e.g., cow). This is not so for mass nouns. This analysis accounts, according to her, for Quine's "built-in modes . . . of dividing their reference" that such nouns possess, relating to the conceptual object-denoting vs. substance-denoting distinction. Second, semantic representations for plural nouns (but not collectives or mass) involve an individuation function *V*, which provides access to individual elements of the set *u*.

   Wiese's account then (as I perceive it) involves two stages of individuation. Collectives (unlike masses) benefit from the first stage, being objects, and count nouns benefit from the second stage, for the different kinds of cardinal counting constructions. The analysis does not seem, however, to provide any clear account of how singulatives or groups are integrated in the syntactic number system with its various modes of individuation.

3.5 Acquaviva's Multilayered Architecture

Acquaviva (2016, 2017) assumes that *n* stands for a noun concept, naming an entity type *e* (there being no pre-existing elements of content labelled by roots, and subsequently classified as "nouny," as in Harbour [2014]). A noun defines a *type* that may or may not be instantiated by particulars.[22] Nouns then denote initially just abstract types, and secondarily, elements of larger syntactic structures, token individuals that can be pointed to and referred to by DPs.[23] The notion of entity type identifies the semantic content that singles out nominality from other categories. What names the entity type is not the root but the "noun-defining context." A root is just a purely differential index

with no conceptual content (as in Acquaviva [2014] and Harley [2014]). It becomes an index for an entity type when categorized as a noun (in syntax). Then phrasal constituents larger than morphological nouns have the semantic properties of a common noun if they identify a kind.[24] What counts as nominal, then, is an identifier of an entity type. It is not a property (type $<e,t>$) but a label (abstract), denoting entities of type e.

Next comes a fine-grained analysis of "division of reference" (Borer 2005). Above the nominalized root, $[\ \sqrt{}\ ]_n$, there is a syntactic mereological level, notated as $[[\ \sqrt{}\ ]_n]\ _P\Sigma$, where "P$\Sigma$" stands for "property of sums," and a sum is, in the mereological sense, an individual in the most general possible sense: any atom or any set of atoms, but also any sum in an atomless mereology. A noun interpreted as this level denotes a property in the least informative way: if $[\ \sqrt{}\ ]_n$ identifies an entity of type e, $[[\ \sqrt{}\ ]_n]\ _P\Sigma$ represents the property of being that entity type, with no restriction on what entity it might be.[25] At the PΣ level then, every noun has the interpretation of a mass noun like *water*, denoting all things that are true of the property P and all sums of those things—that is, *P; as a result, P = *P (as in Borer 2005, 222).

Turning to countability, it means "having additional semantic characterizations that restrict the uninformative characterization conveyed by PΣ." That means that nominals interpreted as count contain more information than those having mass interpretation. Note that countability is a cluster of properties, which Acquaviva represents as a higher functor.[26] It can be called Div, after Borer. But the division of a noun's reference, or the determination of its part structure, takes place in two stages. First, an abstract entity type is turned into the property, which denotes that entity, the domain of which is minimally characterized as *a lattice* of undescribed elements and all their sums. Then the lattice is qualified as *constructed on a particular set* of elements, the members of the partition and their sums. The following structure results (Acquaviva 2016, 223):

(57)

	FUNCTOR	LABEL	DESCRIPTION
	Div	$[[[\ \sqrt{}\ ]_n]\ _{P\Sigma}]\ _{Div}$	property of individuals; $<e,t>$ (partitions the set of sums)
	PΣ	$[[\ \sqrt{}\ ]_n]\ _{P\Sigma}$	sums; $<e,t>$ (introduces variable, creates lattice)
	n	$[\ \sqrt{}\ ]_n$	entity name; e (names an entity type)
		$\sqrt{}$	root

For nouns like *table*, the noun itself acts as a criterion for atomicity: the domain of its denotation is partitioned into stable atoms, each of which is named as a table-entity.[27] But although he observes that "the partition introduced by Div is a necessary but not sufficient condition for countability: it is not a countability switch," Div is still "the appropriate locus for those classifiers that categorize referents on the basis of their physical shape," and dimensionality is encoded at Div, with dimensional adjectives attached at this level.[28]

As for Number, its semantic contribution is twofold. First, it turns the atomic property P defined by Div into *P (closure under sum formation). Second, it provides semantic number features, which restricts the lattice of *P. For Harbour (2014), the attested typological spectrum can be derived on the basis of the features [±atomic], [±minimal], [[±additive] and their combinations. These features restrict the denotation to just atoms, or non-atoms, or sets with or without minimal parts, like the dual, or approximative "small number," or "too many to count," etc.[29]

In short, although Acquaviva's sytem is a clear advancement in implementing individuation and number in the nominal architecture in a generative model, it remains unclear how his unification of masses and objects at an early stage can lead to an early split that can provide the first stage individuation associated with Wiese's collectives or ours. Second, it is not clear how unities as distinct from atomicities can be accounted for.

Summing up the section, I have discussed some approaches of Number that have inspired or come close to my analysis of Number and individuation from various facets, supporting this direction of research as a whole. Various authors point out the necessity of splitting Div into two components: one that separates objects from substances, a first stage of individuation that I identify as atomicity, and a second (distinct) stage that separates unities from non-unities. Furthermore, these two stages have been assumed to be reflected in grammatical architecture, through AtomP and UnitP projections.

4 FURTHER COMPLEXITIES AND ARCHITECTURE

In this section, I discuss more complexities of the number system, built around the atomic and the unity features, and the projections involved in (44) above. While (nominal) Number is found in many forms and contexts, and combinations of more than one plural form on the same word, its syntax and semantics require detailed elaborations, only some of which are touched on here.

4.1 Where Is Number?

Nominal grammatical Number has various manifestations in terms of form or function, as well as placement in the hierarchical architecture of a DP. It is often stated in traditional and orientalist literature that there are three kinds of nominal Number in Arabic: singular, dual, and plural (see, e.g., Wright [1971] and Hasan [1971], among others). This ternary system is exemplified by the following patterns:

(58) a. *mudarris-un* teacher-NOM   'a teacher'
    b. *mudarris-aan* teacher-DUAL.NOM   'two teachers'
    c. *mudarris-uun* teacher-PL.NOM-N   'teachers'

These are examples of "sound" number, which applies productively only to adjectives and verbs. For nouns, however, observe that only the dual is systematically "sound," in the sense that it is formed from the singular by concatenative vowel lengthening [*aa*]. In the normal case, a nominal plural is rather "broken," as illustrated in (59) and (60):[30]

(59) a. *rajul-un*   man-NOM   'a man'
    b. *rajul-aan*   man-DUAL.NOM   'two men'
    c. *rijaal-un*   men-NOM   '(some) men'
(60) a. *kaatib-un*   writer-NOM   'a writer'
    b. *kaatib-aan*   writer-DUAL.NOM   'two writers'
    c. *kuttab-un*   writers-NOM   'writers'

The concatenative **rajul-uun* and **kaatib-uun* in (61), however, are unattested nominal plurals:[31]

(61) a. **rajul-uun*   man-PL.NOM
    b. **kaatib-uun*   writer-PL.NOM

Indeed, it is the broken plural that constitutes the essential manifestation of nominal plurality. Moreover, some of these sound forms are accepted as pluralized agentive adjectives, as is the case of *kaatib-uun* "writing-pl" in (65):

(62) *hal ʔantum kaatib-uu-na   li-l-maqaal-i*
    Q   you.pl writing-PL-N   of-the-article-GEN
    'Are you going to write the article?'

And although broken plurals can also be used as plural adjectives, as in (63a), the general tendency is to use the broken plural for nouns, and the sound plural for adjectives, as in (63b) and (63c), respectively:

(63) a. *nadl-un* 'jerk-NOM'; *ʔandaal-un* 'jerk.PL-NOM' broken plural;
     * *nadl-uun* sound plural.
     b. *nabiil-u-n* 'noble-NOM' *nubalaaʔ-u* 'noble.PL-NOM' (broken plural,
     noun)
     c. *nabiil*-uu-n 'noble-PL.NOM-N' sound plural (adjective)

What (63) shows is that *nabiil* 'noble' can have both broken and sound plural
forms, but *nadl* 'jerk' does not have a sound form. For the purpose of this
study, I will leave aside the peculiarities of the dual, which are not relevant
for the issues I am concerned with here.

   In the case of pairs such as *rajul/rijaal* 'man/men,' *kalb/kilaab* 'dog/dogs,'
vowel lengthening can be associated with a plural structure and interpreta-
tion. Various syntactic tests can be used to assess the plurality of the noun.
For example, the plural verbal agreement in (64) depends on the plurality of
the noun:

(64) *r-rijaal-u*   *jaaʔ-uu*   (* *jaaʔ-a*)
     the-men-NOM   came-PL   (* came-SG)
     'The men came.'

More complexity arises when we introduce the plurative to the picture. First,
the plurative form does not fit simply in the sound/broken divide. A number
of pluratives are sound, given that they do not affect the internal vocalic pat-
tern of the singular but are only concatenated, through an external affix *-at*,
as in (65):

(65) a. *sayyaad* 'hunter, fisherman' > *sayyad-at* 'hunters, fishermen' (as a
     group or profession)
     b. *xayyaal* 'horse-rider' > *xayyaal-at* 'horse-riders'

They obviously share this property with normal sound plurals, which end in
-uu in the nominative masculine, as in (66):

(66) *sayyaad* 'hunter, fisherman' > *sayyad-uun* 'hunters, fishermen'

Note that all pairs are found. In addition, other pluratives can be formed on
already formed plurals, as in *baraber* > *baraber-at*, discussed in chapter
two, or *talaamiiḏ* 'pupils' > *talaamiḏ-at* 'pupils' (as a group), *jahaabiiḏ*
'brilliant men' > *jahaabiḏ-at* 'brilliant men' as a group (with the long vowel
shortened), etc. Another sort of plurative is found in cases where there is no
independent broken plural base, but only the plurative form, as in *mušaat*
'infantrymen' (plural of *maaš-ii*), *rumaat* 'archers, bowmen' (plural of

raamii), the singular of which is used only in the adjectival/participial sense, and hardly in the nominal professional sense. What this variation suggests is that although the core morphology of the plurative is the "feminine affix," the plurative can be sound, or both broken and sound. Or in other words, there is no correlation between being broken and the plurative morphology, as has been thought. On the contrary, the core of the plurative morphology is concatenative (or "sound").

With regard to where Number is found, it can be part of the nominal root ($\sqrt{}$) or n, rather than above n, as Cl or Num. Acquaviva (2008) calls these cases lexical plurals. Consider the following three derived words, all (potentially) related to the consonantal root *ʕrb*, and having the affix *ii*, which can function as a classifier:

(67) *ʕarab*   →   *ʕarab-ii*
     Arab   Arab-CL
     'Arabs'   'An Arab'
(68) *ʔaʕraab*   *ʔaʕraab-ii*
     bedouin-Arab   bedouin Arab-CL
     'Bedouin Arabs' 'A bedouin Arab'
(69) *ʕuruub-ii*
     arab-ii
     'A nationalist Arab'

In (67), the affix *ii* functions as a singulative, and it forms a singular noun from the collective, to designate one of the Arabs (a "unit"). Similarly, in (68), the affix plays the same role. What is particular is that *ʔaʕraab*, having the form of a plural, is not interpreted as a plural of the collective *ʕarab* 'Arabs,' but rather as meaning something else. *ʔaʕraab* in (68) turns out to be just another "collective," designating a particular subclass (or socio-ethnic category) of Arabs, namely the Bedouin Arabs. The singulative then designates one of them. What is important to observe here is that this meaning is due to the plural form, and that the plural is part of the noun, or of naming. It is not "inflectional" in any sense.

Consider finally the derivation of the word in (69). The affix there is "attributive," in the sense that the property of the noun base serves for forming an adjective. This nominal base is in fact not used as an independent nominal word, although it looks as if it is a plural (in regard to its form). But there is no plural meaning here too. Rather, the meaning is similar to that in *ʕuruub-at* 'arabity,' the characteristic (or quality) of being an Arab. Once again, a plural form is lexicalized as having a specific meaning, not necessarily that of the (consonantal) root (see Fassi Fehri [2003–2004, 2012] for more detail).[32]

4.2 Masses

Mass is often taken to be just as non-numbered and non-count in the narrow sense. Contrary to general nouns, which I analysed as part of the atomic domain, more like singulars and plurals, masses do not belong to the atomistic domain (see Chierchia 1998a). They are rather atomless, as in Link (1983, 1998). First, I compare mass and plurals, and provide reasons for not taking mass as atomistic. Second, I investigate the properties of the plural of masses, as well as those of the plural of plural of count nouns, or the plural of general nouns. Third, I provide a grammar architecture that takes these differences into account.[33]

4.2.1 Mass as Atomless

Link (1983, 1998) takes the domain of mass to be homomorphic with that of individuals, except that it is not atomic. They are defined on a domain (D), constituted by "the set of all individual portions of matter in the model." Plurals, on the other hand, are atomistic and defined on a domain (E) of individuals. In Chierchia (1998b), however, mass and count belong to the same domain, which is atomistic.[34] Taking object mass nouns like *furniture* to be a prototype of mass, and substance mass like *water* to be analogously treated, he claims that what differentiates mass from count is that mass comes out of the lexicon as already pluralized, hence "a mass noun like *furniture* will be true in an undifferentiated manner of singular pieces of furniture, as well as pluralities there of" (347). The lexicalized plurality of mass is represented as in (70):[35]

(70) a. {a, b, c}
          [{a, b} {a, c} {a, b}] 'furniture'
          a b c
      b. {a, b, c}: 'pieces of furniture'
      c. a, b, c : 'chair, table, etc.'

A mass noun then "denotes the closure under U of a set of atoms." Consequently, they can't be pluralized because they are already inherently plural (Chierchia 1998b, 347).

But there are a number of reasons to question Chierchia's view on both conceptual and empirical grounds. In particular, I will question the following claims: (a) mass is atomistic, (b) object mass (like "furniture") and substance mass (like "oil") are structured alike, and (c) masses cannot be pluralized.

With respect to the object/substance distinction, it is striking that language acquisition experiments related to quantity judgements tend to indicate that the measurement of objects is distinct from the measurement of substances,

suggesting a perceptual/cognitive distinction of atomistic and atomless "masses" (Barner and Snedeker 2005; Rothstein 2010; Wiese 2012; Grimm 2012a–b). Second, cross-linguistic variation also supports the distinction. According to Tsoulas (2009), Greek instantiates only substance mass, not object mass. Third, and more importantly, mass cannot be seen as atomistic and neutralizing the singular/plural distinction, like a general noun, as revealed by its distinct behavior with respect to counting (recall, for example, the constrasts in [1] and [7] above).

4.2.2 Mass Is Cumulative and Non-Divisive

One of the most unifying properties of mass and plural is cumulative reference, as well as the lack of divisive reference. Divisive reference, a property of count nouns, is explained in Quine (1960, 91) as follows:

> to learn a full-fledged general term like "apple," it is not enough to learn "how much of what goes on counts as apple": "we must learn how much counts as *an* apple, and how much as another. Such terms possess built-in modes . . . of dividing their reference."

In contrast, so-called "mass terms" do not divide their reference. "There is no learning of 'how much counts as *some* water and how much counts as some *more*." This is "the semantical property of referring cumulatively," that is "any sum of parts which are *water* is *water*"; there is "no built-in reference-division" or no-RD. (Laycock 2005, 535)

The semantically distinct categories of nouns to which the no-RD criterion applies identically are non-count and plural nouns. Thus "although we learn 'how much counts as *an* apple, and how much as another,' there is no learning of 'how much counts as *some* apples, and how much as *more* apples.' While the singular 'apple' applies to just one apple at a time, 'apples' sets no limits on what count as apples." With respect to Quine's cumulativity, any sum of parts, each of which is *an* apple, will not be *another* apple, but any sum of parts which are *apples* will simply be more *apples* (Laycock 2005, 535–536).

4.2.3 Mass as Distinct from Plural

But despite their common behavior with respect to cumulative (and divisive reference), there are significant mass/plural distinctions. For example, it is normally thought that plurals denote aggregates of atomic individuals, and mass nouns don't. Jackendoff (1991) notes in this respect that plurals are aggregates of discrete entities, which have [+internal structure], unlike mass. Likewise, Chierchia (1998a, 59–60) states that a plural "must map a set of atoms into the set of pluralities constituted by those atoms." Moreover,

Moltmann (1997) observes that mass, unlike plural, does not express whole properties of individuals. Further distinguishing properties of mass and plural have been pointed out. For example, reciprocity is felicitous with the plural, but not with the mass object, as pointed out above. Likewise, some predicates select the plural, but not its mass counterpart (Moltmann 1997, 87):

(71) a. John cannot distinguish the rice grains.
     b. * John cannot distinguish the rice.

Note further that some quantifiers selecting an atomistic plural do not apply to a singular mass, although they apply to a plural mass. Thus the grouping quantifier *jamiiʕ* 'all-together' applies, for example, to plurals of individual objects, or to plurals of masses, but crucially not to singular masses:[36]

(72) *jamiiʕ-u*   *r-rijaal-i*
     all-together-nom the-men-gen
     'the men altogether'
(73) *jamiiʕ-u*   *l-miyyaah-i*
     all-together   the-waters
     'the waters altogether'
(74) * *jamiiʕ-u*   *l-maaʔ-i*
       all-together   the-water

(See the more recent work of Acquaviva [2016, 2017] for more on these tests, as well as a new conception and criteria.)

4.2.4 Plural of Mass Is Productive

Mass plurals are productively available, contrary to Chierchia's expectations. Their properties are worth investigating, especially because they share some interpretive properties with plurals of plurals, or plurals of general nouns. In all these cases, the plural is interpretable, although it is neither a "divider" nor a multiplier (meaning "many" or "more-than-one"). Rather, it is either "taxonomic" (i.e., extending to a sum of different kinds of a non-discrete quantity), or plural of "abundance" (i.e., a modifier of an amount of a non-discrete quantity), etc. Consequently, plural inflection on masses is clearly interpretable as such, and it would be both empirically and conceptually inadequate to ban pluralization of masses. Likewise, it is equally inadequate to assume that this ban recalls the ban on double pluralization, since double plurals are found in various languages, including Arabic (see Acquaviva [2008] and Corbett [2000]; see also the more recent work of Acquaviva [2017] for interpreting mass plurality).

Recall some important characteristics of mass pluralization in Arabic. Mass nouns do undergo pluralization productively, like general nouns and other plurals (which then form double plurals). The following examples illustrate:

(75) SA

    maaʔ ⟶ miyyaah   'water; a lot of water; (different) kinds of water'

(76) MA

    a. *šta* 'rain' ⟶ " *štaw-at* 'a lot of rain'

    b. *telj* 'snow' ⟶ *tluj-aat* 'a lot of snow'

(77) SA

    qawl ⟶   *ʔaqwaal* ⟶ *ʔaqawiil*

    'saying' ⟶ 'sayings' ⟶ 'a lot of sayings; many kinds of sayings'

(78) a. *xayl* ⟶ *xuyuul* 'horses; a lot of horses; kinds of horses'

    b. *samak* ⟶ *ʔasmaak* 'fishes; a lot of fishes; many kinds of fishes'

Note that a double plural can denote a sum of cohesive collections:

(79) a. *rajul* ⟶ *rijaal* ⟶ *rijaal-aat*

    'man' ⟶ 'men' ⟶ '(dedicated) collections of men'

    b. *farq* ⟶   *furuuq*   ⟶ *furuuq-aat*

    'difference' ⟶ 'differences' ⟶ '(dedicated) collections of differences; a lot of differences'

It is striking that in none of these cases can the plural be thought of as a divider in Quine's or Borer's sense, nor as a mere formal agreement marker. It is rather a modifier of the mass nP, interpreted as increasing the amount of the substance, basically like "a lot"; alternatively, it is a plural of collections. For more detail, see Fassi Fehri (2012, chapter eleven).[37] These multiple applications of Number to masses and count nouns render the claim of a unique Number application to all nouns totally inadequate. Moreover, they seriously question Borer's view, according to which Plural/Number inflection is dedicated to a divider function.[38]

As shown in Fassi Fehri (2003–2004, 2005, 2012) and Fassi Fehri and Vinet (2008), various plurals can re-pluralize in SA and MA (and from what I know in a number of other colloquials as well). However, the new-formed plural (via vowel lengthening as in [78], or concatenative suffixation as in [79b]) is not *stricto sensu* "a plural of a plural" in the sense that a new sum is formed from discrete sums taken as atomic or unit entities (more like what happens, for example, with the plural of groups). In other words, the second plural is

not a "multiplier" or a double sum (** e) plural. It is rather interpreted as either (a) "taxonomic plural" (i.e., a plural that pluralizes sorts or kinds), or (b) an "intensive plural," in the sense that it increases the amount or quantity of the entities involved, as is the case with *ʔaqaawiil* in (78), which has one of the two mentioned interpretations.

Likewise, mass nouns like *maaʔ* 'water' and *ʔaṯaaṯ* 'furniture' can also be pluralized. When they are, their plural does not behave like a normal multiplier/sum plural, but rather like either the intensive or the taxonomic plural. Thus *miyyaah* 'waters' means either "a lot of water" (intensive), or "many sorts of water" (taxonomic). In sum, the 'plural of the plural' of count nouns appears to behave more like the plural of nouns for kinds or masses. The latter are non-atomic entities. Their plural is different from the (inflectional) plural of individuals or groups, which forms a [-atom] sum from [+atom] entities (as in, for example, Link [1983, 1998]). Let us now see in more concrete terms how these "plural of plural," "second plural," plurals of masses, etc. can be syntactically represented.

In its intensive (or amount) reading, I take *ʔaqaawiil* to have two numbers, which are generated under Num: one Num acts as a pluralizing *head* (meaning basically "more than one" or "many"; = Pl_1), and a second Num is an adjoined *modifier*, which contributes the intensive (or big quantity) reading (= Pl_2) as follows (slashes are used at the bottom of the tree to avoid more detail of the structure):

(80)   NumP

   NumP   NumP

   $[Pl_2]$ Num   nP

   ʔaqaawiil $[Pl_1]$

                   qawl

            ʔaqwaal
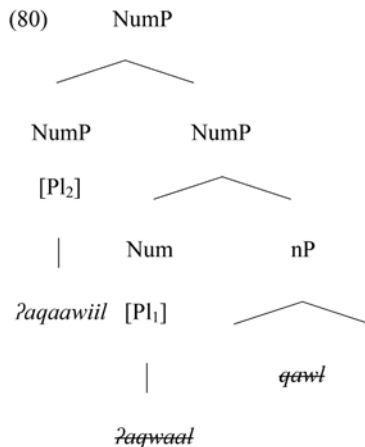
In its taxonomic reading, I take *Ɂaqaawiil* to be headed by a taxonomic classifier Cl-T, which is pluralized via a Num head, as in the following:

(81)   NumP

NumP   ClP
[Pl₂]

| Cl   nP

Ɂaqaawiil [Pl₁]

| *qawl*

~~*Ɂaqwaal*~~
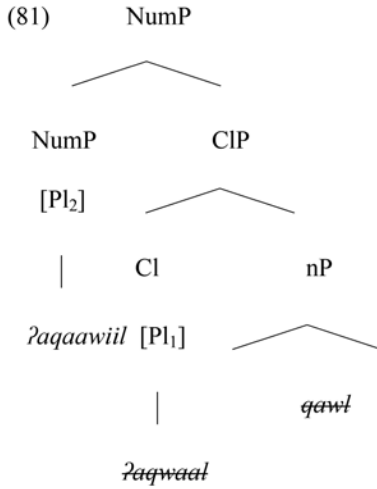
In the two structures, the two plural forms are assumed to be part of syntax, fulfilling the positions and the functions indicated, building on ideas by Krifka (1995), Borer (2005), and Wiltschko (2008), among others.

Let us turn now to plurals of masses like *miyyaah* 'waters.' In their taxonomic reading, it is reasonable to think that their structure is quasi-identical to that of (81), except that the Cl-T is "hidden," and there is only one Pl expressed rather than two:

(82)   NumP

NumP   ClP
[Pl₂]

| Cl   nP

miyyaah [Pl₁]

| ~~*maaɁ*~~

~~*miyyaah*~~
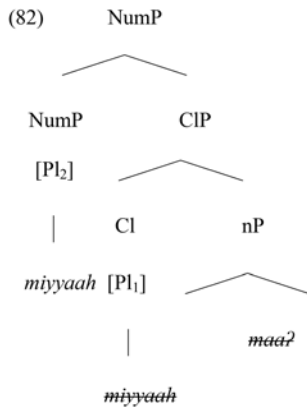
As for the "intensive" reading of masses or kinds, I assume (tentatively) a parallel structure to (80), in which Num (meaning basically "a lot" or "much") is adjoined (as a modifier) to nP rather than its head:

(83)

```
                          nP
                    ┌─────────────┐
                 Num              nP
                 [Pl]          ┌──────────┐
                  |            maa?
               miyyaah
```
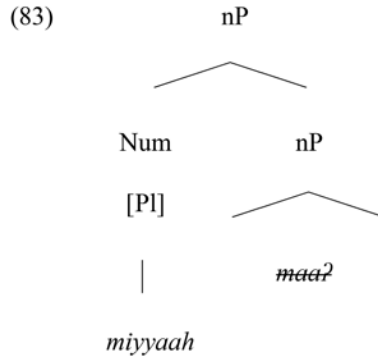
Consider finally the plural of general nouns or "collectives" like those in (78). Their plural behaves exactly like the double plural in (79), in being ambiguous between a taxonomic reading and an intensive (amount) reading. The two structures (80) and (81) are strictly extendable to these cases. The analysis I adopted combines atomistic pluralization, modification by a quantity plural like "many" or "much," taxonomic classification, etc.[39]

4.3 Quantifiers Revisited: Partitivity and Individuation

It is possible to revisit the Q features in light of the new system of features presented in this chapter. It is reasonable to think that the traditional [±count] distinction, as well as the [±dist] distinction, would be subsumed under (or be replaced by) the [±atom] and [±unit] features.

Consider again the contrast between *biḍʕ* and *baʕḍ*, discussed above. We have seen that the Q *biḍʕ* basically selects a [+count] complement, whereas *baʕḍ* is underdetermined. Since the nominal complement of *biḍʕ* is necessarily plural, and since the Q *biḍʕ-at* can carry a feminine marker, which is a sort of classifier, we can hypothesize that this classifier stands for unity, more like a plurative. Since unities are countable, it follows that only nouns of this class (i.e., atoms or unities) can be a complement of *biḍʕ*, to match its properties. This is not the case for *baʕḍ*, which does not have such a requirement. Since we have dispensed with the notion "count" for characterizing individuation, it appears to be a natural move to dispense with notion when dealing with Q selection.

Consider now the trilogy of interpretations of the quantifier *kull*, as $kull_{al}$, $kull_{ev}$, and $kull_{ea}$. Suppose that the first major distinction collective/distributive is equivalent to *whole* and *part*, respectively. Moreover, suppose that part (for partitive) can express the mereological relations *part of* (to be marked as [+ part]), and the relation *whole of* (to be marked as [− part]). Then $kull_{al}$, denoting a whole, will be associated with the negative value [− part], while the two others will be positively [+ part]. If so, then the vague distinction between $kull_{ea}$ and $kull_{ev}$ as strongly and weakly distributive can be in fact more efficiently replaced by an individuative specfication. Thus $kull_{ea}$ is positively marked as individuative, being either [+ unit] or [+ atom], depending on singulars, whereas $kull_{ev}$ is not so specified. In the case of the specfication of Q for a feature F, its complement would bear an unvalued feature, which probes for the valued feature on Q. More research is needed for this refinement, which appears to be in the status of speculation at this stage.

4.4 Architectures

In this subsection, I provide samples of the structures that have been assumed so far and motivated. Only the directly relevant projections are provided; other irrelevant projections like KP, DP, QP, etc., are not.

The simplest nominal structure to be assigned is to mass substance like *zayt* in (). The structure is the less specified, compared to other structures, which are "loaded." It is as follows:

(84)

```
              nP
            /    \
          n      RootP
          |      /    \
        zayt   zayt   zayt
```
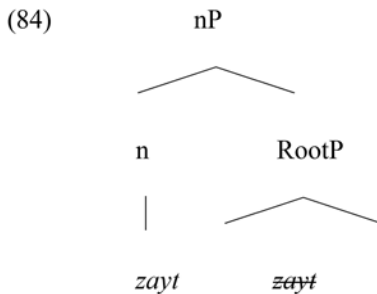
The second structure to be considered is that of general (or "collective") nouns. It projects an atomP of the first level (= atom¹), as in (78b) for the general noun *samak*, marked as ±:

(85)   AtomP

$[\pm \text{atom}^1]$ nP

                                    n   RootP

                                    |

                                 samak   ~~*samak*~~
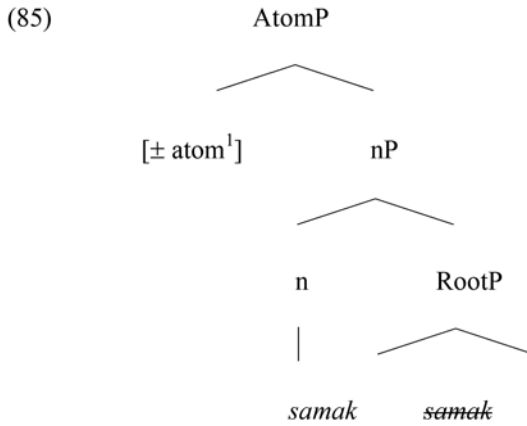
I assume at the NumberP level (or atom^{2}P), the value of the atom is replicated and interpreted as "one" (+) "or more" (−), thus providing both the positive and the negative values as possible interpretation.

Consider now the structure of a singulative like *samak-at*, which is both an atomicity of the first level and a unity, as in (86):

(86)   UnitP

          [+unit]   atom^{1}P

             |

    samak-at $[\pm \text{atom}^1]$ nP

                                n   RootP

                                |

                             ~~*samak*~~   ~~*samak*~~
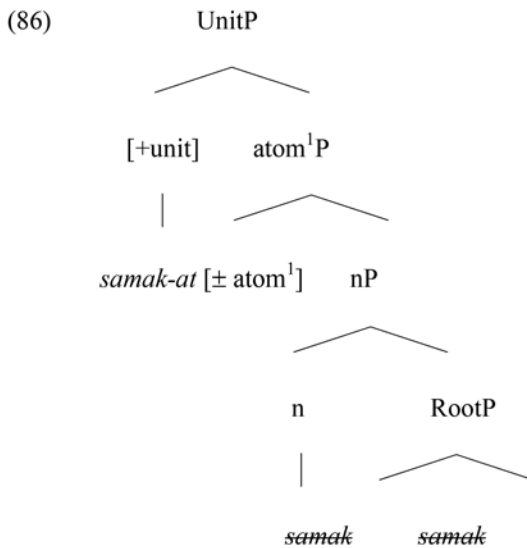
When pluralized as *samak-aat*, the plural of the singulative introduces the second level of atomicity, as in the following structure:

(87)
$$\text{NumP} \quad (= \text{Atom}^2\text{P})$$

$$[\text{-atom}^2] \qquad\qquad \text{UnitP}$$

$$\textit{samak-aat} \qquad [\text{+unit}] \qquad \text{atom}^1\text{P}$$

$$\textit{~~samak-at~~} \; [\pm \text{atom}^1] \qquad \text{nP}$$

$$\text{n} \qquad\qquad \text{RootP}$$

$$\textit{~~samak~~} \qquad \textit{~~samak~~}$$
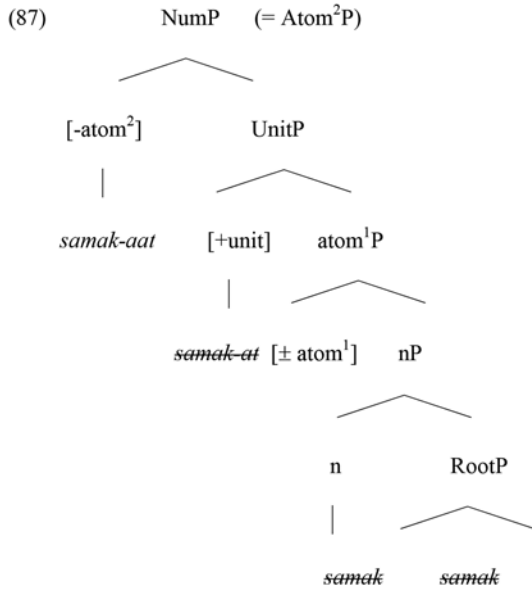
Third, consider a normal plural like *kilaab* 'dogs,' which features no singula-tive. I assume that when it is interpreted as "plural of a singular" (or "more than one dog"), its structure is the following:

(88)
$$\text{NumP} \quad (= \text{Atom}^2\text{P})$$

$$[\text{-atom}^2] \qquad\qquad \text{atom}^1\text{P}$$

$$\textit{kilaab} \qquad [\text{+ atom}^1] \qquad\qquad \text{nP}$$

$$\textit{~~kalb~~} \quad \text{n} \qquad\qquad \text{RootP}$$

$$\textit{~~kalb~~} \qquad\qquad \textit{~~kalb~~}$$
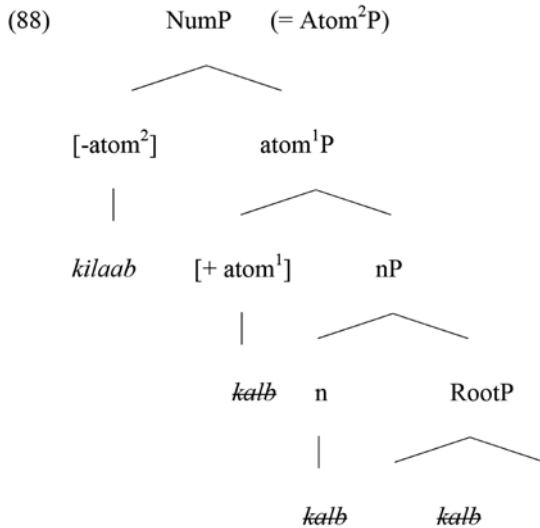
As for pluratives, I assume that the UnitP there can be higher than NumP (or Atom^{2}P). Note that I am giving only the structure of pluratives that function as such in syntax (e.g., when they control plurative agreement on the predicate), and not the structure of the plurative word when it functions as plural only (in which case it is not a unity). In the case of syntactic plurative, the structure is as follows:

(89)   UnitP

        Unit   Atom^{2}P

         |
   talaamiḏ-at [-atom^2]   atom^{1}P

            |
      ~~*talaamiiḏ*~~ [+ atom^1]   nP

                 |
           ~~*tilmiiḏ*~~   n   RootP

                      |
                 tilmiiḏ   ~~*-tilmiiḏ*~~
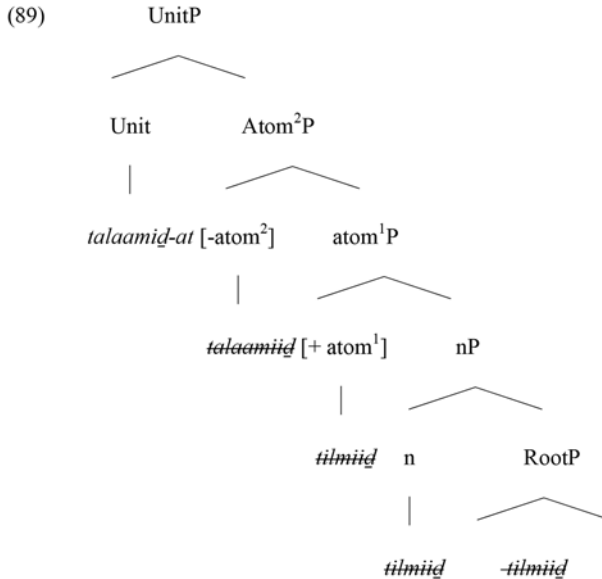
5 CONCLUSION

I have provided and motivated a system of number and individuation based essentially on two bivalent features: [± atom] and [± unit]. I have shown that a system that uses only atomicity can account for plural and singular characteristics (basically English or French type languages), without providing bases to account for singulatives and pluratives found in Arabic, Welsh, or Persian, in addition to groups found cross-linguistically.[40] I have also motivated this division by looking at differences between pure masses and general nouns, with respect to counting and other number properties, and more importantly by motivating the four number classes given in (46).

It has also been shown that these features project different categories, atomP and unitP, which interact in interesting ways to account for variation found in Arabic and other languages. Finally, I have discussed the possibility

of dispensing with the feature [± dist], used in chapter four to specify quantifiers, in favour of [± unit].

NOTES

1. Krifka (2004) distinguishes counting atoms (for objects), and counting units (for measures). Similarly, Rothstein (2010) distinguishes counting and measuring operations. See Section 3 for a foundational discussion along similar lines, though with an articulated syntactic architecture.

2. For unitization, see Krifka (1995), among others. For the notion of packager, see Pelletier and Schubert (1989) and Jackendoff (1991), among others.

3. Perhaps the core case of the singulative is the application to individuals as a *refinement* process, and it is *severing* the denotation of the singulative to the finest set, which includes only atomic units, in comparison to the (general) kind, which is coarser, and denotes the whole lattice (see Ojeda [1992] for such a view). If this is so, then it is better seen as a *unitizer* (than as a *divider*), because if it is an operator, it applies to an (already) individualized domain. As for the singulative of masses, it is close to the "packager" sense (as in Pelletier and Schubert [1989]; see Acquaviva [2015] and Mathieu [2013], among others, for discussion).

4. For this mechanism, see Pelletier (1979), Gillon (1992), and Bunt (2006), among others.

5. This subsection basically reproduces Section 3 of chapter five from Fassi Fehri (2012, 134–38 and readapts it to fit the analysis proposed in the chapter here. Thanks to John Benjamins for granting me permission for this partial reproduction.

6. For more on properties of Arabic groups, see Fassi Fehri (2003–2004, 2012).

7. According to Corbett (2000, 10), "the meaning of the noun can be expressed without reference to number. We shall call this "general number," by which we mean that it is outside the number system. Various other terms have been used: Jespersen (1924, 198) writes of the lack of "a common number form" (i.e., a form that disregards the distinction between singular and plural); Hayward (1984) introduced the term "unit reference"; the German tradition is to use "transnumeral," as in Biermann (1982). We follow Andrzejewski (1960) in using the term "general." As we will see, however, general nouns are far from being "outside" the number and individuation system.

8. That two features, rather than one, are relevant for countability interpretation is widely accepted in the literature in various forms. See, for example, Rothstein (2010), Watanabe (2006, 2010), Jackendoff (1991), and Harbour (2007), who uses the feature [augmented] in addition to atomicity, as well as the motivation and interpretation of redundancy. Likewise, Rijkoff (1991, 294) uses "shape" (boundednes) and "structure" (dividable) and takes "set nouns" to be both bounded or shaped, but their structure is ambiguous. In Fijian, for example, you do not get more sets, but rather the number of individuals that make up the set (297). In fact, the notion "set noun" comes close to our notion of general noun. Hence "a set noun may be aspectually disambiguated by means of an individual or a collective aspect marker, which indicates whether

the set consists of [only] one or more individuals" (298). Individual and collective aspect markers then tend to be confused with singular/plural number markers. In a direct construction with a cardinal numeral, nominal aspect markers do not [tend] to occur. The numeral merely counts the number of individuals, and the noun designates a single set. Adding an individual or a collective aspect marker is basically redundant.

9. Obviously the issue is still very disputed. In Fassi Fehri (1997), I implemented an L-syntax à la Hale and Keyser (2002) to derive various words from a common root in Arabic. See also Levinson (2014), Harbour (2014), Fassi Fehri (2014), and Harley (2014), among others, for various implementations of root theory.

10. See Grimm (2012a–b), in particular, on this point.

11. The PΣ level is close to Harbour's (2014) notion of a concept becoming "nouny." It is proposed that *n* structures concepts as lattices, although this underdetermines whether or not the lattice has an atomic stratum—that is, whether it is count or mass.

12. It is conceivable that natural atoms marked as [+ atomP] are headed by a hidden classifier providing a unit for counting, as in Krifka (1995), which would then unify all the countable entities as units. If so, then the variation between languages comes down to whether unit classifiers are overt (Arabic) or hidden (English). I have no clue at this point to expand this idea. But such expansion is in line with the double source hypothesis of individuation adopted here.

13. There are scales of individuation (apart from these prototypes) that are in need of more granular grammar, or scale grammar, that I will not attempt here. The low levels of grammar may be involved in such a gradability (including nP and split DivP), but also higher levels than NumP (DP, or even higher [Sauerland 2003]), defining higher levels of reference (Longobardi and Guardiano 2009).

14. This subsection is based on subsection 2.1 of Fassi Fehri (2012), chapter five, pp. 129–30. Thanks to John Benjamins for allowing this partial reproduction (with adaptation to the text).

15. Its non-ambiguity is corroborated by traditional ambiguity tests (Rullmann and You 2006, 180).

16. The association of unity marking (or Classifier) with the masculine gender in old German has been reported by Leiss (2000). Manzini and Savoia (2016) and Acquaviva (2017) report the interaction of the feminine and the plural in (dialects of) Italian. See also Luraghi (2011) for such an interaction in Indo-European.

17. Grimm (2012b, 104). Bunt (1985, 46) defines mass nouns as those that adhere to the homogeneous reference hypothesis: "Mass nouns refer to entities as having part whole structure without singling out any particular parts and without making any commitments concerning the existence of minimal parts." As already pointed out by Quine (1960, 99), "there are parts of *water*, *sugar* and *furniture* too small to count as *water*, *sugar* and *furniture*." This problem is termed as the "minimal parts problem" (Grimm 2012b, 120).

18. An entity x is self-connected if any two parts that make up the whole of x are connected toeach other (*ibid*, 134, part of D 24).

19. The following scale of individuation is suggested (p. 55):

   (i) liquids < foodstuffs < granular aggregates < vegetation/cereals/fruits < insects < small animals < pair/grouped body parts < middle-sized animals < types of people < individuals.

20. A (mereological) individual is Maximally Strongly Self-Connected relative to a property if: (a) every (interior) part of the individual is connected to (overlaps) the whole (Strongly Self-Connected), and (b) anything else that has the same property and overlaps it is once again part of it (Maximality) (Grimm 2012b, 135).

21. The following contrasts (from Persian) illustrate what Wiese calls "transnumeral singular and plural marking" for a mass noun (7):

   (i) *aab* 'water'
   (ii) *aab-ii* water-sing 'some water; a certain amount of water'
   (iii) *aab-haa* water-pl 'a lot of water'

Only in these cases can we say that "transnumeral number marking does not identify an exact number, but rather indicates a large or small amount," but this description cannot extend to all transnumerals or my "general number" in all cases, as shown earlier. On the other hand, taking morphologically marked collectives and singulatives as parts of the transnumeral number in Wiese's sense is doubtless, given their specifications as number values.

22. This is, in Acquaviva's view, the Aristotelian notion of "substance" (*Ćategoriae*, 5), of which both a *universal* (like "man," or secondary substance) and a *particular* (like "Socrates," or primary substance) are further specifications (Acquaviva 2016, 220). It is a different proposal from that of Harbour, for whom "roots name concepts and n^o makes concepts 'nouny,' structuring them as lattices. . . . *n* underdetermines whether that lattice has an atomic stratum of whether its subparts have ever smaller subparts—that is, whether it is count or mass. It is Number that actually introduces the variable and that constrains it, and hence the lattice, to range over atoms and their combinations" (Harbour 2014, 191).

23. Acquaviva (2016, 220) claims that this proposal is close to those that posit an initial domain of kinds (e.g., Mueller-Reichau 2006; Borik and Espinal 2014). The proposal has, in my view, an antecedent in Carlson's (1977a–b) conception of kinds and their instantiations.

24. This can include, for example, modified structures like *long-grain rice* or plurals in the pairs *brain/brains*, *membro/membra*, which identify distinct entity types (*ibid* p. 5).

25. This is another nominal function identified by Harbour (2014): *n* structure concepts as lattices, although this underdetermines whether the lattice has an atomic stratum or not—that is, whether it is count or mass.

26. The latter divides the set of sums denoted by PΣ into a set of mutually disjoint elements, modelled as a partition over the set denoted by PΣ (a function Π [PΣ] such that its output is a set of sets made up of all and only the elements of the original set PΣ and having no element in common).

27. In another scenario, the context may license a partition whose content is not described. Acquaviva (2016, 223) then suggests that this is the case for mass plurals like *waters* (with undescribed concrete quantities of the substance), as has been

argued by Mathieu (2012) and Deal (2013) as the normal value of plurality in Ojibwe and Nez Perce (liquids not being freely divisible precisely).

28. If indeed dimensionality is part of Div, then it is not clear how Acquaviva would incorporate the idea that countability decomposes into numerability and dimensionality, which are syntactically distinct. The author brought results by Zhang (2012) and de Belder (2011) for this decomposition, but early decomposition of a similar sort has been argued for by the author (Fassi Fehri 2003–2004), as well as Fassi Fehri and Vinet (2008).

29. Scenarios of interaction with higher functors involve number expressed at D-level (Butler 2012), or a "low" plural, basically counting as DivP in English (Borer 2005), or Lebanese (according to Ouwayda 2014), where apparently Number projection seems to be involved. Other cases are plural mass nouns like *waters*, which must denote concrete, spatiotemporally situated instances, and cannot be interpreted as kinds. The kind-level reading is not possible here "because what makes plural possible (the partition) is also what enforces an instantiation reading" (Acquaviva 2016, 225–226).

30. The sound/broken terminology is standard in the Arabist tradition, compared to the more technical concatenative/non-concatenative distinction. "Broken" basically means that the vocalic pattern of the singular is lost or not carried over in a derivation of a plural, although the latter form can be related to the former through a morphological process of a more abstract sort, as in McCarthy and Prince (1990). For example, the plural *rijaal* in (59c), being broken, does not preserve the vowels of the singular *rajul* in (59a), whereas the dual in (59b), being sound, does.

31. For the non-arabist reader, it might be useful to indicate that the long vowel [-*aa*] or [-*uu*] fuses both number information and case information (i.e., nominative). With non-nominative case, the dual is rather [-*ay*], and the plural [-*ii*]. The [-*n*] ending that I use in the glosses (called *tanwiin* or *nunation* in traditional grammars) is difficult to translate because of its disputed identity. It has been wrongly identified as an indefinite marker (see Kouloughli [2007] for a recent defense of this thesis). It is rather a head of Poss(essive) phrase, which marks the absence of the possessor constituent, or absence of individuation. Indeed, it disappears from nouns heading a construct state, or individuated vocative nominals (see Fassi Fehri 1993, 2006).

32. In this structure, only Num counts as a (dedicated) category head for the placement of Pl, in line with Ritter's (1991) original proposal. Pl can also be seen as adjunct to other (non-Num) heads, or as a (phi) feature of heads, etc. See Fassi Fehri (2003–2004, 2006, 2007), among other references, for a defense of this architecture.

33. This subsection is based on section 4 of chapter 5 in Fassi Fehri (2012, 138–43), reproduced with permission from the publisher, and adapted to this chapter.

34. Chierchia's (1998b, 347–48) main argument in favor of a single (atomistic) domain for both mass and count nouns is one of economy, since the structure revealed by plurals suffices to account for the properties of mass nouns: "Why hypothesize two different domains when all that is needed to account for mass nouns can be found in the familiar atomic domain of count objects? The intuition that a mass noun like *furniture* means something subtly but deeply different from a count counterpart like *pieces of furniture* is an optical illusion, a gestalt effect due to the different groupings of their denotations."

35. According to Chierchia (1998b, 347): "The extension of nouns like *water* is analogous to the one of nouns like *furniture*, the only difference being that what counts as a minimal portion of *water* is somewhat vague and may vary from context to context." The impossibility of pluralizing mass nouns is claimed to follow immediately from the fact that they are already plural. Direct counting with a mass noun (i.e., *three furnitures) is impossible, because for counting we need to individuate a level at which to count (i.e., a set of atoms for natural language). But a mass noun does not correspond to a set of atoms. To count a mass noun we need a classifier phrase (like *piece of*) or a measure phrase (like *tons of*). Classifier phrases map mass noun denotations into sets of atoms. Measure phrases can be thought of as functions from objects into numbers (see, e.g., Krifka [1989] and Higginbotham [1995]). More recently, Chierchia (2010) has treated core mass like *water*, as basically "vague," a notion which comes close—although it is not identical—to being atomless.

36. In fact, *jamiiʕ* applies equally to collectives of individuals like *naas* 'people,' or to general terms like *samak* 'fish,' hence singling out only the singular mass:

(i) *jamiiʕ-u   n-naas-i*
   all-together   the people
(ii) *jamiiʕ-u   s-samak-i*
   all-together   the fish
(iii) * *jamiiʕ-u   l-maaʔ-i*
   all-together   the water

37. Note first that it is not the case that "stems which are marked as plural . . . become count by definition," as Borer (2005, 109) put it. Second, the fact that plural morphology on nouns with numerals is just a matter of (formal) agreement, as originally pointed out by Krifka, is not applicable here (e.g., to [85]).

38. Some forms of plurals are also semantically bleached, so that no semantic composition based on the singular is possible, as illustrated by the following Moroccan examples:

a. *lyali*
   nights = 'very cold winter'
b. *ṣmayim*
   summers = 'very hot summer'
a. *ʕwašer*
   holidays = 'holiday'
b. *ʕwašr-aat* = 'a lot of holidays'

39. See Fassi Fehri (2012) for more detail and more motivation. I leave for future research the comparison of my analysis with new competing ones, namely that of Acqaviva (2016).

40. Harbour (2011) proposes a [± group] feature for groups and dispenses with it in Harbour (2014). As far as I can tell, the [± unit] feature not only subsumes the group feature, but it also relates pluratives, singulatives, and groups, as I have explained, which the group feature alone cannot do. But I leave the matter of a critical comparison for future research.

Conclusion

This book has investigated essential questions and puzzles that face an adequate description of genders, numerals, quantifiers, and numbers in some Arabic varieties, essentially Standard Arabic, but also Moroccan and Lebanese, in addition to comparison with various other languages. It has also been concerned with the nature of the grammatical categories involved, their features, and their projections in the nominal spine and clausal architecture.

Crucial to the ingredients of the theory and mechanisms adopted is the idea that Gender cuts across many traditional categories that are unexpectedly "gendered," and it is central to the grammar rather than peripheral or parasitic on categories. It has been argued that Gender plays the essential role of unitization, as one way of constructing units or unities (instantiated by singulatives and pluratives), and it interacts significantly with traditional categories such as Classifier and Number (in addition to Determiner). It also plays other roles in the grammar of evaluation and performativity. This diversity of roles suggests strongly that Gender is clearly not a (inherent) property of only nouns, or *n*, as the dominant Indo-European–based view has it, but is "constructed" or built in syntax at various layers of the nominal spine, namely above nP (in the case of singulatives), above NumP (in the case of pluratives), and above CP (in SAP), in the case of performative Gender.

The second central idea is that individuation in the grammar comes in two "flavours" or categories, namely *atomicities* and *unities*. These categories project as AtomP and UnitP, which subsume the two essential functions and senses of traditional classifier phrases (or ClPs). It has been argued that the singular/plural distinction is not sufficient to describe the behaviour of pluralities and singularities. Rather, the singulative/plurative distinction is also needed. Four descriptive classes of individuals (or individuatives) are

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then established, using [± atom] and [± unit] features: (a) singulative = [+ atom; + unit]; (b) singular = [+ atom; − unit]; (c) plural = [− atom; − unit]; (d) plurative = [− atom; + unit]. These features are also able to distinguish the various traditional "collectives" or "groups," which have distinct structures, depending typically on whether they can control a "feminine" or a "masculine" predicate. Note also that these features are assigned and interpreted/valued at various layers of the DP, or the CP, in the appropriate discourse or perspective context.

Given this system of individuation, we can now explain why there are many ways of "numbering" (pluralizing or singularizing), and many ways of counting. Feminine (the marked member of Gender), being essentially a unitizer in the case of nouns, distinguishes two classes of counted entities and numerals: (a) numerals used for "natural" (or mathematical) *numbers* (which are "integral," or "complete"), for example, in a counting sequence context, and (b) numerals used to count *objects*. It looks as if the "free state" status of the mathematical numeral is treated as a unity (in some abstract sense), but the "construct state" (or compound) status of the object counting numeral is not so treated. This description is novel and essential to understanding how the system works.

As for quantifiers, besides proposing their architecture (articulated basically around DP and QP), explaining how they are gendered, and in which ways they Q-float, our investigation has centred around the expression of universal quantification and its properties. It has been established that Arabic *kull* is three-way ambiguous, enabling speakers to express with distinct syntax what English expresses with three vocabulary items, namely *all*, *each*, and *every*. Three features have essentially been used to describe their behaviours: (a) [± part] (for partitive), (b) [± dist] (for distributive), and (c) [± def] (for definite). It has also been suggested that the [± dist] feature can be dispensed with, once the [± unit] feature is introduced into the system.

On the whole, I hope I have proposed new ways and mechanisms for rethinking and restructuring the grammar of gender, individuation, counting, and quantifying. I have also implemented my analysis in the generative model referred to, without excess of technicalities. In terms of traditional typologies, Arabic turns out (descriptively) to be a "gender language," a "classifier language," and a "number language." One consequence of this state of affairs is that a new typology or theory of variation is needed, which makes room for existing languages of this sort, in which a wide inventory of functional features pertaining to various systems normally associated traditionally with separately classified languages turns out to be found in the same language. I have suggested that the system needed is basically microparametric, although the macro-parametric dimension remains an option for some properties of "genealogically" related languages. I have also shown that

once one looks with more scrutiny into Romance or Germanic (throughout their history), similar ingredients of Gender related to individuation or other roles are found, and it is also the case for Slavic. Obviously, a lot of descriptive work is needed to establish similar descriptions for other varieties of Arabic and Semitic that are not included here, in addition to other languages, including Amazonian, Sino-Tibetan, Bantu, or Cushitic. Needless to say, more research is needed to confirm or refine the picture, but there are hopefully some significant convergences in the already available literature.

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