Systematic Polysemy in Arabic: A Generative Lexicon-based Account

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Declaration

"This thesis is my original work and
of my own execution and authorship."

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Abstract

This thesis is the first of its kind to study the (linguistic) phenomenon of *systematic polysemy* and examine its pervasiveness in Arabic (both Modern Standard Arabic (MSA) and Jordanian Arabic (JA)). Systematic polysemy in this study is defined as the case where a lexeme has more than one distinct sense and the relationship between the senses is predictable by rules in language. In the narrow sense, however, this phenomenon refers only to the productive type of regular polysemy, which is defined vis-à-vis Apresjan's (1974) notion of *totality of scope* (e.g. the content/container type). The integral function of this research is to (i) identify the major (as well as the minor) patterns of regular polysemy in Arabic in the major lexical categories of nouns, verbs, and adjectives; (ii) determine the extent to which these patterns converge with or diverge from the already explored patterns, mainly in English; and (iii) test the applicability of Pustejovsky's (1995) Generative Lexicon (the GL) in accounting for the various Arabic data on polysemy.

The study found that nearly every regular polysemous pattern observed in English was also present in Arabic, albeit with a few attested differences. For example, the regular pattern of the mass-to-count alternation (e.g. coffee—a coffee) is very rarely encountered in Arabic. In addition, the animal/meat alternation in English behaves rather differently in Arabic in the way the language elicits a non-countable (mass) meaning from a countable counterpart. With respect to lexicography, this study adds to the already studied patterns in Atkins and Rundell (2008). The dissertation also raises additional questions for the GL framework with respect to property nominalizations, nominalized adjectives, and generic collective nouns.

To the loving memory of my father
Prof Abdel-Majid Thalji
(1944-2007)

To my ex-fiancée, Ola

To those who have no one to remember them

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Arabic Transliteration

Consonants	Romanization	IPA symbols
أ, ء	ʔ	[ʔ]
ب	b	[b]
ت	t	[t]
ث	th	[θ]
ج	ǧ	[ʤ]
ح	H	[ħ]
خ	x	[x]
د	d	[d]
ذ	ḏ	[ð]
ر	r	[r]
ز	z	[z]
س	s	[s]
ش	š	[ʃ]
ص	ṣ	[sˤ]
ض	ḍ	[dˤ]
ط	ṭ	[tˤ]
ظ	ẓ	[ðˤ]
ع	3	[ʕ]
غ	gh	[ɣ]
ف	f	[f]
ق	q	[q]
ك	k	[k]
ل	l	[l]
م	m	[m]
ن	n	[n]
ه	h	[h]
و	w	[w]
ي	y	[j]

Gemination		
ّ	consonant doubling	
Short vowels		
َ	a	[a]
ُ	u	[u]
ِ	i	[i]
Long vowels		
ا	ā	[aː]
ُو	ū	[uː]
ِي	ī	[iː]
Diphthongs		
َو	aw	[aʊ]
َيْ	ay	[aɪ]

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Abbreviations

1	First person
2	Second person
3	Third person
ACC	Accusative
CAUS	Causative
DEF	Definite article
F	Feminine
GEN	Genitive case
GL	The Generative Lexicon theory
IMPERF	Imperfective
INCHO	Inchoative
LCCM	Theory of Lexical Concepts and Cognitive Models
lcp	Lexical conceptual paradigm
M	Masculine
MASS	Mass or non-count noun
NEG	Negative
NOM	Nominative case
PASS	Passive
PERF	Perfective
PL	Plural
POSS	Possessive
PP	The Principled Polysemy approach
PRES	Present tense
PRO	Pronoun
PST	Past tense
RT	Relevance Theory
SBJ	Subject
SG	Singular

Typographic conventions

? unnatural

?? awkward construction (zeugmatic)

* ungrammatical construction

pragmatically-marked uses

! uninformative sentence (tautology)

( ) optional elements

*( ) elements inside parentheses are obligatory

(*) elements inside parentheses are ungrammatical

Chapter 1 Introduction

This thesis is the first of its kind to study the phenomenon of *systematic polysemy* and examine its pervasiveness in Arabic (both Modern Standard Arabic (MSA) and Jordanian Arabic (JA)). Systematic polysemy, which will be explored and examined throughout this study, represents the case where a single lexeme has two or more distinct but related meanings, and that the relationship between these meanings of the lexeme is predictable (by rules) in language. The importance of investigating this phenomenon in these two Arabic varieties is twofold: First, MSA represents the official language that is used as a means of written communications and formal conversations by any Arabic-speaking outlet/organisation in the Arab world. It is, thus, considered a 'superposed' literary language that is natively spoken by no Arab (cf. Thalji, 1982). As such, the rationale for choosing MSA as a primary object of study resides in the wealth of written materials that establish a point of focus in this study. Second, JA, as a spoken vernacular, is the author's native language. Taken together, the aim is to intensify the understanding of the phenomenon under probe.

Insofar as systematic polysemy is concerned, the significance of and interest in this research is rooted in the fact that there is a big lacuna in the Arabic studies that needs to be filled since this phenomenon is absent in any Arabic research to date. Moreover, whilst most non-Arabic studies focus on systematic patterns mainly in the word class of nouns (cf. Nunberg 1996, Copestake and Briscoe 1995, Wałaszewska 2008, Falkum 2011, and Dölling (to appear), *inter alia*), there is still a lack of focus on it in the other major lexical categories of adjectives and verbs. This study also aims to fill this gap in research by exploring in detail and comparing these three parts of speech (nouns, verbs, and adjectives) within and in relation to the systematic patterns in Arabic.

A rising contemporary interest in the subject of systematic polysemy, especially in the English language, is witnessed in the fields of lexicography (Atkins and Rundell 2008), corpus studies (Lapata 2001), cognitive linguistics (Nunberg 2004; Evans 2015), pragmatics (Wałaszewska 2008, Falkum 2011), and computational linguistics (Pustejovsky 1991, 1995; Copestake and Briscoe 1995). In Arabic, however, this phenomenon is still untapped. We know of no research to date that ever mentioned or studied it, let alone that any study that distinguishes between the two major concepts of polysemy and homonymy (which are subsumed in the Arabic concept of *al-muštarak al-lafẓi* 'lit. shared words'—as we will shortly investigate in Section 1.2 below) makes such a distinction rather obscured. Therefore, inasmuch as most of the studies focus on

European languages such as Russian, Italian, and especially English, it is essential, for the purpose of this thesis, to extend and apply this previous research to this topic in Arabic.

1.1 Defining polysemy

Much research starts with the opening question of 'what is polysemy?' (for instance, cf. Nightingale 1999, Ravin and Leacock 2000, Pethö 2001b, and Falkum 2011 amongst many others). Here, however, we do not wish to repeat the same question but to provide an agreed-upon definition of 'what polysemy is'.

Polysemy sports a number of definitions in the (English) literature which, more or less, share the same grounds; that is, one word with or that has different but related meanings. Here, again, as the purpose of this section is to introduce this notion briefly, we restrict ourselves to mentioning only a few of these definitions.

For Lyons, polysemy is about "one lexeme with several different senses" (1977, vol.2: 550).[1] This particular definition of polysemy is drawn in opposition to the notion of homonymy, which, according to him, is seen as involving distinct homonymous lexemes (we return to this point in Chapter 2).[2] The examples he uses are that of 'mouth' and 'port', respectively (ibid)— 'mouth' with the meanings of 'organ of body', 'entrance of cave' is representative of a simple polysemous lexeme, while 'port' with the meanings of 'harbour' and 'kind of fortified wine' is an illustration of homonymy.

Other authors have also posited roughly the same definition for polysemy. For instance, Cruse states that a word is (or is said to be) polysemous if it has "more than one distinct, established **sense**" (2006: 133; emphasis is his).[3] Likewise, Murphy and Koskela mention that polysemy "refers to the phenomenon where a single **LEXEME** (a **polyseme**) is associated with multiple distinct but related **SENSES**" (2010: 122; emphasis is theirs).

Nevertheless, a more detailed account of polysemy and the different types of it will be presented in the next chapter.

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[1] Lyons is, of course, aware of the notion of *relatedness of meaning* in this respect (cf. 1977, pp. 551). We shall explain this notion later in this study.

[2] Throughout the study, we will be using the term homonymy in its prototypical sense (i.e. words that are identical in both spoken and written forms but have unrelated meanings) (cf. Cruse, 2006).

[3] Cruse defines the two notions of 'sense' and 'established sense' as follows (2006: 96):

> **Sense:** "A distinct meaning which has an established association with a given word-form is called a (lexical) sense".
>
> **Established sense:** "Established senses normally have separate definitions in a dictionary".

1.2 Polysemy in the (old and modern) Arabic tradition

The term polysemy in English has, to the best of our knowledge, no direct equivalent in the pre-modern Arabic literature; however, the general term of 'al-muštarak al-lafẓi' is used and can be roughly translated as the "multiplicity of word meaning". This rough translation, however, is by no means accurate, but at least captures the general idea of the term. The reason is that it represents a subtype of *al-ʔishtirāk* (lit. 'sharing or participation'); a head term that covers two major types, of which al-mushtarak al-lafẓi is one. Therefore, a full understanding of what the latter means requires a deep understanding of what al-ʔishtirāk means and how it is/was used in the pre-modern Arabic period. That, honestly, needs independent research to detail. Nonetheless, we confine ourselves to briefly explaining al-muštarak al-lafẓi.

The term *al-muštarak al-lafẓi*, which—as we will shortly realise—seems to subsume the current notions of polysemy and homonymy, had received considerable attention in the old literature of Arabic. For example, old Arab grammarians, such as *Al-farāhīdi*, *Sībawayh*, and *Ibn Hishām*, amongst many others, had provided an account of it. In the following, we briefly discuss what some of them say about it, starting with the forefather of Arab grammarians, Sībawayh.

Sībawayh (died 180 AH) mentions in his Kitāb that a word can have several meanings (as opposed to the two cases of monosemy and synonymy). He mentions the following (1988: 1/24):

> "i3lam anna min kalāmihim ixtilāf ul-lafẓayn lixtilāf alma3nayayn, wa ixtilāf ul-lafẓayn wa-lma3nā wāHid, wa ittifāq ul-lafẓayn wa ixtilāf alma3nayayn"
>
> Literally: You should know that in their Kalām (roughly, *speech* or *utterance*) there are two different words because of two different meanings, and two different words but the meaning is one, and two same words but two different meanings.

Underlined: *those [words] that have the same form but differ in their meanings*.

Notice that the term 'lafẓa' (lit. 'a pronounced word')[4] in his quote is roughly equivalent to the phonological word in English.[5] The example that Sībawayh cites in this context is the verb 'wağada' (lit. 'to find'). Consider the following:

[4] The noun 'lafẓa' in Arabic literally means a word that is pronounced once. This is based on the Arabic verbal noun or *maṣdar* 'fa3la' that is used to denote the number of times of the occurrence of an event.

(1) a. wağad-tu 3alay-hi (meaning: got angry at him)[6]
found-1SG on-him
'I got angry at him'

b. wağad-tu aš-šayʔa (meaning: found it)
found-1SG the-thing
'I found the thing'

According to Sibawayh, the verb *wağad* is ambiguous and has different meanings in (1a) and (1b). In fact, a closer look shows that the syntax is also different in both instances. In (1a) *wağad* is a phrasal verb that always occurs with the preposition *3ala* (loosely, *on*) to mean 'be angry at someone', whereas in (1b) it is followed by a direct object (a noun) to mean 'to find'.

With the exception of Ibn Durustuwayh (258-347 AH)[7], several others after Sībawayh, such as Al-Mubarrad (210-286 AH); Ibn Jinni (322-392 AH); and Ibn Fāris (died 395 AH), had also provided a similar account of this phenomenon of *al-muštarak al-lafẓi*.

For Ibn Durustuwayh, however, he argues that all the instances of the verb 'wağada' in Sībawayh's example have one meaning only, which is 'to realise a thing whether it is good or bad'.[8] What counts for Ibn Durustuwayh as a 'very rare' case of 'al-muštarak al-lafẓi'—of course, he denies this too for the reason stated below— are these examples in which two verbs such as *waqafa* (lit. 'he stopped/stood') and *ʔawqafa* (lit. 'to stop someone or something')— each corresponds to a different verb Form[9]— are both used in the form of 'waqafa' in two different languages (=dialects). Consider the following (2004: 71):

(2) a. waqaf-tu ad-dābat-a
stopped-1SG the-animal.F-ACC
'I stopped the animal'

[5] This is very important when it comes to understand what 'al-muštarak al-lafẓi' essentially means. Since, at least in Arabic (=Standard Arabic, not the dialects), almost every word is written in exactly the same way it is pronounced (i.e. the spelling of a word (always) agrees with its pronunciation; hence, the phonological word form = the orthographic word form), it becomes clear that this notion in Arabic already presumes matching between the phonological and orthographic word forms. Thus, when two words agree in pronunciation (and automatically in spelling) but differ in meaning, we call that 'al-muštarak al-lafẓi'. In English, however, this is not always the case where spelling matches pronunciation (e.g. 'I' and 'eye'). This latter case in English is known as homophony.

[6] See almaany.com Arabic-Arabic dictionary.

[7] Of course, Ibn Durustuwayh was not the only exception, but he was the first to deny it in Arabic. Here, however, for the sake of brevity, we omit many others who share the same view with Ibn Durustuwayh.

[8] Ibn Durustuwayh offers no explanation as to what he actually means by this, nor do we understand how this only meaning of *wağada*, as given by him, applies to example (1a) above, at least.

[9] We discuss and explain the Arabic verb Forms (or *awzān*) in Chapter 4.

b. waqaf-tu anā
stopped-1SG PRO.1SG
'I stopped/stood up'

Ibn Durustuwayh explains that, on the face of it, this example represents a rare case of 'al-muštarak al-lafẓi' that may lead people to think that there are two meanings for the same verb, while in fact each verb originally corresponds to different verb Forms (*ʔawqafa* and *waqafa*, respectively). Hence, they are not one word with different meanings because one of them is transitive and the other is intransitive (ibid). Of course, he provides several reasons for such an occurrence, which we omit here. Many others after Ibn Durustuwayh did not accept his argument about that al-muštarak al-lafẓi does not occur in the language. Nor are we obliged to accept his strong position, too, for that Ibn Durustuwayh seemed to be deeply concerned with the study of verbs; thus, seriously overlooking the occurrence of similar examples in the other parts of speech.

So far, the examples cited by these authors mainly concern verbs; however, Ibn Fāris, for instance, mentions that *al-mušarak al-lafẓi* is seen in the use of the noun *3ayn* 'eye' in the following examples (1997: 152):

(3) a. *3ayn*-u l-māʔ-i
eye-NOM DEF-water-GEN
'the eye of water'
meaning: water spring

b. *3ayn*-u l-māl-i
eye-NOM DEF-water-GEN
'the eye of money'
meaning: physical money/cash (i.e. coins, for instance)

Moving swiftly, in the contemporary literature of Arabic, modern-day Arab grammarians, influenced by the advancement of Western research in linguistics (semantics, in particular), now distinguish between two types of al-muštarak al-lafẓi: (i) 'one word—several meanings' (polysemy) and (ii) 'several words—several meanings' (homonymy) (for instance, cf. Omar, 1998: 137). The first type, i.e. polysemy, is referred to by the term *ta3addud al-ma3na* 'lit. the multiplicity of meaning' (or *bolizīmī* as English) whereas the second type, i.e. homonymy, shares

the same name of al-muštarak al-lafẓi (also called *homonīmī*) (cf. Omar 1998 and Zafinkī 2010: 109).[10] The examples that illustrate each type are the following (Omar, 1998: 137):

Polysemy

(4) 'operation', as in:

military *operation*
medical or surgical *operation*
banking *operation*

Homonymy

(5) 'see' vs. 'sea' (for Omar, spelling does not matter)

Alhough Omar and others distinguish between these two types of lexcial ambiguity, they define the general term of al-muštarak al-lafẓi as a word that has several meanings (see Omar, 1998: 145). This definition, however, still does not differentiate between its two types; or, more precisely, it applies only to the first type (i.e. polysemy).

Still yet, there seems to be an ongoing division among modern Arab grammarians on the existence of *almuštarak al-lafẓi* in the language. While the majority of these grammarians follow Sībawayh and others in acknowledging the prevalence of this phenomenon in Arabic, Ibrāhīm Anīs (1984), for instance, (partially) sides with Ibn Durustuwayh in the denial of *al-muštarak al-lafẓi*. This is evident in the following passage, which reads as follows (1984: 213; my translation—original reads in Arabic):

> "If it becomes apparent to us, in texts, that one word may express two completely contrastive meanings, we call it [i.e. this phenomenon] al-muštarak al-lafẓi. However, if it becomes clear that one of the two meanings is primary and the other is metaphoric to the first, it is thus incorrect to consider it [the word] as an example of al-muštarak al-lafẓi".

On this basis, Anīs (ibid: 214) offers two examples which illustrate each case described above. For the first case, i.e. al-muštarak al-lafẓi, he mentions the two nouns 'ʔrḍ' ('earth') and 'xāl' ('uncle'). As he explains, 'ʔrḍ' has two contrastive meanings, which are 'the Earth', and 'the common cold'. Similarly, the noun 'xāl' can mean either 'the mother's brother' or 'the mole on the face' or 'the small hill or mound'. These two nouns represent what he refers to as the 'true'

[10] Interestingly, as is clear from the classification above, the term *al-muštarak al-lafẓi* is used on one occasion as a general term to cover the two types mentioned above, and, on another, as a specific term to refer only to the 'homonymy' type. This situation, in which the same term or word is used to simultaneously cover both general and specific readings, is referred to as *vertical polysemy*; a term that will be explained in detail in Chapter 2.

muštarak lafẓi since there exists no established relationship or link between the meanings of each of these nouns (ibid). In modern linguistic terms, Anīs's examples are illustrative of homonymy, regardless of whether or not the meanings are historically related.

As for the second case, i.e. that involving a primary meaning and other metaphorically-derived meanings, he provides the example of the noun 'hilāl' ('crescent'). As he argues, the primary meaning of 'hilāl', which is the crescent Moon, can be metaphorically applied to the shoe upper and the fishing rod, which look like the crescent (ibid). So, the argument is that these metaphorical meanings of the noun 'crescent' cannot be conceived of as al-muštarak al-lafẓi because the meaning is one, and it is the metaphor that licenses the other secondary meanings (ibid). Thus, considering the earlier passage by Anīs, al-muštarak al-lafẓi is strictly *homonymy*, and where meanings are related (by metaphor, for example) they are not homonyms but something else that Anīs does not describe.

A summary: Some final thoughts

This quick preview of *al-muštarak al-lafẓi* as a term used in Arabic to describe word(s) with multiple meanings reveals the following remarks:

1. Old Arab grammarians did not explicitly state that the term is strictly used to refer to two words that have the same pronunciation and spelling. However, as it appears from their definitions and cited examples, and the fact mentioned in footnote 5, their use of the term seems to presuppose the matching between the phonological and orthographic word forms (see examples (1)-(3) above).
2. The definition laid down by Sībawayh and others after him was never intended to take the notion of 'relatedness of meaning' into account, nor was the intention to distinguish between what is now known as polysemy and homonymy.
3. The definition put forward by modern Arab grammarians, such as Omar—but not Anīs (1984), already excludes from it the second type (homonymy), unless of course the term al-muštarak al-lafẓi is redefined and used again to cover specifically the second type, in which case the term itself becomes (taxonomically) polysemous!
4. Al-muštarak al-lafẓi as a term employed in the narrow sense to refer to the homonymy type could be better replaced, though hesitantly, with the term *al-ǧināS at-tām*[11] (a term used in 'the science of rhetoric') in Arabic. It best describes the situation where two

[11] This is equivalent to the term *homonymic pun* in English; a subtype of pun (also called paronomasia, i.e. wordplay). However, it is important to bear in mind that this term in Arabic does not denote in itself the sense of pun, but 'puns' make use of it.

words agree in pronunciation, the number of letters and their order in the given two words (i.e. their spelling), but ultimately have different (unrelated)[12] meanings. Consider the following example.

(6) a. *al-maghrib* (= the prayer immediately after sunset)
b. *al-maghrib* (=country 'Morocco')

This term is more restrictive than al-muštarak al-lafẓi since it omits the possibility of having words with the same pronunciation but different spelling (for example, 'see' and 'sea' in Omar's example above). This would also eliminate other existing cases in some Arabic dialects (e.g. the Jordanian Ammāni dialect) where the noun 'qalam' (pen or pencil) is pronounced 'ʔlam'; the same as for the noun 'ʔlam', which means 'pain'. However, the term might not distinguish between related vs. unrelated meanings.

Apart from the terminological confusion as well as misapplication in some places, lacking in literature of Arabic is the concept of systematic polysemy, to which we now turn.

1.3 Systematic polysemy

Systematic polysemy was noticed as early as in the 1970s in the works of the Russian linguist and lexicographer, Juri Apresjan. It is mainly defined as the case where a single lexeme has two or more distinct but related senses or meanings, and that the relationship between them is predictable (cf. Apresjan 1974, Pustejovsky 1991, 1995, Cruse 2000; 2006, Murphy 2010, Wechsler (2015), and Dölling (to appear), to name a very few). A widely discussed example of this phenomenon is the lexeme BOOK and its two distinct, related senses of *container (physical object)* and *content (information)*. In a context such as *John is reading the book*, the correct sense of BOOK that is selected here is the *content (information)* sense, while in a context such as *Mary bought a book yesterday*, it is the *container (physical object)* sense that is being selected. This type of polysemy is by no means restricted to the word class of nouns, as is represented by the example of 'book'. In actuality, similar examples of systematic polysemy are also found in the lexical categories of verbs and adjectives, as the next subsection shows.

Systematic polysemy might seem, to the native speakers of a language, trivial or insignificant, in the sense that it does not constitute a 'genuine' form of polysemy; or, the polysemy is not real. This is because, in this case, which is unlike that of homonymy where a speaker can choose the correct sense of a word such as BANK from its context of utterance, a speaker is not challenged

[12] This might be open to dispute.

with 'distinct', unrelated senses to choose from. Indeed, the two types are different, and systematic polysemy, unlike irregular or accidental polysemy (see Chapter 2), goes unnoticed by many language speakers. Nonetheless, this phenomenon remains of high importance in identifying and explaining the polymorphic (or 'protean')[13] nature of words in language.

1.3.1 Where do we find systematic polysemy in language?

Polysemy is ubiquitous, and so is systematic polysemy. Systematic polysemy is observed in the major parts of speech: nouns, verbs, adjectives, and prepositions. The lexical category of nouns represents the most widely-studied area on the subject of systematic polysemy, with moderate attention paid to it in verbs and adjectives. To the best of our knowledge, apart from Cognitive Grammar (e.g. Langacker, 1987) and cognitive linguistics accounts (e.g. Evans, 2004; 2015 and Evans and Green, 2006), systematic polysemy in the word class of prepositions is sparsely addressed. We, too, do not discuss the polysemy of prepositions in the current work, for it is beyond the scope and limit of this study.

Starting with nouns, systematic polysemy is attested in patterns including, but not limited to, the content/container alternation, count/mass alternation, plant/food alternation, fruit/colour alternation, and product/producer alternation (cf. Apresjan 1974, Pustejovsky 1995, Copestake and Briscoe 1995, Nunberg 1996, Lapata 2001, Wałaszewska 2008, and Falkum 2011, to mention a few). Furthermore, as Lapata (2001) notes, the phenomenon also seems to extend to "noun combinations", as in *student administration* where *student* can be interpreted as the subject or object of *administration*.

Moving to the lexical category of verbs, we also find it prevails in alternations such as the causative/inchoative, which represents the most commonly-studied alternation in the literature (e.g. Levin and Rappaport Hovav 1995, and Pustejovsky 1991; 1995). Consider the following examples.

(6) a. Thomas dried the clothes.
    b. The clothes dried. (Piñón, 2001: 346)
(7) a. David dressed the baby.
    b. David dressed. (Lapata, 2001: 18)

[13] We explain these terms in Chapter 2 (see Footnote (31) in Section 2.4.1).

As for the lexical category of adjectives, adjectives such as *fast*, *good*, *slow*, etc. are also argued to exhibit this kind of systematic polysemy. Consider the following examples.

(8) a. a *good* book (= a book which is good to read)
b. an *easy* problem (=a problem which is easy to solve)
c. a *difficult* language (= a language which is difficult to read, speak, etc.)

In addition to these regular alternations in nouns, verbs, and adjectives, systematic polysemy also occurs in property nominalisations (a detailed account of this particular phenomenon will be given in Chapter 4). Consider the following example.

(9) a. His *callousness* surprised me.
b. *Callousness* is not a virtue.

In (9), each occurrence of *callousness* carries a distinct interpretation: while (9a) gives rise to the factive or extent meaning; i.e. *the fact that or the extent to which he was callous surprised me*, (9b) only expresses the quality meaning, which is interpreted here as *the quality of being callous is not a virtue*.

Furthermore, it can also be found in gerundive constructions, as the following example of 'drawing' shows (Killean, 1967: 3).

(10) a. His drawing fascinated me because I didn't know he could be persuaded so easily.
b. His drawing the picture rapidly fascinated me.
(11) a. His drawing fascinated me because he always did it left-handed.
b. His rapid drawing of the picture fascinated me.

Here, the two uses of *drawing* in (10) denote the 'factive' reading of the nominal 'drawing', while the other instances in (11) denote the 'active or action' reading.

1.3.2 Systematic polysemy across languages

We have seen in the previous subsection that the phenomenon under consideration is found in English in the main lexical categories, but the question is whether it can be traced in languages other than English. In fact, we already mentioned that this notion is attributed originally to Apresjan (1974), who identified several patterns of it in Russian. Moreover, Systematic polysemy seems to be occurring in many languages of the world, as reported recently in Srinivasan and Rabagliati (2015), especially with respect to the word class of nouns.

Srinivasan and Rabagliati's study includes languages that mostly belong to the Indo-European family and others such as Vietnamese and Japanese, for instance. Here, however, we focus on examples in a few European languages; starting with Russian.

1. **Russian:** (Apresjan, 1974; 1992)

'Nominal polysemy'

Pattern 1: 'a vessel—liquid in a vessel, quantity'

Example: *kastrjulja* 'pan'

(12) V bočke bylo ne bol'še **kastrjuli** vody
In barrel was no more saucepans water
'The barrel contained no more than a saucepan of water'

Pattern 2: 'plant—fruit of this plant'

Example: *abrikos* 'apricot'

Pattern 3: 'plant—flower of this plant'

Example: *astra* 'aster'

Pattern 4: 'plant—food made of mustard'

Example: *gorčica* 'mustard'

Pattern 5: 'material—article made from it'

Example: *bronza* 'bronze'

Pattern 6: 'glass—material made of glass'

Example: *steklo* 'glass'

Pattern 7: 'body organ—its disease'

Example: *počki* 'kidneys'

(13) U nee **počki**
she has kidneys
'she has (a disease of the) kidneys'

Pattern 8: 'animal, insect—person similar to it'

Example: *Pauk* 'spider'

These are a few selected patterns occurring in Russian nouns. Apresjan (1974; 1992) provides a more detailed list of such regular patterns.

2. Italian:

'Event nominals'

'Process—Result' alternation (Ježek, 2008: 3)

(14) a. la costruzione (del palazzo) e' durata due anni =PROCESS
'the building (of the house) took two years'

b. la costruzione (*del palazzo) e' alta due piani =RESULT
'the building (*of the house) is two floors high'

'Event—information' alternation (Ježek, 2008: 9)

(15) a. interrompo il *discorso* per darvi una buona notizia =EVENT
'I interrupt the speech to give you good news'

b. Clinton ha criticato il *discorso* di Arafat =INFORMATION
'Clinton critized Arafat's speech'

These are just very few examples; however, Melloni (2006; 2007) and Ježek and Melloni (2011) provide many more examples of systematic polysemy in Italian.

3. French:

In French, metonymy-based polysemy, or regular metonymy, occurs when the same animal-noun form is used to denote both the animal and its meat (Brdar and Brdar-Szabo, 2013: 221):[14]

(16) a. *Porc* 'pig, pork'
b. *Veau* 'calf, veal'
c. *Boeuf* 'ox/steer, beef'

[14] The topic of Brdar and Brdar-Szabo is not about the study of systematic polysemy per se, as they are mainly concerned with the translation of 'metonymy' from a cognitive linguistics perspective. However, they do mention examples on how logical metonymies are rendered in languages other than English.

4. German:

In German, too, we can have the following examples (examples are mine):

(17) Wir essen *Huhn* mit Reis
we eat chicken with rice
'We eat chicken with rice'

(18) Ich esse *Schwein*/ Schweinfleisch
I eat pig.SG.MASS/ pig-meat
'I eat pig/pork'

(19) Wir haben ein *Schwein* in der Farm
We have one pig in the farm
'We have a pig in the farm'

However, as Brdar and Brdar-Szabo claim, this kind of regularity is sometimes constrained in German (as well as in Hungarian) because the language makes use of compound nouns (i.e. N + meat combination), with *fleisch* 'meat' being the compound head (e.g. *Schwein**fleisch*** in example (18) above). This process of word formation where N+N combinations are used would, according to Brdar and Brdar-Szabo, "result in the loss of this facetization type of metonymy" (ibid: 223). This, in fact, is somewhat similar to some of the lexicalized words in English such as *beef, mutton,* etc. where, for some reason, the sense of 'meat' is realised by a distinct form. These issues will be explained in the next chapters.

Apart from the data reported for some European languages, there seems to be little to no extensive research on the phenomenon in other non-European languages (e.g. Semitic languages, in particular).

1.4 Significance of the study

Although the previous section acknowledges, through examples, the widespread occurrence of systematic polysemy in many different languages, there is still no formal study of this concept as far as Arabic is concerned, let alone any extensive investigation of real data. Hence, the main objectives of the current research are to explore systematic polysemy in Arabic and to identify the major patterns that exhibit this kind of polysemy in the language. To this end, the study attempts to answer the following major set of questions:

1.1 Given the fact that systematic polysemy exists in Arabic, what are the major patterns that reveal this kind of regularity?

1.2 In what ways are these patterns identified in Arabic similar to or different from those identified in other languages, especially English?

1.3 Regarding (formal) analysis, how could these regularities be analysed within the framework of the Generative Lexicon?

1.5 The Generative Lexicon as the theoretical framework

This thesis adopts the Generative Lexicon's framework advanced by James Pustejovsky in the early 1990s. His theory, which is situated in the field of computational linguistics, attempts to study and explain the 'protean' behaviour of words in context. The theory adopts a compositional view about lexical meaning, in the sense that word meaning is dynamic as it interacts with other constituents in a given structure. This is opposed to the 'static' view of word meaning, which realises a word as having a fixed number of senses (referred to by Pustejovsky as Sense Enumeration Lexicons—*SELs*, for short).

The theory is primarily concerned with the notion of systematic polysemy (or 'logical polysemy' in Pustejovsky's terminology). It was the first to study this phenomenon in detail. In later years, however, a soaring interest in the study of systematic polysemy started to emerge in the theoretical fields of cognitive linguistics (e.g. Evans 2015) and lexical pragmatics—Relevance Theory in particular (e.g. Wałaszewska 2008 and Falkum 2011).

Obviously, these emerging approaches couldn't proceed without Pustejovsky's significant contribution to the understanding of this phenomenon in language. This, of course, had led some of these developing accounts to criticise Pustejovsky's theory in favour of their approaches. However, despite the 'heavy' criticism the theory has, so far, received (and perhaps continues to receive today), it remains one of the most influential and innovative theories to explain the phenomenon in question. In contrast with these cognitive and communicative theories of word meaning, the Generative Lexicon is a rule-based theory. That is, word meaning is generated by rules in language.

As a theoretical framework, the current research aims to describe and explain the phenomenon of systematic polysemy in Arabic and to test its applicability in the Generative Lexicon.

1.6 Thesis outline

This thesis comprises six chapters in total, including the introduction (this chapter) and the conclusion chapter.

Chapter 2 is about polysemy in the literature. It consists of two integral parts. Part one presents the various projected typologies of polysemy in the existing literature and attempts to draw on the similarities and dissimilarities between these types; followed by a summary of the major characteristics that each type of polysemy seems to possess. Part two of the chapter introduces some of the theoretical approaches to polysemy, including Pustejovsky's (1995) Generative Lexicon, Relevance Theory of pragmatics (Wałaszewska (2008) and Falkum (2011)), and, within the domain of cognitive linguistics, Tyler and Evans' (2001b, 2003) theory of Principled Polysemy and Evan's (2015) LCCM theory. The overall aim of this chapter is to provide a detailed, comprehensive summary and review of the different polysemy types and to introduce the recent theories on the topic, with particular emphasis on the notion of systematic (or regular) polysemy.

Chapter 3 is dedicated to introducing in detail the theory of the Generative Lexicon. It contains five main sections; the first three introduce and discuss the tenets upon which the theory is founded. The last two remaining sections are about criticism advanced against the theory and some reflections that argue in favour of the theory.

Chapter 4 provides a descriptive account of systematic polysemy in Arabic (MSA and JA) and seeks to explore patterns of systematic polysemy in the major categories of nouns, verbs, and adjectives. The chapter includes, in addition to introductory sections, three main sections, which address a number of existing regular alternations in the language. The first section (§4.4) begins with the word class of nouns and identifies nominal alternations similar to those identified by Pustejovsky and others, which were discussed in the previous chapters. This section is divided in two halves: the first half looks at simple nominal alternations and the second studies the complex alternation, with particular focus on the count/mass polysemy. Then, the next section (§4.5) studies patterns of systematic polysemy in the lexical category of adjectives, particularly in the province of nominalized adjectives; focussing on *property nominalisation*. The final section (§4.6) is about systematic polysemy in verbs, with particular emphasis on the causative/inchoative type manifested in some Form I alternating verbs in MSA and Form I and Form II alternating verbs in JA.

Chapter 5 analyses patterns of systematic polysemy identified in the previous chapter on Arabic in the light of the Generative Lexicon theory presented in Chapter three. This chapter consists of three main sections, each focussing on the analysis of regular polysemous pattern in Arabic. The overall aim of this chapter is to assess the extent to which the Generative Lexicon can account for the regular alternations explored in Arabic.

Finally, **Chapter 6** closes the study with a summary and further recommendation for future research.

Chapter 2 Polysemy in Studies

The chapter studies the different projected typologies of polysemy by different authors, attempts to delineate the differences between each type, and reviews and assesses the current theoretical approaches to the phenomena.

2.1 Introduction

This chapter summarises the ways that polysemy has been treated in existing literature. It divides into two definite parts: Part I and Part II. Part I covers the classification of polysemy as presented in the literature. Part II is about the theoretical approaches to polysemy. The reason for this division is linked to the fact that the study of polysemy is very complex and requires a detailed explanation before any theoretical discussion is attempted. Moreover, the concept of polysemy, specifically systematic (or regular) polysemy—as we shall see in Part I—goes by different names according to different authors. Thus, the effort done in Part I is to establish what constitutes an instance of systematic polysemy, which will ultimately be used in the investigation of the Arabic data in Chapter 4.

The chapter, overall, divides into four main sections. Section two introduces the various typologies of polysemy explored in the literature; starting with the accidental type, moving to the irregular type, and finishing with the regular type. Section three closes Part I with a discussion and summary of the main ideas introduced in section two. Then, section four, which falls under Part II, brings the studied types of polysemy into theoretical focus. Finally, section five ends Part II with a discussion and summary of the theoretical frameworks to polysemy.

PART I: TYPOLOGIES

2.2 Types of polysemy

The literature contains many types of polysemy, and each type defines a specific relationship between words (lexemes, to be precise) and their meanings. These include, but not limited to, the following: contrastive polysemy, vertical and horizontal polysemy, coerced polysemy, facets of meaning, and logical polysemy. Sometimes, some of these types, as we shall see below, are given different names (in different theories or proposals), but are fundamentally about the same concept.

In this section, the projected typologies are derived from the major works of the following authors: Apresjan (1974); Copestake and Briscoe (1995); Pustejovsky (1995); Cruse (2000); and Blank (1999). The purpose, therefore, is to introduce and to clarify the relationship between the different kinds of polysemic relationships, within and in relation to the major notion of systematic (regular) polysemy. Discussion and summary of the main ideas follow at the end of Part I.

2.2.1 Apresjan's typology of polysemy

Apresjan (1974) distinguishes between two classes of polysemy: the regular and the irregular polysemy. He bases the distinction on metaphor and metonymy relations. Thus, regular polysemy is triggered by metonymy whereas irregular polysemy is metaphorically-motivated. Examples that describe each case include the following:

(1) She is the *apple* of my eye. (metaphor-based)
(2) *Britain* voted to leave the EU. (metonymy-based)

In example (1), the use of *apple* does not literally refer to the apple tree or fruit, but it metaphorically describes, in this context, someone who is cherished above others—in fact, the whole expression *the apple of my eye* is idiomatic. On the other hand, the use of *Britain* in (2) refers not the country but to the people of that country; hence, there is an association between the meaning of *Britain* as a country and the meaning of *Britain* as its people. This, according to Apresjan, represents a case of metonymy-triggered polysemy.

Apresjan was interested in exploring the kind of regular polysemy in the language, for which he provides the following definition:

> "Polysemy of a word A with the meaning a_i and a_j is called regular if, in the given language, there exists at least one other word B with the meaning b_i and b_j, which are semantically distinguished from each other in exactly the same way as a_i and a_j and if a_i and b_i;, a_j and b_j are non-synonymous". (Apresjan, 1974: 16)

A simple breakdown of the definition can be put in this way: imagine a word 'cherry', with the meaning *fruit* and *colour,* and there exists at least another word, say 'melon', with the meaning *fruit* and *colour* as well. In that case, we have a regular polysemy pattern called the *fruit-colour* pattern. Notice that *cherry* is not synonymous with *melon* with respect to *fruit* and *colour* meanings (i.e. *cherry-fruit ≠melon-fruit; cherry-colour ≠melon-colour*).

The fact that Apresjan restricts the definition only to cases where the senses of two lexemes are non-synonymous is due to the existence of synonymous senses between other lexemes in the same language (at least in English). For example, we have in English the lexemes *aubergine* and *eggplant* which both have the same meaning (*aubergine* as is used in British English and *eggplant* in American English).[15] However, the two senses of *aubergine* (fruit and colour) are synonymous with the two senses of *eggplant* (fruit and colour) since the meaning of both lexemes is the same. That is, *aubergine-fruit = eggplant-fruit* and *aubergine-colour = eggplant-colour*.

Apresjan (1992) offers another definition of a special type of regular polysemy. He calls it the *productive* type, and it is defined as follows:

> "We will call a given type 'A' – 'B' of regular polysemy *productive*, if for any word which has the meaning 'A' it is true that it can be used also in the meaning 'B' (if 'A', then 'B') […] Consequently, productivity is determined only by totality of scope of the units with the given combination of properties, the class itself of such units may be very small". (Apresjan, 1992: 214)

Thus, in the light of the previous examples of the fruit-colour nouns, lexemes such as *cherry* and *melon* are of the regular polysemy type given that their senses (*fruit* and *colour*) are not synonymous. This definition of *productive polysemy* takes a regular pattern (e.g. the *fruit—colour* pattern) and posits that it is *productive* only if it applies to any lexeme in a language which denotes *fruit* and *colour*. Let us consider this in more detail in the next subsection.

[15] This example is credited to Prof. Andrew Spencer.

2.2.1.1 The fruit-colour regular pattern

If we reconsider the fruit-colour examples above, we notice that it is not always the case that, for every noun denoting the two related senses of *fruit* and *colour*, all nouns of this pattern can be used to express the *fruit* sense in one context and the *colour* sense in another. Consider the following sentences in which the *colour* sense is used (Barque and Chaumartin, 2006: 3):

(3) a. I like your *cherry* shirt.
b.# I like your *banana* shirt.
c.# I like your *pear* shirt.

In these examples, we notice that, in spite of the regularity involved in the fruit-colour pattern, it appears to be difficult to extend this pattern to include every other *fruit-colour*-denoting lexemes in the language. Indeed, the readings in (3b) and (3c) above do not seem to suggest a colour-denoting meaning. Hence, the relation between the two senses of a lexeme denoting *fruit* and *colour* is deemed **not systematic**. That is, "it is difficult to generate a lexical unit that denotes a color from every lexical unit that denotes a fruit" (ibid: 2).[16]

Systematic polysemy, therefore, can be defined as that every lexeme with the meanings *x* and *y* can be used to denote *x* in one context and *y* in another. For instance, the lexeme 'bowl' can be used in the sense of *quantity* and in the sense of '*dish*', i.e. physical object, and thus, the relation is systematic since one can derive the sense of *quantity* from every lexeme that has the sense of *dish* (ibid: 3). Other examples include these nouns belonging to the content-container pattern, such as *bottle*, *book*, etc. We come to discuss such patterns in more detail in sections to follow.

For Apresjan, there exist many patterns of regular (or metonymically-motivated) polysemy in the language, as we earlier highlighted in Chapter 1. The point to stress here is the importance of Apresjan's classification to the study of polysemy in general and regular polysemy in particular, as we shall see in the next sections.

2.2.2 Copestake and Briscoe's typology of polysemy

In their work, Copestake and Briscoe (1995) propose a typology in which they discuss two main classes of systematic[17] (or conventional[18]) polysemy, namely *constructional polysemy*

[16] We return to explain the reason behind such constraints on *systematicity* in "Part I: Discussion and Summary", section 2.3 below.

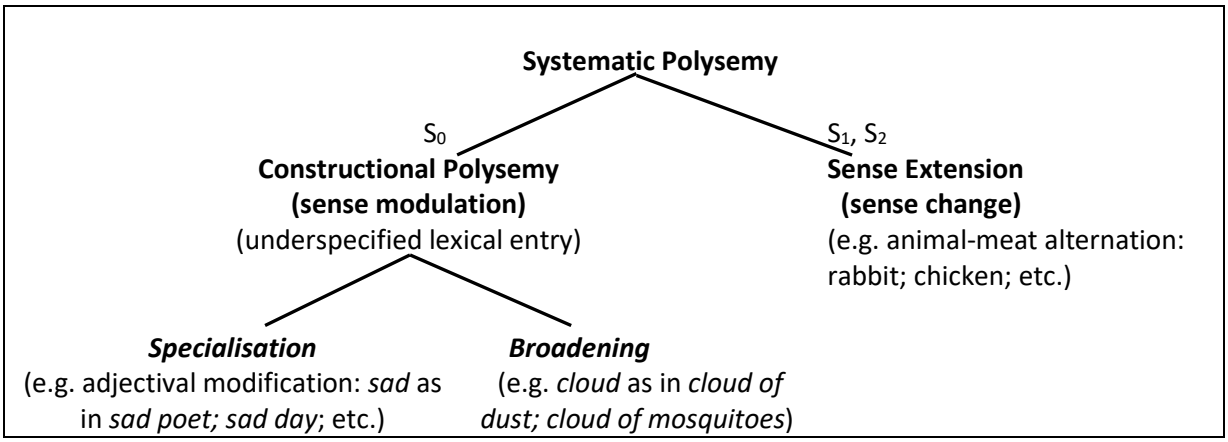
[17] The term 'systematic' in Copestake and Briscoe's study is partly compatible with the notion of systematic polysemy in our study. Copestake and Briscoe's term of 'systematic' polysemy appears to subsume cases of predictable, rule-generated senses and unpredictable, (non)-rule generated senses. Systematic polysemy in our study is strictly defined as the predictable, productive and rule generated type.

(sense modulation) and *sense extension (sense change)*—see Figure 2.1 below. The difference between each concept is explained as follows (ibid: 18):

> "In constructional polysemy, the polysemy is more apparent than real, because lexically there is only one sense and it is the process of syntagmatic co-composition […] which causes sense modulation. […] Sense extension, on the other hand requires lexical rules which create derived senses from basic senses, often correlating with morphological or syntactic changes".

Examples of the first case, i.e. constructional polysemy, include *sad* and *cloud*, and of the second include *chicken*. The quote above clearly suggests that the basic difference between the two types of polysemy lies in the number of senses a word has in each case. In constructional polysemy, a word has only one sense (which is underspecified in meaning; annotated as S_0 in Figure 2.1 below) whereas in sense extension a word has at least two senses; one is basic and the other is derived (annotated as S_1 and S_2, respectively).

Figure 2.1 Copestake and Briscoe's (1995) typology of polysemy



Copestake and Briscoe's (constraint-based) approach attempts to draw a distinction between cases of sense modulation (constructional polysemy) and sense extension (sense change) based on their behaviour under the co-predication test and the traditional distinction between ambiguity and vagueness (ibid: 60). However, as they argue, it is not always possible to make such a distinction between the two because of the absence of clear tests. Nonetheless, they conclude that "both constructional polysemy and sense extension are productive processes which require 'generative' lexical mechanisms, in the sense of Pustejovsky (1991)" (ibid: 61).

[18] Copestake and Briscoe mention that the term *conventional* denotes a sense which is "accepted and well-attested within a speech community" (1995: 62, note 2). As they mention, the term 'conventional' sometimes parallel the term 'institutionalised' (as in Bauer, 1983) or 'established' (as in Cruse, 1986).

To this point, we focus on the constructional polysemy type first and return to discuss sense extension in §2.2.2.2 below.

2.2.2.1 Constructional polysemy

As noted above, constructional polysemy is a subtype of systematic polysemy, and it is defined as follows (1995: 30):

> "[T]he lexical item is assigned one (often more abstract) sense and processes of syntagmatic combination or 'co-composition' (Pustejovsky, 1991) are utilised to specialise this sense appropriately".

The name 'constructional' comes from this fact; the fact that the basic sense (the often more abstract sense) is modulated via co-composition or syntagmatic combination processes (i.e. through its interaction with other elements occurring in the same construction or syntactic environment). Constructional polysemy or sense modulation involves two processes: *specialisation* and *broadening* (1995: 30; 34). In what follows, we introduce them briefly.

Specialisation* and *Broadening

1. Specialisation

An example of specialisation is the noun *reel* in its container sense, as illustrated by (4) below (ibid: 30-31).

(4) film *reel*
fishing *reel*
tape *reel*

As Copestake and Briscoe argue, "the polysemy involved in the distinction between e.g. *film reel* and *fishing reel* is not regarded as lexical…" (1995: 31). By 'not regarded as lexical', they mean the noun *reel* encodes only one sense, which is the 'container' sense (ibid). A more complex example of this process, as they demonstrate, is the adjectival premodification (1995: 31). Consider the following (ibid).

(5) a. a sad poem / poet / day.
b. a fast motorway / car / driver.

In this example, the adjectives *sad* and *fast* "take on different meanings depending on the nature of the modified head" (ibid: 31). For instance, in (5a) the meaning of *sad poem* (a poem that makes someone feel sad) is not the same as *sad poet* (a person who is sad); thus, in each occurrence, the adjective *sad* has a different interpretation.

We return to discuss the 'polysemy' of these adjectives in Section 2.2.3 below.

2. Broadening

According to Copestake and Briscoe, *broadening* describes a different operation in constructional polysemy because, as they explain, some "usages are available in context which appear to subsume the basic sense semanticaly [sic]" (1995: 34). An example of the process of broadening is the noun *cloud*. The basic sense of *cloud* is 'water vapour' (ibid: 35). However, other usages could be also 'derived', as in *cloud of mosquitos* and *dust cloud* (ibid). These clearly show that the basic sense of *cloud* has been broadened, except for the third sense in (6) below, which is metaphorical. Consider the following.

(6)	Cloud	basic sense:	**a mass *of*** *water vapour*
		broadened sense:	**a mass *of*** *dust, mosquitos, etc.*
		metaphorical sense:	*e.g. a cloud of suspicion*

Notice that the basic sense of *cloud* is subsumed in the broadened sense. The difference in meaning relates to what a cloud is made of, i.e. the component. Similarly, the same goes for the noun *forest* in *forest of hands* in example (7) below, though the broadened sense of *forest* may appear metaphorical, as is claimed (ibid: 35).

(7)	Forest	basic sense:	an area covered *with trees and plants*
		broadened sense:	a cluster of hands
		(more metaphorical)	

What is noticeable about these examples is the fact that they do not involve a complete shift in meaning (ibid: 35), as opposed to the case of '*cloud of suspicion'* where the meaning is completely changed, through metaphor, to mean 'disbelief, distrust'.

On the difference between specialisation and broadening

As Copestake and Briscoe note, the two processes of *specialisation* and *broadening* are not equal. The difference between them is explained as follows:

> "…in contrast with the case of *reel* given earlier, there is a very strong preference for one particular sense and the alternative interpretations are not conventionalised, but given by context (there is no conventional interpretation of *cloud* as *cloud of mosquitos*)". (1995: 35).

As they further explain *broadening*,

> "This implies that non-default interpretations will only be usual in contexts which explicitly give the exceptional component (normally by compounding or post-modification)" (ibid).

2.2.2.2 Sense extensions

In the previous section, we have explained the first type of Copestake and Briscoe's systematic polysemy, which is constructional polysemy or sense modulation.

Sense extensions, on the other hand, are "systematic polysemies which are best represented as lexical rules" (1995: 36) — they are defined as the "predictable creation of different but related senses" (ibid). Examples of sense extensions, as is listed in Copestake and Briscoe (1995), include grinding and portioning, nominal metonymies, and phrasal sense extension. These are, according to them, broadly described as metonymic examples.

1. Grinding and portioning

This is a process which "creates mass nouns denoting an unindividuated substance from count nouns denoting an individuated physical object of some kind" (1995: 37). An example of this process is the following:

(8) a. The *lamb* ran in the field.
b. John eats *lamb*.

While *lamb* stands for the animal in (8a), it refers to the food (meat) sense in (8b). This represents a process known as the *animal-meat grinding* or *grinding*, for short, which is characterized as "a set of metonymic sense extensions in which the animal comes to stand for something derived from the animal" (ibid: 43).

2. Nominal metonymies

Similar to the process of grinding discussed above, these sense extensions involve objects standing for people (ibid: 43). Consider the following examples (ibid).

(9) a. *the third violin* is playing badly.
b. *London* said that a new passport could not be issued.
c. *the village* voted conservative at the last election.

What these sentences share is the fact that they all contain objects (NPs) standing for person or people: In (9a), the NP 'the third violin' is metonymically used to refer to the person who plays the violin, and in both (9b and 9c) the NPs 'London' and 'the village' stand for the people living in these places. These examples, as is argued by Copestake and Briscoe, have no grammatical

effects (e.g. subject-verb agreement induced by the nominal). However, others in the following alternations can affect agreement, as the examples below show (ibid).

Food standing for people

(10) a. The *ham sandwich* wants a coke.
b. The French fries is getting impatient.

As they explain, the agreement in (10b) is determined by "the referent rather than the syntax of the NP *French fries* which would induce plural agreement given a non-metonymic reading" (ibid). **Co-predication** is also awkward. Consider this example (ibid).

(11) ?? The *ham sandwich* wants a coke and has gone stale.

The problem with this example is that only one sense can be selected in a coordinate structure. As noticed, it seems unacceptable to refer simultaneously to the sense of 'person who ordered the ham sandwich' and the sense of 'ham sandwich as food'. We talk about this in more detail when we come to discuss Cruse's (2000) concept of *coerced polysemy* in a later section.

Fruit standing for plant bearing that type of fruit

These include examples such as *apple*, *strawberry*, *walnut*, etc.

The examples of *apple, strawberry, etc.* show another kind of sense extension, in which a word denoting a fruit is also used to denote the tree/plant bearing the fruit. In other languages (Romance languages, for instance), as Copestake and Briscoe mention, this kind of alternation is different since the fruit is usually feminine whereas the tree is masculine, due to different grammatical encoding in the language. This is the case in Spanish, for example. Consider the following (ibid).

(12) Aceituna (feminine: olive_fruit)
Aceituno (masculine: olive_tree)

Copestake and Briscoe's contention about these types of nominal metonymies is that they are best accounted for by lexical rules, and as based on the observations about grammatical effects above, such nominal metonymies "must have a non-pragmatic component and must be treated as distinct senses/signs" (ibid: 44).

Phrasal sense extension

This is another case of sense extension, which applies to phrases. The example given by Copestake and Briscoe below represents the *place-group* sense extension (1995: 45).

(13) The south side of Cambridge voted Conservative.

The point here is clear. Sense extension is not restricted to single lexemes or words; it can also include entire phrases, as the example shows. However, there are some misleading cases of sense extension being applied to phrases (ibid). Such cases, as Copestake and Briscoe argue, include the following examples of adjectival phrases as modifiers (ibid).

Misleading cases of phrasal sense extension

(14) a. corn-fed chicken
b. young lamb

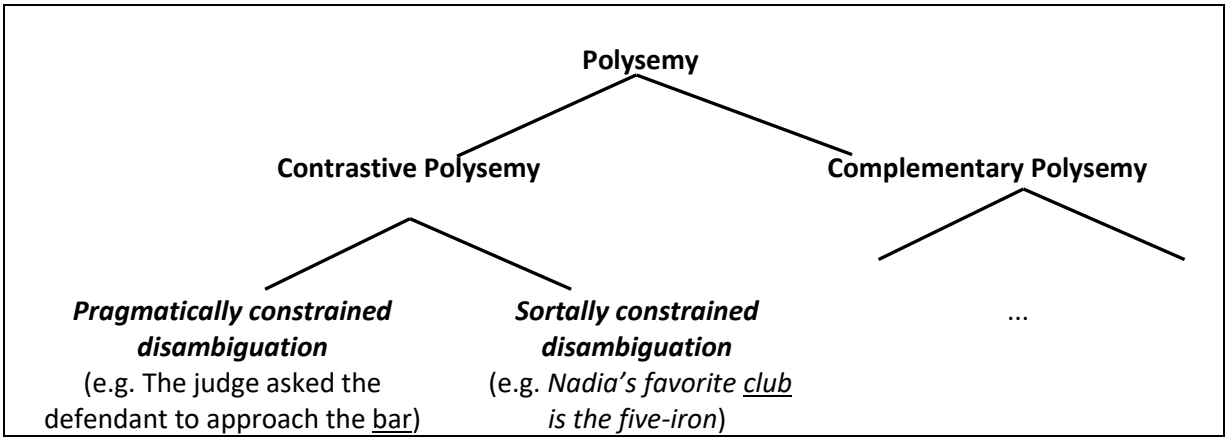
According to Copestake and Briscoe, example (14) above represents a case where sense extension (the meat grinding process) might be thought to apply to the entire phrase. But in (14a) and (14b) the adjectives *corn-fed* and *young* apply to the animal, not the meat. In fact, there are other examples which do not involve sense extension, such as *grass-fed beef*, for instance, where the adjective modifies the animal sense only. The argument, therefore, is that the process of sense extension in such cases does not apply to a phrase (ibid).

2.2.3 Pustejovsky's typology of polysemy

Pustejovsky (1995) distinguishes between two types of polysemy: contrastive and complementary (see Figure 2.2 below). The distinction is based on that of Weinreich (1964). *Contrastive polysemy* describes the accidental polysemy type, i.e. homonymy, which we discuss below (and in more detail in relation to regular polysemy in section 2.3).[19] *Complementary polysemy*, on the other hand, refers, in part, to Apresjan's examples of regular polysemy as well as Copestake and Briscoe's sense extensions. In what follows, we explain in detail, following Pustejovsky (1995), how the two terms are defined and, thus, distinguished from each other. First, consider the diagram below.

[19] See also Chapter 1, section 1.1 on the difference between homonymy and polysemy.

Figure 2.2 Pustejovsky's (1995) typology of polysemy



2.2.3.1 Contrastive polysemy

According to Pustejovsky, *contrastive polysemy* (or homonymy) is defined as the case whereby a lexical item has "more that [sic] one lexical sense" (ibid: 27), and that this case describes "the essentially arbitrary association of multiple senses with a single word" (ibid: 29). Moreover, Pustejovsky states that even if the lexical senses of a word are "historically related or accidents of orthographic and phonological blending", this fact remains irrelevant for the synchronic study of meaning or lexicon construction (ibid: 28).

The diagram above shows two sub-types that fall under *contrastive polysemy*: the pragmatically constrained disambiguation and the sortally constrained disambiguation. These are, more or less, factors or strategies that could help disambiguate the contrastive senses of a lexical item. To briefly introduce what these actually mean, let us look, again, at the examples provided in the diagram above.

- *Pragmatically constrained disambiguation*

(15) a. The judge asked the defendant to approach the bar.
b. The defendant was in the pub at the bar.

(Pustejovsky, 1995: 30)

The argument being made here is that the two contrastive senses of *bar* in these two examples can be disambiguated depending on the notions of *priming* and *context setting* (ibid). That is, in the context in which the participants are the judge and the defendant, it is more likely that the word *bar* refers to the 'bar (not bench) in a courtroom' rather than the 'counter in a pub'.

- *Sortally constrained disambiguation*

(16) a. Nadia's favorite club is the five-iron.
b. Nadia's favorite club is The Carlton.

(Pustejovsky, 1995: 30)

Unlike the examples in (15), the contrastive senses of *club* in (16) can be disambiguated depending on the 'sortal knowledge' of the NP that comes after the word *club* (or as Pustejovsky puts it, the NP which appears in the inverted subject position). Thus, the disambiguation of the senses of *club* does not require context or pragmatic information, as Pustejovsky argues. That is, knowing that the NP 'the five-iron' in (16a) refers to the implements one plays golf with (i.e. the sticks), the ambiguity involved in *club* becomes resolved.

In fact, Pustejovsky states that these are not the only two factors; there are "many finer distinctions to make in the nature of contrastive ambiguity" (1995: 30). Nevertheless, Pustejovsky does not pursue further this issue, as he is mainly interested in accounting for the complementary type, which we discuss next.

2.2.3.2 Complementary polysemy

This type of ambiguity, as Pustejovsky argues, involves "lexical senses which are manifestations of the same basic meaning of the word as it occurs in different contexts" (1995: 28). Examples of complementary polysemy are given below (ibid).

(17) a. the bank raised its interest rates yesterday.
b. the store is next to the newly constructed bank. Category preserving

(18) a. John crawled through the window.
b. the window is closed. Category preserving

(19) a. the farm will fail unless we receive the subsidy promised.
b. to farm this land would be both foolish and without reward. Category changing

(20) a. if the store is open, check the price of coffee.
b. Zac tried to open his mouth for the dentist. Category changing

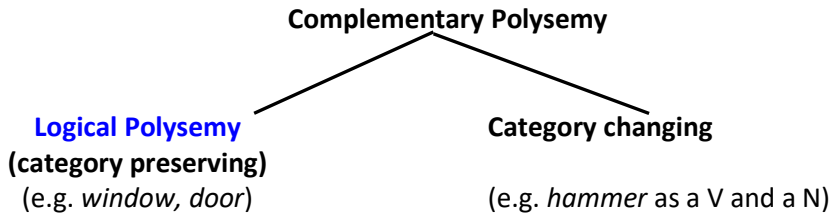
The first two examples describe the category-preserving polysemy, where the nouns *bank* in (17) and *window* in (18) alternate between two distinct readings without changing category: *bank* denotes the financial institution reading in (17a) and the building reading in (17b), and *window* alternates between the window-opening reading and the physical object reading in (18a) and

(18b), respectively. The last two examples describe the category-changing polysemy, where the same word-form is used but belongs to a different word-class: In (19), the word *farm* is once used as a noun in (19a) to denote the area used for growing crops and once as a verb in (19b) to denote the meaning of 'to use the land for growing crops'. Similarly, in (20), the word *open* is used as an adjective in (20a) to mean 'not closed or shut' and as a verb in (20b) to mean 'to part/move away the lips'.

Types of complementary polysemy

Based on the examples given above, Pustejovsky mentions two main subtypes of what he calls *sense complementarity* (1995: 28)—see the diagram below: the first is *category preserving* and the second is *category changing*. Under this dichotomy, the term *logical polysemy* identifies the first type only.

Figure 2.3 Pustejovsky's (1995) typology of polysemy—continued



Logical polysemy is defined as a "complementary ambiguity where there is no change in lexical category, and the multiple senses of the word have overlapping, dependent, or shared meanings" (1995: 28). Viewed in this way, the term complementary polysemy becomes (slightly) broader than the term logical polysemy (ibid). Also, it becomes obvious that the two terms *logical polysemy* and *category preserving* mean the same thing.

On the distinction between contrastive and complementary polysemy

Pustejovsky points out a number of differences between these two types of polysemy. These can be summarised as follows:

1. Word senses in contrastive polysemy are contradictory in nature. That is, only one sense of an ambiguous word is available in a given context, or as Pustejovsky puts it, "one sense is available only if every other sense is not available" (ibid: 32).

2. In the case of contrastive polysemy, relevant factors, such as *context priming* and *discourse setting* are helpful in the disambiguation process. However, such factors are of

no help in the case of complementary senses. This is because complementary senses, as Pustejovsky argues, have "a much weaker shadowing effect" (ibid).

3. Finally, the two complementary senses of, say, the noun *book* are both available for interpretation in context; nonetheless, it appears that one of these senses is *focused* for purposes of a particular context (ibid).

Logical polysemy in parts of speech

Nouns

Pustejovsky identifies several types of logical alternations that occur so frequently in the class of nouns. Consider the following noun alternations (adapted from Pustejovsky, 1995: 31):

1) *Count/mass alternation*
   a. The lamb is running in the field.
   b. John ate lamb for breakfast.
   c. There is an apple on the table.
   d. There is apple in the salad.
2) *Plant/food alternation*
   a. Mary watered the figs in the garden.
   b. Mary ate a fig for lunch.
3) *Container/content alternation*
   a. Mary broke the bottle.
   b. The baby finished the bottle.
4) *Product/producer alternation*
   a. The newspaper fired its editor.
   b. John spilled coffee on the newspaper.
5) *Process/result diathesis*
   a. The company's merger with Honda will begin next fall.
   b. The merger will lead to the production of more cars.
6) *Alternations involving location:* Building/institution (e.g. *university*), Place/people (e.g. *John travelled to New York; New York kicked the mayor out of office*).
7) *Figure/Ground Reversals*
   a. The door is locked.
   b. John went through the door.

Of course, the above list of nominal alternations is not exhaustive, if we are to consider Apresjan's identified nominal regular patterns, for instance. However, it is important to point here that we rely on this list of nominal alternations in our later investigation of the Arabic data in Chapter 4.

Adjectives

Logical polysemy is also identified in adjectives, but its behaviour is quite different from that identified in nominal alternations. In fact, there seems to be no alternation involved. That is, unlike the case of *book,* for example, where the meaning alternates between a *physical object* sense and *information* sense, this kind of alternation does not seem to be present in adjectives. The example that Pustejovsky gives is the adjective *good*. Consider the following.

(21) a. a <u>good</u> car.
b. a <u>good</u> meal.
c. a <u>good</u> knife. (1995: 32)

As Pustejovsky argues, the meaning of *good* in each instance above is dependent on the noun being modified by the adjective. Hence, "there does not seem to be an alternation or focusing effect, but rather a functional dependency on the head being modified" (1995: 32). This is essentially what Copestake and Briscoe argued for, as we saw in the earlier section. This kind of adjectival logical polysemy corresponds to Copestake and Briscoe's *specialisation* type of constructional polysemy. As noted there, the polysemy involved is not lexical. In other words, it does not seem that the adjective has more than one sense; rather, it encodes only one (often more abstract) sense which is modulated via co-composition or syntagmatic combination processes.

The other important point with respect to adjectives is the remark that their meaning depends on the noun they modify. To a certain degree, the argument is true. However, as Copestake and Briscoe note, there are other examples which do not seem to support this claim. For instance, on Pustejovsky's view, a *fast typist* is necessarily the one who types fast, but in the context of a car race between typists and, say, pianists, the meaning of *fast* relates to the one who drives fast. This means that the lexical interpretation of *fast* in this example is given contextually. Thus, according to Copestake and Briscoe, "[t]he interpretation of *fast typist* as someone who types fast is defeasible" (1995:33).

Copestake and Briscoe's argument is undoubtedly true. However, it is important to remember that Pustejovsky mentioned, in particular reference to the adjective *fast*, that it is in fact polysemous, in that *fast* can actually modify both individuals and events (1995: 128).

Verbs

As for the class of verbs, Pustejovsky identifies different 'varieties' of verbal logical polysemy. These include the aspectual verbs such as *begin* and *finish*, the causative/inchoative alternation such as *open*, and in polysemy involving co-composition such as *bake*.

1. *Aspectual verbs*

The first relates to the logical polysemy associated with "the multiple complements types that verbs select for" (ibid). Consider the aspectual verbs *begin* and *finish* in the following examples (1995: 32; 199).

(22) a. Mary began to read the novel. (VP [+INF])
b. Mary began reading the novel. (VP [+PRG])
c. Mary began the novel. (NP)

(23) a. Mary finished drinking her beer. (VP [+PRG])
b. Mary finished her beer. (NP)

In these sentences, the verb *begin* selects for different syntactic complement types: a Verb Phrase is selected in (22a) while a Gerundive Phrase and a Noun Phrase are selected in (22b) and (22c), respectively. Though it does not seem to be the case that the meaning of *begin* is altered in each instance above (in fact, the verb retains the same meaning, as Pustejovsky maintains), the verb, nonetheless, is polysemous as it "must be able to select for a multiple number of syntactic and semantic contexts" (1995: 32-3). The same explanation goes for the verb *finish* in (23).

We are not certain, however, whether or not the phenomenon of multiple subcategorization is a sufficient criterion for the polysemy argument, at least in the current study. As we see it, the verb's meaning in the examples above is not altered, nor the different syntactic complements affect its meaning in any particular way.

2. *The causative/inchoative alternation*

The causative/inchoative verb alternation represents another kind of logical polysemy in verbs. This type of logical alternation is illustrated by the *break* example in (24) below.

(24) a. The bottle broke.
b. John broke the bottle. (1995: 33)

What is noticeable here is the fact that the meaning of *break* in the two distinct constructions is altered, but the two senses arising in these grammatical constructions are related in a well-

defined manner, i.e. "one sense… is actually entailed by the other sense" (ibid: 33). Hence, such verbal alternations are seen as logical polysemies, too.

The logical polysemy of the causative/inchoative alternation will be relevant to the discussion of Arabic verbal alternations in Chapter 4.

3. *The verb 'bake'*

The verb *bake* represents the case of verbal logical polysemy, where the polysemy of *bake* arises via the co-composition process (we explain this in detail in Chapter 3). In the two examples given below, *bake* is polysemous between the *change-of-state* sense and the *creation* sense (ibid: 122).

(25) a. John baked the potato.
b. John baked the cake.

In the example above, *bake* has the change-of-state sense in (25a) and the creation sense in (25b). The creation sense of *bake* in (25b) is assumed to be the new derived sense for *bake*. Here, what shifts the sense of the verb *bake* is the information carried by the nominal complement (the noun *cake*). In this regard, Pustejovsky claims that when the generative process of co-composition takes place, it generates new non-lexicalised senses for the governing verb (cf. Pustejovsky 1995: 61). This, in fact, suggests that, similar to what Copestake and Briscoe's argument about constructional polysemy, the polysemy involved in *bake* is more apparent than real, in the sense that there is only one sense for the verb and it is the process of syntagmatic co-composition which causes sense modulation.

2.2.4 Cruse's varieties of polysemy

Cruse (2000) distinguishes between two major types of polysemy relations: linear and non-linear. Linear polysemy involves *sense specialisation* and *sense generalisation*. Such linear relations, as we shall explain shortly, are fundamentally based on the notions of hyponymy and meronymy. Non-linear polysemy, on the other hand, is reliant on metaphor and metonymy (ibid: 110).

2.2.4.1 Linear polysemy

First is *linear* or *vertical* polysemy. This type of polysemy seems to have first discussed and explained in detail by Gévaudan (1997) in his article 'La polysémie vertical: Hypothèses,

analyses et interprétations'. According to Gévaudan (1997), vertical polysemy describes a "special form of polysemy which occurs when different meanings of the same word stand in a hyponymic relation" (ibid: 1). Examples of this kind include the noun *dog* in its broad (canine) sense and specific (male dog) sense. In other words, the polysemy of this type seems to arise due a lexical gap (or a "hole") being filled by an existing lexeme in the hierarchy (cf. 'Lexical gaps', Lyons 1977, vol. 1: 301).

Cruse (2000) extends this concept to the meronymy relation. Hence, cases of vertical polysemy or 'linear polysemy', as Cruse (2000) calls it, include the following three sub-types: [20] **AUTOHYPONYMY** (e.g. dog), **AUTOMERONYMY** (e.g. door), and **AUTOSUPERORDINATION** (e.g. cow). Noticeably, *autohyponymy* and *autosuperordination* are based on the hyponymy relation.

The difference between *autohyponymy* and *automeronymy*, on the one hand, can be explained as follows: autohyponymy is about a lexeme that has a general reading and a specific one which is (i.e. the specific reading) seen as a **subtype** (e.g. 'dog', which can refer to dogs in general or to only a male dog) ; automeronymy is about a lexeme which has a general reading and a specific one which is seen as a **subpart** (e.g. 'door', which can refer to the whole door or a subpart of it) (see Cruse, 2000: 110-111).

On the other hand, the distinction between *autohyponymy* and *autosuperordination* can be summarised as follows: in autohyponymy we use a general sense (usually the default or 'basic' sense) to cover a gap in the specific sense (e.g. **male** dog), whilst in autosuperordination we use a specific sense (usually the default sense) to cover a gap in the general sense (e.g. *man* and *cow*; both as gender neutral).

2.2.4.2 Non-linear polysemy

Second is the type of *non-linear* or *horizontal* polysemy. Horizontal polysemy differs from vertical polysemy in that the relationship between word senses is not based on the hyponymy or inclusion relationship, but often on metaphor or metonymy. Cruse (2000) mentions that non-linear polysemy subsumes three types: metaphor and metonymy, and the 'miscellaneous' type (Cruse, 2000: 112).

[20] In fact, Cruse (2000) mentions four sub-types, but we will exclude the fourth (which is *auto-holonymy*) for that it is not always clear the distinction between auto-meronymy and auto-holonymy, as Cruse himself admits.

Both metaphor and metonymy are distinct processes of sense extension (ibid: 211)—not to be confused with the same term by Copestake and Briscoe.[21] Metaphor is simply defined as a "figurative usage based on resemblance" (ibid: 112). Examples of metaphor are many, but consider the word 'position' in the following (ibid):

(26) a. That is an uncomfortable *position* to sleep in.
b. You've put me in an awkward *position.*
c. What is your *position* on EU membership?

We have also already seen another example of metaphor discussed earlier in Copestake and Briscoe's typology, namely the metaphoric use of the noun 'cloud' in *cloud of suspicion* (see section 2.2.2.1 above).

Metonymy[22] can be loosely defined as a "figurative use based on association" Cruse (2000: 112). It is more often coupled with the term 'contiguity', which describes the 'stand-for' relationship.[23] Examples include the following (ibid):

(27) a. He is the **voice** of the people.
b. He has a loud **voice.**
(28) a. There are too many **mouths** to feed.
b. Don't talk with your **mouth** full.

Cruse (2000: 212) mentions several patterns of metonymy. These include the following:

(i) CONTAINER for CONTAINED
(ii) POSSESSOR for POSSESSED/ATTRIBUTE
(iii) REPRESENTED ENTITY for REPRESENTATIVE
(iv) WHOLE for PART
(v) PART for WHOLE
(vi) PLACE for INSTITUTION

The last type of non-linear polysemy is what Cruse calls the 'miscellaneous' type. The relationship between word senses in this type is claimed to be inexplicable in terms of either

[21] Sense extension in Copestake and Briscoe's terminology appears to apply only to the metonymically-motivated polysemy.

[22] Metonymy is also known as the phenomenon of **SEMANTIC COERCION** (see Stallard, 1993). Stallard distinguishes between two types of metonymy: referential metonymy and predicative metonymy. The difference between these two kinds is based on whether the actual and intended referent of a metonymic noun is the literal or non-literal meaning of that noun. We do not discuss this issue further, but cf. Stallard, 1993. Also, we do not refer to metonymy only as *semantic coercion* because semantic coercion actually covers a lot more than metonymy. It occurs whenever there is a shift in meaning typically dependent on local linguistic context.

[23] In fact, the issue about whether metonymy is based on the notion of association or contiguity is much debated in the literature, at least in the literature of Cognitive Linguistics (for instance, cf. Barcelona et al, 2011). Here we do not aim to go further with it, but we will assume a basic understanding of metonymy.

metaphor or metonymy (2000: 112-3). The example, which he provides, is that of the *calendric* and *non-calendric* readings of, say, *month*, *week*, and *year* (ibid). It is argued that in the case of *month*, the two readings (i.e. the calendric and non-calendric) express different lengths of time. That is, in the calendric reading, the month, say April, begins on 1 April and ends on the day before 1 May, and so is the case for the remaining months of the year. However, in the non-calendric reading, the month starts on any day and ends in 4-weeks' time (ibid). The same also applies to the difference between a calendar year and, say, non-calendar year which starts in any month of the year (consider, for example, the fiscal year).

2.2.4.3 Coerced polysemy

This type is essentially based on metonymic relations (i.e. based on association; see also earlier discussion of Copestake and Briscoe's example of *ham sandwich* and *French fries*). In fact, examples of this type, as we shall see below, are not typical uses of expressions; they denote a deliberate use of a lexeme (such as *pizza* and *ham sandwich*, for instance). Consider the following (Cruse, 2000: 108):

(29) a. John ordered a pizza.
b. The pizza doesn't look too happy with what he's been given.

Expressions like these of *pizza* normally appear in what Cruse calls 'café language', but, nonetheless, are "perfectly intelligible to all" (2000: 211). However, we prefer not to use Cruse's term of 'coerced polysemy' here because the term appears to be misleading and only restricted to the examples mentioned above (they are precisely of the type *referential polysemy*[24]). These are better termed **nonce expressions** (cf. Dooly, 2006, for example). In fact, later in his book, Cruse himself talks about **nonce extensions/readings** (see Cruse, 2000: 201). Nonce extensions, as is claimed by Cruse, are different from *naturalized extensions* and *established extensions* (consult Cruse, 2000: 201 on the difference between *naturalized* vs. *established* extensions) in that they (i.e. nonce extensions) are "ones for which there are no entries in the mental lexicon; they therefore cannot be 'looked up', but have to be generated and interpreted using strategies of meaning extension such as metaphor and metonymy" (ibid: 201).

The question, however, is how do these nonce expressions arise? Cruse (2001: 257) has already asked this question before, to which he gives the following answer:

[24] Deane (1988) calls this class of polysemy *closed referential polysemy*, which strictly prevents cross-sense anaphora—see the earlier zeugmatic *ham sandwich* example by Copestake and Briscoe.

> "Not by selection, but by coercion: if none of the established readings fits the context, then some process of sense-generation is triggered off, which produces a new reading".

Furthermore, Lascarides (n.d.) emphasises that, in addition to the fact that these nonce words (or expressions) are not established or recorded in the lexicon; they are "interpretable via generative devices". In a similar vein, Wechsler (2015) also argues that cases such as the *ham sandwich* are "genuine instances of rule-generated meaning shifts, at least according to Copestake and Briscoe" (2015: 27).

2.2.4.4 Facets of meaning

These are not ordinary cases of lexical ambiguity, as Cruse points out. According to him, "[fa]cets can be described as fully discrete but non-antagonistic readings of a word" (2000: 116). That is, in the example of *book* below, the discrete senses of *tome* and *text* can coordinate happily without zeugma; suggesting that the meaning of *book* is of a dual nature.

(30) Put this *book* back on the shelf: it's quite unreadable. (ibid: 114)

Another example of the facet phenomenon is the noun *speech* in the following (ibid: 116).

(31) a. John's *speech* was inaudible.
b. John's *speech* was very interesting.

Further to these examples, Cruse mentions that facets are also found in a group of nouns represented by the example of *Britain* below (ibid: 117).

(32) a. *Britain* lies under one metre of snow.
b. *Britain* mourns the death of the Queen Mother's corgi.
c. *Britain* has declared war on San Marino.

The three readings of *Britain* in (32a, b, c) refer to the geographical entity, the population, and the government (the political entity), respectively. Like the previous examples of *book* and *speech* above, the three readings of *Britain* also can coordinate without zeugma, as shown in (33) below.

(33) Britain, despite the fact that it is lying under one metre of snow and is mourning the death of the Queen Mother's corgi, has declared war on San Marino. (ibid)

2.2.5 Blank's typology of polysemy

Blank (1999) provides a fourfold typology of polysemy that is guided by discourse rules, lexicalisation, and cognitive backgrounds. These four levels of polysemy, as we explain below, are based on the study of some examples mainly in English, French, and German.

1. Rule-based, non-lexicalized polysemy

According to Blank, this type of polysemy is represented by the following examples (1999: 24)

(34) The *ham sandwich* is waiting for his check English

(ORDERED DISH—CUSTOMER in waiters' discourse)

(35) *Ich* werde verlängert German
'I will become extended'

(EMPLOYEE—CONTRACT in discourses concerning work)

In these examples, the metonymic use of *ham sandwich* in (34) to refer to the customer who ordered a ham sandwich and the first person pronoun *ich* in (35) to refer to the contract signed by the employee is based on the discourse setting in which these examples are used. Therefore, as Blank argues, this type of polysemy is "restricted to a very specific discourse type and […] is only appliable to a limited number of contexts" (ibid: 25). In other words, these instances of metonymy are "…nothing more or less than a discourse rule…" in, say, waiter or work discourse; thus, "[t]here seems to be no further lexicalization of this discourse rule…" (ibid).

Remember here that copredication, as mentioned earlier, is awkward. Consider the following:

(36) ?? The *ham sandwich* is waiting for the bill and sells quickly.

(37) ?? *I* am extended and available for download in PDF format.

It is interesting to see that copredication does not seem to work for examples of this polysemy type. One of the reasons might be attributed to the fact that, as Blank stresses, such metonymic uses occur in limited contexts; thus, they are not lexicalized (also cf. the earlier discussion of Cruse's *coerced polysemy*). However, the lexical rule applying to these instances, disregarding lexicalization and copredication, seems to be productive in at least English.

2. Rule based and lexicalized polysemy with no or few idiosyncratic restrictions

This second type of polysemy is what Blank describes, based on empirical evidence, as that which "speakers actually seem to have difficulties in distinguishing polysemous senses" (ibid: 26). The examples illustrating this type are the following (ibid: 19):

(38) a. I just bought Chomsky's latest *book*. (= CONTAINER)
b. Chomsky's latest *book* is awful. (= CONTENT)

(39) a. Mary is *sad*. (= STATE [AS RESULTING FROM STH.])
b. Mary brings *sad* news. (= CAUSE)

The discussion of examples (38) and (39) is straightforward since we have already explained the logical polysemy involved in these examples in the previous sections. However, to just follow Blank's argument here, the logical polysemy of *book* and *sad* above, "derive from an encyclopedic (maybe universal) cognitive background and are instances of rather unspecific discourse rules…" (ibid: 25). Moreover, he further adds that instances of this type of polysemy do not seem to convey a communicative effect (ibid: 26).

3. Rule-based and lexicalized polysemy with idiosyncratic restrictions

This type is, in fact, nearly similar to type 2 above, except that (i) it is more restricted; i.e. it does not occur in a wide range of contexts; therefore, it "inhibits full transfer to analogous concepts" (ibid: 25), and (ii) instances of this type seem to convey a communicative effect (ibid: 26). These observations are based on the following examples (ibid: 19-21):

(40) a. The children are now at the *school*.
b. *School* starts at the age of six.
c. The entire *school* rose when the headmaster entered the auditorium.
d. After *school* the children rush home.
e. John now teaches at Harvard Medical *School*.

(41) John *sleeps* in this hotel. – This hotel *sleeps* 100 guests. English
Jean *dort* dans cet hôtel. – *Cet hôtel *dort* 100 clients. French
Hans *schläft* in diesem Hotel.– *Dieses Hotel *schläft* 100 Gäste. German

(42) a. Sam enjoyed the *lamb*.
b. The *lamb* is running out in the field.

(43) a. #We ordered *cow* for dinner. [25]

b. #The *frog* here is excellent.

What these examples show is the fact that there are some cases where a word such as *school* can be used in different contexts to convey distinct but related meanings, and there are other cases where the use of a word such as *lamb* in certain contexts (and within the same language; English here) to denote either the animal sense or the meat sense does not seem to be transferrable to other analogous concepts, as the examples of *cow* and *frog* above show. In addition, cross-linguistically, what appears to be perfectly acceptable in English, where the verb *sleep* can be logically polysemous between either a transitive meaning or an intransitive meaning, does not seem to be acceptable in other languages.

4. Idiosyncratic lexicalized polysemy

This represents the type of polysemy which, according to Blank, has "developed without the overt application of a conventional pattern, i.e. a conceptual metaphor, metonymy or taxonomy" (ibid: 26). It includes subtypes such as auto-converse polysemy and auto-antonymic polysemy. Consider the following examples (ibid).

(44) French: *hôte* 'host', 'guest' auto-converse polysemy

(45) English (slang): *bad* 'bad', 'excellent'. auto-antonymic polysemy[26]

As Blank argues, this idiosyncratic polysemy type "is too heterogenous [sic] for generalizations: here everything depends on the individual instance of polysemy" (ibid).

2.3 Part I: Discussion and Summary

The previous sections presented many distinct types of polysemy. In this section, we compare and contrast between the various proposed types and concepts discussed earlier in order to draw general as well as specific conclusions that will help to refine further the concept of polysemy that the current study adopts.

[25] Blank marks these examples with an asterisk (*). We, however, use the hashtag instead because the sentences are not ungrammatical; they are just pragmatically marked.

[26] This type of polysemy is also known as **CONTRONYMS** in English. Further examples include *sanction* 'to boycott or penalize' or 'to approve'; *to dust* 'to add dust' or 'to remove dust'; etc. This is an interesting case which also occurs in Arabic and is known as **al-ʔḍād**, but we do not discuss it in this study for it does not relate to the kind of systematic polysemy that we are investigating.

First, we observe that Copestake and Briscoe's distinction between constructional polysemy and sense extension is partly compatible with that of Pustejovsky's. Indeed, Pustejovsky does not discuss the subtype *broadening* in his framework, as the examples that Copestake and Briscoe cite seem to be an instance of metaphor-based meaning extension; hence, unpredictable.

Second, as regards Copestake and Briscoe's examples of *ham sandwich* and *French fries*, these are not different from both Cruse's coerced polysemy and Blank's rule-based, non-lexicalised polysemy. In fact, these instances of polysemy, as we have argued earlier, are better termed nonce-expressions (i.e. on-the-fly concepts). Cruse's explanation for the occurrence of such uses in what he called "café language" is quite accurate; and, indeed, Blank shares the same view with Cruse on that the polysemy of this type is restricted to a specific discourse type and, hence, the derived sense of *pizza*, for instance, is not recorded in the lexicon. However, Arabic (whether MSA or JA) does not have this particular variety of (metonymy-based) polysemy, strictly with reference to the *ham sandwich* and *pizza* examples in the English context. the type of 'coerced' polysemy does not appear to be universal, in the sense that the discourse rule responsible for deriving such meanings is either rare or absent in similar contexts in Arabic, at least.

Third, we categorise the previous studied types of polysemy into three groups: accidental polysemy, irregular polysemy, and regular polysemy. This classification is based on the following suggested criteria derived from the current literature: conceptual relationship, rule-governance, predictability, and lexicalisation.

i. Accidental polysemy

It mainly defines homonymy and includes Pustejovsky's contrastive polysemy. The distinction between homonymy or contrastive polysemy, on the one hand, and irregular and regular polysemy, on the other hand, is summarised in the following points:

Firstly, as Pustejovsky already mentioned, word senses in contrastive polysemy are contradictory or antagonistic to one another (i.e. they are mutually exclusive), which means they cannot appear together without zeugmatic interpretation—see example (46) below. Moreover, regarding the notion of lexicalisation, Cruse notes, in comparison with 'coerced polysemy', that "homonymy is possible only with established senses" (2000: 109). This does not necessarily mean that **sense establishment** is not relevant to polysemy. On the contrary, Cruse preserves this criterion for polysemy, too (ibid). However, the point here is to affirm that cases of homonymy must satisfy

the criterion of lexicalisation or sense establishment, which is not required particularly for the case of coerced polysemy.

Secondly, homonymy is distinguished from regular polysemy (which we discuss below) by these two tests (cf. Cruse, 2000; Asher, 2011; and Asher *et al.*, 2016): ***copredication***[27]***(or conjunction)*** and ***pronominalization***. The argument being made here is if these two tests produce zeugmatic (or anomalous) sentences, then the word in question is accidentally polysemous; i.e. homonymous. Consider the following examples.

(46) a. #The bank$_i$ specializes in IPOs. It$_i$ is steep and muddy and thus slippery. (pronominalization)
b. #The bank specializes in IPOs and is steep and muddy and thus slippery. (copredication)
c. Lunch was delicious but took forever. (copredication)
d. He paid the bill and threw it away. (pronominalization)
e. The city has 500,000 inhabitants and outlawed smoking in bars last year. (copredication)

(Asher, 2011: 63)

In example (46), the sentences (46a) and (46b) show, the word *bank* in its two unrelated senses (*riverside* and *institution*) cannot be used copredicatively in (46b) nor is it possible to pronominalize the occurrence of *bank* felicitously in (46a). The problem in (46a) is explained as follows: *bank* in the first clause has the meaning of *financial institution* as determined by the predicate; the second clause has the pronominal subject *it* as an argument of a predicate requiring a different sense (the *riverside* sense of 'bank'); which is thus unacceptable in the given context. As for (46b), we face the same problem.

On the other hand, sentences in (46c) to (46e) are acceptable as they pass the copredication and pronominalization tests. In other words, although the nouns *lunch*, *bill*, and *city* apparently have distinct senses, they can still be conjoined and appear in constructions that require a reference to a different sense. To further explain, the two senses of *lunch* in (46c) do not seem to render the sentence infelicitous despite that the *food* sense of *lunch* in "…was delicious" is not the same as

[27] See Sandra Antunes and Rui Chaves (2003) for further details about this notion. See also Ježek and Melloni (2011) for more about co-predication restrictions and polysemy of action nominals (e.g. constructions, building, translation, etc.).

that in "…but took forever", which is the *event* sense. This is also true for *bill* and *city* in the remaining examples.

ii. Irregular polysemy

It includes Apresjan's metaphoric-based polysemy, Copestake and Briscoe's *broadening* subtype of constructional polysemy, Cruse's linear polysemy, and Blank's idiosyncratic polysemy

In irregular polysemy we have a conceptual connection between the two senses of a lexeme, as in the following example:

(47) a. He nodded his *head* in agreement.
b. Che Guevara was the *head* of Cuba's Foreign Liberation Department.
(48) a. I draw a thick, coloured *line* on the paper.
b. I am on the other *line*. I'll call you back.

In (47a), *head* refers to the upper part of the body whereas in (47b) it refers to a person who is in top position, i.e. chief. Here, the conceptual link is established between the two *heads* in (47a and b): *head* in (47b) is used metaphorically to refer to the upper part of, say, an organisation. Example (48) is similar. The noun *line* in (48a) denotes the long and thin mark whereas it refers to the telephone connection in (48b).

However, this case of irregular polysemy does not seem to be predictable. What 'predictable' means in this context is the fact that the instances of this type, as we shall see below, do not seem to follow a general pattern in language.

iii. Regular polysemy

It includes Apresjan's regular (metonymy-triggered) polysemy, Copestake and Briscoe's sense extension, Pustejovsky's logical polysemy, Cruse's facets of meaning and the metonymy type of non-linear polysemy, and Blank's three types of rule-based polysemy.

As we noticed in these accounts, metonymy is the primary source of the regular polysemy type. We have seen many of these regular metonymies in various patterns, such as the *fruit-colour*, the *animal-meat*, the *place-people*, and the *product-producer*, to mention a few. There are many nouns that belong to these patterns that show regular shifts in meaning. However, as pointed out by Blank (1999), for instance, there exist some idiosyncrasies in certain regular patterns. For instance, recall that in the examples of *banana* and *pear* given by Barque and Chaumartin

(2006), they note that not all nouns under the *fruit-colour* pattern can denote these two senses in all contexts. This suggests that there may be a sociocultural aspect governing systematic polysemy since one can imagine a culture in which all fruit names can give rise to colour interpretations. Indeed, there are ways of contextualising uses so that these readings are possible in English. Consider the following examples.[28]

(49) Oh my god, Jack's painted his room *banana*.

(50) Jill has gone a rather alarming *pear* shade.

This argument is also true for the kind of regular polysemy involved in the *animal/meat* examples (see Blank's rule-based polysemy with idiosyncratic restrictions, and Copestake and Briscoe's sense extensions). This is a topic we discuss in great detail in Chapter 4 under the count/mass nominal alternations.

In summary, we present the different kinds of polysemy discussed so far in Table 2.1 below, which outlines the main themes covered earlier alongside the features pertaining to each polysemy type.

The abbreviations used in the table are defined as follows:

-CL= no conceptual link
idio= idiosyncratic restrictions
+L= Lexicalised
-L= non-lexicalised
+P= productive (*totality of scope*)
+Pred= predictable
+R= rule-based
-R= non-rule based

[28] These examples are credited to Prof. Ronnie Cann.

Table 2.1: Classification and features of polysemy types

	Type of Polysemy	**Author(s)**	**Examples**	**Characteristics**
Homonymy	Accidental polysemy Contrastive polysemy Idiosyncratic polysemy *(these are not different types of homonymy but just different names)*	*many* Weinreich 1964; Pustejovsky 1995 Copestake and Briscoe 1995	bank, bill	-CL -R +L
Irregular polysemy	Constructional polysemy Vertical, linear polysemy Metaphoric Polysemy	Copestake and Briscoe 1995 Gevaudan 1997, Cruse 2000 Apresjan '74	cloud dog, man foot	-R -L -R (?) +L -R +L
Regular polysemy	Complementary polysemy Non-linear polysemy (only the metonymy type) Sense extension Metonymic Polysemy	Weinreich 1964; Pustejovsky 1995 Cruse 2000 C&B 1995 Apresjan '74	book, lamb	+R +P +Pred +L (+idio)
Nonce expression (referential polysemy)	Coerced polysemy Rule-based, non lexicalized polysemy	Cruse 2000 Blank 1999	ham sandwich, pizza, Saxophone	+R -L
Idiosyncratic polysemy **(no conventional pattern)**	Auto-converse polysemy Auto-antonymic polysemy	Blank 1999 =	Fr. *hôte* (host, guest) *bad* (bad, excellent)	+L +idio +CL (?) -R

The table above is useful in several ways: Firstly, it summarises the several studied types of polysemy, and highlights the fact that some of these types go by various names according to different authors; however, the concept is the same. Accidental polysemy or homonymy is an important example here. Secondly, it shows how complex the notion of polysemy, in general, is.

Thirdly, it provides the different characteristics or features that each type of polysemy possesses. As noticed, the two features of *regular (vs. irregular)* and *lexicalised (vs non-lexicalised)* seem to be of crucial importance to any (theoretical and/or descriptive) classification of polysemy.

To recap, we focus in this table on the three categories of the irregular, regular, and referential polysemy. These are going to be the focus of Part II. Idiosyncratic polysemy in Blank (1999) is not pursued any further in neither Part II nor the next chapters but is introduced here as part of Blank's four-fold classification (note that Copestake and Briscoe's idiosyncratic polysemy is not the same as Blank's).

Under the category of irregular polysemy, three types are identified. First is the constructional polysemy type by Copestake and Briscoe which subsumes the two cases of specialisation and broadening. Although it is argued by Copestake and Briscoe that these cases are systematic in the sense they require some generative mechanisms, we do not classify them as being part of the regular polysemy because (i) sense modulation is different from sense extension in that it involves no complete shift in meaning and (ii) in sense modulation, the derived sense is not lexicalised. Second is the linear polysemy type, which includes Cruse's three subtypes (see earlier discussion). Again, we classify linear polysemy as belonging to the irregular type because, in our study, (i) it does not fit, at least, the second definition posited by Apresjan (1974) for the class of regular polysemy, and (ii) the kind of the relationship that exists between the senses of a vertically polysemous word is different from that of the regular types mentioned in the table.[29] The last type falling under this category is the metaphoric polysemy type.

Under the category of regular polysemy, there are four types. Complementary polysemy on Pustejovsky's account covers the two types of category preserving polysemy and category changing polysemy. Here we focus only on the category preserving polysemy (logical polysemy). The remaining three types focus on the metonymically motivated polysemy in nouns, although the term employed by Cruse covers the metaphor-based polysemy, which we exclude from this classification.

Nonce expressions or referential polysemy represents, in our view, an intermediate case between irregular and regular polysemy. In fact, words such as *pizza* that are used to denote something falling outside the 'literal' meaning, do not have established senses (-L). The new sense acquired

[29] However, vertical polysemy could still be seen as an instance of the regular polysemy type, in the sense that whenever there exists a lexical gap in a given hierarchy, the most frequent lexeme in the language (e.g. *dog*) is used to fill that gap.

in context is, thus, a result of coercion (that is why Cruse calls this type *coerced polysemy*). However, as regards the notion of regularity, it appears that cases of referential polysemy are widespread in at least English. Hence, they are regular in the sense they follow the general pattern of, say, *food/person ordering food* (i.e. they can be generated by the use of a lexical rule, +R). The *saxophone* in 'The saxophone left the concert' is another example that follows the pattern '*musical instrument/player of that instrument*'. However, as we noted earlier, this particular kind of polysemy does not seem to exist in Arabic. For that reason, we do not study them in Chapter 4, but still are mentioned in the theoretical discussion in Part II because the theoretical frameworks discussed there deal with the general notion of polysemy; hence employing examples that refer to different polysemy types.

In the next part, which introduces some theories of polysemy, we see how the different projected typologies are explained. After that, systematic (or regular) polysemy will be the prime topic of the remaining chapters.

PART II: THEORIES

In Part II we review a number of the theoretical accounts that dealt with the concept of polysemy, including Pustejovsky's Generative Lexicon, Relevance Theory of pragmatics (Wałaszewska (2008) and Falkum (2011)), and, within the domain of cognitive linguistics, Tyler and Evans' (2001b, 2003) theory of Principled Polysemy and Evan's (2015) LCCM theory.

It is important to bear in mind, however, that Part II attends only to therories of non-experimental nature. That is, experimental (psycholinguistic) studies (such as Klein and Muprhy 2002, and Klepousniotou 2002), corpora studies (such as Lapata 2001), and NLP[30] applications (such as Buitelaar 1998) are excluded from this literature coverage. This is because Part II reviews systematic polysemy from a purely theoretical point of view. This, of course, need not be understood in a way whereby these experimental studies do not contribute to the theoretical discussion, as they do actually reflect on theoretical analyses. For example, Klepousniotou (2002), Klepousniotou *et al.*'s (2012) EEG study, and Beretta *et al.* (2005) in their MEG studies show evidence that both polysemy and homonymy, for instance, are different, in that the subjects of their experiments reacted differently to the different kinds of lexical ambiguity; showing a faster reaction time for the case of polysemy, and, thereafter, interpreting this as due to different processes involved. Such results, therefore, are not in support of *sense enumeration lexicons*; a traditional approach which Pustejovsky (1995) argues against, in relation to word meaning.

2.4 Theoretical approaches to polysemy

In this section, we survey three main approaches to lexical meaning, with specific reference to the theories which directly address the phenomenon of (regular) polysemy; the primary focus of this study.

2.4.1 Pustejovsky's (1995) Generative Lexicon

Pustejovsky's framework aims to describe and explain the polymorphic behaviour[31] of word-senses, with respect to the phenomenon of *regular polysemy* (or what he calls *logical*

[30] Stands for Natural Language Processing.

[31] Polymorphism comes from Greek *poly* 'many' and *morphe* 'shape or form'. The term seems to be mainly used in biology to refer to the existence of a species in different forms or shapes (e.g. bees, ants, or even blood groups in humans). This term, however, is now used in computer science to specifically mean the ability of, say, a word to assign different meanings in different contexts. Hence, a polymorphic behaviour in the context of Pustejovsky (1995) describes the situation in which two words, say, *book* and *dictionary* belong to the same object class or type

polysemy; see §2.2.3). The tenets upon which the Generative Lexicon system is founded are the following: (i) four levels of linguistic representation, which are the *Argument structure*, *Event structure*, *Qualia structure*, and *Lexical inheritance structure*, and (ii) generative mechanisms, which include *coercion*, *co-composition*, and *selective binding*. As it is not the aim here to discuss in detail what these representation levels and generative mechanisms are about, we defer a detailed and comprehensive presentation of the theory to Chapter 3; however, for the purpose of this section, we only provide a general, short introduction to the theory.

As we have seen in an earlier section in the previous part, Pustejovsky (1995) distinguishes between two types of polysemy: the complementary and contrastive types. As he observes, the phenomenon of complementary polysemy entails a very different type of relation between senses (1995: 31). This motivates him to identify several occurrences of complementary polysemy, logical polysemy in specific, in the three main categories of Nouns, Verbs, and Adjectives. For example, he identifies cases of nouns which occur within a larger set of alternations, such as the nouns *door* and *window* which are part of a logical alternation that he calls *Figure-Ground Reversals.* These alternations are amongst many nominal alternations that convey systematic relations between senses, and are described as *logical polysemy* (ibid).

In dealing with this type of complementary polysemy (i.e. logical polysemy), Pustejovsky argues that "the correct sense within a logical polysemy is identified only by virtue of the context around it" (1995: 32). This claim, of course, adds nothing to the distinction of contrastive and complementary ambiguity; however, it stresses again the importance of context in specifying the correct sense of a word even in the case of logical polysemy (see the discussion in Part I). But, as Pustejovsky maintains, "[t]he biggest difference is that, while contextual priming and discourse setting helps disambiguate contrastive senses, it seems irrelevant to the issue of determining the sense of a logically polysemous noun" (ibid). Nonetheless, the difference between logical polysemy and contrastive ambiguity concerns "the manner in which the senses are related" (ibid).

Pustejovsky's distinction between these two types of ambiguity and the claims made with regard to the role of context in the disambiguation of word senses is an attempt to address a problem related to the traditional dictionary's way of listing word meanings (such dictionaries are dubbed

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but each exhibits a distinct behaviour in context. As we will see shortly when we talk about Sense Enumeration Lexicon below, Pustejovsky describes such approaches to lexical meaning as being *monomorphic*, i.e. they depend on the multiple listing of word senses, and thus lexical ambiguity is treated by multiple listing of words (cf. Pustejovsky 1995).

by Pustejovsky *Sense Enumeration Lexicons*, or *SELs* for short), in which word senses in these dictionaries are fixed in number and are static in nature; hence,they cannot account for the dynamic nature of word meaning in context, especially with respect to the case of logical polysemy.

To see how these dictionaries are inadequate for capturing the dynamic nature of word meaning, let us first consider how they are defined. For Pustejovsky, a dictionary as is a Sense Enumeration Lexicon (SEL), which is given the following characterization (1995: 34):

> A lexicon L is a Sense Enumeration Lexicon if and only if for words w in L, having multiple senses s1, …, sn, associated with that word, then the lexical entries expressing these senses are stored as $\{Ws_1,\ldots., Ws_n\}$.

In light of the definition given above, an attempt is made to analyse some cases of nominal polysemy (logical polysemy in the class of nouns) in terms of SEL representations (1995: 37). Consider, for instance, the example of *lamb* below.

(51) The *lamb* is in the field.
(52) John ate *lamb* for lunch.

Traditionally, as Pustejovsky argues, this case was treated as a simple case of sense enumeration, along the lines of contrastive ambiguity (ibid). In other words, like homonymous words with several unrelated meanings, the senses of a logically polysemous word, as in the example of *lamb* above, are listed separately, as shown below.

$$\begin{bmatrix} \boldsymbol{lamb1} \\ CAT = count\_noun \\ GENUS = animal \end{bmatrix}$$

$$\begin{bmatrix} \boldsymbol{lamb2} \\ CAT = mass\_noun \\ GENUS = meat \end{bmatrix}$$

Obviosuly, this traditional way of listing does not capture the logical relationship between $lamb_1$ and $lamb_2$. Therefore, in order to differentiate contrastive word-senses from complementary word-senses, Pustejovsky suggests a modification to the SEL, which is to store complementary senses in a single entry and to distinguish between them by sense-identification number as follows (ibid).

$$\begin{bmatrix} \textbf{lamb} \\ SENSE\ 1 = \begin{bmatrix} CAT = mass\_noun \\ GENUS = meat \end{bmatrix} \\ SENSE\ 2 = \begin{bmatrix} CAT = count\_noun \\ GENUS = animal \end{bmatrix} \end{bmatrix}$$

On this view, SEL is accordingly redefined to account for how logical polysemies are stored (1995: 38), as follows:

> A lexicon *L* is a *Sense Enumeration Lexicon* if and only if for a word *w* in *L*, having multiple senses $s_{1,\ldots,}\ s_n$ associated with that word, then:
>
> (i) If $s_{1,\ldots,}\ s_n$ are contrastive senses, the lexical entries expressing these senses are stored as $w_{s1,\ldots,}w_{sn}$.
> (ii)If $s1,\ldots,sn$ are complementary senses, the lexical entry expressing these senses is stored as $w\{s_{1,\ldots,}s_n\}$.

In principle, complementary senses should be stored as part of the same lexical entry, not as separate lexical entries. However, despite all the attempts that were made to refine the definition, Pustejovsky claims that the SEL approaches to lexical meaning are still inadequate to account for the description of natural language semantics for these three basic reasons (1995: 39):

(1) the creative use of words, i.e. words assume new senses in novel conexts,
(2) the permeability of word senses, i.e. word senses are not atomic definitions but overlap and make reference to other senses of the word, and
(3) the expression of multiple syntactic forms, i.e. a single word sense can have multiple syntactic realisation.

A full explanation of these three arguments against the SEL frameworks is given in Pustejovsky (1995; Chapter 4, pp.42-54). Nonetheless, following these three arguments , SELs are seen as "poor models of natural language semantics" (ibid), and they are only "sufficient for contrastive ambiguity" (ibid: 39).

Pustejovsky's Generative Lexicon theory is, therefore, an alternative to capture the logical relationship between senses of logical polysemy and to provide a rich, better account for lexical meaning. This is going to be explained at great length in Chapter 3.

2.4.2 Relevance Theory of Pragmatics

This section presents two recent theoretical accounts of polysemy couched within the framework of Sperber and Wilson's Relevance Theory (henceforth, RT). First, there are two

main principles: The Cognitive and Communicative Principles of Relevance. The former is defined by Sperber and Wilson (1995) as that "human cognition tends to be geared to the maximisation of relevance" (1995: 260). The latter, i.e. the communicative principle, is defined as "every act of ostensive communication communicates a presumption of its own optimal relevance" (ibid). Second, the notion of 'inferential process' along with the notions of 'optimal relevance' and 'explicatures and implicatures' are essential components for communication in that they help the speaker/hearer communicate the utterance that is most relevant and that meets their expectations of relevance with less processing effort (cf. Sperber and Wilson, 1986/1995; and Carston 2002).

The two accounts of Wałaszewska and Falkum discussed below share roughly the same principle, method, and mode of analysis. They fundamentally exploit the RT's notion of *ad-hoc concepts*, which we explain below, when looking into the issue of polysemy. By doing so, they attempt to offer a treatment of polysemy from an RT's perspective.

Let us first understand, briefly, how RT approaches the study of word meaning. Here we rely, in part, on Wałaszewska's paper to introduce some of the basic views of RT towards the study of word meaning (however, cf. Sperber and Wilson, 1995; Carston, 2002, 2010; and Clark, 2013).

According to Wałaszewska, "the relevance-theoretic approach to lexical pragmatics assumes that the concept conveyed by the use of a word does not have to be the concept encoded by that word" (2008: 124). What this means is that a word, in a given context, "might merely serve as a pointer to a concept involved in the speaker's meaning or even to the conceptual space in which the conveyed non-lexicalised concept originates" (ibid). According to Wilson and Sperber (2012: 31), "[m]ental concepts are relatively stable and distinct structures in the mind, comparable to entries in an encyclopaedia or permanent files in a database". A mental concept carries, or precisely may carry, three kinds of information: logical content, encyclopaedic or general knowledge, and lexical properties (Carston, 2002: 321).

To understand these three kinds of information stored by a concept, let us take the concept of CAT (ibid: 321). According to Carston, the concept CAT has available to it the following three components (2002: 321):

1) a logical content that contains "an inference rule whose output is ANIMAL OF A CERTAIN KIND;

2) an encyclopaedic knowledge which contains "general knowledge about the appearance and behaviour of cats, including, perhaps, visual images of cats […]"; and,

3) a lexical entry, or lexical properties that contain "the phonetic structure and grammatical properties of the word 'cat'".

However, as Carston notes, not all concepts have the three kinds of information available to them, as some concepts lack one or perhaps two of them (ibid: 322). To give an example, the disjunctive word "or" may encode a concept that lacks an encyclopaedic entry (ibid).

To use the RT's terminology, words that encode the three kinds of information mentioned above, such as *cat, dog, milk,* etc. are so-called **fully-fledged concepts**, whereas words that lack one of the three kinds of information, such as *or, my, near, etc*. are so-called **pro-concepts** (Sperber and Wilson, 1997) or **concept schemas** (Carston, 2002), i.e. not fully-fledged concepts. The difference between fully-fledged concepts and pro-concepts is that the latter (i.e. pro-concepts) have "some conceptual content, but their semantic contribution necessarily requires contextual specification for an utterance containing them to have a truth-value" (Sperber and Wilson, 1997; cited in Wałaszewska).

Lastly is the term **ad-hoc concept**. This is an online construction process that, in RT, refers to "meanings which are not lexically-encoded, but derived pragmatically by hearers in the process of utterance interpretation" (Wałaszewska, 2008: 125). Ad-hoc concepts are, in RT conventions, starred concepts, i.e. marked with an asterisk: BOOK*. The (*) on the concept is, as Carston (2012; n.2) mentions, a notational device to indicate that the concept with the asterisk is pragmatically derived and is distinct from the originally encoded concept (i.e. the semantic concept, so to say).

Further to this, an ad-hoc concept involves the process of lexical broadening or lexical narrowing, or even both of them in some situations as in metaphor, which is claimed to combine both broadening and narrowing (ibid: 126). To understand this process, let us first take the concept of lexical narrowing. Consider the noun 'bird' in the following examples (ibid: 125):

(53) a. While I looked round the room, the *bird* returned to its cage.
[birds which are kept in captivity as pets]

b. At Christmas, the *bird* was delicious.
[excludes, among others, live or inedible birds]

c. Suddenly, a large *bird* caught a mouse with its talons.
[birds of prey]

As Wałaszewska argues, the noun 'bird' in each example communicates a particular meaning or concept (the ad-hoc concept BIRD*) that is narrower in its denotation than the concept encoded by the word *bird*. To clarify this, take (53a) in which the ad-hoc concept of 'bird' has a narrower denotation and is specific to birds that are "kept in captivity as pets" (ibid). (53b) and (53c) also communicate other ad-hoc concepts with narrower denotations, which refer to edible birds and birds of prey, respectively (ibid).

As for lexical broadening (or widening), consider these examples (ibid: 125):

(54) a. I was born with a *square* mark on my foot.
[Not only perfect squares but also those which are close enough to be called square]

b. You are a *genius*!
[Not only those who are intellectually great but also those who are skilful than expected]

c. Sally is a *chameleon*.
[Not only chameleons but also people who can easily change their behaviours]

Opposite to lexical narrowing, in lexical broadening an ad-hoc concept has a broader denotation (i.e. a more general sense) than the linguistically-encoded one. Lexical broadening seems to work with linguistic devices such as approximation, hyperbole, and metaphor as is shown in examples (54a); (54b); and (54c), respectively (ibid: 125).

Now that we have introduced the basic concepts in RT and its approach to the study of word meaning, we turn to Wałaszewska and Falkum's accounts of polysemy.

2.4.2.1 Wałaszewska (2008)

Wałaszewska investigates *how* polysemy can be accounted for in RT. Her starting point for the analysis of polysemy is Sperber and Wilson's (1997) observation about certain words serving as "pointers to indefinitely many notions and concepts" (Wałaszewska, 2008: 126) and their use of the polysemous word *open*, as an example, to corroborate their claim.

In a situation where Mary says to Peter:

(55) Open the washing machine. (Sperber and Wilson, 1997: 109)

Sperber and Wilson argue that the meaning of *open* in this example can vary between Mary asking Peter to "open the lid of the machine", or to "unscrew the back", or even to "blow the

machine open", or whatever relevant to the concept of opening (ibid: 109). This, hence, suggests that the verb *open* can be used to convey an indefinite number of concepts (ibid). Further to this is the argument that it is "impossible for all of these [senses] to be listed in the lexicon. Nor can they be generated at a purely linguistic level […]" (ibid: 109). Hence, they conclude that "a word like 'open' is often used to convey a concept that is encoded neither by the word itself nor by the verb phrase 'open X'" (ibid: 110). We, nevertheless, doubt that this is a true claim. In our view, the "polysemy" of *open* is due to indeterminacy; i.e. *open* is just indeterminate with respect to the manner of opening (compare this with the example of, say, *pilot*, which is gender-indeterminate). To clarify further, we argue that *open* is genuinely indeterminate between a non-finite number of *manner* interpretations that are not necessarily all recorded in the mental lexicon, in so much as the noun *pilot* carries indefinite number of interpretations with respect to *age*, for instance. Hence, in (55) above, whatever the manner of open is, the sentence only means this: to CAUSE something to BECOME OPEN (by way of $_{manner\_1…manner\_n}$, where $_{n}$ stands for the infinite number of ways). Compare this to the meaning of *pilot*: A PERSON THAT FLIES AN AIRCRAFT, whose age is between $_{age\_n1…age\_nn}$). Thus, in neither case can this argument be valid: 'open' or 'pilot' is used to convey a concept that is neither encoded by the word itself or by the verb/noun phrase. The second point regards the complement of the verb in 'open X'. Here, we also believe that the complement *does* play a role in specifying the verb's manner; thus, the emerging senses *are*, to a great extent, generated compositionally. For example, the way of opening a car is not the same as that of opening a bottle or a folder. Non-prototypical ways of opening such as those suggested by Sperber and Wilson seem to occur in extremely marked contexts, which should not be taken as concrete evidence for their discussion of *open*.

Sperber and Wilson's conclusion about the polysemy of the verb 'open' leads Carston (2002; cited in Wałaszewska, 2008), to assume that *open* "does not encode any concept but a schema, or a pro-concept" (Wałaszewska, 2008: 127) (see the earlier definition of pro-concepts above).

Moving to her analysis of polysemy, Wałaszewska studies several types of polysemy existing in the literature, summarised below for convenience, and attempts to see if inferential routes can be "successfully applied to various types of polysemy" (ibid: 128).

1) Cruse (2000): polysemy and coerced polysemy.
2) Apresjan (1974): metaphorically motivated (irregular) polysemy and metonymically motivated (regular) polysemy.

3) Copestake and Briscoe (1995): Systematic (or conventional) polysemy, which includes two classes: constructional polysemy and sense extension. Constructional polysemy is further divided into: specialisation and broadening (see Figure 2.1 in Part I above).

Starting with Cruse's typology where he distinguishes between polysemy which describes those established senses of a word (see discussion in Part I) and coerced polysemy which describes those nonce senses of a word, Wałaszewska takes the latter case (i.e. coerced polysemy) and notes that in Cruse's example of,

(56) The *pizza* doesn't look too happy with what he's been given.

The intended meaning of *pizza* denotes a non-established sense (the person who ordered the pizza in that situation) that is "not registered in a dictionary nor it is permanently stored in the mental lexicon" (Wałaszewska, 2008: 129). From an RT point of view, she argues that Cruse's type of coerced polysemy corresponds to RT's ad-hoc concepts where meanings are not lexically-encoded but pragmatically derived (ibid).

Second are Apresjan's two types of polysemy: the metaphorically motivated (the irregular) and the metonymically motivated (the regular) polysemy. Wałaszewska takes the two examples of *foot* and *chicken* as follows:

(57) *foot*

primary 'physical' sense: 'the bottom part of a leg'

metaphorically-derived sense: 'the lower or lowest part of something', i.e. the base, such as in: the *foot* of the page/ the *foot* of the mountain

(58) *Chicken*

primary sense: 'a farm bird'

metonymically-derived sense: 'the meat of that bird'

Based on the two examples of *foot* and *chicken*, Wałaszewska argues the following:

> "It is reasonable to suppose that from a pragmatic perspective, disregarding the lexicalisation, both these types should be analysed in the same way as their source phenomena, that is metaphor and metonymy, respectively". (2008: 129).

Third, and finally, is the 'complex' typology of polysemy laid down by Copestake and Briscoe (see earlier discussion in section 2.2.2 above). Wałaszewska starts with the adjective *sad* (constructional polysemy) and cites Carston (2002) who argues that expressions such as *sad*

person, sad face, etc. are "too systematic to be part of pragmatics" (Wałaszewska, 2008: 131). However, this leads Wałaszewska to argue against Carston's remark and to claim that the pragmatic phenomena are systematic and that "these examples are not much different from the case of *open*" (ibid: 131). In arguing so, she analyses *sad* as an outcome of a lexical pragmatic process called 'concept modulation or adjustment' (ibid). Hence, she claims that the polysemy of *sad* is due to the fact that it is a pro-concept or a concept schema, not a fully-fledged concept (ibid).[32] The pro-concept SAD points to "something along the lines of RELATED IN SOME WAY TO THE FEELING OF SADNESS" (ibid). According to her analysis, the pro-concept SAD requires two things (ibid):

1) "narrowing in the direction indicated by the premodified noun", and
2) access to the "encyclopaedic assumptions associated with the concept encoded by the noun in order to infer the kind of relation in question, for example 'causing sadness', 'experiencing sadness', or 'expressing sadness'".

Moving to the second subtype of constructional polysemy (i.e. broadening), Wałaszewska takes the two examples of *foot* (Apresjan's example of the metaphorically motivated polysemy) and *cloud* (Copestake and Briscoe's example of broadening), and analyses them in light of the "combined processes of broadening and narrowing" (ibid: 131). Wałaszewska sees the two as an example of metaphor which requires both broadening and narrowing processes. Here we have two ad-hoc concepts; one is broadened, and the other is narrowed. The broadened ad-hoc concept seems, as Wałaszewska claims, to be a pro-concept, while the narrowed concept is "non-overlapping with the basic sense", i.e. the basic sense of, say, *foot* (Wałaszewska, 2008: 131). To take the example of *foot,* Wałaszewska states that the primary (basic) sense (i.e. the bottom part of the leg) gets broadened, yielding a superordinate underspecified ad-hoc concept FOOT* with the meaning 'the bottom part'. Then, this abstract sense is narrowed by the '*of* conjunct' (i.e. *of the page; of the mountain*) to give another ad-hoc concept FOOT**. The same analysis applies to *cloud* (ibid).

To summarise, Wałaszewska's pragmatic analysis of polysemy is put as follows:

1) Cruse's type of coerced polysemy (the example of *pizza*) is analysed in terms of pragmatically derived ad-hoc concepts.

[32] This, as Wałaszewska states, agrees with Carston's (2002) claim that some verbs and adjectives encode pro-concepts.

2) Apresjan's type of metaphorically motivated polysemy (the example of *foot)* is analogous to the analysis of metaphor in RT in terms of lexical broadening and narrowing. However, Wałaszewska does not offer an analysis for the second type (the example of *chicken*), but she suggests that the analysis is to be taken in light of the RT's analysis of metonymy, and that further research is required to account for this case (ibid: 132).
3) In Copestake and Briscoe's complex typology, Wałaszewska deals with the first type (constructional polysemy) and analyses the example of *sad* (the subtype 'broadening') in terms of RT's pro-concepts. The other examples of *foot* and *cloud* (the subtype 'specialisation') are analysed in light of the lexical broadening and narrowing (i.e. in the same way Apresjan's metaphorically motivated polysemy is analysed). Wałaszewska, however, does not offer an analysis for the examples of the second type (i.e. sense extension); leaving it for future research.

2.4.2.2 Falkum (2011)

Falkum (2011) is an attempt to offer a wholly pragmatic account of polysemy, specifically the type of the metonymically-motivated polysemy. In doing so, she seems to take Wałaszewska's suggestion, though she does not cite her work, and advances an RT-based account of (systematic) polysemy in light of the RT's analysis of metonymy.

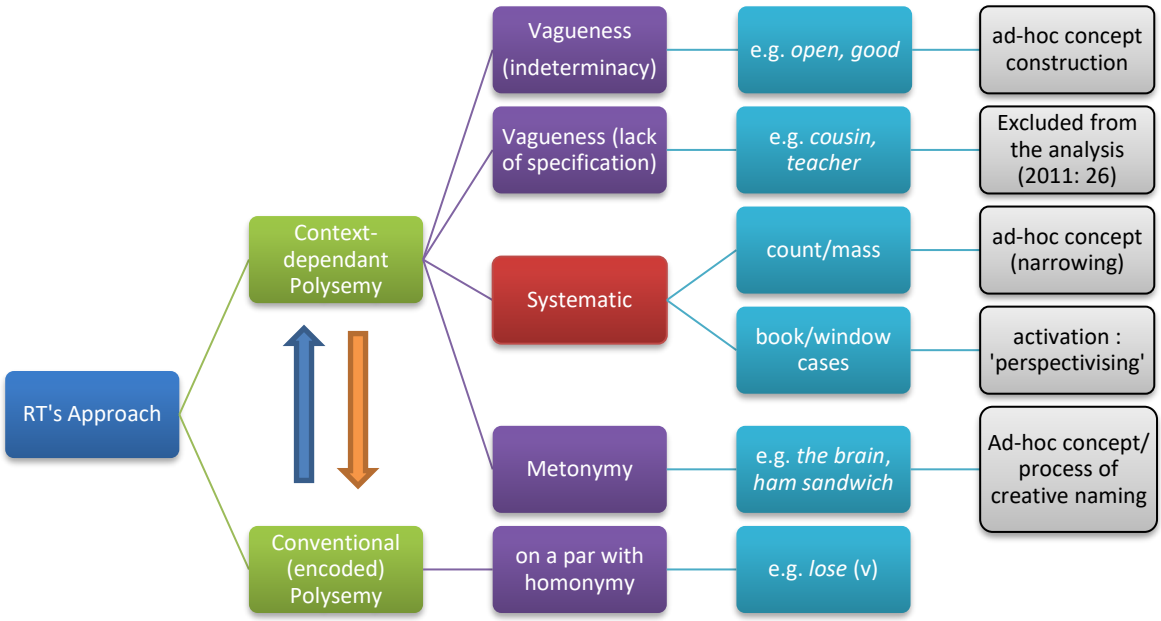
The term polysemy, in her approach, subsumes cases of conventional polysemy (lexically encoded polysemy) and contextually-derived polysemy, which includes cases of vagueness that she refers to as 'indeterminacy of meaning' (as in the examples of *open* and *good*) but does not include cases of vagueness termed as 'lack of specification' (such as *cousin*) (ibid: 26). The reason for excluding them is because there seems to be no actual modulation of the encoded meaning in context.

First of all, polysemy in Falkum's RT-based account is seen arising as a result of an ad-hoc concept inferential process, which gives two outcomes: either a concept with a narrower denotation than the lexically encoded one, or a concept with a broader denotation than the lexically encoded one. Her examples are the words *open* and *wizard,* respectively. This seems to be in line with Walaszewska's proposed analysis discussed above.

Second is the case of systematic polysemy, which seems to pose a challenge for the pragmatic analysis. Systematic polysemy in her analysis subsumes cases of the count/mass alternation and

what she calls the book/window cases. The structure of her RT's account to polysemy, along with the suggested analysis, is illustrated below for convenience.

Figure 2.4 Falkum's (2011) Relevance Theory's approach to polysemy



A few remarks about the diagram above: (i) the down arrow means that contextually-derived polysemy may at some point become conventionalised and the up arrow means that instances of conventional polysemy are also context-dependent; (ii) the term 'on a par with homonymy' means that, on the RT account, the senses of a conventional polysemous lexeme such as *lose* are represented as separate lexical entries in the same way homonymous senses are; and (iii) with respect to metonymy, it is offered and analysis which employs either the process of 'creative naming' or the notion of ad hoc concept construction.

Now, as the diagram above clearly shows, Falkum's account mainly centres on the analysis of noun alternations; particularly those alternations which rest on the count/mass distinction. The sense of systematic polysemy with which she operates is defined, originally in Nunberg (1996), as follows:

- If an expression has a use of type A, it also has a use of type A' (ibid: 148)

As she points out, and as we have shown in §3.2.4 above, this type of systematic polysemy had long been known in the literature by different names. The principal view shared amongst these

scholars is that there is a single lexical entry whose senses are generated via a set of lexical rules in the language. These rules, however, are constrained by the so-called pre-emption or blocking phenomenon. The idea of pre-emption by synonymy is originally attributed to Clark and Clark (1979) who define it in their context of denominal verbs (i.e. verbs derived from nouns, such as 'to bicycle' or 'to e-mail') as follows:

> "If a potential innovative denominal verb would be precisely synonymous with a well-established [i.e. lexicalized] verb, the innovative verb is normally pre-empted [i.e. blocked] by the well-established verb, and is therefore considered unacceptable" (1979: 798).

Here, Clark and Clark give the example of the denominal verb 'hospital', which could be seen as an innovative verb that is intended to mean 'put into a hospital'. However, because the verb 'hospitalize' is lexicalized or well-established in English and has exactly the precise sense of the innovative verb 'hospital' (i.e. synonymous), this denominal verb is then blocked or pre-empted by 'hospitalize'.

Similarly, in the context of the animal/meat alternation, the rule to generate the sense of meat from 'calf' is restricted because there exists (at least in English) the lexeme *veal* with the meaning 'calf's meat'.

Returning to Falkum's approach, she focusses on Copestake and Briscoe's typology and addresses the second type (sense extension) which is seen as a case of systematic polysemy. Remember that Wałaszewska has dealt with the first type (constructional polysemy), and here Falkum seems to complete the second half of Copestake and Briscoe's analysis from an RT perspective. Let us now turn to Falkum's analysis.

As we have already mentioned, Falkum is mainly concerned with the analysis of the count/mass nouns in Copestake and Briscoe's approach. Consider the following examples (ibid: 152-3).

(59) After a tractor had run over the body, there was *rabbit* splattered all over the yard.
(60) When the kids left, there was *cherry* all over the kitchen floor.
(61) We got quite dark from all the *sun*.
(62) That's a lot of *shopping centre* for a small town

According to Copestake and Briscoe, there is a 'universal grinding' rule (Pelletier and Schubert, 1989; cited in Copestake and Briscoe, 1995) that is responsible for creating a mass reading (unindividuated substance) from a count reading (often denoting a physical object). Further to

this rule, they posit a specialised *meat grinding rule*; a sub-type of the universal grinding rule. The meat grinding rule turns any countable noun denoting the sense of animal into a mass noun denoting the meat sense of that animal. In short, these (specialised) lexical rules are employed to make the 'regular' shift in meaning. One major advantage of such rules is that they are productive, in the sense they apply to new words entering this pattern in language. However, these rules are not unconstrained. Consider the following examples (Falkum, 2011: 154).

(63) #Joan likes to eat *calf* (veal).
(64) #We're having *pig* for dinner (pork).
(65) #Matt is preparing *sheep* for our anniversary (mutton).

The existence of synonymy in the language leads Copestake and Briscoe to talk about exceptions to the meat grinding rule. In some cases, however, they note that the derived senses can co-exist with the lexicalized synonymous forms such as *pork, veal*, etc.

On Falkum's account, all these instances of the count/mass alternations are given a wholly pragmatic account, as opposed to the linguistic approach advanced by Copestake and Briscoe, including others. Moreover, as she argues, the 'blocking' phenomenon can be explained in terms of conventions of use; that is, the use of the non-lexicalised forms in (63) to (65) (as opposed to the lexicalised ones in parentheses) can be analysed as inducing an extra processing effort that is justified by the extra contextual (cognitive) effect derived from context (ibid: 157). In other words, these non-lexicalised uses carry additional meaning that cannot be conveyed by the already lexicalised forms (for more details, see Falkum, 2011: 154-158; 180-181).

The RT-based Analysis

Falkum adopts Fodor's atomistic approach and Fodor and Lepore's (2002) view in which they see polysemy arising as a matter of how things are in the world, downplaying the lexical semantics approaches to polysemy (ibid: 160).

Count/mass and systematic polysemy

After reviewing a number of accounts to the count/mass distinction, such as these by Pelletier, Ware, Quine and others, Falkum claims that that pragmatics plays an important role in distinguishing between countable and mass nouns, or even in not making such a distinction. According to her view, the count/mass distinction has mainly either an inferential basis or a perceptual basis (ibid: 172-3). Consider the following representations of the concepts HORSE

and WATER, respectively, in which each concept is associated with three kinds of information (ibid: 170).

(66) **HORSE**

Lexical entry: +N (…etc.)
Logical entry: HORSE→ ANIMAL OF A CERTAIN KIND
Encyclopaedic entry: IS USED FOR RIDING, IS OFTEN DOMESTICATED, IS POPULAR AMONG YOUNG GIRLS, LOOK LIKE THIS [MENTAL IMAGE] …etc.

(67) **WATER**

Lexical entry: +N (…etc.)
Logical entry: WATER→LIQUID OF A CERTAIN KIND
Encyclopaedic entry: IS USED FOR DRINKING […], LOOKS LIKE THIS [MENTAL IMAGE] …etc.

Based on these representations, the distinction between countable nouns and mass nouns is captured from either (ibid: 170):

(i) the meaning postulate(s) associated with the concept (the logical entry), or
(ii) real-world knowledge of the denotation of the concept (the encyclopaedic entry).

In the first instance, the concept WATER via information in the logical entry causes tokening of the concept LIQUID OF A CERTAIN KIND, and hence it may activate the concept of UNINDIVIDUATED ENTITY via the 'spontaneous' inference LIQUID OF A CERTAIN KIND→ UNINDIVIDUATED ENTITY (ibid: 172). The same mechanism applies to the concept of HORSE. Hence, if the distinction between individuated and unindividuated entities is inferred from the logical entry, the distinction has an inferential basis; Falkum claims (ibid).

In the second instance, the distinction between individuated and unindividuated entities (such as *horse* and *water*) can be established via the information stored in the encyclopaedic entry which contains 'imagistic representations' of the entities in the world, i.e. prototypical instances of a concept. On this view, the distinction is argued to have a perceptual basis; Falkum claims (ibid: 173).

The book/window cases

These are given the following description:

> "a set of cases that seem to involve a regular alternation between distinct senses, but where the intuition is that the senses (somehow) belong to a single conceptual unit, and

where there is no syntactic/morphological difference corresponding with different senses" (2011: 182).

Given that description, Falkum suggests a possible account for them that is based on the idea of **perspectivising**. The idea of *perspectivising* is directly borrowed from Cruse's notion of *perspectives* or *ways of seeing*. It also principally mirrors Langacker's *active zones* and Evans' *highlighting*. We discuss this point further when we present Evans' LCCM theory in the next section.

2.4.2.3 A comparison between Wałaszewska and Falkum's analyses

Here we provide a summary of Wałaszewska and Falkum's RT-based analyses of polysemy. Consider the table below.

Table 2.2: Wałaszewska and Falkum's analyses: A comparison

Typology	Examples	Wałaszewska (2008)	Falkum (2011)
Metonymic polysemy (Sense extension)	*Animal/meat: Chicken*	RT's metonymy (disregarding the lexicalisation)	Ad-hoc concept (narrowing)
Metaphoric polysemy	*Foot/ mouth*	Lexical broadening and narrowing	Ad-hoc concept
Constructional polysemy: 1. Broadening 2. Specialisation	*Foot* *Good, sad*	Lexical broadening and narrowing Pro-concept (concept modulation or adjustment)	Ad-hoc concept Ad-hoc concept (narrowing)
Coerced polysemy	*Pizza, ham sandwich*	Ad-hoc concept	Creative naming/ Ad-hoc concept (neither narrowing nor broadening)
Metonymy (proper names and coerced polysemy)	*Pentagon/Woolf*	-	Creative naming/ Ad-hoc concept (neither narrowing nor broadening)
The *book/window* polysemy	*Book, window* *school, newspaper*	-	Perspectivising/pro concept Ad-hoc concept
Prepositional polysemy[33]	*over*	-	Pro-concept (2011: 144)

Table 2.2 summarises the findings of Wałaszewska and Falkum's analyses of the polysemy phenomenon within the Framework of Relevance Theory. There are several points to clarify, however. The first point is about the different polysemy types in column 1 in the table. As we noted earlier, Wałaszewska looks at polysemy in the classification provided by Apresjan, Cruse and Copestake and Briscoe. Thus, metonymic and metaphoric types of polysemy refer to Apresjan's (1974) proposed distinction, while constructional polysemy and coerced polysemy are the kinds proposed by Copestake and Briscoe (1995) and Cruse (2000), respectively. Metonymy is the phenomenon investigated in Falkum's work, which covers coerced polysemy, but we separate it in the table from coerced polysemy because the examples of *Pentagon*, for instance, are different from that of *pizza* (see our earlier discussion of nonce expressions and

[33] Falkum offers a short, tentative analysis of the prepositional polysemy type that benefits from the Principled Polysemy approach we present in the next section. She believes, however, that prepositions encode some conceptual content or "instrumental or relational meaning" that necessarily requires context specification.

facet nouns in Part I). The last type is what Falkum calls the *book/window* polysemy, which includes some examples that Cruse (2000) describes as facets. Prepositional polysemy is not a major topic in Falkum's study, but we include it here to show the range of the polysemy types that both Wałaszewska and Falkum highlighted in their works.

The second point concerns Wałaszewska and Falkum's analyses of the different phenomena. As observed, there exist some discrepancies between the two accounts. On the one hand, the differences lie in the proposed analysis for the polysemy types of specialisation and coerced polysemy, at least. For Wałaszewska, Copestake and Briscoe's examples of specialisation are explained in RT in the light of the notion of pro-concepts or concept schemas. That is to say, they are underspecified in meaning and serve as a pointer to other concepts. As for Falkum, however, the examples of this polysemy kind are analysed as instances of lexical narrowing. As regards the coerced polysemy type, Wałaszewska only hints at analysis in terms of the process of ad-hoc concept construction, but she does specify whether there is lexical narrowing or broadening involved in the process. Falkum's, however, takes a different approach to the analysis, suggesting two ways to analyse this phenomenon: either by the process of creative naming or as an instance of ad-hoc concept. Nonetheless, the similarities can also be noted. For example, instances of the metonymic polysemy (such as the *animal/meat* pattern) are analysed in the light of the narrowing process of ad hoc concept construction.

The third point concerns the notion of the RT's ad-hoc concept in both Wałaszewska and Falkum's accounts. On Wałaszewska's account, an ad-hoc concept is defined as an online construction that involves either narrowing or broadening of the linguistically encoded concept. On Falkum's account, especially with respect to metonymy and coerced polysemy, an ad-hoc concept is an entirely different concept, which involves neither narrowing nor broadening of the linguistically encoded concept (for more details, cf. Falkum, 2011: Chapter 6).

2.4.3 Cognitive Linguistics

In cognitive linguistics, the widely-discussed example of polysemy is the preposition 'over', which is assumed to cover a wide range of meaning variations, depending on the context in which it is used (for example, see Lakoff 1987; Tyler and Evans 2003; and Evans and Green 2006). Nevertheless, the two approaches studied here consider polysemy not only in the word class of prepositions but also in the other lexical categories, namely nouns and verbs.

In the next sub-sections, we present two recent cognitive linguistics approaches to polysemy, especially the Principled Polysemy approach and the Theory of Lexical Concepts and Cognitive Models (the LCCM), which are advanced by Tyler and Evans (2001b) and Evans (2006, 2009), respectively.

2.4.3.1 The Principled Polysemy Approach

This approach is claimed to tackle the problem of Lakoff's (1987) full-specification approach that 'exaggerates' the number of distinct senses a particular lexical item has (Evans and Green, 2006: 328-9). The Principled Polysemy approach comes, as is argued, to constrain the number of distinct senses associated with a single word (ibid). It was first introduced by Tyler and Evans (2001b, 2003) in an attempt to account for the semantics of English prepositions, with a particular focus on the preposition 'over'. Evans (2004a) claims to take the approach further by investigating polysemy in the class of nouns (the case of the polysemous noun *time*). Later, it has been also argued that the approach goes beyond the study of prepositions by looking at lexical items in all other word classes (Evans and Green, 2006: 348). In short, the Principled Polysemy approach is assumed to apply to all lexical classes (ibid).

The approach is based on 'decision principles' and aims to achieve these two goals: (1) to determine what counts as a distinct sense and distinguish between sense stored in semantic memory (polysemy) and context-dependent meanings constructed 'on-line' (vagueness), and (2) to establish the prototypical or central sense associated with a particular radial category (Evans and Green, 2006: 342). We only discuss the first goal which concerns the notion of *sense distinction* (for more, however, consult Evans and Green, 2006).

For the first objective, which is to determine what counts as a distinct sense, the following three criteria are proposed, particularly in relation to the discussion of the polysemy of the noun *time* (ibid: 348):

1) The meaning criterion: For a sense to count as distinct, it must contain additional meaning not apparent in any other senses associated with lexeme *x*. That is, a distinct sense must add 'extra' meaning.
2) The concept elaboration criterion: For a sense to count as distinct, it should project distinct patterns of concept elaboration. Concept elaboration relates to *semantic selection restrictions* which determine how the lexical concept can be metaphorically structured and thus elaborated at the linguistic level. In other words, this criterion concerns "which

lexical items are selected to appear in a syntagmatic or collocational relationship with the lexeme [*x*]" (Evans, 2005: 41).

3) The grammatical criterion: For a sense to count as distinct, it must exhibit distinctive grammatical behaviour. That is, it has to appear in unique grammatical constructions.

To apply, let us take the motion verb *fly* (ibid: 351) and see how it has been analysed in the light of the three criteria mentioned above. Consider the following examples (ibid: 351; numbering as in original).

(68) a. The plane/bird is flying (in the sky).

b. The pilot is flying the plane (in the sky).

c. The child is flying the kite (in the breeze).

d. The flag is flying (in the breeze).

1. *The meaning criterion*

As is argued, each reading of *fly* in (68) is distinct, i.e. each instance of *fly* has a unique meaning, resulting in *fly* having distinct senses. For example, in (68a) the meaning of *fly* represents "SELF-PROPELLED AERODYNAMIC MOTION and entails absence of contact with the ground", whereas it represents an "OPERATION BY AGENT OF ENTITY CAPABLE OF AERODYNAMIC MOTION" in (68b), a "CONTROL OF LIGHTWEIGHT ENTITY BY AGENT (for example, using an attachment like a piece of string, with the result that it remains airborne)" in (68c), and finally, the meaning of "SUSPENSION OF LIGHTWEIGHT OBJECT (like a flag, with the result that it remains extended and visible)" (ibid) .

What is, then, clear following the meaning criterion is that each sense of *fly* in these examples has a distinct meaning that is not shared with the other instances or senses of *fly*.

2. *The concept elaboration criterion*

For the senses of *fly* to be counted as distinct in each instance above, they must appear in distinct patterns (ibid). In these examples, we notice that, semantically, the arguments required for each instance of *fly* are distinct. For example, in (68a), the semantic argument of 'fly' is only relevant to "entities that are capable of self-propelled aerodynamic motion". This is evidenced by the following ungrammatical example where the entity is not self-propelled (ibid):

(69) **the tennis ball is flying in the sky*

For (68b), the semantic argument of this sense is only applicable to AGENT-operated entities which "can undergo self-propelled aerodynamic motion". As Evans and Green argue, this explains "why planes and hot air balloons are compatible with this sense" while non-AGENT-operated entities are not, such as 'sparrow' in the following example (ibid):

(70) ?? He flew the sparrow across the English Channel.

For (68c), the semantic argument of this sense is "restricted to entities that are capable of becoming airborne by turbulence and can be controlled by an AGENT on the ground". This explains why *kites*, for instance, are licensed by this sense.

Finally, with regard to (68d), the semantic argument of 'fly' must be of the type of "entities that can be horizontally extended by virtue of air turbulence yet retain contact with the ground by virtue of remaining physically attached to another (non-agentive) fixed entity". Other examples of entities which can be licensed by this sense are *hair* and *scarves*, as Evans and Green mention.

3. *The grammatical criterion*

As defined earlier, this criterion stipulates that *fly* must exhibit a distinctive grammatical behaviour. This distinct grammatical behaviour is, as evident in these examples, linked to the notion of **transitivity.** The verb *fly* in (68a, d) has an intransitive use which is distinct from the transitive use of *fly* in (68b, c).

Nonetheless, most recently, Evans (2015: 122) states that the Principled Polysemy approach is 'too simplistic' in arguing for multiple distinct sense-units being stored in semantic memory (the polysemy view, as opposed to Ruhl's (1989) monosemy view). In claiming so, Evans believes that his theory of LCCM (discussed below) provides a better account of lexical representation and semantic composition, and facilitates an account of polysemy, to which we now turn.

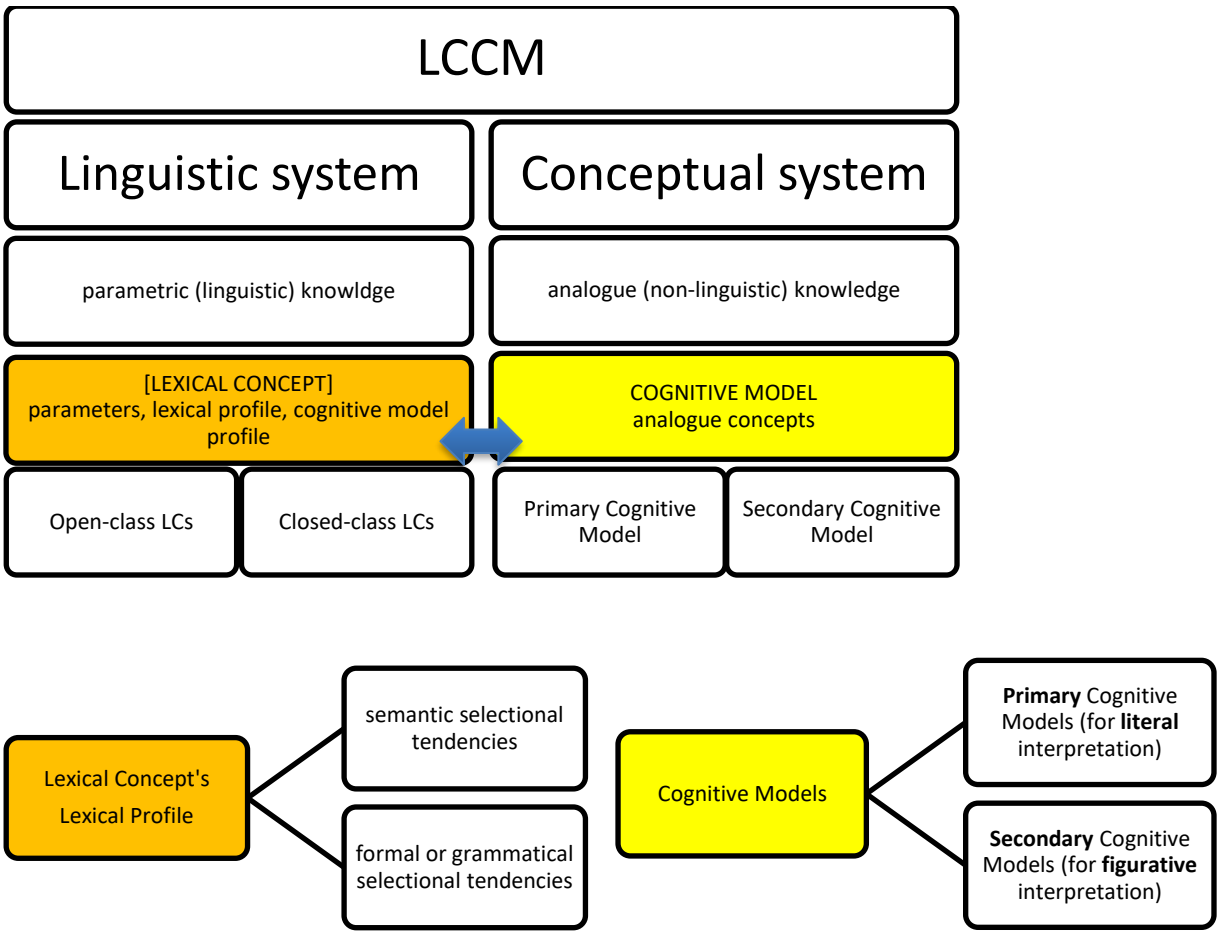
2.4.3.2 The LCCM Approach

The theory of Lexical Concepts and Cognitive Models (LCCM) is due to Evans (2006, 2009). It is a theory of lexical representation and semantic composition (ibid), which is mainly based on "the distinction between its two foundational theoretical constructs—the lexical concept and cognitive model"[34] (2015: 103).

[34] Evans' distinction between lexical concept and cognitive model reminds us of Pustejovsky and Anick's original distinction between *L-system* and *C-system* (i.e. the linguistic system and the conceptual system, respectively) (see Pustejovsky and Anick, 1988).

The theory can be summarised as follows: there are two fundamental components (constructs) of which the theory is made: the lexical concept which corresponds to the linguistic system, and the cognitive model which corresponds to the conceptual system. These two systems (the linguistic and the conceptual) play distinct but complementary roles in the process of meaning construction (2015: 103). The architecture of the LCCM theory can be roughly sketched as follows:

Figure 2.5 The architecture of Evans' LCCM Theory



Without going into details of the theory (however, see Evans 2015: 103-8), the LCCM is assumed to provide an account for the three types of polysemy mentioned in Evans (2015). These three types are the *conceptual polysemy*, *lexical polysemy*, and *inter-lexical polysemy*[35].

Conceptual Polysemy

Conceptual polysemy is, according to Evans, a type of polysemy which arises from the encyclopaedic or "non-linguistic knowledge to which words facilitate access" (2015: 100). It is

[35] Here we are only concerned with the discussion of the first two types of polysemy: conceptual polysemy and lexical polysemy. However, for a detailed discussion on the third type, see Evans (2015: 112-3).

also defined, in Evans' words, as the "construal of linguistically-mediated sense-boundaries" (2015: 110). An example representing type is the noun *book*, as is given below (ibid: 100).

Phenomenon 1:

(71) a. That's a heavy book. 'tome'

b. That antiquarian book is illegible. 'text'

c. That's a boring book. 'level of interest'

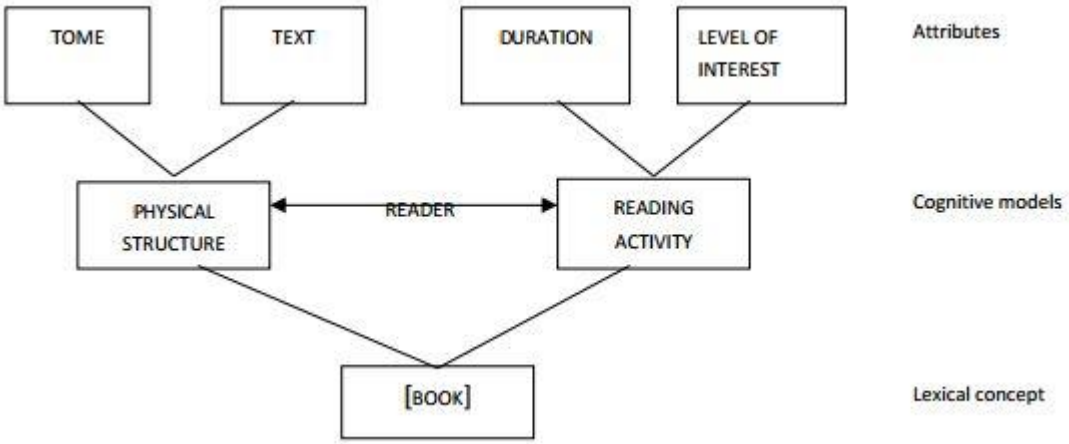
d. That's a long book. 'duration'

Each instance of *book* in these examples gives a distinct reading, as shown in the second column next to each example. The argument made here is that these different readings of *book* (tome, text, etc.) are a result of the 'activation' process. This process of 'activation' represents the similar case of *active zones* in Langacker (1987, 2000), in which this phenomenon is explained as such that part of the conceptual representation of, say, *book* is activated during language understanding. The active part is triggered by the linguistics context (ibid: 101).

Within the LCCM, Evans explains that "polysemy of this sort is a consequence of differential activation of regions of the cognitive model profile—the vast semantic potential—to which the lexical concept [BOOK] facilitates access" (2015: 109).

Given the basic outline of the LCCM theory above, one can easily imagine how the lexical concept [BOOK] interfaces with the cognitive model, and how certain aspects of that model are being activated; thus, resulting in the specific readings of *book* being 'highlighted' in these contexts given in (71). The focus here clearly concerns the 'cognitive model' construct in the LCCM theory. Consider the following illustration (2015: 109).

Figure 2.6 The relationship between lexical concepts, cognitive models, and attributes



With respect to the figure above, we have to overlook some theory-related details, such as that the two cognitive models of PHYSICAL STRUCTURE and READING ACTIVITY are related by virtue of READER (for further details, see Evans, 2015: 109). Nonetheless, as for the LCCM's analysis of *book* in (71), the interpretation of *book* in the sentences (71a-d) depends on which cognitive model is activated by the lexical concept [BOOK]. For (71a) and (70b), the two readings of *book* (i.e. the *tome* and *text*) are accessed via the PHYSICAL STRUCTURE cognitive model, whereas the readings of *level of interest* and *duration* in (71c and d) are accessed via the activation of the READING ACTIVITY cognitive model. In both cases, each cognitive model activates the attributes associated with it. Thus, after the activation of the required cognitive model and its attributes, the relevant attribute, which is required for the distinct interpretation of *book* in each sentence, is highlighted (ibid: 110).

On a side note, the LCCM theory assumes, at least, two cognitive models associated with a lexical concept: Primary cognitive models and secondary cognitive models. Secondary cognitive models can have further secondary models, too. (ibid: 106). As he mentions, literal interpretation activates the primary cognitive models while figurative interpretation involves activation of the secondary models (ibid: 108). As regards the example of [BOOK], and in relation to Figure 2.6 above, we have to mention that the two cognitive models laid down by Evans must be primary (see LCCM's architecture above), which are involved in the literal interpretation of these utterances. The figure above shows no secondary cognitive models, however. Evans, instead, calls these (what are supposed to be secondary) levels, in this case of [BOOK], *attributes* of primary cognitive models. These attributes are what the cognitive models consist of, and they are

defined as "a large, detailed, but structured, body of knowledge" (Evans, 2015: 109). But, still, Evans offers no explanation as to why they are not called secondary cognitive models (ibid).[36]

However, in terms of the *distinctness of senses* involved in the type of conceptual polysemy, Evans says that "…we would not want to say, presumably, that *book* has distinct, conventionalised word-senses" (2015: 109).

Lexical Polysemy

Lexical polysemy describes the type of polysemy which arises from "distinct, albeit related, conventionalised sense-units associated with the same linguistic form" (2015: 100). This phenomenon is illustrated by the examples below (ibid).

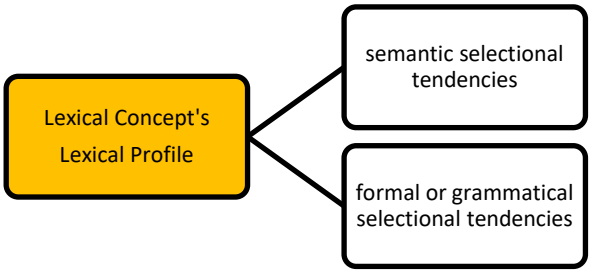
Phenomenon 2:

(72) a. The kitten is in the box. 'spatial'
b. The cow is in milk. 'physiological state'
c. The girl is in love. 'psycho-somatic state'
d. He's in banking. 'mode of employment'

The example shows different readings of the preposition *in*. This example looks somewhat similar to that of *book* in the previous discussion, in that each sentence in (72) records a distinct reading/meaning of *in*. However, the argument is not the same. Evans mentions that each reading/meaning of *in* in (72a-d) is distinct and conventionalised (ibid: 110). That is, we have here distinct, conventional lexical concepts, but not a single lexical concept as in the case of conceptual polysemy (ibid).

What is crucial and relevant to the discussion of this type is the 'lexical concept' construct of the LCCM theory (ibid). Hence, the focus here is on the lexical concept, specifically its *lexical profile* (see below). The lexical profile of a lexical concept is important here, insofar as the term 'distinct' is concerned, because the "hallmark of a distinct (=conventionalised) lexical concept is that it has a unique lexical profile" (ibid: 110).

[36] Perhaps, the reason is that we are talking about attributes of real books, not figurative ones.



As is clearly shown in the diagram above, the lexical profile of a lexical concept specifies *selectional tendencies* (restrictions); these are semantic and formal/grammatical selectional tendencies, as suggested by Evans. What this means is that "part of what we know about any given lexical concept concerns the other symbolic units [such as a word] that it habitually co-occurs with" (ibid: 110). In other words, part of knowing the meaning of a lexical item, such as the preposition *in* in these examples, includes knowing the syntagmatic/collocational patterns or constructions, as well as the semantic arguments with which this preposition occurs (ibid).

Thus, insofar as the examples in (72) are concerned, we notice the following:

In terms of the formal selectional criterion of the lexical profile associated with each lexical concept (SPATIAL, PHYSICAL CONDITION, STATE, and MODE OF EMPLOYMENT), it is the same for each. That is, every example in which 'in' occurs has the same grammatical structure, which consists of sentential subject and a noun-like object (ibid: 111). However, the difference is tied to the semantic selectional criterion. For example, the semantic argument for the object in each instance is different. In (72a) 'the box' refers to a physical entity which serves as a container and in which the subject 'the kitten' is contained, so it is a relation of physical containment. In (72c), however, 'love' refers to what Evans calls a psycho-somatic state, in which the relation established by 'in' between the subject and the object is that of 'immersion' rather than 'containment' (ibid).

Hence, the distinction manifested by the semantic selectional criterion, alone, leads to distinct senses associated with the preposition 'in'. In this context, it is also important to mention that a "successful application of one of the two criteria [of the lexical profile of a lexical concept] will normally be sufficient to point to the likelihood of a distinct lexical concept" (ibid: 111).

Overall, this LCCM-based analysis points out that each occurrence of *in* is distinct, i.e. conventionalised; hence, the preposition is polysemous rather than monosemic (for further discussion, see Evans, 2015: 111-112).

2.5 Part II: Discussion and Summary

In Part II we presented three theoretical accounts to polysemy. These included Pustejovsky's GL, Wałaszewska and Falkum's RT-based accounts, and Tyler and Evans' PP and Evan's LCCM cognitive-based approaches. The aim of this section is to discuss these several accounts within and in relation to the primary topic of this study, systematic (or regular) polysemy. However, as we noted earlier in section 2.4.1, we leave the detailed, technical discussion of Pustejovsky's GL to the next chapter, where the merits as well as the limitations of the theory are considered; hence, only general remarks in relation to the other proposed accounts will be made.

We have seen how the various projected typologies in Part I were analysed from different perspectives, in different theories. Firstly, in the RT-based approaches, the general phenomenon of polysemy is given a unified treatment and is considered the outcome of the single process of ad-hoc concept construction (cf. Falkum, 2011). One of the advantages of these RT-based accounts concerns the range of the polysemy phenomena they address. As noticed, the various polysemy types presented in Part I are discussed and offered explanation in RT. However, there are still cases that are not attempted an explanation or analysis (e.g. the causative/inchoative alternations in Pustejovsky's classification). We expect these examples to be offered an analysis in the light of ad-hoc concept construction, as the process seems to apply to virtually every content word, but at the same time doubt the usefulness of such a process to a phenomenon that is purely linguistic in nature. The other significant advantage which can be derived from the first one is the flexibility of the theory in accommodating the different polysemy phenomena, with the power to explain them. This is one of the major points, as we shall discuss in the next chapter, which has been advanced against the GL theory. However, there might be some problems associated with the RT accounts. The first problem is that reducing polysemy to a single general process of ad-hoc concept construction, which is not in itself a disadvantage, might miss several generalizations, especially in relation to the regular polysemy type. For example, how can the regularity between word-senses be captured given the fact that the process of ad-hoc concept construction applies virtually to every content word? One possible answer to this, however, is to assume the existence of lexicalized pragmatic routes or patterns, to which the process applies

(e.g. the container-content pattern). If that is the case, then is the process of ad-hoc concept construction recursive or is it just a one-off, occasion-specific process? And what about the processes of *creative naming* as well as *perspectivising;* are they different processes or just sub-processes of the main process of ad-hoc concept construction? The second problem is: how is it possible to distinguish 'pragmatically' between established and non-established word-senses? On this theory, this problem does not exist because polysemy is automatically resolved in communication; hence, such a distinction is at best a distraction. The third problem, which is more empirical than theoretical, is that it would be extremely difficult, in the absence of such distinctions, to formalize a system that could possibly benefit NLP applications.

Secondly, as regards the cognitive linguistic approaches to polysemy, we have shown that Tyler and Evan's PP approach is an alternative to Lakoff's (1987) full-specification approach, and it is believed to address polysemy in all lexical categories. The model is based on *decision principles* whose primary function is to help 'decide', *inter alia*, whether or not a particular lexeme in language has distinct senses. The three criteria we discussed were: the meaning criterion, the concept elaboration criterion, and the grammatical criterion. Although these criteria are important in determining what counts as a case of polysemy, it is still not clear to us if they must be taken altogether or if only one or two of them will suffice. The reason is that some lexemes belonging to the class of nouns, for example, do not necessarily have to appear in distinct grammatical structures (e.g. nouns of the container-content pattern). Moreover, if these criteria are a matter of either/or, then the meaning criterion, for example, would be self-sufficient, which means that the three criteria can be reduced to one. But this would have a self-destructive effect in that it would face the same problem associated with Lakoff's account. Nevertheless, as Evans (2015) pointed out, the PP model is too simplistic to argue for the notion of *sense distinctiveness* in relation to polysemy. These are not the only disadvantages of this model; there are several others discussed below in relation to the LCCM theory.

The second cognitive-based approach to polysemy is Evans' (2015) new LCCM model. In his account, Evans distinguished between three types of polysemy: The conceptual polysemy, the lexical polysemy, and the inter-lexical polysemy (which we excluded from the discussion). As regards conceptual polysemy (which is argued to arise non-linguistically), it seems to us that this type parallels Cruse's *facets of meaning* and perhaps Pustejovsky's *logical nominal polysemy* presented in Part I, as Evans discusses the example of *book* only, in which he views the polysemy involved in this case as a consequence of different activation of regions of the

cognitive model profile. The lexical polysemy type (the example of the preposition *in*), on the other hand, arises as a result of having a single lexical item with multiple, distinct and (possibly) conventionalised senses (i.e. lexical ambiguity). On this model, as we have shown, conceptual polysemy depends on the process of 'activation', which is triggered by the linguistic context (see earlier discussion in 2.4.3.2). The matter with lexical polysemy, however, is different because the meaning of a polysemous word depends on the linguistic context in which it occurs. But, although the distinction between conceptual and lexical polysemy may sound appealing, we do not see how important it is for the study of regular polysemy, at least. Evans does not apply any linguistic tests for ambiguity (e.g. the *copredication* and *pronominalization* tests) to corroborate his assumptions, though he seems to be aware of them. Thus, in our view, his theory would fail to account for the zeugmatic interpretations as well as the idiosyncratic behaviours involved in the use of many examples of the conceptual polysemy type—to use his terminology— (e.g. *ham sandwich*, some nouns of the animal/meat pattern such as *cow*, for instance). Moreover, what about the issue of sense lexicalisation? Do we need to assume that, like the analysis given for *book*, words of the conceptual polysemy type do not appear to have distinct, conventionalised senses? If that is the case, then why the zeugma arises in some attested uses involving the use of similar nouns, such as *newspaper*, for instance? The second point relates to regular polysemy in the word class of verbs. The LCCM offers no insights on how logically polysemous verbs (e.g. the causative/inchoative alternation) are accounted for in this model. Do they belong to the class of conceptual polysemy or lexical polysemy; or, do they have a distinct polysemy class in their own right?

In summary, we have so far shown that neither the RT-based proposals nor the cognitive linguistics-based models seem to offer a complete account for the class of regular polysemy as explored in Pustejovsky (1995) at least. Pustejovsky's GL theory, which we shall introduce in the next chapter, offers a comprehensive, cross-categorial treatment for the class of logical polysemy, although the theory itself has its own limitations, as we shall also point out.

2.6 Conclusion

This chapter comprised two well-defined parts. Part I was mainly devoted to bringing an up-to-date coverage on the literature of polysemy and to presenting the recent theoretical approaches to the topic, mainly in pragmatics and cognitive linguistics. The second aim of this part was also to show how systematic polysemy compares to or differs from the other cases of polysemy. To summarise briefly, in homonymy, a lexeme has two (or more) unrelated meanings that happened to

share only one phonological form (e.g. *bank*). The relationship between senses of a homonymous word, therefore, is deemed lacking a conceptual connection. Thus, typically, they are listed separately in dictionaries as different entries. For the polysemy case, however, we have a lexeme whose meanings/ senses are both distinct and related. Here we distinguished between two major types of polysemy, namely the regular and the irregular. Irregular polysemy is metaphorically motivated, and it is closer to homonymy since it does not follow a general pattern in the language; i.e. unpredictable. On the other hand, regular polysemy is predictable by rules in the language. This is manifested in the examples of, say, the container-content pattern such as book, bottle, etc.

In Part II of this chapter, some theoretical frameworks were discussed and evaluated. These mainly included the Relevance Theoretic accounts of Wałaszewska (2008) and Falkum (2011), and, within the province of cognitive linguistics, Tyler and Evans' (2001b, 2003) theory of Principled Polysemy and Evan's (2015) LCCM theory. As it was discussed in Part II, although these theories attempt to provide a detailed account of the polysemy phenomenon, they still have some gaps, especially in relation to regular polysemy. As we pointed out, the regular polysemy in the lexical category of verbs and adjectives is not addressed.

Chapter 3 The Generative Lexicon

3.1 Introduction

This chapter introduces the theory of the Generative Lexicon (henceforth the GL). The GL was proposed by James Pustejovsky in the early 1990s and was later codified in 1995. Characterised as a computational system, the GL aims to provide "a formal statement of language that is both expressive and flexible enough to capture the generative nature of lexical creativity and sense extension phenomena" (Pustejovsky, 1995: 61). In other words, the theory posits a principled way of accounting for the polymorphic nature of word meaning, particularly the phenomenon of *logical polysemy*, which, as we already saw in the previous chapters, is broadly defined as "… the ability of a lexical item to shift its meaning in context…" (Pustejovsky and Busa, 1995: 161).

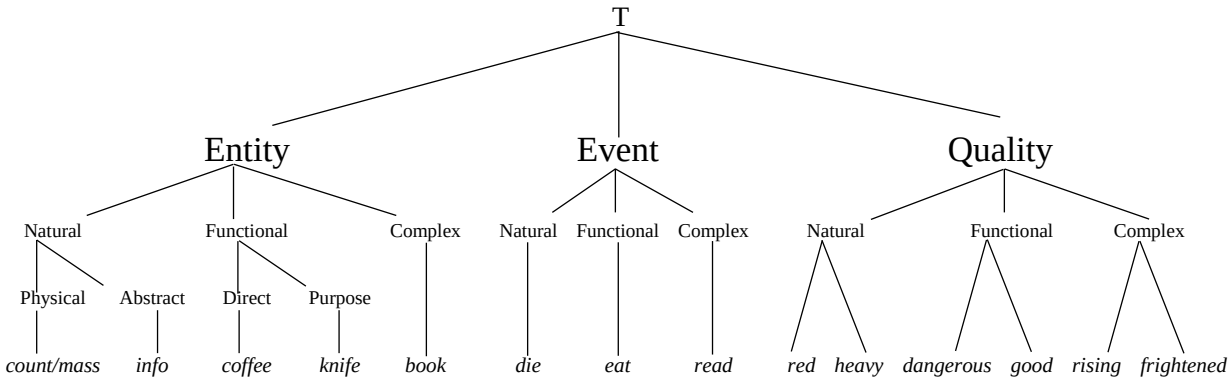
The chapter divides into five main sections. Sections two and three introduce the tenets of the GL system and discuss the four GL representation levels for a lexical item. Section four, then, provides the generative mechanisms that are needed to connect the four levels and that work to explain the compositional nature of word meaning. Section five presents two main critiques advanced against the GL. Finally, section six reflects on these critiques and argues, with particular reference to the two main issues of *newspaper* and *good*, that such objections are mainly based on misunderstanding and misreading of the GL theory.

3.2 The Lexicon of the Generative Lexicon

The GL lexicon, which is a repository of lexical listings containing rich lexical information, is a dynamic (open-ended) lexicon that is constantly updated (Pustejovsky, 1995; 2013). In other words, in contrast to traditional lexicons, it is not just a fixed or 'frozen' list of lexical entries.

Moreover, The GL lexicon is ontology-based, i.e. concepts in the lexicon are represented according to defined categories or ontological types. Consider Figure 3.1 below.

Figure 3.1: Tripartite Concept Lattice—Pustejovsky (2001)



As is shown, concepts are structured into three main domains: entities, events, and qualities. Each domain is further structured into types. Hence, as a type-based system, The GL mainly relies on the distinction between three different types. These are (Pustejovsky 2001, 2013) (one should ignore the discussion about 'qualia roles' for the moment; we return to discuss them in the next section):

(1) **Natural (or simple) types**: these are natural kind concepts (or natural kinds, for short) which make reference only to the FORMAL and CONST qualia roles. Examples include *rock, weather, wolf, woman, tree,* etc.

(2) **Artefactual (or unified) types**: these are concepts making reference to purpose or function (i.e. the TELIC qualia role). Examples include *knife, coffee, house*, etc. These are made from natural types to assume a purpose or function. That is why they are also called *functional types*.

(3) **Complex (or dot object) types**: these are concepts making reference to an inherent relation between types. Examples include *book, newspaper,* etc. This type will be relevant to explaining logical polysemy. The complex type is created by a type constructor known as the *Lexical Conceptual Paradigm* (*lcp*), which is seen as "the lexicalization of a number of distinct semantic types into one lexical form" (Pustejovsky, 1995: 133). According to Asher and Pustejovsky, the complex type is "introduced to explain *copredications* in the context of polysemy" (2013: 43). To clarify further, dot objects may occur wherever the qualia structure of a word (which we explain below) contains information about the different manifestations of the denotation of that word that are distinct. They allow referring to an object that has more than one manifestation without contradiction. If there were no dot objects in the GL system, what we

would have is essentially a sense enumerative lexicon; hence, their importance in the theory. We return to elaborate further on complex types in section 3.3.3.1 below.

While each type in the lexicon represents the level of information (lexical) knowledge associated with a lexical entry in the lexicon, the *natural type is* the simplest type from which the other types are derived or constructed (cf. Pustejovsky, 2001).

3.3 Representation Levels

The GL enterprise is set out as an attempt to give a better account, with the aid of computational tools, to these issues in lexical semantics (1995: 5):

a) The *polymorphic nature* of language.

b) The *semanticality*[37] of natural language utterances.

c) The *creative use of words* in novel contexts.

d) The *co-compositional* semantic representation.

In Pustejovsky's view, these four issues (or properties) are of crucial importance to any theory about lexical semantics. The first point relates to the fact that, as we have shown before, word meaning is not static in nature; a word can have multiple related senses in different contexts. Thus, the assumption in the GL is that there is no need to create a separate lexical entry for every distinct sense. The second point, which is about the notion of *semanticality*, defines the fact that expressions in language have to be semantically well-formed; in a similar view to the notion of *grammaticality* (we clarify this notion of semanticality further when we discuss *type coercion*, for instance). The third point is that the theory must be able to account for the novel word senses that arise in context. As regards the last issue, which is about *compositionality*, it describes how the meaning of an expression is determined by its structure and the meanings of the other words (constituents) with which it occurs.

To achieve these goals, the GL comprises four levels of linguistic representation; also called the *interpretive levels* (Pustejovsky, 1995: 61), which are as follows (ibid: 61; 85):

1. **Argument Structure:** this specifies the number and type of logical arguments, and how they are realized syntactically.

[37] The notion of **semanticality**, according to Pustejovsky, is "analogous to the view of grammaticality…but ranging over semantic expressions rather than syntactic structures" (1995: 40).

2. **Event Structure:** this defines the event type of a lexical item and a phrase. It also includes sorts of an event such as STATE, TRANSITION, and PROCESS.
3. **Qualia Structure:** it includes modes of explanation (or *generative factors*), composed of FORMAL, CONSTITUTIVE, TELIC, and AGENTIVE roles.
4. **Lexical Inheritance Structure:**[38] it identifies how a lexical structure is related to other structures in the type hierarchy (or type lattice), and its contribution to the global organization of a lexicon.

In what follows, we explain the first three structures separately.

3.3.1 Argument Structure

The Argument structure is a necessary component for the semantic representation of a lexical item. It contains four types of arguments (for verbs) (ibid: 63): *true arguments*, *default arguments*, *shadow arguments*, *and true adjuncts*, schematically represented as:

(1)
$$\begin{bmatrix} \boldsymbol{\alpha} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \cdots \\ \text{ARG2} = \cdots \\ \text{D} - \text{ARG1} = \cdots \\ \text{S} - \text{ARG1} = \cdots \end{bmatrix} \end{bmatrix}$$

The above schema shows that the arguments for (α) "are represented in a list structure where *argument type* is directly encoded in the argument structure, ARGSTR" (Pustejovsky, 1995: 67). The ARG1 and ARG2 are called ***true arguments***, which must be realised in the syntax (syntactically realised); the D-ARG1 is the ***default argument*** that is not necessarily syntactically realised but is fundamental for the logical well-formedness of the sentence; and the S-ARG1 refers to ***shadow argument*** that is expressed under certain conditions.

To understand these argument types, consider the following examples (ibid: 63-4).

(2) Mary arrived early.

(*Mary* is a true argument that must be expressed at syntax)

(3) He built a house out of bricks.

(*out of bricks* is a default argument that can be optionally expressed at syntax)

[38] We will have to ignore the discussion about this structure as Pustejovsky himself does not discuss it in any further detail. However, as the definition above illustrates, this type of structure is more tied to the entire organization of a lexicon.

(4) Mary buttered her toast with an expensive butter.

(*with an expensive butter* is a shadow argument that is semantically incorporated in the verb *butter*, but only expressed by discourse specification).

(5) Mary went to London on Monday.

(*on Monday* is a true adjunct that is not tied to the semantic representation of *go*)

In short, the argument structure (ARGSTR) recognises different types of arguments (ARG1, ARG2, D-ARG1, and S-ARG1) which are encoded in the semantic representation of a lexical item (**α**)**.** For instance, the argument structure for the verb *butter* as in *Penny buttered her sandwich*, is represented as (ibid, pp. 67):

(6)
$$\begin{bmatrix} \textbf{BUTTER} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \textbf{human} \\ \text{ARG2} = \textbf{phys\_object} \\ \text{S} - \text{ARG1} = \textbf{butter} \\ \dots \end{bmatrix} \end{bmatrix}$$

Notice that *butter* here takes the argument **human** (ARG1) as its subject; a **physical object** as its complement (ARG2), and **butter** as its shadow argument (S-ARG1) that refers to the material used in the buttering act. Hence, a sentence such as *Penny buttered her sandwich* is realised as *Penny-$_{ARG1}$ buttered her sandwich-$_{ARG2}$ (*! *with butter-$_{S\text{-}ARG1}$).*

One important observation about shadow arguments is the fact that they are only expressed under certain specific conditions. This is because shadow arguments are "semantically incorporated into the lexical item" (ibid: 63).[39] Hence, this also explains why sentences (7) and (10) are uninformative, but not (8, 9, 11) which have shadow arguments expressed under further specification.

(7) ! Mary buttered her toast with butter.

(8) Mary buttered her toast with margarine.

(9) Mary buttered her toast with an expensive butter.

(10) ! John danced a dance.

(11) John danced a waltz.

Another example in which we can have the default argument (D-ARG1) is the verb *build*. Its argument structure (ARGSTR) is given as follows (ibid, pp. 67):

[39] This phenomenon is known as **AUTOTROPONYMY.** For example, a verb such as *butter* conflates with the noun *butter* to create a new sense (the conflated sense). Thus, the noun *butter* becomes semantically incorporated in the verb *butter*. For more about this phenomenon, see Fellbaum (2000).

(12)
$$\begin{bmatrix} \textbf{BUILD} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \textbf{animate\_individual} \\ \text{ARG2} = \textbf{artifact} \\ \text{D} - \text{ARG1} = \textbf{material} \\ \dots \end{bmatrix} \end{bmatrix}$$

As noticed, *build* encodes three arguments, one of which is a default argument. The first two are true arguments that must be expressed in syntax. The third argument, however, is the default argument (D-ARG1=material) that is optional in the surface syntax.

One final remark is about true adjuncts. We have seen in example (5) above that the temporal expression, *on Monday,* is not encoded in the argument structure of *go*. In fact, as Pustejovsky (1995: 64) emphasises, true adjuncts "are part of the situational interpretation, and are not tied to any particular lexical item's semantic representation". Hence, this type of arguments such as temporal and locative modifiers (for instance, *on Monday*, and *in London*, respectively) is defined by complementarity (ibid).

3.3.2 Event structure

The event structure of a lexical item defines the event type associated with that item. In addition, the event structure also encodes subevents (i.e. more than one event type). Pustejovsky (1991; 1995), following Vendler's (1967) classification, differentiates between three aspectual types for verbs and verb phrases. Events, accordingly, are put into the category of *transitions*, *processes,* or *states.* These are referred to as *event types* or *aspectual types* (ibid). Let us briefly consider what each type means or denotes.

1) **Process**: A *process* is a verb (or a sentence) which does not denote or convey "information regarding the temporal extent of the activity", i.e. an activity of indefinite length (ibid: 34). Consider the example *John walked* in which the sentence lacks the temporal extent of the activity *walk*.
2) **Transition**: transitions are divided into two subtypes:
   a) **Accomplishments**: these indicate that a process "has a logical culmination or duration, such that the activity is over [i.e. terminated]" (ibid: 48). A sentence such as *John walked to the shop* is an example of this type.
   b) **Achievements**: An achievement is defined as "an event that results in a change of some sort, just as an accomplishment does, but where the change is thought of as occurring instantaneously" (ibid: 49). Examples of this type include verbs such as *die, arrive, find*…etc.

3) **State**: states are distinct from the previous two types in that they express neither a change nor a reference to initial or final periods (ibid). *Sick, love, know*…etc. are some examples which express the aspectual type of state.

In the GL, Pustejovsky (1991; 1995) further assumes a subeventual structure for each aspectual type, which provides "a template for verbal decomposition" and also makes "reference to other embedded types" (1991: 47).

To this point, let us see how an event structure of a verb is represented in the GL. consider the event structure (EVENTSTR) for the verb *build*, which is given as follows (adapted from Pustejovsky, 1995:82):

(13)
$$\begin{bmatrix} \textbf{BUILD} \\ \text{EVENTSTR} = \begin{bmatrix} E_1 = \textbf{process} \\ E_2 = \textbf{state} \\ \text{RESTR} = < \boldsymbol{\alpha} \\ \text{HEAD} = \mathbf{E_1} \end{bmatrix} \\ \dots \end{bmatrix}$$

It is noticeable that the event structure for the verb *build* contains two sub-events: E_1 as process and E_2 as state. In this case of having two sub-events as part of the main EVENTSTR, there is a restriction rule (*abbrev.* RESTR) that is applied to the ordering of the two sub-events. This rule specifies, in the case of *build*, that E_1 must precede E_2, which, as a result, picks E_1 as the head of the EVENTSTR.

Therefore, in the context of having subevents in the event structure of a given lexical item, one of the following three restriction rules (also called *temporal ordering relations*[40]) is activated on the ordering (Pustejovsky, 1995):

(i) [RESTR= $<_\alpha$]; describes a subeventual structure that involves a development process and a resulting state, for example the verb *build.*

(ii) [RESTR= $<o_\alpha$]; describes two simultaneous sub-events where one starts before the other, for example the verb *walk.*

(iii)[RESTR= o_α]; describes two completely simultaneous sub-events, for example the verb *accompany.*

[40] Pustejovsky (1995: 73).

When one of these restriction rules is applied, "the most prominent subevent of the event structure of a predicate, which contributes to the "focus" of the interpretation" is indicated by the HEAD feature (Pustejovsky, 1995: 72). The next section focusses on this key feature of the event structure.

3.3.2.1 Event headedness

One very important aspect of the event structure is the notion of **EVENT HEADEDNESS**. According to Pustejovsky (1995: 72), event headedness "provides a way of indicating a type of foregrounding and backgrounding of event arguments". He further adds,

> "An event structure provides a configuration where events are not only ordered by temporal precedence, but also by relative prominence" (ibid).

This means there is another aspect in which events are ordered, which relies not only on temporal precedence, but also on event prominence. Therefore, any event includes a specification of the HEAD (also referred to as *HEAD marker*), with the role of indicating "prominence and distinction" (ibid). In simple terms, we can conceive of the head as contributing to *the focus of the interpretation* (ibid). This is in fact the quintessence of the property of headedness.

In the GL system, the head marker is annotated as *e**. Pustejovsky (1995: 73) argues that there are at least twelve possible head configurations, including unheaded and double-headed events; taking into account the three restriction rules discussed above:

a. $[e^{\sigma}\ e_{1*} <_{\alpha} e_2]$—*build*
b. $[e^{\sigma}\ e_1 <_{\alpha} e_{2*}]$—*arrive*
c. $[e^{\sigma}\ e_{1*} <_{\alpha} e_{2*}]$—*give*
d. $[e^{\sigma}\ e_1 <_{\alpha} e_2]$—UNDERSPECIFIED
e. $[e^{\sigma}\ e_{1*}\ o_{\alpha}\ e_2]$—*buy*
f. $[e^{\sigma}\ e_1\ o_{\alpha}\ e_{2*}]$—*sell*
g. $[e^{\sigma}\ e_{1*}\ o_{\alpha}\ e_{2*}]$—*marry*
h. $[e^{\sigma}\ e_1\ o_{\alpha}\ e_2]$—UNDERSPECIFIED
i. $[e^{\sigma}\ e_{1*} <o_{\alpha}\ e_2]$—*walk*
j. $[e^{\sigma}\ e_1 <o_{\alpha}\ e_{2*}]$—*walk home*
k. $[e^{\sigma}\ e_{1*} <o_{\alpha}\ e_{2*}]$—*??*
l. $[e^{\sigma}\ e_1 <o_{\alpha}\ e_2]$—UNDERSPECIFED

We do not aim to discuss each head configuration in further detail (but, cf. Pustejovsky 1995: 73). However, what is important to our study are those head configurations which have underspecified events, particularly the (d.) configuration, which stands for the *causative/inchoative* predicates such as *break*. We return to this point in Chapter 5 when we study first the causative/inchoative alternation in Arabic in the next chapter.

3.3.3 Qualia Structure

The Qualia structure, whose idea goes back at least to Aristotle, is one of the distinctive features of Pustejovsky's GL model. Pustejovsky claims that the qualia structure is "the set of properties or events associated with a lexical item which best explain what the word means" (ibid, pp. 77). In addition, it specifies four aspects of meaning (each aspect is also referred to as *role or quale*) (ibid: 85-6):

a) CONSTITUTIVE (i.e. meronymic relations): specifies the relation between an object and its parts.
b) FORMAL (i.e. hierarchical relations): distinguishes that relation (between the object and its parts) within a larger domain.
c) TELIC: describes the purpose and function of the object.
d) AGENTIVE: factors involved in bringing about the object; i.e. describes how the object comes into being.

These four qualia aspects or roles capture the conceptual differences in the lexicon. In Pustejovsky's words, the "conceptual differences in the mental lexicon are reflected in the qualia structures for the lexical items associated with those concepts. Hence, the nouns *person, typist, water,* and *wine*, all have distinct qualia structures reflecting their conceptual distinctions" (Pustejovsky, 2013: 30). In the GL, a lexical entry, say, α will look like this (Pustejovsky, 1995; 2001):

(14)
$$\begin{bmatrix} \boldsymbol{\alpha} \\ \dots \\ \text{QUALIA} = \begin{bmatrix} \text{CONST} = \textit{what } \boldsymbol{a} \textit{ is made of} \\ \text{FORMAL} = \textit{what } \boldsymbol{a} \textit{ is} \\ \text{TELIC} = \textit{function or purpose of } \boldsymbol{a} \\ \text{AGENT} = \textit{how } \boldsymbol{a} \textit{ came into being} \end{bmatrix} \end{bmatrix}$$

To take a simple example, a schematic representation for the noun *novel* is illustrated as follows (adapted from Pustejovsky, 1995: 78):

(15)
$$\begin{bmatrix} \textbf{NOVEL} \\ \dots \\ \text{QUALIA} = \begin{bmatrix} \text{CONST} = \textbf{narrative}\ (\mathbf{x}) \\ \text{FORMAL} = \textbf{book}\ (\mathbf{x}) \\ \text{TELIC} = \textbf{READ}\ (\mathbf{e}, \mathbf{y}, \mathbf{x}) \\ \text{AGENTIVE} = \textbf{WRITE}\ (\mathbf{e}', \mathbf{z}, \mathbf{x}) \end{bmatrix} \end{bmatrix}$$

That is to say, a novel contains a narrative is a kind of book, whose purpose is to be read, and which is produced by writing. Pustejovsky argues that the qualia structure could be defined for all types of lexical items; however, not every role of the qualia is required to have a value in the lexical representation (ibid, pp. 76). For example, the verb *break* has only two qualia roles, as shown in the following lexical representation (ibid: 80):

(16)
$$\begin{bmatrix} \textbf{BREAK} \\ \dots \\ \text{EVENTSTR} = \begin{bmatrix} \text{E}_1 = \mathbf{e_1}\textbf{:PROCESS} \\ \text{E}_2 = \mathbf{e_2}\textbf{:STATE} \\ \text{RESTR} = < \alpha \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \textbf{broken}\ (\mathbf{e_2}, \mathbf{y}) \\ \text{AGENTIVE} = \textbf{break\_act}\ (\mathbf{e_1}, \mathbf{x}, \mathbf{y}) \\ \dots \end{bmatrix} \end{bmatrix}$$

In comparison with (15) above, the schematic representation in (16) shows that the qualia structure of BREAK carries information for the FORMAL and AGENTIVE roles only.

In short, what the qualia structure is (or is not) can be summarised in the following three points; these will be the topics of the next sections:

1. The qualia structure is not a mere listing of features associated with lexical items; it actually represents "the set of semantic constraints by which we understand a word when embedded within the language (1995: 86).
2. It provides "the structural template over which semantic transformations may apply to alter the denotation of a lexical item or phrase" (ibid). These transformations are the three generative mechanisms that we explain in the next section: *type coercion, co-composition,* and *selective binding*. As Pustejovsky further explains, "[t]hese transformations are the generative devices… which formally map the expression to a new meaning" (ibid: 86).
3. Pustejovsky further adds that the "Qualia... not only structure our knowledge of words, but also "suggest" interpretations of words in context" (ibid: 87).

3.3.3.1 Dot Objects

The main focus within the qualia structure is on *dot objects* that refer to a unique class of types in the GL, which is: the *complex type* (Pustejovsky, 1995; 2001; 2005). Complex types or dot objects, as Pustejovsky claims (2005), have the property of *inherent polysemy*. According to him, inherent polysemy is the "ability to appear in selectional contexts that are contradictory in type specification" (ibid: 2), as in the example of the canonical dot object *book*, where it is used to convey distinct facets or aspects of meaning: physical object and information. Intuitively, while the physical object type is incompatible with the information type, and the dot object binds these two aspects to yield a complex type (i.e. a dotted-type: **physobj•info**).

A key remark about dot objects is that the aspects (or constituents) of meaning of a lexical item must be distinct; that is, they must not share the same type:

> "[…]a dot-type A • B can only be formed if the types A and B do not share any components: it is a dot-type only when the constituent types A and B present different and incompatible aspects of the objects" (Xue and Luo, 2012: 236).

What this means is explained by Xue and Luo as follows (ibid: 236):

1) Phy • Phy should not be a dot-type because its constituent types are the same type Phy.
2) Phy • (Phy • Info) should not be a dot-type because its constituent types Phy and Phy • Info share the component Phy.

In short, dot objects, as Pustejovsky (1995: 178) argues, are created from other objects with the help of the *lcp* type constructor, and they "are constructed in a pair-wise recursive fashion" (1995: 155)—see Pustejovsky (1995: 155-156) for further discussion.

3.4 Generative Mechanisms

3.4.1 Coercion

Pustejovsky argues that logical polysemy can be better accounted for using a feature in language; that is *coercion*, which can make regular semantic shifts possible.

Type Coercion

Type coercion is defined as follows (1995: 111):

> "A semantic operation that converts an argument to the type that is expected by a function, where it would otherwise result in a type error".

In type coercion, a verb type, for example, remains unchanged (i.e. monomorphic) with respect to semantic selection, whilst its complement is changed to the type required by that verb (ibid: 111). This operation of type coercion is a lexically governed type shifting (ibid). What this means is that the verb governs the type of complement it selects for, hence to accommodate the various syntactic environments. Consider the following example of *want* (ibid: 110).

(17) a. Mary wants John to leave. (S [+INF])
b. Mary wants to leave. (VP [+INF])
c. Mary wants a beer. (NP)

What is noticeable about these sentences in (17) is the syntactic environment required by *want*. *Want* requires a complement of the type [+INF] as in (17a-b); however, in (17c) it is followed by an NP. To account for such a difference in the complement type, a type shifting operation is applied to convert the NP to the event type required by *want*, so that (17c) is interpreted as 'Mary wants to drink a beer' (also, see *true type coercion* below).

Subtype Coercion

This kind of coercion is a simple one, which involves a specific kind of semantic shifting (ibid: 113). It ensures that the (coercion) relation between the type denoted by a complement and the type required by a verb is accepted (ibid: 113). To put it simply, let us take the following example (ibid):

(18) Mary drives a Honda.

Intuitively, *drive* requires a complement of the type *vehicle*. *Honda* is a subtype of *car* that is also a subtype of *vehicle*. By establishing this subtype relation, we ensure that "if a function selects for type T_1 and the actually occurring form is T_2, where T_2 is a subtype of T_1 ($T_2 \leq T_1$), it too should be accepted by the function as a legitimate argument" (ibid: 113).

This kind of subtyping also ensures that the complement, which is of T_2, given in (20), inherits the properties of the main type T_1, given in (19), as follows (ibid: 113-4):

(19)
$$\begin{bmatrix} \textbf{CAR} \\ \text{ARGSTR} = [\text{ARG1} = \textbf{x}\text{: }\textbf{vehicle}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \textbf{x} \\ \text{TELIC} = \textbf{drive}\ (\textbf{e}, \textbf{y}, \textbf{x}) \\ \text{AGENTIVE} = \textbf{create}\ (\textbf{e}, \textbf{z}, \textbf{x}) \end{bmatrix} \end{bmatrix}$$

(20)
$$\begin{bmatrix} \textbf{HONDA} \\ \text{ARGSTR} = [\text{ARG1} = \textbf{x}\text{: }\textbf{car}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \textbf{x} \\ \text{TELIC} = \textbf{drive}\ (\textbf{e}, \textbf{y}, \textbf{x}) \\ \text{AGENTIVE} = \textbf{create}\ (\textbf{e}, \textbf{HONDA}, \textbf{x}) \end{bmatrix} \end{bmatrix}$$

Now, the GL argument goes as follows: Given the lexical representation of *drive* below (ibid: 114), we ensure, after applying subtype coercion, that the type required by the verb (ARG2) matches the type denoted by *Honda* (ARG1) in the representation above.

(21)
$$\begin{bmatrix} \textbf{DRIVE} \\ \dots \\ \text{EVENTSTR} = \begin{bmatrix} \text{E}_1 = \textbf{e}_1\text{: }\textbf{PROCESS} \\ \text{E}_2 = \textbf{e}_2\text{: }\textbf{STATE} \\ \text{RESTR} = < \text{o} \end{bmatrix} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \textbf{x}\text{: }\textbf{human} \\ \text{ARG2} = \textbf{y}\text{: }\textbf{vehicle} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \textbf{move}\ (\textbf{e}_2, \textbf{y}) \\ \text{AGENTIVE} = \textbf{drive\_act}\ (\textbf{e}_1, \textbf{x}, \textbf{y}) \\ \dots \end{bmatrix} \end{bmatrix}$$

In our view, however, we do not think that subtype coercion represents a case of 'real' coercion. In fact, as we see it, this is just a type of (default) inheritance process. That is, since a car is a vehicle, cars inherit all properties of vehicles (modulo perhaps certain specific properties). Therefore, the ARG1 in Honda is **x:car[vehicle]** and no real coercion takes place.

True Type Coercion

This kind of coercion is different from the previous two in that it "involves the strict shifting of one type to another specified type, licensed by lexical governance" (ibid: 115). Let us first take these examples.

(22) Mary wants a beer.

(23) Mary began a book.

Recall that in (17) above, the verb *want* requires a complement of the event type. We have also seen that the complement in (17c) is an NP which does not satisfy the semantic type (i.e. event) required by *want*. But in order to satisfy that condition, the semantic type of the NP is coerced to an event type.

In these examples, we are going to show how this kind of semantic shifting works to ensure that the semantic type of a complement is coerced to match the selection requirement by the semantic

type of a verb. Let us take the verb *begin*, whose semantic representation is given below (ibid: 116).

(24)
$$\begin{bmatrix} \textbf{BEGIN} \\ \text{EventSTR} = \begin{bmatrix} \text{E1} = \textbf{transition} \\ \text{E2} = \textbf{transition} \\ \text{RESTR} = <\text{o}_\alpha \end{bmatrix} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \textbf{x}\text{:}\,\textbf{human} \\ \text{ARG2} = \mathbf{e_2} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \text{Formal} = \mathbf{P}(\mathbf{e_2}, \mathbf{x}) \\ \text{AGENTIVE} = \textbf{begin} - \textbf{act}\ (\mathbf{e_1}, \mathbf{x}, \mathbf{e_2}) \end{bmatrix} \end{bmatrix}$$

It is obvious that the second argument (ARG2, i.e. the complement) of *begin* must be of an event sort. In example (23), however, the complement (*a book*) is an NP and not of an event type (of course there are other NPs that can denote events directly, such as *meeting*). For *begin* to select a complement of the same semantic type (i.e. the event type), type coercion applies to reconstruct an event reading from the NP (ibid).

Before we proceed to show how this reconstruction process works, there are two key points to mention with regard to this issue: 1) coercion does not shift the syntactic (but the semantic) type of a complement, i.e. *a book* remains an NP; and 2) coercion is only successful if the NP "has available to it an *alias* of the appropriate type" (ibid: 116). According to Pustejovsky, an alias "can be thought of as an alternative type that is available to a element [sic], be it lexical or phrasal" (ibid).

Now, in (23) the NP *a book* is forced to denote an event type, which can be reconstructed from its qualia structure, as given below (ibid: 116).

(25)
$$\begin{bmatrix} \textbf{BOOK} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \textbf{x}\text{:}\,\textbf{info} \\ \text{ARG2} = \textbf{y}\text{:}\,\textbf{physobj} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{info}.\textbf{physobj} - \textbf{lcp} \\ \text{FORMAL} = \textbf{hold}\ (\mathbf{y}, \mathbf{x}) \\ \text{TELIC} = \textbf{read}\ (\mathbf{e}, \mathbf{w}, \mathbf{x}.\mathbf{y}) \\ \text{AGENTIVE} = \textbf{write}\ (\mathbf{e}', \mathbf{v}, \mathbf{x}.\mathbf{y}) \end{bmatrix} \end{bmatrix}$$

Given the semantics of the qualia structure of *book*, we notice that, through the *telic* and *agentive* roles, an event denotation is possible if the NP *a book* is coerced to satisfy the event type required by *begin*. That is, there are two possible event denotations available to *book* in its qualia structure: **read** and **write**. Hence, a type shifting mechanism works to coerce the type of the NP to the event type required by *begin*, so that it can mean 'begin to read' or 'begin to write'.

3.4.2 Co-composition

Unlike *type coercion* that converts an argument (a complement) to the type that is expected by a function, the *co-composition* generative mechanism, as Pustejovsky (1995: 122) states, accounts for verbal logical polysemy and acts upon structures that allow for more than one function application. *Co-composition* works in the opposite direction to *type coercion*, i.e. co-composition acts upon the verb and shifts its event type (ibid: 123), but does not shift the semantic type of its complement as *type coercion* does.

To understand this, consider the following example of *bake*.

(26) a. Mary baked a cake.
b. Mary baked a potato.

It is believed that the verb *bake* in (26) is polysemous between two different interpretations: the creation sense in (26a), and the change-of-state sense in (26b). In the GL, one of these interpretations comes about by co-composition. That is, the complement of the verb contributes to the verb's 'core' meaning.

Now, for the case of *bake*, Pustejovsky (ibid: 123) assumes the following GL representation:

(27)
$$\begin{bmatrix} \textbf{BAKE} \\ \dots \\ \text{EVENTSTR} = \begin{bmatrix} \text{E}_1 = \mathbf{e_1}\text{:}\,\textbf{PROCESS} \\ \text{HEAD} = \mathbf{e_1} \end{bmatrix} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = ① \begin{bmatrix} \textbf{animate\_ind} \\ \text{FORMAL} = \textbf{physobj} \end{bmatrix} \\ \text{ARG2} = ② \begin{bmatrix} \textbf{mass} \\ \text{FORMAL} = \textbf{physob} \end{bmatrix} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{state\_change} - \textbf{lcp} \\ \text{AGENTIVE} = \textbf{bake\_act}\,(\mathbf{e_1}, ①, ②) \\ \dots \end{bmatrix} \end{bmatrix}$$

Notice that the schema given by Pustejovsky contains only one sense for *bake*; that is the change-of-state sense, which is encoded as a process in the event structure. Pustejovsky here argues that the other meaning of *bake* (i.e. the creation sense) is derived compositionally. In principle, what this means is that the derived meaning of *bake* depends on the complement the verb takes. For instance, the meaning of *bake a cake* is different from the meaning of *bake a potato* since these complements are of different kinds; the former is an artefact whilst the latter is a natural kind (ibid). Hence, intuitively, *a cake* denotes the sense of creation whereas *a potato*

does not. To understand this, let us assume the following simple QUALIA representations of *cake* and *potato* with respect to their AGENTIVE roles.

(28)
$$\begin{bmatrix} \textbf{CAKE} \\ \text{QUALIA} = \begin{bmatrix} \text{AGENTIVE} = \overset{\dots}{\textbf{bake\_act}} \end{bmatrix} \end{bmatrix}$$

(29)
$$\begin{bmatrix} \textbf{POTATO} \\ \text{QUALIA} = \begin{bmatrix} \text{AGENTIVE} = \overset{\dots}{\textbf{grow}} \end{bmatrix} \end{bmatrix}$$

This provides us with the minimal distinction between the two representations. Clearly, since both *cake* and *potato* denote entities, each one of them stands different with respect to their AGENTIVE quale. What this means is the fact that *potato* cannot have an effect[41] on the 'basic' meaning of *bake* whereas *cake* makes reference to the *bake* activity, which in turn plays a role in shifting the event of *bake* from *process* to *state* (1991: 422).

As a result of having *cake* as a complement of *bake*, a new sense for *bake* is compositionally generated. Consider the following GL schema for *bake a cake* (1995: 125).

(30)
$$\begin{bmatrix} \boldsymbol{bake\ a\ cake} \\ \text{EventSTR} = \begin{bmatrix} \text{E1} = \boldsymbol{e_1}\boldsymbol{:process} \\ \text{E2} = \boldsymbol{e_2}\boldsymbol{:state} \\ \text{RESTR} = < \infty \\ \text{HEAD} = \boldsymbol{e_1} \end{bmatrix} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = ① \begin{bmatrix} \textbf{animate} - \textbf{ind} \\ \text{FORMAL} = \textbf{physobj} \end{bmatrix} \\ \text{ARG2} = ② \begin{bmatrix} \textbf{artifact} \\ \text{CONST} = ③ \\ \text{FORMAL} = \textbf{physobj} \end{bmatrix} \\ \text{D} - \text{ARG1} = ③ \begin{bmatrix} \textbf{material} \\ \text{FORMAL} = \textbf{mass} \end{bmatrix} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \boldsymbol{create} - \boldsymbol{lcp} \\ \text{FORMAL} = \textbf{exist}\ (\boldsymbol{e_2}, ②) \\ \text{AGENTIVE} = \textbf{bake} - \textbf{act}\ (\boldsymbol{e_1}, ①, ③) \end{bmatrix} \end{bmatrix}$$

The structure in (30) is called a *co-composition* structure, which is the outcome of combining the *bake*'s structure in (27) and that of *cake* in (28) above, facilitated by the mechanism of co-composition. Let us first point out that the lexical structure for *cake* in (28) above is incomplete, as the aim was to focus on the AGENTIVE role only; however, the complete lexical structure is given by Pustejovsky (1995: 123) as follows:

[41] What we mean here is that the AGENTIVE quale of *potato* is suppressed when in composition with *bake*.

(28')

$$\begin{bmatrix} \textbf{CAKE} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \mathbf{x}\text{: } \mathbf{food\_ind} \\ \text{D} - \text{ARG1} = \mathbf{y}\text{: } \mathbf{mass} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \text{CONST} = \mathbf{y} \\ \text{FORMAL} = \mathbf{x} \\ \text{TELIC} = \mathbf{eat}(\mathbf{e_2}, \mathbf{z}, \mathbf{x}) \\ \text{AGENTIVE} = \mathbf{bake\_act}(\mathbf{e_1}, \mathbf{w}, \mathbf{y}) \end{bmatrix} \end{bmatrix}$$

It should now become clear that ARG2 and D-ARG1 in (30) come from (28') by binding the argument structure of *cake* into that of *bake* (ibid: 124). Also, the AGENTIVE role for *bake* is unified with that for *cake* because their values match (known as *feature unification*, cf. Pustejovsky, 1995: 124). The result of this co-composition mechanism is a derived sense of *bake* (the creation sense): Notice that we now have another event arising from this co-composition mechanism, which is E_2 (state), and the FORMAL role for *cake* in (28') becomes the FORMAL role for the entire VP.

Before we conclude this section, we want to raise one issue regarding the lexical structure of *bake* in (27) above, as given by Pustejovsky. The argument structure for *bake* contains two arguments, but it is not clear to us why the second argument (ARG2) is specified as 'mass'. Perhaps Pustejovsky wants to show us how the *creation* sense is derived when *bake* combines with *cake* (the cake-batter reading), but it must be noted here that this causes a problem for *bake* to combine with *potato*, for example. Specifically, there would a problem in binding *potato* into the argument structure of *bake*: *potato* cannot occur as a mass noun here.

3.4.3 Selective binding

The mechanism of selective binding is set to deal with adjectival polysemy, particularly in adjective-noun constructions (ibid: 127). According to Pustejovsky (1995:61), selective binding is the mechanism whereby an adjective or an adjectival phrase operates specifically on the qualia structure of the modified noun or noun phrase to capture the appropriate reading required in context. In other words, it is understood as the generative mechanism that facilitates a 'selective' interpretation when the default interpretation is not correct by 'binding' the adjective to a particular quale within the modified noun (i.e. by modifying different facets of the head noun, depending on the type required by the modifier). Consider the following example of *fast* (ibid: 127).

(31) a. We need a fast boat to get back in time.
b. John is a fast typist.
c. Fast drivers will be caught.

The underlying ambiguity in these examples is manifested in the adjective being able to modify both NPs and VPs; that is, it is able to modify individuals or events (ibid). For instance, the interpretation of (31a.) can be either a boat that is driven quickly or a boat that is inherently fast (i.e. a property). However, (31b and c) can only mean a typist/driver who types/drives quickly (but see the discussion about the notion of *defeasibility* in Chapter 2, section 2.2.3.2).

To understand how *fast* is able to modify an event reading, let us take the GL schema for *typist* (ibid: 128).

(32)
$$\begin{bmatrix} \textbf{TYPIST} \\ \text{ARGSTR} = [\text{ARG1} = \mathbf{x}\text{: }\textbf{human}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \mathbf{x} \\ \text{TELIC} = \textbf{type}\ (\mathbf{e}, \mathbf{x}) \\ \ldots \end{bmatrix} \end{bmatrix}$$

The head noun 'typist' in the above representation refers to an event that is projected by the TELIC role. Hence, the adjective *fast* "is able to make available a selective interpretation of an event expression contained in the qualia for the head noun" (ibid: 128). This interpretation is motivated by a generative mechanism that Pustejovsky calls *selective binding*.

Selective binding seems also to work with adjectives such as *old* and *new* to generate a non-intersective interpretation. Consider the following (ibid: 130).

(33) an old friend: (a friend for a long time)

The interpretation of (33) is in fact ambiguous between *old* modifying the noun *friend* (an intersective reading) and *old* modifying *friendship* as duration.

However, one important remark about *selective binding* is that it is constrained. That is, with adjectives such as *old* modifying non-relational nouns, the mechanism stops working. Consider the following examples (ibid: 131).

(34) a. # an old movie: (one that I have had for a long time)
b. # an old house: (one that I have had for a long time)

Although it is not clear to us why the process stops working in these examples, as such examples can be contextualised to get the apparently excluded reading in parenthesis (e.g. (34b) is uttered by someone whom the addressee knows is a property tycoon who is referring to a house she's owned for a long time), the rule of *selective binding*, as Pustejovsky explains, is "an instance of a more general mechanism facilitating the selection of substructures through a path of features in the semantic description of a phrase" (ibid: 131). Hence, opposite to the standard view within SELs where every new sense of an adjective has to be recorded to account for the distinct interpretations arising in different contexts, the GL assumes that the meaning of an adjective is mainly determined by the semantics of the head it modifies, and that the contextualised senses are a result of this generative mechanism (ibid: 127).

3.5 Criticism

We mentioned in Chapters 1 and 2 that Pustejovsky's theory has not gone uncriticised. In this section, we present and also review some of these critiques; noting, despite the criticism, the usefulness of the theory in accounting for the notion of *regular polysemy*.

3.5.1 Fodor and Lepore

In this section, we provide a brief discussion of Fodor and Lepore's (1998) arguments against Pustejovsky's GL. In fact, Pustejovsky already replied to their criticism (cf. Pustejovsky 1998a). However, we summarise here the main points made in Fodor and Lepore (1998).

To begin, Fodor and Lepore reject Pustejovsky's main argument that "the complexity of lexical entries is required to account for lexical generativity" (ibid: 269). That is, contrary to Pustejovsky's rich (or complex) lexical representation (see earlier discussion), Fodor and Leopre believe in lexical atomism, i.e. lexical meaning is atomistic in the sense they "lack internal structure" (ibid: 270). This further means that "the only thing a lexical entry specifies is the denotation of the item it describes" (ibid).

Fodor and Lepore's argument is divided into three parts: Pustejovsky's theory, the notion of generativity, and compositionality and logical form. Here, we discuss briefly the first two parts only since the third one is, to some extent, tied to what is discussed in the first two (however, cf. Fodor and Lepore, 1998: 283-286).

(1) Pustejovsky's Theory

One of the main arguments against the GL is about Pustejovsky's notion of *semanticality* (see earlier discussion in section 3.3 above). Fodor and Lepore are uncertain about what this notion might be, or whether it is a property of the lexicon (ibid: 275). As Pustejovsky argues, examples such as the following are semantically ill-formed because of what we normally associate with *rock* and *dictionary*.

(35) a. ? John began the dictionary.
b. ? Mary began the rock.

However, Fodor and Lepore believe that, contrary to Pustejovsky's view, there is nothing wrong with these examples. In fact, in a context where, say, *Mary began to paint the rock*, "the perplexity vanishes and so does the intuition that something is awry with the sentence" (ibid). This is a true statement, and we agree with Fodor and Lepore that the examples in (35) are only ill-formed when they are decontextualized. Although Pustejovsky (1995: 41) admits that an interpretation is (pragmatically) still available, he does not show how these interpretations could be recovered in context, even though the noun *rock*, for instance, on the GL theory, does not encode this information (see *natural kinds*). However, despite this limitation, the notion of *semanticality* is still very relevant here: For these sentences to be semantically well-formed, there must be some sort of event type that is compatible with the type required by *begin* (see *coercion* in section 3.4.1 above).

The second argument contra the GL is about syntactic distribution. Consider the examples below (ibid: 276).

(36) a. The woman ate her meal quickly.
b. The woman ate quickly.
c. The dog devoured the cookie.
d.*The dog devoured.

On Pustejovsky's account, the difference between *eat* and *devour* with respect to 'direct object dropping' is explained on the grounds that *eat* denotes an activity of unbounded duration whereas *devour* denotes a transition, and "it carries a completive implicature that is absent from *eat*" (Pustejovsky, 1995: 11; cited in Fodor and Lepore, 1998: 276). For Fodor and Lepore, however, this line of explanation cannot be true, inasmuch as we have the following examples that denote unbounded activities, but do not allow their direct object to delete (ibid: 277).

(37) *John stroked
*John ground (/his teeth)
*John pounded
*John smelled (/the salt air).

We have not discussed these examples anywhere in this study, nor do we intend to introduce them later; hence, we have little to say about them. But it is important to note here that Fodor and Lepore do not seem to get Pustejovsky's argument correctly. According to Pustejovsky (1998a: 302), "[t]he question is not whether the feature [+/-completive] adequately distinguishes the behavior of the two verbs, but rather, what knowledge of our language is responsible for the inviolable linguistic distinctions…" (for full discussion, cf. Pustejovsky, 1998a: 302-303; n. 6).

(2) Generativity

This is based on Pustejovsky's argument about the polysemy of the verb *bake* (cf. supra §3.4.2). As we mentioned earlier, the verb *bake*, on his account, is polysemous between two distinct but related meanings: the change-of-state sense and the creative sense. The change-of-state sense is basic and the creative sense is derived depending on the complement that the verb takes (e.g. *bake a cake*). Fodor and Lepore argue that "[i]f the creative sense of *bake* is determined by something that it inherits from its direct object… then *bake a cake* must have *only* the ''creative'' reading" (ibid: 280). According to them, however, this cannot be true because *bake a cake* is, in fact, still ambiguous between these two interpretations, since it is possible to bake a 'pre-existent' cake, in which case *bake* would have the 'non-creative' reading. Furthermore, the distinction between artefacts and natural kinds in the lexicon is not enough (ibid). This is because "…although knives and trolleys are artefacts, *bake a knife* and *bake a trolley* resist a creative reading quite as much as *bake a potato* does" (ibid).

Therefore, for Fodor and Lepore, the "right story" is as follows:

> "As far as the language is concerned, *bake* is polysemous and *bake a potato* and *bake a knife* are both ambiguous. What makes *bake a potato* and *bake a knife* sound funny is a thing about the world, not a thing about the words: everybody knows that you can't make either a potato or a knife by baking them. […]" (ibid).

Accordingly, they argue that Pustejovsky's analysis is wrong. While they maintain that *bake* is polysemous, they disagree with him on the fact that distinguishing artefacts from natural kinds is enough to account for the difference in meaning between *bake a cake* and *bake a potato*. As we

just mentioned above, they argue that *bake a cake* is itself ambiguous between the creative sense and the change of state sense.

Whether this is true or not is something not directly related to the study of Arabic in the next chapter, as such polysemy or (phrasal) ambiguity does not exist in the language, particularly in relation to the verb *bake*. But our contention on the matter is this: Fodor and Lepore's claim that *bake a cake* is still ambiguous between the *create* and the *heat up* readings is correct; however, what is not correct is their conclusion about *bake* being ambiguous in both *bake a potato* and *bake a knife* (ibid: 283); surely, *bake a potato or a knife* is not ambiguous. And to accept their conclusion is to accept (i) the fact that there are two homophonous entries in the lexicon for each sense of *bake* –this fundamentally being the view of their atomistic approach, and (ii) that *bake* is always ambiguous in any expression in which it occurs, which means that the speaker/hearer has to rule out, based on his/her knowledge of the world, one of these meanings every time the expression that includes *bake* is used. This, we argue, is something far from being true. Hence, we agree with Pustejovsky that the distinction between artefacts and natural kinds *is* important: To bake a potato or fish, for instance, will never result in a creative reading. In addition, what makes *bake a knife* sound funny is the same thing that makes *bake water* sound funny, too. Both complement types (whether artefacts or natural kinds), in relation to *bake*, are highly constrained.

The ambiguity of *bake* can be further understood by examining these examples outside the English context. In Arabic, for instance, the verb *yaxbiz* (to bake) is not ambiguous and is only used with objects that strictly require the creative reading (i.e. human-made objects, often food, that come into being by baking them). This essentially means that *natural kinds* (e.g. potato) are automatically ruled out, which provides further support for the distinction between natural kinds vs artefacts in the lexicon. Furthermore, the already *baked* food (e.g. a pre-existent cake or pizza) can never combine with *yaxbiz* again to mean *heat up*.

After all, Fodor and Lepore's lexical atomistic approach is incompatible with Pustejovsky's: Lexical atomism assumes that lexical meaning has no internal structure whatsoever; thus, consequently, the distinction between homonymy and polysemy at least does not exist. Surely there is a lot to say here about atomism (Fodor's approach) vs decomposition (Pustejovsky's GL), but it suffices to say that we are not going to embrace a theory that conflates homonymy with polysemy (cf. the experimental studies that we mentioned in passing in Chapter 2, Part II such as Klepousniotou *et al.* (2012), which refute Fodor and Lepore's argument).

3.5.2 Falkum

Falkum's (2007) critique of the GL is based, in great part, on Fodor and Lepore's arguments, but advanced from the perspective of Relevance Theory.

In her paper *Generativity, Relevance and the Problem of Polysemy,* Falkum (2007) discusses and at the same time assesses Pustejovsky's generative account of word meanings in context. As the main objective of the GL is to provide a formal account of what Pustejovsky calls 'logical polysemy', Falkum argues that the GL fails to account for the flexibility of the processes involved in the modulation of lexical meaning in context, and thus it makes wrong predictions with regard to the derivation of componential interpretations (Falkum, 2007). Furthermore, she argues that "it is doubtful that the complex lexical representations assumed by the generative lexicon theory actually succeed in picking out the right denotations in the world" (ibid, p.207). Her argument goes further to claim that GL does not provide a proper distinction between word meaning (what exactly is encoded by a word) and world knowledge (ibid). Falkum's claim is that the phenomenon of logical polysemy is better accounted for within the relevance-theoretic framework (see Chapter 2, section 2.4.2).

Falkum mainly discusses the three cases of 'nominal polysemy', 'verbal polysemy', and 'adjectival polysemy' in Pustejovsky's GL. She bases her arguments on the following examples (2007: 206):

(38) a. The *newspaper* fired its editors.
b. Mary spilled coffee on the *newspaper*.
c. The *newspaper* revealed surprising details of the trial.

(39) Mary *began* a book.

(40) a. John *baked* a potato.
b. John *baked* a cake.

(41) a. Every chef needs a *good* knife.
b. 'The Kite Runner' is a *good* book.

For clarity of exposition, we split Falkum's argument into three main subheadings: nominal polysemy, verbal polysemy, and adjectival polysemy.

Nominal polysemy

Example (38) above discusses the issue of nominal polysemy. *'Newspaper'* is taken as the prime example of nominal polysemy in which Falkum (2007) claims that the GL theory makes the wrong predictions.

The noun *'newspaper'* suggests different readings (or meanings) in (38a-c). It refers to the publisher of the newspaper in (38a); it denotes a physical object in (38b), and it denotes information in (38c). Falkum states that this noun has been treated in Nunberg's (1996) account as a *densely metonymous* term, in which he claims that such a noun is associated with a number of interdefined denotations (e.g. organisation, edition or publication type, physical object or token, etc.), and which also licenses a "widespread predicate transfer from the properties of one of its denotations to another" (Nunberg, 1996: 126).

The GL, on the other hand, treats the polysemy of *newspaper* by directly encoding the three senses into its semantic structure with the help of the *lexical conceptual paradigm (lcp)*, which acts as a type constructor that creates a complex type for *newspaper*, carrying the polysemous senses associated with the noun. This is sketched in Pustejovsky (1995: 156) as follows:

(42)
$$\begin{bmatrix} \textbf{NEWSPAPER} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \mathbf{x}\text{: }\mathbf{org} \\ \text{ARG2} = \mathbf{y}\text{: }\mathbf{info.physobj} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \mathbf{org.info.physobj\_lcp} \\ \text{FORMAL} = \mathbf{y} \\ \text{TELIC} = \mathbf{read}\ (\mathbf{e_2}, \mathbf{w}, \mathbf{y}) \\ \text{AGENT} = \mathbf{publish}\ (\mathbf{e_1}, \mathbf{x}, \mathbf{y}) \end{bmatrix} \end{bmatrix}$$

The difference between Nunberg and Pustejovsky's accounts is that, in the former, there is a difficulty in deciding which sense of the noun is 'basic' and which senses are 'derived'; making it difficult to know the direction of the transfer due to this kind of metonymy (Falkum, 2007: 213). In contrast, Pustejovsky's account seems to overcome this problem by simply encoding all these senses in the qualia structure of that noun, thus, avoiding the 'basic sense' problem (ibid).

However, Falkum argues that the use of *lcp* to account for metonymous senses encounters two problems: First, the case of *newspaper* in Pustejovsky's account is not different from the SEL approach in that the two 'basic' senses are both encoded in the lexical representation for the word; second, the lcp operator generates a sense for *newspaper* (i.e. the 'org.info.physobj' sense) which corresponds to no denotation (ibid; p.221). Therefore, the GL would result in generating unsatisfactory readings or impossible senses. But there are two important points to clarify in

relation to these two objections to the GL: First, the GL *is* different from the SEL approach because, as we have shown in this chapter and previously in Chapter 2, the *logical relationship* between senses is *not* captured on the SEL approach. Second, the *lcp* is **not** an *operator that generates senses*; rather, it only *clusters* multiple senses (or semantic types) in order to be projected in distinct syntactic and semantic environments. This is a major misunderstanding of how this mechanism works. We return to explain the *lcp* in more detail in section 3.6 below.

Returning to RT, a reanalysis is assumed to be given to account for this problem of metonymy (ibid; p.231). However, it is conceded that "the question of how to analyse cases of metonymy within the relevance-theoretic framework (in terms of ad hoc concept construction) is not straightforwardly answerable" (ibid) (but, cf. Chapter 2, section 2.4.2). Wilson and Carston (2007) suggest that some cases of metonymy could be analysed in terms of *lexical broadening*. Nevertheless, it is, again, conceded that the case of *newspaper* seems difficult to analyse in terms of *lexical broadening or narrowing*, and that the notion of metonymy is harder to grasp than that of e.g. metaphor (ibid; p. 232).

The short story, therefore, is this: Insofar as nominal polysemy is concerned, especially with respect to the example of *newspaper*, no satisfactory alternative, like Fodor and Lepore above, is given, but it is assumed that the RT approach does better than the GL.

Verbal polysemy

Cases of verbal polysemy discussed in Falkum's paper concern the examples (39) and (40) mentioned above. The crucial point to be noted here is that example (39) is accounted for in the GL via the type coercion mechanism, while (40) is handled by the co-composition mechanism. The two cases will be discussed separately.

- **Type coercion**

Recall that Pustejovsky defines *type coercion* as the mechanism that converts an argument to the semantic type expected by its predicate. In (43a) below, the verb *begin* has an underspecified semantic structure, leaving the VP undefined in relation to the activity associated with it, such as reading, writing, etc.

(43) a. **Mary began *a book*.**
b. Mary began *reading a book.*
c. Mary began *to read a book.*

d. Mary began *writing a book.*

e. Mary began *to write a book.*

Example (43a) shows that the verb *begin* takes an NP as its complement; however, the NP does not satisfy the semantic type 'event' required by *begin*. In that case, the mechanism of *type coercion* operates over the NP to coerce it to an event type by reconstructing the semantics of the NP complement.[42] Remember that the qualia structure of *book* encodes two event readings in the TELIC and AGENTIVE roles.

Falkum (2007: 207) argues that example (43) "stands out as different from the previous cases, as the polysemy of *begin* is viewed as related to the different complement types it may select for. Pustejovsky's notion of polysemy is thus a broad one".[43] In addition, she argues that the "coercion mechanism fails to indicate which is the default interpretation in cases where there is more than one possible interpretation compatible with the selection requirement of a verb" (Falkum, 2007: 219). That is, there is more than one possible interpretation generated by the *type coercion* device through the qualia structure for *book*. Thus, the question is which interpretation of *Mary began a book* is to be taken as the default one, and why? (ibid). Indeed, Pustejovsky does not address this problem. But here we ask this question: Why does the GL need to specify a default interpretation? Is that a necessary property of the GL? In fact, Pustejovsky's discussion of the case of *begin NP* is relevant to the notion of *semanticality* that he introduced and does not argue whether a default interpretation is needed or must be defined.

Returning to RT, Falkum reanalyses this case of logical polysemy in light of the pragmatic concept of **FREE ENRICHMENT**.[44] She claims that no such information is supposed to be encoded by the noun *book* (i.e. the events of reading and writing which are encoded in the qualia of *book*), and such event readings are entirely supplied on pragmatic grounds as a case of free enrichment (ibid; p. 226). Therefore, in a context where 'Mary began [DUSTING] a book', the utterance is contextually derived and the recovery of the 'dusting' activity is a matter of context and pragmatic inference (ibid). This is a valid argument with which we agree, but it should be noted,

[42] It should be emphasised, again, that the process of coercion is successful only if the NP has the event type available to it; otherwise, coercion does not apply (Pustejovsky, 1995: 116); a point which we already emphasised in §3.4.1

[43] In fact, as we argued in Chapter 2 (part I, section 2.2.3), we do not consider the phenomenon of multiple subcategorization a sufficient criterion for the polysemy argument in this study; thus, agreeing with Falkum that the notion of polysemy on Pustejovsky's account is a broad one.

[44] Free Enrichment (known also as EXPANSION) is an optional pragmatic process (i.e. it may not apply in certain contexts) which involves the addition of conceptual material to the decoded logical form (e.g. it's snowing [IN LONDON]) (Carston, 2001).

again, that it adds nothing to Pustejovsky's original argument about discourse and discourse factors. As we have discussed in the previous section, in relation to Fodor and Lepore's objection, Pustejovsky (1991, 1995) *does* admit the role of pragmatic factors and contextual influences in creating indefinite number of interpretations, but the major limitation of his account is that it does not tell us how the finite 'default' readings encoded in the structure of *book* can be overridden in context. The notion of *defeasibility* is absent in the GL system.

However, in cases of 'null' contexts, as Falkum claims, she agrees with Pustejovesky's account in assuming that "certain interpretations come more readily to mind than others in a 'null context'" (ibid; p.227), and thus the utterance in example (43) would most often yield the interpretation 'Mary began reading a book' where there is no real-life contextual constraints (ibid).

- **Co-composition**

The verb *bake* in example (40) above has two interpretations: the change-of-state sense in (40a), and the creative sense in (40b). This is an issue that we already discussed in the previous section, but it is reconsidered here from the RT perspective.

In the GL's view, as previously discussed, the verb *bake* has a single lexical representation that carries one sense for *bake*, which is the change-of-state- sense. The second sense (the creation sense), however, is derived via the *co-composition* mechanism. As a reminder, the qualia structure of *cake* refers to the process denoted by the VP through the AGENTIVE role (i.e. bake_act) via a relation that Pustejovsky calls *co-specification*. Thus, the semantics of *cake* specifies the meaning of the verb *bake* (i.e. shifts the 'change-of state' sense of BAKE to the 'creation' sense) as a result of co-composition application.

One of the important objections to the GL is the way certain inferences "seem to come out as strictly necessary entailments as a result of the application of the generative operations over lexical entries" (Falkum, 2007: 218). In fact, this objection has already been raised by Fodor and Lepore (1998), as well as others like Blutner (2002). The following example explains the issue further:

(44) Mary *baked* the pizza.

As already explained, on the GL approach, (44) is analysed via the co-composition process, depending on the semantics of the complement noun. Therefore, following Pustejovsky's account, the lexical representations of the verb *bake* and the noun *pizza* would predict the

'creation' sense of *bake*. This is because the lexical representation of *pizza* is much the same as *cake*. That is, the qualia structure of *pizza* includes a specification of an event type (AGENTIVE= *bake_act*) that shifts the basic meaning of *bake* to the 'creation' sense.

Now this is the main point of disagreement between RT and GL. From an RT perspective, the example of (44) can also predict a non-creative reading (i.e. the change-of-state- sense of *bake*) if Mary is only heating up a frozen pizza, and that the change of the verb's meaning in *bake a cake* is a pragmatic matter rather than an internal lexical operation (Falkum, 2007: 229). Hence, the generative process of *co-composition* is defeasible.

In RT, however, such a case is handled by the process of *ad hoc concept construction*. They assume that if the concept of BAKE is linguistically-specified as the change-of state meaning, then the meaning of *bake* in ([7b]: *John baked a cake*) could be reanalysed via the concept of *pragmatic narrowing* since the 'creation' sense embeds the 'change-of-state' sense and not vice versa. Falkum explains this process as follows:

> "The decoded meaning of the sentence in [7b] will contain the concepts BAKE and CAKE, both of which will give access to a range of encyclopaedic information associated with their denotations. The encyclopaedic entry for CAKE will contain assumptions about the way in which cakes come into being, i.e. as a result of a 'creative' process of baking. The interpretation according to which BAKE communicates the creation sense of BAKE*, would in this case be the one that is most accessible to the hearer" (ibid).

Based on Falkum's analysis given above, we wonder about the difference between the RT and GL's analyses. Obviously, there is no account given on how a non-creative sense is established in (40a). A simple answer would be this: both POTATO* and BAKE* communicate the change-of-state interpretation, based on the assumptions encoded by the concept POTATO; however, beyond this simplistic view, the theory has nothing to suggest. As it appears, then, Falkum *follows* the same line of analysis originally developed by Pustejovsky for the example of *cake*.

Indeed, as Falkum states, it is just a matter of whether one favours the RT's account (i.e. the information associated with the complement nouns is part of the encyclopaedic knowledge associated with the encoded concept) or the GL's account (information associated with complement nouns is linguistically encoded). Yet, she concludes that "the pragmatic analysis has a great advantage over the semantic one, in that it allows for the necessary flexibility in lexical interpretation" (ibid; p.230). Notwithstanding this, the pragmatic analysis of 'bake' still does not

answer the question of whether or not *bake* is ambiguous, or if it is indeed the complement of *bake* that shifts the verb's meaning.

Adjectival polysemy

Logical polysemy is also seen in adjectives. An adjective like *good* gives rise to different interpretations as is shown in example (41) above; repeated below as (45):

(45) a. Every chef needs a *good* knife.
b. 'The Kite Runner' is a *good* book.

Note that this is a case of an evaluative adjective where the process of selective binding operates over the TELIC role of the head noun in order to yield a satisfactory interpretation. There are other adjectives, such as *expensive*, that do not modify the TELIC reading via selective binding, but they modify the FORMAL quale reading (e.g. *this is an expensive book*).

In the RT framework, examples of selective binding have been analysed as cases of lexical narrowing (Falkum, 2007). The adjective *good* is assumed to have a very broad concept that needs to be "pragmatically adjusted in order to arrive at the interpretation that was intended by a speaker" (ibid; p.230). Therefore, the dependency of the meaning of *good* on the function of the object it modifies is inadequate; Falkum claims. But if we are to accept this argument, then what about examples such as, say, *a fearful book*: does *fearful* have a very broad concept that does not depend on the noun it modifies? How can lexical narrowing explain the ambiguity of *good violinist* or *beautiful dancer*? We return to this point in the next section.

3.6 Reflections

In this section, we reply to some of the claims advanced against the GL. We believe, as so does Pustejovsky (1998a), that such claims are, in fact, based on misunderstanding and misreading of the GL theory. We confine our discussion to only two examples that are frequently cited in these works.

3.6.1 The case of *newspaper*

The claim that the GL makes wrong predictions does not seem valid. Pustejovsky himself already emphasised that there is a difference between the semantics of *book* and that of *newspaper* (1995: 156). He clearly stated that *newspaper* cannot have the 'dot object' *flexibility* that book has. In other words, *newspaper* (and many other nouns such as *magazine*,

journal…etc.) can never denote the complete dot object (info.physobj.org). This is justified based on how the qualia structure relates the dot objects (1995: 256; n. 3):

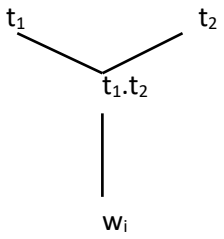
> "What distinguishes these nominals is the way in which the qualia structure relate [sic] the dot elements. […] For *newspaper*, the dot elements are "split" between qualia values, where the producer sense functions separately from the product sense in the qualia".

This leads us to talk about *split lexicalization*; a point that the RT account has certainly missed. Pustejovsky (1995: 177-180) explains the grounds on which lexemes such as *newspaper*, *sale*, *transaction, etc*. are clear instances of split lexicalization:

> "For any possible lcp, $lcp_{i,}$ constructed in the type system, the language may express this paradigm through the unique expression of a single lexical item, or it may *split* this lcp into distinct lexical forms" (ibid: 178).

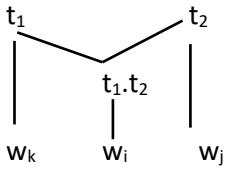
What Pustejovsky means by this statement is that we have two distinct situations. The first one in which "the language may express this paradigm through the unique expression of a single lexical item" corresponds to the following representation, in which the dot object results in logical polysemy (ibid: 178).

(46) *t* stands for *type* and *w* stands for *word*



The second situation is the case of *split lexicalisation*. Consider the following representation (ibid: 178).

(47)



Hence, for the case of *newspaper*, the lcp constructor is established as follows:

(48)

$$\frac{\alpha: \sigma 3 \qquad \alpha: \sigma 1.\sigma 2}{lcp(\alpha): \sigma 3.(\sigma 1.\sigma 2)}$$

The equation translates as:

(49)

$$\frac{newspaper: org \qquad newspaper: info.physobj}{lcp(newspaper): org.(info.physobj)}$$

What is understood by (47) and (48) is the fact that *newspaper* is unable to refer to the complete lcp type. In other words, *newspaper* makes reference only to the individual types (*newspaper: org; newspaper: info.physobj*) but not to the dot object (*lcp (newspaper)*). This entails that the resulting lcp type "does not actually result in a logical polysemy in the lexical system for the language" (ibid: 178).

The consequence of this split on the qualia of *newspaper* is put by Pustejovsky (1995: 256; n. 3) as follows:

> "No quale role makes reference to the dot object, however, which presumably restricts the noun's denotational possibilities; that is, *newspaper* can never refer simultaneously to the organization and the product on the same predicative level" (ibid).

To understand better the *split*, let us take Pustejovsky's example of *transaction* in which we have another direction of *split*. As he argues, *transaction* only refers to the lcp type but not to the individual types in the following representation (ibid: 179).

(50)

$$\frac{\alpha: \textbf{give} \qquad \alpha: \textbf{take}}{lcp(\alpha): \textbf{give}.\textbf{take}}$$

Since *transaction* is a bilateral event, it cannot refer to the individual types (α: give) and (α: take). These individual types are expressed by different lexical items: *sale* in the case of *give* and *purchase* in the case of *take*. *Transaction*, however, is only expressed by the lcp (give.take).

Indeed, the way the phenomenon of *split lexicalisation* works in the language, as described by Pustejovsky, explains the reason why *newspaper*, for instance, cannot denote the complete dot object. More importantly, it also emphasises the fact that the *lcp* type is not a conjunction of types (or, loosely, senses). It is only a type that clusters multiple semantic types in order to be projected in distinct syntactic and semantic environments. That is why Pustejovsky (1995: 93;

153) defines the *lcp* type as a Cartesian product, i.e. an operation which returns a type from multiple types.

3.6.2 The case of *good*

Recall that Falkum's analysis of *good* is based on the pragmatic notion of lexical narrowing. Under this view, the adjective *good* is a broad concept that is then pragmatically adjusted to arrive at the intended interpretation. This means, as she claims, that the dependency of the meaning of *good* on the function of the object it modifies is inadequate.

In fact, Pustejovsky already argued in favour of the general claim that the meaning of an adjective is better kept *vague* enough to account for meaning variations in context (1995: 43). Such an argument is in line with the RT's argument of having a broad concept for an adjective, which then (through lexical narrowing) is pragmatically adjusted. However, we are inclined to argue that Falkum has in fact overlooked Pustejovsky's main argument about adjective-meaning, and the fact that the meaning of an adjective depends on the head it modifies is essentially adequate. This is already supported by Falkum's (2011: 96) own argument, which reads as follows:

> "[…] the concept that is communicated by *good* when it modifies, e.g. the noun *book*, would have, as a result of pragmatic specification, a narrower denotation than that which is encoded (e.g. 'good read')".

This, of course, fundamentally means that a narrower denotation of the concept 'good read' *is* constrained by the head it modifies (*book* in her quote). Clearly, this is a contradiction to her earlier claim. If this is so, i.e. if the meaning of an adjective is derived only by means of pragmatic adjustment (narrowing), then she needs to explain to us how some ambiguous adjectives, such as *fearful* in the examples below, have different meanings when followed by different nouns.

(28) He is a fearful man.

(29) It is a fearful book.

While *fearful* in (28) is ambiguous between the meaning of causing people to be afraid and the meaning of feeling or showing fear, only the former meaning is available for (29). Therefore, in examples such as these, the meaning of the adjective seems to depend on the following modified noun.

However, let us return to Pustejovsky's main argument. Firstly, Pustejovsky identifies the problem with a SEL approach to adjective meaning. In SEL, adjective meanings are listed as distinct senses, which then require such an approach to list every new emerging sense (as in *good weather, good children…*etc.) as separate entries in a dictionary. Hence, the problem of SEL listing of each new sense is that "the cardinality of the senses of *good* will equal (at least) the number of distinct types in the language to which the adjective applies" (ibid: 43).

Secondly, as an alternative to the SEL account, Pustejovsky considers treating the adjective meaning (he uses the example of *good* here) vague enough, so as to cover all the instances in which it occurs. By doing so, he argues, it becomes the role of world knowledge or pragmatic effects to determine the meaning of an adjective by "commonsense understanding of the phrase and the situation within which it is uttered" (ibid: 43). However, he remains agnostic about such an alternative since he believes that the meaning of an adjective is part of the meaning of the head it modifies (ibid; italics as in original):

> "The problem with this strategy, however, is that the particular chunks of commonsense knowledge needed to interpret how *good* modifies in a specific phrase are actually part of the meaning of the noun being modified, and not simply part of world knowledge".

Thus, it is not clear that the pragmatic analysis, alone, offers a convincing argument in relation to adjective's meaning. Surely, there are contextually-influenced readings that depend on discourse setting and pragmatic reasoning (e.g. *good weather*), where the noun does not encode any telic/agentive readings that would influence the meaning of the adjective with which it combines. Moreover, to what extent can pragmatics influence the interpretation of sentences involving the use of predicative and non-predicative adjectives (e.g. *an electrical engineer* vs. **the engineer is electrical*; also, *the nervous system* vs. **the system is nervous*)?

3.7 Conclusion

In this chapter we provided a detailed description of Pustejovsky's *Generative Lexicon*. We started by looking at the four levels of lexical representation in the theory (i.e., the argument structure, event structure, qualia structure, and lexical inheritance structure). We, then, studied the generative mechanisms responsible for explaining the compositional nature of word-meaning: coercion, co-composition, and selective binding. Finally, in the last two sections we discussed two critiques of the GL, and then we have shown, through the examples of *newspaper*

and *good*, that certain claims made against the GL were simply invalid due to the misunderstanding of the theory.

Chapter 4 Systematic polysemy in Arabic

4.1 Introduction

This chapter studies systematic polysemy and provides a descriptive account of it in Arabic (both MSA and Jordanian Arabic (JA)). The chapter includes three main sections, which address a number of existing Arabic regular alternations. Starting with the noun category, Section 4.4 identifies nominal alternations similar to those identified mainly by Pustejovsky (see Chapter 2, Section 2.2.3). Section 4.5, then, investigates systematic alternations within the domain of nominalized adjectives, with particular focus on *property nominalisations*. In this section, we attempt to identify the extent to which this type of adjective nominalisation is manifested in the language and the degree to which the derived nouns of this type express systematic polysemous readings, similar to those explored by Aronoff (1976) and Spencer (2013) in English. Section 4.6 is devoted to the study of regular alternations in verbs. It first paves the way to the study of the systematic polysemy of causative/inchoative verbs by explaining the major concepts of decausativization and passivisation. However, since the topic of the causative/inchoative verbs is mainly dependent on the understanding of the Arabic verb Forms (or *awzān* 'measures'), subsection 4.6.1 focusses on the distinction between the passive voice '*al-mabnī li-lmağHūl'* and the middle-voice '*al-fi3l al-muṭāwi3'* in Arabic. The distinction between the passive voice and the middle-voice is central to the understanding of alternating verb Forms in the context of systematic polysemy. Finally, the remaining subsections discuss the topic of the causative/inchoative alternation in verbs of Form I in MSA and of Form I and Form II in JA.

4.2 The Data

The data collected for the current study of Arabic are separated into two parts: The MSA data and the JA data. Data obtained for MSA are mainly of two sources: Dictionaries (both monolingual (Arabic-Arabic) and bilingual (Arabic-English)) and online corpora. As for dictionaries, the following are used: a*l-Mu3jam al-Waseet* [The Intermediary Dictionary], *Lisān al-Arab* [The Tongue of Arabs]*, Hans Wehr's dictionary of Modern Written Arabic,* and *Mu3jam al-lugha al-3arabiyya al-mu3āṣira* [The Contemporary Arabic Dictionary]. As for online corpora, on the other hand, these are used: The Arabic Corpus Tool (arabiCorpus) and Sketch Engine Arabic Corpus (arTenTen).

On the other hand, data obtained for JA alternate between the author's own examples (him being the native user of the language), self-observations, and citations in local usages, including newspapers and other media forms. Online corpora for JA, however, are currently not available; hence, what remains lacking in places is the scope and frequency of the occurrence of systematic polysemy in some of the areas investigated. This, of course, does not jeopardise the analysis of the cases identified, since the main purpose is to pinpoint areas that reveal the phenomenon.

This separation between MSA data and JA data, which is mainly seen in the use of source data for the analysis, serves two pivotal points: Firstly, it shows that the situation in MSA is not necessarily the same as that in JA, which must be the case because the two are in fact two separate entities. Secondly, some of the areas where systematic polysemy occurs are absent, for one reason or another that we explain, in either MSA or JA. Thus, it would be difficult to maintain the argument without a proper explanation of the situation in both MSA and JA. However, where similarities and/or differences occur in both situations, this will be indicated.

4.3 Elementary aspects of substantives in Modern Standard Arabic

This section serves as the basis for the discussion in the next section that focusses on the study of noun alternations. Although the discussion here is basic, the complexities that we identify later, especially in respect of collective nouns, are dependent on these elementary aspects that we briefly explain below.

- **The masculine/feminine gender**

Arabic is a gender-inflected language. Hence, most words are gender-biased, in the sense that they reflect the masculine/feminine distinction. For example, nouns and adjectives in the following examples are either masculine or feminine (for simplicity matters, we drop case marking in these examples).

(1)	***Masculine***	***Feminine***
	mu3allim 'male teacher'	mu3allim-a 'female teacher'
	ṭabīb 'male doctor'	ṭabīb-a 'female doctor'
	ğamīl 'beautiful'	ğamīl-a 'beautiful'
	kabīr 'big'	kabīr-a 'big'

As is shown, the grammatical gender for words in the second column is feminine, and it is generally distinguished by an additional suffix attached to the end of the (masculine) word. This extra suffix is the short vowel *a* when there is a pause after the word as in the example above or the *tāʔ marbūTa* when the word is case-marked as in (2) below. In JA, feminine words are only marked by the former suffix, i.e. the same as in the example above.

(2) mu3allim-**at**-un 'female teacher' (case: nominative)

mu3allim-**at**-an 'female teacher' (case: accusative)

The masculine gender, however, whether in MSA or JA is not marked by affixation; hence, we may call it the *stem* or *base form* for the derivation of feminine form, the dual number, and the sound (regular) plurals.

- **The singular/dual/plural number**

Nouns in Arabic have three kinds of number: the singular, the dual and the plural. This is illustrated in the following examples.

(3) *mu3allim* 'a male teacher' *Singular*

mu3allim-ān 'two male teachers' *Dual*

mu3allim-ūn 'male teachers' *Plural*

(4) *kitāb* 'book' *Singular*

kitāb-ān 'two books' *Dual*

kutub 'books' *Plural*

The base form of any noun in Arabic is the singular form; which is also called the citation-form because it is the form which is usually listed or looked up in a dictionary (cf. Ryding, 2005). In light of the examples above, this would mean that both *mu3allim* and *kitāb* (the singular form) are lexical or dictionary entries.

- **The plural number**

Plural nouns in Arabic are either regular (or sound) plurals or irregular (broken) plurals. This is parallel to the way plural nouns in English are formed; either regularly by adding the –s suffix or by some sort of affixation (irregular plural).

- **Sound plural**

In the previous example, the singular noun *mu3allim* 'teacher' has the sound masculine plural form, *mu3allimūn* 'teachers'. Sound plurals are formed in two ways depending on the gender of the word: (i) for masculine words, the sound plural is made by adding the –ūn suffix (in the nominative case) to the singular form to mark their plural number. Consider this:

(5) muhandis 'engineer' — muhandis-ūn 'engineers'

muʔmin 'believer' — muʔmin-ūn 'believers'

(ii) for feminine words, the sound plural is formed by adding the –āt suffix to the singular feminine form, like this:

(6) muhandis-a 'female engineer' — muhandis-āt 'female engineers'

muʔmin-a 'female believer' — muʔmin-āt 'female believers'

It is very important to note, in this regard, that the sound masculine plural only applies to nouns and adjectives that refer strictly to male humans. The sound feminine plural, on the other hand, may apply to any noun and adjective; both humans and non-humans. Exceptions exist in both cases, but, nonetheless, are irrelevant to the current study.

- **Broken plural**

Unlike the previous examples where nouns of sound (masculine and feminine) plurals follow a regular, predictable formation rule, some nouns have the broken plural form, as follows.

(7) ṭālib 'male student' — ṭullāb 'students'

kitāb 'a book' — kutub 'books'

- **Sound and broken plurals**

Some Arabic nouns have more than one plural form, i.e. both the sound and broken plurals. This is actually where most generic collective nouns fit.[45]

[45] We are oversimplifying matters here as Arab grammarians differ on whether the form of the plural of the generic collective nouns is considered a broken plural form or not. However, as we will argue later in Part II of section 4.4, the plural form for generic collective nouns is in fact both regular and predictable. 'Regular' is not used here in the sense of the sound plurals that we have just discussed.

(8)

Singular		**Sound plural**		**Broken plural**
baqara ‘a cow’	—	‘baqarāt ‘cows’	—	baqar ‘cows, generic’
tuffāHa ‘an apple’	—	tuffāHāt ‘apples’	—	tuffāH ‘apples’
zahra ‘a flower’	—	zahrāt ‘flowers’	—	zahr ‘flowers’
3ālim ‘scholar’	—	3ālimūn ‘scholars’	—	3ulamāʔ ‘scholars’

- **Mass nouns and plurality**

As the singular, dual, or plural number signifies *countability*; intuitively, uncountable (mass) nouns do not normally enter this system. But when a mass noun is pluralised (usually has the broken plural form), its meaning is changed. Consider the following.

(9)

Mass noun		**Broken plural**	**Meaning**
māʔ ‘water’	—	miyāh ‘waters’	different sources/kinds of water
3asīr ‘juice’	—	3asāʔir ‘juices’	different kinds of juice
laban ‘yoghurt’	—	ʔlbān ‘yoghurts’	dairy products

- **The definite/indefinite**

Definiteness or indefiniteness is another elementary feature of nouns and adjectives alike. Definiteness is basically used to restrict the meaning of a noun or adjective. In Arabic, there are three ways to achieve this (cf. Ryding 2005):

(i) the definite article *al* (e.g. English *the*)

(ii) iḍāfa (annexation)
e.g. laHm-u l-xinzīr-i
meat-NOM DEF-pig-GEN
‘The meat of the pig/ pig-meat’

(iii) possessive pronoun suffixation
e.g. manzil-ī
house-1SG.POSS
‘My house’

Numerals and noun agreement

Grammatical agreement is a complex subject in Arabic; however, the aim here is to discuss the basic elements of the agreement system that have a direct link to the discussion below.

To begin, we explain the agreement between the noun in the masculine and feminine forms and the cardinal numerals from one to three only. These numbers, in grammar, are words that are used to express quantity. Consider the table below (we assume the nominative case in these examples).

Number	**Masculine**	**Feminine**
One	wāhid	wāhida
Two	ithnān	ithnatān

The table shows the first two Arabic numerals in their masculine and feminine forms. The masculine form is used with masculine nouns and the feminine form is used with feminine nouns. Moreover, with respect to the Arabic syntax, the numerals normally appear in post-position, i.e. like predicative adjectives, as is shown below.

(10) Kitāb-un wāhid-un ‘one book’ kitābān ithnān ‘two books’

(11) zahrat-un wāhidat-un ‘one flower’ zahratān ithnatān ‘two flowers’

As is noticed, the agreement is in both number and gender. Now we come to explain the numeral *three* which is not included in the table above for the reasons explained below. First, let us study the table below.

Number	**Masculine**	**Feminine**
Three	thalāth	thalāthat

Numbers from 3-10 in Arabic show *reverse (gender) agreement*. Consider the following examples.

(12) *thalāthat-u* *kutub-in*
three.F-NOM books.M-GEN
‘three books’

(13) *thalāth-u* *zahrāt-in*
three.M-NOM flowers.F-GEN
‘three flowers’

As is noticed in these examples, there are two main remarks about the numeral *three* and its counted noun with respect to grammatical agreement: Firstly, the feminine form of the numeral

must be used whenever the singular of the counted noun is masculine (e.g. the singular of *kutub* is *kitāb,* which is masculine). Secondly, the syntactic construction when these numerals are used with countable nouns is an *idāfa* (i.e. genitive) construction. In the examples above, the numeral precedes the noun and the counted noun receives the genitive case.

As we stated earlier, the topic of numerals and noun agreement is far more complex. However, we will not go beyond the basic description provided here, since in the later discussion of the data, we will only highlight the agreement between these three numerals and the count/mass nouns.

Summary

Having discussed the basic aspects of substantives in Arabic, we now turn to study the areas where systematic polysemy is (potentially) found.

4.4 Nominal alternations

Nominal (or noun) alternations are widespread in Arabic in the same way as they are in English. Pustejovsky's nominal alternations identified earlier in Chapter 2 (cf. section 2.2.3) can be extended to Arabic. In the following discussion, we consider how regular or irregular these alternations are in Arabic.

Let us first study, in relation to the Arabic data, six nominal alternations given in Pustejovsky (1995) which are thought to be the frequent types of polysemy; repeated below for convenience:

1. Container/content
2. Count/mass:
    a) Animal/meat
    b) Object/stuff
    c) Stuff/portion
3. Plant/food
4. Product/producer
5. Place/people
6. Figure/ground reversals

Now, given the above classification, we separate the discussion into two main parts: The first part looks at examples that behave quite similarly to their counterparts in English; hence the

discussion is relatively straightforward. The second part, on the other hand, discusses cases that seem somehow complex and rather problematic for a later analysis.

PART I: Simplex alternations

From the earlier classification by Pustejovsky (1995), we define simplex alternations as these nominal alternations that exhibit no differences in terms of syntax and/or morphology. These include all the patterns listed above except the count/mass alternations.

We first provide examples for each pattern and then provide a theoretical discussion at the end.

- ***The container/content alternation***

Container/content alternation		
Lexemes	**Sense$_1$**	**Sense$_2$**
kitāb ‘book’ qāmūs ‘dictionary’ mu3ğam ‘dictionary’	Physical object	Content/information
qinnīna ‘bottle –usually made of glass’	=	Content/liquid
kaʔs ‘glass’	=	=
ṭanğara ‘cooking pot’	=	Content/food
ṣaHn ‘plate’	=	Content/food
usṭuwāna ((gas) cylinder)	=	Content/liquid (gas)
xazzān ‘(water) tank’	=	Content/liquid (water)

Table 4.1: The container/content pattern in Arabic

As is clear, Table 4.1 above contains lexical items that belong to the common pattern of ‘container/content’. We observe that in both MSA and JA we refer to the container/content senses using the same lexeme as in the following (examples are in MSA):

(1) *lā* *tansa* ***kitāb****-ak-a* *ghad-an*
not forget book-your-ACC tomorrow-ACC
‘Do not forget your book (.object) tomorrow’

(2) *ʔrhaqa-nī* ***kitāb****-uk-a* *ḏāka, kān-a* *mumti3-an w* *mut3ib-an* *mithla-ka*
tired-me book-your-NOM that, was-it interesting-acc and tiring-acc like-you
‘Your book exhausted me; it was enjoyable and tiring like you’

(3) *šariba* *al-walad-u* *az-**zuğāğat**-a* *bi ʔkmal-i-ha*
drank.3SGM the-boy-NOM the-bottle-AC all-GEN-it
'The boy drank the whole bottle (.content)'

(4) *lā* *ta-sta3mil* *az-**zuğāğat**-a* *tilka*
Not use the-bottle-ACC that
'Do not use that bottle (.object)!'

In example (1), the noun *kitāb* 'book' is used in its physical object (or the container) sense. This particular sense is determined by the main verb (predicate) in the sentence.

In the second example, (2), it is the 'information' sense of *kitāb* which is selected. Although it seems unclear in the first clause which particular sense is selected, as the predicate 'exhaust' may in fact select both for it is not determined the type of exhaustion being exerted (i.e. whether physical or mental), the second clause tells which exact sense is being referred to. It becomes clear; however, from the modifying adjectives in the second part of the sentence that *kitāb* is being used in the sense of 'information'.

The third and fourth examples are not different but the type of 'content' is different. In these examples, the noun *zuğāğat* (bottle) is used on one occasion in its 'object' sense and on another in its 'content' sense as a way of measuring the quantity of the content being drunk.

A brief discussion

Nouns of the 'container/content' pattern, in general, are illustrative of the 'facet' interpretation (cf. Chapter 2, section 2.2.4). For simplicity, we may call them ***facet nouns*** (cf. Cruse, 2000). In other words, their semantics encodes, as part of the meaning of the noun, two readings or senses that can be accessed independently or simultaneously in context. Independently as shown in the case of examples (1), (3), and (4), and simultaneously as in example (2).

It is also important to remember in this context that the linguistic tests of co-predication and pronominalization (Chapter 2, Part I) apply successfully to these examples. In other words, the senses of facet nouns can appear together without zeugmatic interpretation, as in example (2) above.

- ***The plant/food alternation***

Plant/Food Alternations		
Lexemes	**Sense$_1$**	**Sense$_2$**
za3tar ‘thyme’	Plant	food
muluxiyya ‘jute leaves/ Jew’s mallow’	=	=
meramiyya ‘sage’	=	=
bābūniğ ‘chamomile’	=	=

Table 4.2: The plant/food pattern in Arabic

Like the previous type of alternation, the *plant/food* alternation is, to a certain degree, similar. Consider the following examples in MSA.

(5) *al-**bābūniğ*** *yusā3id* *3ala* *l-istirxāʔ*
the-chamomile helps.3SGM to relaxation
‘Chamomile (.plant .food) helps to relax’

(6) *kāna* *yaʔkul-u* *l-**muluxiyyat**-a* *ʔms*
was.3SGM eat.IMPV-3SGM the-Jew’s mallow yesterday
‘He was eating Jew’s mallow (.food)yesterday’

(7) *tanmu* *l-**muluxiyya*** *fi* *mu3ẓam* *ʔnwā3* *al-ʔrāḍi*
grows.3SGF the-Jew’s mallow in most kinds the-lands
‘Jew’s mallow (.plant) grows in most kinds of soils’

The noun *bābūniğ* in (5) has available to it two readings, which are the plant and food readings, and there seems to be no element in the sentence that brings a particular sense into focus. Similarly, the noun *muluxiyyat* in (6) and (7) has two distinct senses that alternate between the plant and food readings. Lastly, example (7) shows that *muluxiyyat* is strictly used in the plant sense as determined by the sentence’s verb *grow*.

A brief discussion

Given their contexts, it might seem that, like the *kitāb* ‘book’ example, *bābūniğ* and *muluxiyyat* behave in a similar way, i.e. as facet nouns. However, unlike facet nouns such as *book* which are defined by a containment relationship, *bābūniğ* and other similar nouns of the plant/food pattern are defined by a different relationship.

In addition, unlike the first alternation type, elements in this pattern are quite different in terms of their ontological status. All plants are natural kinds. That is, we normally do not expect the 'food' reading to be part and parcel of the noun's semantics unless it is used as such.

In the context of the GL theory, nouns of this pattern are treated as belonging to the natural kind or simple type in the type hierarchy. This, of course, is where theoretical treatment might differ from that of the container/content type.

- ***Product/producer alternation***

Product/ Producer Alternations		
Lexical item	**Sense$_1$**	**Sense$_2$**
Honda	Product	Company
Adustour	Newspaper	Producer; organisation
Microsoft	Product	Company
Dior	Product (perfume)	Producer

Table 4.3: The product/producer pattern in Arabic

Similar to the previous patterns, the *product/ producer* alternation is no different; except that it may contain some lexical items where one of whose meanings corresponds to a different pattern at the same time. Consider the following examples in MSA.

(8) *ištara* ***addustour*** *li* *yabHatha* *3an* *waẓīfat-in*
bought.3SGM Addustour to search.3SGM for job-GEN
'He bought Adustour (.newspaper) to look for a job'.

(9) *ʔqdama-t* ***addustour*** *3ala* *našr-i* *axbār-in* *kāḏibat-in*
came-f Addustour to publishing-GEN news-GEN fake-GEN
'Adustour (.organisation) published hoax news'.

(10) ***Microsoft*** *tuṭliqu* *rasmiyy-an* *niẓām-a* *l-tašghīl windows 10*
Microsoft launch.3SGf official-ACC system-ACC DEF-operating-GEN windows 10
'Microsoft (.company) officially launches Windows 10'.

(11) *al-ghālibiyya tastaxdimu* ***Microsoft*** *haḏihi l-fatrat-i*
DEF-majority use.3SGf Microsoft this DEF-period-GEN
'The majority use Microsoft (.product(s)) these days'.

Examples (8) and (9) show how the noun *addustour*, which is the name of a newspaper in Jordan, alternates between two distinct readings: The first reading in (8) refers to the *product* or *newspaper* sense of the noun, while the second reading in (9) denotes the *producer* sense, i.e. the organisation which produces the newspaper. The exact reading of *addustour* is specified by the predicate of the sentence, which is the verb in these examples. Examples (10) and (11) which use the proper noun *Microsoft* are explained in the same way.

One observation about the noun *addustour* in its first sense, i.e. the *newspaper* sense, concerns the fact that the *newspaper* sense is itself a construction of the *container/content* alternation, with the readings *object* and *information*. This means that $Sense_1$ of *addustour* also alternates between the *object* reading and the *information* reading. Example (8), for instance, shows the *object* reading of the *newspaper* sense.

A brief discussion

Nouns of this pattern exhibit properties that are mainly based on the hyponymy-hyperonymy relationship that exists between the senses of the noun. For example, the brand name *Honda* in the product sense is a type of *vehicle.* What this signifies, from a theoretical viewpoint, is the fact that *Honda* inherits the properties of *vehicle* (i.e. class inheritance). For instance, *vehicle* is a machine used for transportation and so is *Honda* in the product sense. Similarly, *Honda* in the company sense inherits the properties of *organisation* or *company.*

Generally, brand names such as these mentioned in the table and others like *Kleenex,* for example, behave in a very similar, predictable way that would be easily identified and extended to new words entering the language.

- ***Place/people alternation***

Place/People Alternations		
Lexical item	**$Sense_1$**	**$Sense_2$**
London	Place	People
Ammān	=	=

Table 4.4: The place/people pattern in Arabic

Again, like the previous patterns, the *place/people* pattern is the same, too. Consider the following.

(12) Sāfara ilā Ammān
travelled.3SGM to Amman
'He travelled to Amman'

(13) taHtafilu Amman bi yawm-i l-istiqlāl-i
celebrate.3SGF Amman bi day-GEN DEF-independence-GEN
'Amman celebrates the Independence Day'

The examples are straightforward. In (12) the common noun *Amman* denotes the place or the city, whereas it is used in (13) to refer to the people living in the city of Amman.

A brief discussion

The examples are based on the place-for-people metonymy (see the discussion in Chapter 2). Syntactically speaking, it is worth remembering that the place/people alternation is not necessarily restricted to single lexemes such as *Amman* as it can also be applied to phrases; what Copestake and Briscoe (1995) called *phrasal sense extension* (see Chapter 2, section 2.2.2.2).

- ***Figure/ground reversals***

Figure/ Ground Reversals		
Lexical item	**Sense$_1$**	**Sense$_2$**
šubbāk 'window'	Physical object	Aperture
bāb 'door'	=	=
madxal 'entrance'	=	=

Table 4.5: Examples of figure/ground reversals in Arabic

Figure-ground nominals refer to 2-dimensional objects, such as the ones in the table above as well as to 3D objects such as *room* (Pustejovsky, 1995). These nominals are logically ambiguous between two distinct interpretations. Consider the following examples.

(14) *xarağa* *min* *al-**nāfiḏat**-i*
came out of DEF-window-GEN
'He came out of the window'

(15) *kasara* *al-**nāfiḍat**-a*
broke DEF-window-ACC
'He broke the window'

Examples (14) and (15) show two distinct but related interpretations for the noun *nāfiḍat*: the *aperture* and *physical object*, respectively. The *aperture* or *opening* reading in the first example is determined by the predicate of the sentence, which is in this case the phrasal verb 'go out'. The *object* reading in the second example is also specified by the verb 'break', which requires a noun of the object type to which the action of breaking applies.

A brief discussion

In Pustejovsky and Anick (1988) and Pustejovsky (1995), the shift in perspective is seen as a shift in meaning. In the examples provided above, the **figure** refers to the *object* and the **inverted figure** refers to the *space* or *aperture* in the absence of the object.

4.4.1 Part I: Summary

All the data in the tables show great similarity between Arabic and English nominal alternations. There are also numerous examples on the place/people, and figure/ground alternations, including the other alternations as well. However, we provided only a few of them since we expect no occurring differences.

One prominent point about what we called *simplex alternations* is the fact that they do not seem to have any effect on either the morphological form of the noun or the syntactic structure in which they occur. As with respect to the notion of regular polysemy, these alternations seem to be very productive, in the sense of Apresjan (1974) (cf. Chapter 2, section 2.2.1). That is to say, it is easy to see, based on the ample data we investigated for Arabic (cf. section 4.2 of this chapter for data sources), that for any noun belonging to one of these patterns given above there is always a systematic, predictable shift in meaning. These results, as we already emphasised, are in accordance with the findings in the current literature.

PART II: Complex alternations

This is the second part of nominal alternations which display complexities at the syntactic and morphological levels in Arabic. This is the case of the count/mass alternations. First,

consider the table below, which contains different nominal alternations alongside some of the lexical items that participate in each alternation pattern.

- ***Count/mass alternations***

Count-to-Mass Alternations				
Pattern	**Lexemes**	**Glosses**	**Sense$_1$** (count)	**Sense$_2$** (mass)
Object/Stuff	tuffāH (PL.) xiyār (PL.)	apples cucumbers	Objects	Stuff
Animal/Meat	dağaağ (PL.)[46] Hamām (PL.) arānib (PL.) samak (PL.) baṭ (PL.)	chickens pigeons rabbits fish ducks	Animal	Meat
Mass-to-Count Alternations				
Pattern	**Lexeme**	**Glosses**	**Sense$_1$** (mass)	**Sense$_2$** (count)
Stuff/Portion	qahwa 3asīr (only in the dialect and in only one specific context)	coffee juice	Stuff	Portion

Table 4.6: The count/mass patterns in Arabic

The table above identifies three nominal alternations that are subsumed under the primary count/mass alternation. These are the *object/stuff* alternation, the *animal/meat* alternation, and the *stuff/portion* alternation. In fact, there is much to be said here about the data presented in this table, which is why the table is split to cover two main topics in Arabic: the count-to-mass and the mass-to-count alternations. For that reason, we briefly introduce the subject of Arabic count/mass nouns below and, afterward, we proceed to discuss the two topics separately.

[46] The noun *dağāğ* is pronounced in three different ways in MSA: either *dağāğ* or *duğāğ* (considered weak) or *diğāğ*. If you open an Arabic-Arabic dictionary, you will surely find the last two readings listed under the lexical entry DAĞĀĞ. A fact not widely known to most native speakers of Arabic is that the third reading (diğāğ) actually refers to male chickens only, from which the singular noun is *dīk* (rooster). The first reading *dağāğ* is the way native speakers pronounce this word, and it is originally meant to refer to female chickens. Such a difference in meaning, to the best of our knowledge, is never mentioned in any Arabic-Arabic dictionary or Arabic-English dictionary such as Wehr's 1976. Perhaps, this distinction already died long time ago but it is interesting to see these three different spellings still cited in some Arabic-Arabic dictionaries.

4.4.2 The count/mass nouns in Arabic

The topic of this section and the next ones is actually a very diverse and complicated topic in Arabic, which we won't be able to cover thoroughly in a single section or even in a chapter. However, the aim here is to present it very succinctly; bearing in mind that we are only mainly concerned with these nouns that exhibit systematic polysemous readings.

In the broadest sense, a countable noun is defined as a noun that can be counted such as in *dog—dogs*, while a mass noun is that which cannot be counted as in *rice—*rices*. Another crucial distinction between the two, at least in English, lies in the use of determiners (Chierchia, 1998a, 1998b)[47]. For example, we can say *I like the book* but not **I like book*. However, the subject matter is far more complex than what this simple definition suggests.

In this section, we only draw on general distinctions between countable and mass nouns (however, cf., for instance, Wierzbicka 1985; Langacker 1987; Pelletier 2012; and Massam 2012 for fully-fledged accounts)[48]. Before we start, let us first make some points clear with respect to terminology use. This is very important for the discussion included in this section and the following ones. For clarity of exposition, a table is provided below and contains the main concepts/terms with which we shall operate.

[47] Note that the grammaticality tests, such as the use of determiners, do not work for languages like Japanese or Chinese since the language does not grammatically distinguish between countable and mass terms (i.e. the grammatical distinction is absent). Such grammatical distinction is not absent in Arabic, however.

[48] There is a huge body of literature on the count/mass distinction; however, we focus on only a few selections of it. Perhaps, Wierzbicka might be a good starting point for a comprehensive discussion on this particular subject as she distinguishes between fourteen (I-XIV) classes of nouns in respect of countability and non-countability. See Wierzbicka (1985: 311-342).

Table 4.7: Classification of the Arabic countable and mass nouns

English term Arabic term	Mass nouns *ismu l-ğins al-ifrādī*	Collective-mass nouns ?	Generic collective nouns *ismu l-ğins al-ğam3ī*	Collective nouns *ismu l-ğam3*	Countable nouns *al-ğam3*
Examples	māʔ 'water', Halīb 'milk' laHm 'meat', ḍawʔ 'light', 3asal 'honey', etc.	athāth 'furniture'[49],	**English:** ? **Arabic:** tuffāH 'apples', samak 'fish', baqar 'cows', tamr 'date palm'	ğayš 'army' nisāʔ 'women'	tuffāHāt 'apples' baqarāt 'cows' kutub 'books' manāzil 'houses'
contains individual entities	No	Yes, but of **different** kinds	Yes (of the **same** kind)	Yes	Yes (of **same** kind)
Internally homogeneous	Yes	No	Yes	Yes	-
Coercion	*count coerce-able (in English)*	-	*mass coerce-able*	-	-
similarity of function/form	Similarity of form	Contiguity/similarity of function	Similarity of form	Similarity of form	Similarity of form
Objects construed as	Unindividuated entities	Individuated but the word form resists PL (and has no singular form)	Individuated	Individuated (has no singular form)	Individuated

Table 4.7 shows the different types of Arabic nouns in respect of the notion of *countability*, as is given in the top header row. At top level, nouns are divided into two major categories: Mass nouns and countable nouns. At deeper level, mass nouns can be further divided into *collective mass nouns*, and countable nouns into *collective nouns* and *generic collective nouns*. Below we explain briefly what each term means.

1. Mass nouns

A *mass noun* is a noun that identifies a thing that cannot be counted or separated into countable parts, i.e. perceived as an unindividuated entity such as *water*. So, whether it is a drop of water or

[49] The singular form of the noun *athāth* 'furniture' in Arabic is *athātha*. This may sound absurd, and in fact we find it very odd too since we could not find a single Arabic sentence or even a phrase in which this singular form of the noun is used. It is only cited as the singular form of *athāth* in some Arabic-Arabic dictionaries and in Wehr's (1976) Arabic-English dictionary.

an ocean of water, it is *water*. In Arabic, it is called *ismu l-gins al-ifradi* (lit. 'the noun of the single kind; genus). Such nouns do not have a singular form (**a water*) nor a plural form (**waters*).

On the other hand, a *collective mass noun* is a noun that refers to a group or collection of individual things that can be counted but they are not of the same class or genus (e.g. *furniture*, *underwear*, etc.). So, the term *collective* denotes the group as a whole and the term *mass* defines the noun itself. That is, *furniture* for example is a mass noun which has neither a singular form (**a furniture*) nor a plural form (**furnitures*). In Arabic, there seems to be no equivalent of the term *collective mass noun*.

2. Countable nouns

A *countable noun* is a noun that identifies a thing that can be counted, i.e. perceived as an individuated entity such as *flower*. Hence, the singular form is *a flower* and the plural form is *flowers*. In Arabic, the term is called *al-ğam3* (lit. 'the plural'), which essentially defines both meaning and form.

A *collective (countable) noun* is a noun that refers to a group or collection of individuals of the same type or class (e.g. *people*, *team*). In Arabic, the term is known as *ismu l-ğam3* (lit. 'the noun of the plural'). *Ismu l- ğam3* such as *ğayš* 'army' in Arabic does not have a singular form (**ğayša* 'an army'). In fact, a better term to convey this Arabic concept would be *collectives proper* (see Schulz, 2004).

Finally, a *generic collective noun* in Arabic is a noun that denotes a group of things of the same genus (e.g. *apples*). The term is known as *ismu l-ğins al-ğam3ī* (lit. 'the noun of the plural genus'). Often, a noun of this category such as *tuffaH* 'apples' has a singular feminine form (e.g. tuffaHa 'an apple') which denotes the unit reading –i.e. a unit noun or *Nomen unitatis*—and a sound feminine plural form (e.g. *tuffaHat* 'apples').

With that explained, we now turn to discuss the count/mass alternation in Arabic.

4.4.3 The count-to-mass nominal alternations

In the earlier table provided at the start of Part II, we listed two nominal alternations under the count-to-mass alternations: The *object/stuff* alternation and the *animal/meat* alternation. In this section, we focus first on the *animal/meat* alternation and provide a detailed

discussion of how nominals of this pattern behave in the Arabic language and the extent to which their behaviour differs from or agrees with similar nominals in English. As we will notice throughout the discussion, the generic collective noun is systematically polysemous between two readings: the count reading and the mass reading. However, some divergences still occur, which we also explain.

To start, consider the examples below (examples are in MSA and taken from arabicorpus.byu.edu).

(16) *raʔaytu tāğir-a ad-**dağāğ**-i*
saw.1SG trader-ACC DEF-chickens.PL-GEN
'I saw the trader of chickens (.animal/ ?.meat)'

(17) *ʔmsaka bi qit3at-i **dağāğ**-in*
grabbed.3SGM piece-GEN chickens.PL-GEN
'He grabbed a piece of chicken (.meat)'

(18) *raʔaytu-hu yaʔkulu **dağāğat**-an*
saw.1SG-him eat.3SGM chicken.SGF-ACC
'I saw him eating a chicken (.animal)'

(19) *raʔaytu-hu yaʔkulu thalath-a **dağāğāt**-in*
saw.1SG-him eat.3SGM three.M-ACC chickens.PLF-GEN
'I saw him eating three chickens (.animal)'

(20) *raʔaytu-hu yaʔkulu **dağāğ**-an*
saw.1SG-him eat.3SGM chickens.PL-ACC
'I saw him eating chickens (.animal .meat)'

(21) *urīdu ʔn ākula al-**baṭ**-a ma3a-ka*
want.1SG to eat.1SG DEF-ducks.PL-ACC with-2SGM
'I want to eat ducks with you (duck-meat)'

(22) *la adhunnu-ha akalat **baṭ**-an…a kunta taxsha an takun matat b sabab-i al-**bat**-i?*
Not think-she ate ducks-ACC…were afraid that she died because DEF-ducks?

'I don't think she died from eating ducks (.animal .meat)…were you afraid that she died because she ate ducks (.animal .meat)?'

(23) *Kana* *šarih-an* *ya'kulu* *l-**xarūf**-a* *wahdhu*
was.3SGM avid-ACC eat.3SGM DEF-sheep.SG-ACC alone
'He was a gluttonous eater. He used to eat a whole lamb (.animal) alone'.

(24) *Inxafad si3r -u* *l-**xarūf**-i* *l-mustawrad-i* *fi* *l-sūq-i*
decreased price-NOM DEF-sheep.SG-GEN DEF-imported-GEN in DEF-market-GEN
'the price of imported sheep (.animal) decreased in the market'

(25) *ʔs3ār-u* *l-**xirāf**-i* *l-mustawrada-ti* *fi* *l-sūq-i*
prices-NOM DEF-sheep.PL-GEN DEF-imported-GEN in DEF-market-GEN
'Prices of imported sheep (.animal) in the market'

These examples make use of three different animal nouns: ***dağāğ*** 'chickens', ***baṭ*** 'ducks', and ***xarūf*** 'a sheep'. Each noun occurs in different contexts. Let's start with ***dağāğ***, which occurs in the first four examples. In (16), (17), and (20), ***dağāğ*** is used in the broken plural form, while in (18) it is used in the feminine singular form. What is noticed is that the two readings of either *animal* or *meat* appear to be available only when the noun is in the broken plural form. The singular feminine form ***dağāğat*** in (18) and the sound feminine plural form ***dağāğāt*** in (19) denote the animal sense. Moreover, the sound feminine plural form ***dağāğāt*** is preceded by a numeral to indicate countability. Considering ***baṭ*** 'ducks', examples (21) and (22), again, are not different. The noun ***baṭ*** in these examples has the broken plural form, which is used to refer to either the *animal* or *meat* sense. Finally, examples (23), (24) and (25) show how the noun ***xarūf*** 'sheep' is used in its both singular and plural forms to denote the sense of the animal.

There are, at least, three key points to learn from these examples. The first obvious one is that, like English, the countable form of a noun can be used to denote an uncountable reading. The second less obvious point, on the other hand, concerns the way uncountable or mass interpretations are derived from their countable counterparts, which seems to be more constrained. In addition, the precise sense of a noun depends, inter alia, on language-internal factors; one of them as highlighted in the examples above is the issue of the singular/plural distinction. The third point is about how informative the Arabic syntax is in relation to mass readings derived from countable nouns. To investigate these key issues, let us begin with a simple example from English and study it in the Arabic context.

We have seen in the previous chapters (e.g. Chapter 2) that a countable noun such as *rabbit* can be used as a mass noun to denote a mass reading or meaning (for example, *rabbit* can be used to refer to either the animal, or meat or fur sense), as the following example shows.

(26) EN: We ate *rabbit* for dinner

We notice in (26) that *rabbit* denotes only the sense of meat, not the animal. This is obvious as no count syntax is being used to signify the animal sense. Hence, the use of 'rabbit' only specifies the kind of meat that was eaten at dinner, i.e. rabbit meat (not lamb meat or horse meat, for instance).

The situation in MSA

While the above-mentioned example seems interesting in explaining the polysemous nature of the use of the lexeme *rabbit* in its English context, the Arabic language behaves quite differently. First, let us consider below the possible equivalents of the English example of 'rabbit'. The following are translations of the English sentence in (26) above (notice that these translated examples do not use the lexeme *laHm* 'meat'):

(26a) MSA: akal-na **arānib**-an 3ala l-3ašāʔ-i
ate-we rabbits-ACC on the-dinner-GEN
'We ate rabbits for dinner'

(26b) MSA: akal-na **arnab**-an 3ala l-3ašāʔ-i
ate-we a rabbit-ACC on the-dinner-GEN
'We ate a rabbit for dinner'

(26c) MSA: akal-na **al-arnab**-a 3la al-3ashāʔ-i
ate-we the-rabbit-ACC on the-dinner-GEN
'We ate the rabbit for dinner'

(26d) MSA: akal-na **al-arānib**-a 3la al-3ashāʔ-i
ate-we the-rabbits-ACC on the-dinner-GEN
'We ate the rabbits for dinner'

Of these four possible Arabic equivalents, only one seems to be the most accurate rendering of the sense of 'rabbit' in the English example, which is (26a). Let us discuss each example separately.

In (26a), *arānib* 'rabbits' is used in the indefinite broken plural form, which means that (i) the indefinite use of *arānib* does not specify any particular set of rabbits that were eaten, and (ii) the

PL number signifies countability, which in turn signifies the animal sense (as well as the meat sense, as we shall explain shortly).

In (26b), *arnab* is used in the indefinite singular form, which means that (i) the indefinite use does not specify a particular rabbit that was eaten at dinner, and (ii) the singular number also signifies countability, which in turn signifies the animal sense, too.

In (26c), *arnab* is used in the definite singular form, which means that (i) definiteness restricts the meaning of 'rabbit' and specifies that we ate one particular rabbit (which is known to us in its given context of utterance; for instance, we ate the brown rabbit or the big rabbit or even the only rabbit we had in our garden or which we bought yesterday. You can think of an indefinite number of contexts, but the meaning remains constant here), and (ii) the singular form signifies the animal sense.

In (26d), *arānib* is used in the definite broken plural form, which means that (i) the definite use refers to a particular number of rabbits or the set of rabbits that is not defined in this context but which is known to the speaker(s) of this utterance.

In essence, what all these examples signify is the animal sense. The real question, however, is why example (26a) is the one which seems to capture the sense of meat, and how. To answer this question, it is important to reconsider the earlier examples from (16) to (22)—we handle examples (23)-(25) later— in order to explain what happens at the level of word structure, i.e. the morphological structure.

a) The singular /plural distinction

In section 4.3 above where elementary aspects of Arabic nouns are introduced, we mentioned that some nouns have both the sound and broken plural forms. Reflecting on that, it is noticed that the nouns *dağāğ* 'chickens' and *baṭ* 'ducks' in examples (16) to (22) have these two plural forms, as follows:

(27)

Singular	**Sound feminine plural**	**broken plural**
dağāğa(t) ‘a chicken (f)’	*dağāğāt* ‘chickens (f)’	*dağāğ* ‘chickens’
baṭṭa(t) ‘a duck (f)’	*baṭṭāt* ‘ducks (f)’[50]	*baṭ* ‘ducks’

It is also noticed that only the broken plural form of these nouns alternates between the animal/meat readings. Hence, it becomes clear that neither the singular form nor the sound (feminine) plural form can ever be used in the non-countable reading. Rather, it is the broken plural form—of nouns that also have a sound plural form—which seems to encode, in addition to the countable reading, a non-countable reading. But there is more to this: the broken plural form here is more constrained compared to the sound plural form. That is, it is impossible to use a numeral with this form of the broken plural. Consider the following:

(28) a. **thalāthat-u* *dağāğ -in*
three.F-NOM chickens-GEN
‘three chickens’

b. **thalāth-u* *dağāğ -in*
three.M-NOM chickens-GEN
‘three chickens’

Whereas,

(29) *thalāth-u* *dağāğāt-in*
three.M-NOM chickens.PLF-GEN
‘three chickens’

Thus, as regards the remaining examples, the noun *arānib* ‘rabbits’ is used similarly in places where a non-countable reading is required in context, although *arānib* in MSA has only one form for the plural, which is only the broken plural form.

Here it is very important to understand that the broken plural form of, say, *arnab* ‘a rabbit’ is different from the broken plural form of *dağāğa* ‘a chicken’. The crucial difference between the two broken plural forms lies, inter alia, in the use of numerals. Only the plural form *arānib* can be preceded by a numeral. This indicates that the indefinite broken plural for *arānib* is in fact ambiguous between the countable and non-countable readings.

[50] Arabic dictionaries do not list this form as the sound feminine plural of *baṭṭa* ‘a duck’. The noun has only a broken plural form, and the sound feminine plural form, *baṭṭāt* ‘ducks’, is formed by analogy with similar nouns such as *dağāğāt* ‘chickens’.

b) The definite/ indefinite distinction

What remains to explain in the previous examples is the issue of definiteness and the extent to which it affects the countable/mass interpretation. Take, first, the examples of *daǧāǧ* 'chickens' and *baṭ* 'ducks'. In (16), (20), (21) and (22), it is observed that the issue of definiteness seems to play no role in affecting which particular reading is favoured over the other. In fact, both nouns, whether definite or indefinite, seem to always have the two readings available.

On the other hand, indefiniteness in the 'rabbit' example, (26), seems of importance in defining the precise sense of the noun. But why? There seems to be no definite answer to this question because it is possible in this particular context to use both *daǧāǧ* and *baṭ* in their definite and indefinite broken plural forms. And, if *arānib* is used in the contexts of *daǧāǧ* and *baṭ*, the result will be similar.

But since the broken plural form of *arānib* is different, the use of the definite article with the noun will strongly suggest the animal reading. Hence, this might be one of the reasons why the indefinite form is preferred when the noun in question does not belong to the plural form of generic collective nouns.

Now, regardless of the notion of definiteness, the point is clear: the broken or generic plural form of a noun alternates between two distinct but related meanings in the animal/meat pattern. Next is to consider, in light of the above discussion, the last examples (23) to (25) in which the noun ***xarūf*** 'a sheep' occurs. To repeat, in examples (23) and (24) ***xarūf***, which is used in the singular form, denotes the animal sense. In (25), the plural form, ***xirāf*** 'sheep', still denotes the animal sense. Hence, it does not seem that the singular/plural distinction makes any difference with respect to the countable/mass meaning. To further examine whether this is true or not, let us consider the following.

(30) MSA: tanāwal-na l-**xinzīr**-a al-yawma
ate-we the-pig.SG-ACC the-today
'We ate the pig (?.meat)today'

(31) MSA: yaHrum-u tanāwul l-**xinzīr**-a
forbids eating the-pig.SG-ACC
'eating the pig (.meat) is forbidden'

(32) MSA: ? yaHrum-u tanāwul l-**xanāzīr**-a
forbids eating the-pig.PL-ACC
'it is forbidden to eat the pigs (?.meat)'

(33) MSA: ? kānat taʔkul l-**baqar**-a.
was.3SGF eating the-cows.PL-ACC
'she was eating the cows (?.meat)

(34) MSA: ? kānat taʔkul l-**baqarat**-a.
was.3SGF eating the-cow.SGF-ACC
'she was eating the cow (*.meat)'

Firstly, in all these examples from (30) to (34), there appears to be no single usage in which the meat reading of the animal is acceptable, except for the example of *xinzīr* in the singular form, though the mass reading is still not strong enough.

Secondly, the difference between the nouns *xinzīr* 'a pig' and *baqarat* 'a cow' in these examples is similar to that between *dağāğ* 'chickens' and *arānib* 'rabbits' in the earlier examples. In other words, similar to *dağāğ*, *baqar* 'cows' has the generic collective form which does not accept numerals, whereas *xanāzīr* (the plural of xinzīr) has the broken plural form which occurs with numerals, exactly the same as the broken plural form *arānib.* Considering examples (23) to (25), the broken plural form *xirāf* 'sheep' is also the same as both *xanāzīr* and *arānib*.

Thirdly, despite the similarity between the nouns *dağāğ* 'chickens' and *baqar* 'cows' in that both have the same generic collective plural form, the noun *baqar* in these example does not seem to give us a mass reading. This point takes us to consider another important factor that seems to play an important role in the animal/meat alternation, which is the *size of the animal.*[51]

c) The size of the animal

So far, we have noticed that the generic plural form of certain nouns seems to be a key aspect of the animal/meat pattern in Arabic. The notion of definiteness remains less obvious, however. Another important aspect, which does not depend on language itself, is related to the animal's size. To explain, let us first reconsider the animal nouns that we have used in all the earlier examples. These are:

[51] Thanks to Prof. Andrew Spencer for pointing this out to me.

i. *dağāğ* ‘chickens’
ii. *baṭ* ‘ducks’
iii. *arānib* ‘rabbits’
iv. *xarūf* ‘sheep.SG’
v. *xinzīr* ‘a pig’
vi. *baqar* ‘cows’

We noticed that the first three nouns in the broken plural form can alternate between a countable reading and a mass (meat) reading. The last three nouns, even though they have a broken plural form, do not seem to have this kind of alternation in the same way as the first three nouns. The reason seems to be related to a different factor which also depends on the singular/plural distinction that we discussed earlier.

Now, it is important to remember that *dağāğ, baṭ* and *baqar* have the generic plural form and that each one of them has also a sound feminine plural form. However, *baqar* ‘cows’ cannot be used alone to denote the mass reading despite that it has a generic plural form. It is also important to remember that *arānib, xirāf* and *xanāzīr* have the broken plural form but do not have a sound plural form. However, *arānib* ‘rabbits’ appears to denote the mass reading whereas *xirāf* and *xanāzīr* do not.

Taking all these points into consideration, one can notice that the size of the animal seems at play. Animals like *chickens* and *ducks*, for instance, are small in size compared with animals such as *pig* and *sheep*. Hence, in our context, the relationship between the eater and the eaten seems to be affected; assuming that the eater is human, of course. If this is correct, then the size also affects the use of the broken plural form of the noun that refers to an animal. In other words, if the animal is big, then the language reverts to the use of the singular form of the noun in places where the mass reading is intended. To test the validity of this point, let us return to our previous examples.

In examples (30) to (34) where the nouns *xinzīr* ‘a pig’ and *baqar* ‘cows’ are used, it is noticed that only the singular form of the noun *xinzīr* that seems to denote the meat sense. The singular form of *baqar*, however, cannot be used because *baqar* is a generic plural form from which the singular form can only denote the countable reading. Indeed, the following examples seem to support this claim.

(35) taHtawi haḏihi l-muntağāt 3ala l-*xinzīr*
contains this products on the-pig
'These products contain pig (.meat/derivatives)'

(36) taHtawi l-wağbat-u 3ala l-*dağāğ*
contains the-meal-NOM on the-chicken.PL
'The meal contains chicken (.meat)'

But not,

(37) *taHtawi l-wağbat-u 3ala l-*baqara/* l-*baqar*
contains the-meal-NOM on the-cow.PL/ the-cow.SG
Intended: 'The meal contains beef'

The examples below, however, may appear as counterevidence to the earlier claim.

(38) kana insān-u l-kahf-i yaʒīšu 3ala *(lahm) al-*ghazāl*;
was human-NOM the-cave lives.3SGM on *(meat) the-Gazelle
Intended: 'the cave man lived on venison'

(39) yaʔkul-u ṣ-ṣīniyyūn l- *fiʔrān*
eat the-Chinese the-mice
'The Chinese eat the mice (.animal)'

The last two examples, (38) and (39), tell us the following: (i) it is not true that when an animal is big in size, as in (38), the language reverts to the singular form of the noun. On the contrary, the noun *gazelle* cannot be used alone to denote the mass sense unless it is preceded by the lexeme *laHm* 'meat'. In fact, there are many other examples that contradict this claim but, for brevity, we do not include them here. And (ii) the use of the broken plural form in (39) still does not give us the mass interpretation, even though the size of *mouse* is very small compared with, say, *pig*.

These two points can be answered separately. With respect the first point regarding the animal size vis-à-vis the use of the singular form of the noun, the explanation goes as follows: The noun *xinzīr* 'pig' is commonly used in the language (or in the community speaking the language), which means that the frequent use of the noun facilitated the fact that the singular form *xinzīr* can be used to denote the mass (or meat) reading. However, the countable interpretation is still available. This is somehow similar to the way generic collective nouns of

relatively small animals such as *daǧāǧ* 'chickens' are employed in context requiring either a countable or mass interpretation. Having said that, it becomes clear the reason why *gazelle* in (38) cannot be used in the singular form alone to denote a mass reading.

But there is more to this: the size of the animal seems to trigger the lexeme *laHm* 'meat' in the language.

The lexeme *laHm* 'meat'

Once the lexeme *laHm* is used with the noun, the polysemy disappears. However, it is important to note that, in MSA, the lexeme *laHm* can be used with virtually all animal nouns. This may appear contradictory to what we have just mentioned about the size of the animal being the trigger of the lexeme *laHm*. But it is not for several reasons, which are the following:

(i) When the lexeme *laHm* is used with, say, *daǧāǧ* 'chickens', it does not mean that *daǧāǧ* cannot be used alone to denote the meat sense. It only means that in a context where the type of meat is unspecified (i.e. the focus is already on the *meat* sense) the lexeme *laHm* is added only to emphasise the meat source/type.

(ii) The lexeme *laHm* is always needed with animals that are big in size (see earlier examples), even though some animal nouns have a generic plural form (e.g. *cow*). Also, it is important to remember that the noun *xinzīr* 'pig', if we are to overlook the note about the frequency of use, must be preceded by this lexeme.

(iii) Similar to the example of *daǧāǧ*, the lexeme *laHm* is usually not used to modify nouns such as *samak* (fish) because of the relatively small size of some fish and because *samak* is a generic collective plural. However, *laHm* is used with the noun, say, *Hūt* 'whale'.

The plural form and the generic meaning

The second point to explain concerns example (39) above. The noun *fiʔrān* 'mice' in the example has the broken plural form. The broken plural form here strictly denotes the animal sense, not the meat sense. Here, there is another related point to explain. It appears at first sight that the size of animal has no effect on the use of the broken plural form to denote the mass reading, as is the case with *daǧāǧ*, for instance. That is to say, why does the broken plural form of *fiʔrān* not denote the mass interpretation in (39)? The answer here does not depend on the

size of the animal, but it depends on another important observation: the plural form in relation to generic meaning.

We have already emphasised the difference between the use of the generic collective plural and the broken plural (see earlier discussion about the *singular/plural distinction*). We have also stressed the fact that both of the plural forms carry the generic meaning. This essentially means that when a reference to generic reading is intended in context, as in the case of example (39) above, either the generic collective plural form or the broken plural form is used to denote the generic sense of the animal. Consider the following examples in both English and MSA.

(40) In China, people eat cats and dogs. (compare with *The Chinese eat dog and pork*).

(41) yaʔkul-u ṣ-ṣīniyyūn al-*kilāb* wa l-*qiṭaṭ*
eat the-Chinese the-dogs and the-cats
'The Chinese eat cats and dogs'

(42) al-hunūd la yaʔkulūn l-*baqar*
the-Indians do not eat cows
'Indians do not eat cows'

Example (40) refers to *cats* and *dogs* in their generic sense; i.e. the animal sense. Similarly, the MSA examples in (41) and (42) clearly show the use of both the broken plural form of *kilāb* 'dogs' and *qiṭaṭ* 'cats' and the generic collective plural of *baqar* 'cows' to refer to the generic reading of the animal. As is clear, the context does not strictly specify a mass interpretation; rather, it makes a reference to an activity that falls outside a particular community's conventions about animal eating. To put it another way, when it is not common for people in a certain community to have *cats* or *dogs* as food, the generic form of the noun is used to highlight the fact that these animals in another community are taken as food. Likewise, the same goes for when it is common in the same community to have *cow* as food but it is forbidden in another community to eat the animal at all.[52]

Returning to example (39), it becomes clear that the animal sense is the one intended in context. Hence, the broken plural form of *fiʔrān* 'mice' is used in the generic sense.

[52] A question may arise here about how one can decide when a reference to different community conventions is made, to which the answer remains unclear. However, what we are interested in here is the *linguistic explanation* behind the use of generic collective nouns in such contexts.

So, the size of the animal in relation to the generic meaning is no longer at play. However, the factor of size becomes activated when we no longer talk about *fiʔrān* in the non-generic sense. Therefore, the sentence below, like the example of *rabbit* in (26), uses the broken plural form to denote the mass reading (though the animal reading is not cancelled).

(43)	sa-na-tanāwal	*fiʔrān*-an	3ala	al-3ashaa'
	will-we-eat	mice-ACC	at	dinner
	'we are having mice for dinner'			

The situation in JA

The animal/meat alternation in Jordanian Arabic does not differ much in respect of what has been mentioned about the same alternation in MSA. Indeed, the facts cited for the use of generic collective nouns as well as the broken plural form are nearly the same in JA.

4.4.3.1 The logical polysemy of the Arabic generic collective nouns

In the previous section, we have seen that both MSA and JA make use of generic collective nouns such as *arānib* 'rabbits', *dağāğ* 'chickens', *baṭ* 'ducks', etc. in order to elicit a mass reading (e.g. the meat sense) whenever it is required in context. In this section, we continue to investigate the polysemy involved in the use of generic collective nouns; this time focussing on the second count-to-mass alternation: the *object/stuff* pattern.

To begin, let us first explain, again, the Arabic term *ismu l-ğins al-ğam3ī* (i.e. the generic collective noun) and then provide a few examples to further clarify it. The term *generic collective noun* in Arabic means a noun which refers to a group of things, mostly animals or plants, or to something that denotes a mass reading (cf. Schulz 2004, and Ryding 2005).[53] Consider the following data, mainly in MSA.[54]

[53] Schulz (2004) provides a more precise and accurate description of this topic in Arabic than Ryding does. Nonetheless, Ryding's description is also important.

[54] We have intentionally omitted a few important remarks relevant to this term in Arabic in order not to further complicate the subject and to reduce the discussion to minimal. However, for more discussion, see Schulz (2004).

Table 4.8: The generic collective nouns in Arabic

Noun (feminine singular)	Noun (sound feminine plural)	Generic collective noun
baqara(t) 'a cow'	baqarāt 'cows'	baqar 'cows'
tuffāHa(t) 'an apple'	tuffāHāt 'apples'	tuffāH 'apples'
—	—	banadoora 'tomatoes'
(xiyāra(t) 'a cucumber')	—	xiyār 'cucumbers'
šağara(t) 'a tree'	šağarāt 'trees'	šağar 'trees'
dağāğa(t) 'a chicken'	dağāğāt 'chickens'	dağāğ 'chickens'
waraqa(t) 'a paper'	waraqāt 'papers'	waraq 'paper'

Now, consider the following sentences.

(44) MSA: tūjad-u **tuffāHa**t-un 3ala aṭ-ṭāwilat-i
exist.3SGF apple.SGF-NOM on the-table-GEN
'There is an apple on the table'

(45) MSA: yūjad-u **tuffāH**-un 3ala aṭ-ṭāwilat-i
exist.3PL apples-NOM on the-table-GEN
'There are apples on the table'

(46) MSA: taHtawī as-salaṭat-u 3ala at-**tuffāH**
contains.F the-salad.F-NOM on the-apples
'The salad contains apples'/ 'there is apple in the salad'

The examples focus on the occurrence of the noun **tuffāH** in different contexts and in different forms (i.e. the singular and plural forms). Example (44) shows that the singular form **tuffāHa** 'an apple' only denotes the countable reading. Likewise, example (45) shows that the generic plural form is used to denote the countable reading. In the last example, however, the generic plural form denotes the mass reading.

Thus, as these examples clearly show, the generic collective noun alternates between two readings: the mass (substance) reading and the countable (object) reading. The more interesting point, however, relates to the use of the generic form in example (45) to denote the countable reading. Here, the question is why the sound plural form *tuffāHāt* 'apples' is not used so long as it also denotes the countable reading. In other words, can we replace *tuffāH* with *tuffāHāt* in (46)? The answer is no. Consider the use of *tuffāHāt* in these examples.

(47) MSA: *yūjadu **tuffāHāt**-un 3ala aṭ-ṭāwilat-i
exist.3PL apples.PLF-NOM on the-table-GEN
'There are apples on the table'

(48) MSA: yūjad-u thalāth-u **tuffāHāt**-in 3ala aṭ-ṭāwilat-i
exist.3PL three.M-NOM apples.PLF-GEN on the-table-GEN
'There are three apples on the table'

Example (47) is the same as (45) above except that it uses the sound feminine plural form *tuffāHāt*, which is not acceptable. On the other hand, example (48) shows that when a numeral is used with this plural form, the sentence becomes acceptable. The point is in fact related to the morphology/semantics of the form itself. As the sound plural form refers to objects that can be counted individually, the *number* becomes important in this context. That is, for *tuffāHāt* to be used, the sentence must specify the number of apples on the table. Otherwise, in the absence of *number*, only the generic plural form *tuffāH* that is used.

The situation in JA

All what have been said about the *object/stuff* alternation in MSA is just the same in JA. The generic plural form of a noun is employed whenever the two conditions above apply. That is, when the sentence does not define the *number*, the generic plural form is used to denote a countable reading. Similarly, when a mass interpretation is required, the same form is also used. Consider, again, the use of *tuffāH* 'apples' below.

(49) JA: as-salaṭa fī-ha **tuffāH**
the-salad.F in-it(F) apples
'The salad has apples in it'.

(50) JA: fī **tuffāH** 3ala aṭ-ṭāwlih
there apples on the-table
'There are apples on the table'

Systematic polysemy and the collective morphology: A summary

We learn from the discussion laid out in Sections 4.4.3 and 4.4.3.1 above that it is the *generic collective form* of a noun that is more often used (i.e. the default form) in places where either the count or mass interpretation is intended in context. Despite the idiosyncrasies found in the animal/meat alternation with respect to certain animal names such as *pig*, for instance, the following generalisations apply, overall:

(1) Considering the sg/pl distinction, nouns belonging to the category of *ismu l-ğins al-ğam3ī* (‘the generic collective noun’), whose singular form is feminine and denotes the unit reading, are systematically ambiguous between the count and mass interpretation.

(2) Where the noun has no generic collective form (i.e. only exists in the broken plural form), it is the (indefinite) broken plural form that is used where the count or mass reading is required.

(3) Considering the factor of animal’s size, which imposes a further restriction on the use of generic collective nouns, only animal nouns that satisfy point (1) above and that refer to animals that are small in size are employed in contexts requiring either a count or a mass interpretation. Otherwise, where point (1) applies but the animal is relatively big in size, the polysemy seems to disappear and so does the use of the generic collective form to denote a mass interpretation.

(4) Where the noun in question does not satisfy point (1), then the broken plural form of that noun (e.g. arānib) is used to denote a mass interpretation. This particular use is rather more restricted in certain contexts that require the very strict reading of the mass interpretation, such as in the following (example is in MSA):

- *yaHtawi* *l-Hasāʔ* *3ala* **l-arnab/*l-arānib*
  contains the-soup on the-rabbit/the-rabbits
  ‘There is rabbit in the soup’

Here the natural way is to use the lexeme *laHm* ‘meat’ before the noun. Moreover, where the noun in question does not satisfy (1) and that it refers to an animal that is big in size (e.g. xinzīr), the image is less clear. This is more of an exception than a rule, we believe.

Taken together, it becomes evident that the animal/meat alternation is not fully systematic and, thus, cannot be fully rule-governed insofar as the factor of ‘size’ is concerned, which clearly depends on world knowledge.

As for the second pattern of object/stuff (e.g. *tuffāh* ‘apples’), the situation regarding the collective noun morphology is much clearer: for every noun denoting an object reading, that noun is also used to denote a stuff (or mass) reading, providing that the noun exists in the generic collective form.

4.4.4 The mass-to-count nominal alternations

In this section we examine the mass-to-count nominal alternations presented at the start of Part II. The aim here is to provide an explanation for why it is the case in Arabic to have this kind of 'reversed' nominal alternation more restricted than its count-to-mass counterpart.

As we will notice below, the systematic polysemy of the mass-to-count nouns seems difficult to find in the language for (i) it is just not possible for some words and/or (ii) it is subjected to a marked morphological and lexical encoding in some cases where a reference to the 'quantity' (count) interpretation is made (i.e. the polysemy is apparent than real). Therefore, unlike similar cases in English where it seems easy to coerce a non-count reading to a count reading, Arabic tends to disambiguate between the two interpretations.

First, Let us begin by providing some examples of the mass nouns in both English and Arabic (also refer to the 'Mass nouns' column in Table 4.7 above). Consider the following.

- **English:**

  Water, milk, wood, butter, meat, cloth, iron, glass, etc.

- **Arabic:**

  māʔ 'water', Halīb 'milk', laHm 'meat', etc.

We already mentioned in section 4.4.2 above that what distinguishes mass nouns from countable nouns (and generic collective nouns in Arabic) is the fact that mass nouns, morphologically speaking, only exist in the singular form; they are not subjected to count syntax, such as being modified by the indefinite article *a*; and they do not have a plural form (e.g. milk--*milks). Of course, this is a very basic description of mass nouns in general since there exist more complicated cases; however, for simplicity, a basic understanding is all what is needed here.

Now, it is said that, at least in English, we can take a mass noun and turn it into a countable noun to denote a distinct but related meaning. For example, we can say *John drank three coffees* to mean that he actually drank three cups of coffee, where the noun *coffee* is a mass noun that only exists in the singular form, but it has been used as a countable noun in this context. Similarly, the mass noun *milk* can be also counted as *milks* in a context such as *Mary ordered three milks, two coffees, and one water* to mean the quantity.

In Arabic, however, this 'flexibility' does not seem to be available. That is, it is just unacceptable to say the following (assuming that the plural of *qahwa* 'coffee' is *qahwāt* 'coffees'; following the regular plural formation rule for feminine words): [55]

(51) MSA: *šariba Ahmed-u thalāth-a **qahwāt**-in[56]
drank Ahmed-NOM three-ACC coffees-GEN
Intended: 'Ahmed drank three coffees'

(52) JA: *Ahmed širib thalath **qahwāt**
Ahmed drank three coffees
Intended: 'Ahmed drank three coffees'

This countable reading in Arabic is not even possible with predicates such as *ṭalab* 'to order', *ištarā* 'to buy', *Haḍḍara* 'to prepare', etc.

The situation in MSA

The problem with the MSA example above is that *qahwa* 'coffee' cannot be forced to have a countable reading by putting it in the plural form. The only possible way to achieve this, however, is to use some sort of noun premodification that indicates the countable interpretation, such as in the following example.

(53) šariba Ahmed-u thalāthat-a fanāğīn-a **qahwat**-in
drank Ahmed-NOM three.F-ACC cups.M-ACC coffee-GEN
'Ahmed drank three cups of coffee'

It is also possible to have the same reading in a slightly different syntactic structure as follows:

(54) šariba Ahmed-u thalāthat-a fanāğīn-a min l-**qahwat**-in
drank Ahmed-NOM three.F-ACC cups.M-ACC of the-coffee-GEN
'Ahmed drank three cups of coffee'

[55] In Arabic, *qahwa* refers to the hot drink made from *bunn* 'coffee seed or coffee bean'.

[56] Here is an interesting fact to mention about the mass noun *qahwa* 'coffee'. A few Arabic-Arabic dictionaries give the plural form of *qahwa* as *qahawāt* 'coffees'. That is, it appears that this mass noun has actually a countable counterpart. However, this countable noun *qahawāt* seems to exist only as a lexical entry in these dictionaries with no attested use in context. In addition, the mass noun *qahwa* has also another plural form, which is *qahāwi* which denotes the place where one can drink coffee (i.e. café or coffee shop). What is more interesting here is also the fact that this mass noun (i.e. *qahwa*) can be used to mean either coffee or the place in which coffee is served (i.e. polysemous).

As is clear, what is counted here is the number of cups that contain the substance coffee (i.e. mass); hence, the grammatical agreement between the numeral *three* and the noun *cups.* The form of *qahwa(t)* remains singular.

The situation in JA

The situation in JA, on the other hand, is slightly different from that in MSA. While in MSA it is not acceptable to use a mass noun such as *coffee* in the countable or *quantity* reading without premodification, it is possible for the mass noun in JA to be immediately preceded by a cardinal number and without the requirement of noun premodification, as the example below demonstrates. Of course, this fact is not restricted only to the two examples of *qahwa* and *3asir* below, as the situation occurs with all cases of nouns denoting drinks (e.g. *šāy* 'tea', *laymūn* 'lemon juice', etc.) as well as with mass nouns denoting food dishes (e.g. *humus* 'mashed chickpeas', *kofta* 'ground beef', etc.)

(55) JA: Ahmed ṭalab thalāthih **qahwa** w ithnein **3asīr**
Ahmed ordered three.M coffee.F and two.M juice.M
'Ahmed ordered three coffees and two juices'

First, a note on number and gender agreement in JA: numbers *one* and *two* always agree with the counted noun in gender.[57] However, numbers *three* to *ten* always have the masculine form, regardless of whether the counted noun is masculine or feminine. That is, the *reverse gender agreement* that we explained earlier about MSA does not apply to JA. Consider the following.

(56) a. *thalath* karāsi
three.M chair.PLM
'three chairs'

b. *thalath* ṭāwlāt
Three.M table.PLF
'three tables'

[57] It is important to mention here with regard to the use of the numeral *two*, the dialect (like MSA) uses the dual number that inflects on the overt noun being counted (e.g. *wardat-ein* 'two roses'). However, the gender agreement is still seen when *ithnein*(M) or *thintein*(f) is used to modify a covert noun in contexts such as the following:

- qābalt **thintein** fi l- ğām3a
met.1SG two.F in the-univeristy
'I met two [females] at the university'

Returning to the JA example, (55) contains two mass terms: *qahwa* 'coffee' and *3asīr* 'juice'. What is noticeable is that both mass nouns are used in their singular forms despite being modified by a numeral that requires a plural noun. This seems somewhat odd if we are to take grammatical agreement into account. But this could be some sort of 'hidden' grammatical agreement. What this means is that the numerals *thalāthih* 'three' and *ithnein* 'two' in this example may in fact agree with an omitted countable noun, such as *cups* or *glasses*, that does not appear in the surface syntactic structure. If that is true, then it would explain why it is still grammatical to use the numerals with both *qahwa* and *3asīr* in the singular form (notice also that the JA example could be also a simplified version of the MSA structure in (54) above). On the other hand, if that turns out to be wrong, then there must be something that allows the singular mass form to be modified directly by a numeral, other than the notion of 'hidden' agreement. We leave this point open for further research.

Let us now return to the type of mass-to-count alternation discussed earlier in English, which is the *stuff/portion* alternation.

The *stuff/portion* alternation

In English, we can use the lexeme denoting a substance or stuff reading (i.e. mass; e.g. *coffee* above) to indicate a countable reading with the meaning 'portion or quantity' (e.g. *Mary drank one coffee;* i.e. one cup of coffee= quantity). This makes the lexeme *coffee* already polysemous in the language between a mass (substance) reading and a countable (quantity) reading. Consider the example below.

(57) a. This coffee is expensive (substance)
b. She drinks one coffee a day (quantity)
c. Mary relished every coffee she drank (quantity) (adapted from Pustejovsky, 1995: 17)

The first occurrence of *coffee* in (57a) gives us the substance or mass reading, while in both (57b) and (57c) it denotes the quantity reading, i.e. the amount of coffee. Notice that for *coffee* to be considered polysemous, the form must be preserved, i.e. involves zero morphology.

The alternation in the Arabic context

In Arabic, whether MSA or JA, this usage is generally not available (see earlier discussion). However, if polysemy is to be taken into account, and if the notion of *agreement* is to be

overlooked, then we can find a countable reading occurs only in examples similar to this one below and only in JA, at least— (MSA does not allow it):

(58) JA: Ahmed ṭalab *wāHad qahwa* w *wāHad 3asīr*
Ahmed ordered one coffee and one juice
'Ahmed ordered one coffee and one juice'

As (58) shows, the occurrence of both *qahwa* and *3asīr* in their singular forms and the fact that they are modified by the numeral *wāHad* to denote a countable interpretation clearly suggests that they are polysemous. However, if *agreement* is considered, then the only element in the sentence above that appears to be polysemous is the phrase **wāHad 3asīr** 'one juice'. This is because the numeral *wāHad* agrees (or appears to agree) with the noun *3asīr* in gender. The gender agreement between *wāHad* and *qahwa*, however, does not hold. That is to say, because *qahwa* is a feminine singular mass noun, the numeral *wāHad* must be changed to *waHadeh*. But this is not possible as it would render the sentence unacceptable.

Let us take another example; this time when the dual number is used.

(59) JA: Omar ṭalab **qahwat**-ein bi l-Halīb
Omar ordered coffee.DUAL with DEF-milk
'Omar ordered two coffees with milk'

There is one point to clarify regarding the use of the dual noun *qahwatein* in (59)*:* the use of the dual number with uncountable nouns is less common and sometimes gives a different interpretation when a different mass noun is used. For example, if we say *3asīr-ein* 'two juices', it would mean two different kinds of juice. In fact, it seems difficult to find one occurrence of *3asīr* in the dual form similar to that of *qahwa* in (59), i.e. in the strict sense of 'quantity'. Thus, what appears to work for the *qahwa* example does not necessarily have to work for the *juice* example.

Returning to (59), the sentence undoubtedly shows that *qahwa* in the dual form denotes a countable reading, i.e. quantity. This takes us back to example (58) above. Does the singular form *qahwa* actually admit both mass and countable interpretations despite the fact that it is being modified by numerals that require a plural form? And what about the issue of gender agreement in the use of *wāHad* 'one' with *qahwa*? At the present time, we do not have a definite answer to the second question, but, with respect to the first, the noun *qahwa* appears ambiguous because it is, perhaps, so commonly used in the language, and thus is highly lexicalised.

The mass form vs. polysemy

The polysemy of the mass noun *qahwa* 'coffee', where it alternates between a mass reading and a countable reading, seems to arise only when *qahwa* is in the dual form. On the other hand, the (seeming) polysemy of the mass noun *3asīr* 'juice' arises when it is directly modified by the numeral *wāHad* 'one' (see earlier examples); taking the notion of agreement into account, of course. But as we stated from the outset, unlike English where it seems easy to generate a countable reading from mass nouns, the mass-to-count polysemy is either very rare or absent in Arabic.

The other important point to observe concerns the morphological form of these Arabic mass nouns, in relation to the concept of polysemy. As noticed in English, the plural morphology (e.g. *coffee—coffees*) is a consequence of the mass-to-count polysemy; however, the plural morphology for Arabic mass nouns is absent (e.g. *qahwa* 'coffee'—**qahwāt* 'coffees'); indicating once again that there is less or no polysemy.

4.4.5 Part II: Summary

In this summary section, we revisit the main common points raised in Part II in relation to the systematic polysemy of the Arabic nominal alternations. These can be summarised as follows.

1) In the object/stuff pattern under the count/mass alternation, the two given senses of the lexeme, say, *tuffāH* 'apples', are available only when this lexeme is used in the **generic collective form**. When in this form, a lexeme gives rise to two logically related meanings (i.e. polysemous). That is, 'tuffāH' can refer to objects collectively ($sense_1$) and denote a mass reading: stuff ($sense_2$). This second stuff-mass reading of *tuffāH* is often used for processed apple (e.g. apple juice, apple puree, etc.). From a theoretical stance, it is this reading (i.e. the mass sense) that is coerced by a predicate.

   On the other hand, however, when a lexeme of the generic collective type is used in the singular or the sound plural form (e.g. *tuffaHa* 'an apple'—*tuffāHāt* 'apples'), the mass reading is always cancelled. That is, there is no polysemy involved, but only one-to-one meaning-form correspondence (i.e. monosemy).

2) In the animal/meat pattern under the count/mass alternation, there exist some discrepancies which seem to be highly influenced by, inter alia, the singular/plural distinction as well as

the size of the animal. The most obvious point is when an animal noun has the generic collective form and is small in size compared to other animals, as in the case of *daǧāǧ* 'chickens' and *baṭ* 'ducks', for instance. Less obvious, however, is when the animal noun has the broken plural form and is also small in size, as is the case with *arānib* 'rabbits'. In addition to these, the alternation between animal vs. meat senses of a lexeme such as *daǧāǧ* 'chickens' (coll.) seems also to depend on the verb's subject, i.e. whether it is a human or non-human subject. In the case of the subject being non-human, the animal sense is the most recognizable and available for interpretation in context.

Moving on to animals that are relatively big, the subject matter becomes rather vague. In the example of *xinzīr*, it is the singular form which seems to denote the mass reading. But as we explained, this relates to the frequency factor than the factor of size. On the other hand, in the example of *xarūf* 'sheep.SG', it is not clear whether the use of the singular form can actually alternate between the two senses of *animal* and *meat*. Nonetheless, what is obvious is the fact that the size factor triggers the lexeme *laHm* 'meat' to be used with nouns that refer to animals that are big, regardless of whether the noun has generic collective form or not.

Lastly, the animal sense becomes stronger—perhaps the only available sense—in contexts where the noun referring to the animal is used in the generic sense.

3) Finally, in respect of the mass-to-count alternations, the *stuff/portion* pattern is different from the two previous count-to-mass patterns in terms of its availability and productivity in the language. That is, lexemes falling under this pattern are always used as mass nouns. So, the pattern does not appear to exist in Arabic (=MSA), but it appears, however, to exist in a very limited number of contexts in the dialect. Thus, only very few instances of the mass-to-count *coercion* can still be identified, where the use of a mass noun such as *qahwa* 'coffee' in the countable context refers to the sense of 'portion or quantity'.

4.5 Nominalized adjectives

The process of adjective nominalization is about transforming an adjective into a noun. [58] In English, there are two principal strategies to achieve this. The first is to form a noun out of an

[58] Generally, the concept of nominalization applies not only to adjectives but also to verbs. For example, we can make the noun *derivation* out of the verb *derive* through attaching the –a*tion* suffix to the verb's base (this is known as deverbal nominalisation). In both cases of adjective and verb nominalisation, the adjective/verb is turned into a noun in the morphology, and, thus, syntactically, it is the deadjectival noun or the deverbal noun that heads the noun phrase.

adjective by placing the definite article *the* in front of the adjective, i.e. conversion. For example, in English we can turn the adjective *rich* into a noun by simply placing the definite article *the* in front of the adjective *rich*; hence, it becomes *the rich (N)*. Now, *the rich* is a deadjectival nominal, which stands as a noun in a sentence such as *the rich are happy*. We can think of other examples of nominalized adjectives such as *the liberals, the poor, the conservatives,* and so on. The second strategy, however, is realised through morphological derivation, by which an adjective is turned into a noun via some sort of suffixation. For example, the adjective *kind* can be turned into a noun by adding the *–ness* suffix to it, so it becomes *kindness*. This second strategy is referred to as *property nominalisation* (cf. Spencer, 2013).

The two strategies, illustrated by the examples above, are rather different; not only in terms of how an adjective is nominalised or transposed to a noun, but also in respect of their semantics. The first, represented by *the rich*, denotes a group of people, never an individual, and this is already supported by plural agreement (i.e. a plural verb form). The second, exemplified by *kindness,* denotes a property.

In the following discussion, we will look at this second case of nominalized adjectives because it gives rise to the phenomenon of systematic polysemy. Here, we take Spencer (2013) as the departing point of the subsequent investigation

4.5.1 Property nominalizations (*Nomina Essendi*)

Property nominalizations are under-researched and largely neglected in the field of lexicology. Indeed, there is very little on this topic for English, leave alone any other language. In this section, we present a brief account of property nominalisations in English first to clarify the concept and then proceed to identify them in Arabic.

First, consider the following examples in English.

(60) Red—redness
sincere—sincerity
happy—happiness
sad—sadness

These examples are called property nominalizations, which seem to depict regular polysemy, in the sense that a morphologically nominalized adjective (such as *redness*) gives rise to more than one distinct but related meanings (which we will mention shortly). We focus here on three main

accounts by Aronoff (1976), Roy (2010), and Spencer (2013)—the first two are already mentioned and discussed in Spencer (2013). In what follows, we provide a brief summary of each account.

First, Aronoff (1976) studies the semantics (alongside the phonology) of –ness/-ity derivations, and notices that the semantics of nominalized adjectives of the form *Xousness* is ***coherent*** [59], and have always three distinct meanings illustrated as follows (ibid: 38):

a. '*the fact that Y is Xous*'
   His callousness surprised me. = the fact that he was callous surprised me.

b. '*the extent to which Y is Xous*'
   His callousness surprised me. = the extent to which he was callous surprised me.

c. '*the quality or state of being Xous*'
   Callousness is not a virtue. = the quality or state of being callous is not a virtue.

On the other hand, *+ity derivatives*, as he calls it, have also three distinct meanings as in –ness derivatives, but their semantics is not always coherent in the sense that some +ity nouns lack at least one of the three readings above, or perhaps have other **unpredictable**[60] meanings as shown in the following examples (ibid: 38-9).

1. Notorious/notoriety:
   a, b) His notoriety appealed to me.
   c) Notoriety is not a virtue.
   other) All the town's notables and notorieties were there.

2. Curious/curiosity:
   a, b) His curiosity disturbed me.
   c) Curiosity can be dangerous.
   other) They admired his dress, but only as a curiosity

3. Monstrous/monstrosity:
   a, b) The monstrosity of what I had done suddenly dawned upon me.

[59] What Aronoff means by semantic coherence here is that this class of nouns, i.e. the *Xousness*, always gives us three **predictable** readings (a, b, and c above) based on the meaning of the adjective *Xous*.
[60] What we mean by *unpredictable* here is the fact that it is not always the case that we can always derive the meaning of +ity nominals from their adjective base-form.

c) ??Monstrosity is not a pleasant quality.

other) What a monstrosity!

Nevertheless, in spite of the discrepancies between the *–ness* and *–ity* derivatives, Aronoff remains uncertain as to whether we are having either three separate meanings or one 'tripartite' or ambiguous meaning—though himself '*leans towards the latter'*.

Second, Roy (2010) focuses on the (syntactic and) semantic properties of nominalized adjectives (deadjectival nominals, in her terminology) such as *nude-nudity*.[61] She also discusses the ambiguity involved in these nominalized adjectives and gives two classifications of these nominals: state-nominals (S-nominals) and quality-nominals (Q-nominals) (ibid: 136). Furthermore, she posits some syntactic distinctions between the two based on 1) the obligatory realization of an overt external argument, 2) modification by aspectual adjectives such as *constant* and 3) overt subject interpretation. We do not intend a further elaboration on her account, but it is important to note that Roy's state nominals correspond to the factive reading whilst the quality nominals belong to the quality (state-of-affairs) reading in Aronoff's analysis.

Third, Spencer (2013) scrutinizes the two previous analyses and then treats property nominalizations in his paradigm-based model as representing a case of systematic polysemy in the sense that these meaning variations do not create new lexemes in the language. The idea where meaning variants of a derived lexeme do not create a semantic change and are not individuated (i.e. enumerated) as single lexical entries in the dictionary is called **TRANSPOSITION** (cf. Spencer, 2013).

The following table summarises the main points of the three accounts discussed above.

[61] Roy (2010: 136) argues that only predicative adjectives (e.g. 'sick' in *she is sick*) can be nominalised whilst simple attributive adjectives that can never appear as predicates (e.g. 'former' in *the former president*) cannot.

Table 4.9: Property nominalizations: A summary of Aronoff, Roy, and Spencer's accounts

<table>
<tr><th></th><th>Aronoff (1976)</th><th>Roy (2010)</th><th>Spencer (2013)</th></tr>
<tr><td>Nominalisation</td><td>Factive/extent/quality</td><td>State/quality</td><td>Factive/extent/state</td></tr>
<tr><td>Seen as</td><td>Either three separate meanings or one tripartite or ambiguous reading.</td><td>NA</td><td>One tripartite or vague reading</td></tr>
<tr><td colspan="4">Analysis</td></tr>
<tr><td>Factive</td><td></td><td>-they have obligatory external argument

-they have eventive semantics; i.e. they can be modified by adjectives</td><td rowspan="3">Meaning depends on the predicate of the sentence in which the NOM is used.
(i.e. determined by the predicate of the sentence of which the NOM is an argument)</td></tr>
<tr><td>Extent</td><td></td><td>NA</td></tr>
<tr><td>Quality</td><td></td><td>-cannot express external argument

-cannot be modified by eventive adverbs</td></tr>
</table>

As Table 4.9 above shows, Roy (2010), unfortunately, offers no semantic analysis of nominalised adjectives that could inform our work. In addition, as Spencer (2013) pointed out, she does not seem to be aware of Aronoff's analysis; thus, missing the 'extent' reading of these adjectives. Only Aronoff (1976) and Spencer (2013) offer a mainly semantic description of the phenomenon. Aronoff's analysis of nominalized adjectives, especially those of the form *Xousness* in relation to the notion of *coherence*, is important here. In the next section on Arabic, we espouse the notion of *coherence* but at the same time take Spencer's view that these nominalised adjectives are systematic polysemies in that they always express one tripartite or vague meaning, which depends on the predicate of the sentence.

4.5.2 Property nominalizations in Arabic

In this section, we focus on nouns that are derived from adjectives in Arabic. As we have shown earlier, there are two common strategies for creating a noun from an adjective in English: either (i) by conversion [zero morphology], or (ii) by morphological derivation. Arabic follows the same lines as in English, at least with respect to the second strategy. Hence, we will only focus on nominalizations involving derivation and will look closely at these cases that exhibit systematic polysemous readings.

In what follows, we identify two groups of property nominalizations, in relation to systematic polysemy: the *–iyya* group and the colour group. As we explain below, the deadjectival 'colour' nouns and some deadjectival nouns derived by the *–iyya* suffix always give us three predictable readings, i.e. their semantics is *coherent*, in the sense of Aronoff (1976). We now turn to discuss these two groups separately.

1. **Group I: The *–iyya* deadjectival nouns**

Holes (1990: 253) speaks of two types of deadjectival nouns: nouns from descriptive adjectives (such as *ğamīl* 'beautiful' → *l-ğamīl* 'the beautiful'), and *–iyya* nouns from relational adjectives (*nisba adjectives)* ending in –i (which themselves are derived from nouns). The first type represents the adjective-to-noun conversion, which does not interest us, insofar as systematic polysemy is concerned (cf. Pustejovsky's definition of the category-preserving polysemy). The second type, however, is illustrated in the following examples (ibid):

(61) yoom 'day'	yoomi 'daily'	yoomiyya 'daily wage'
(62) ana 'I'	anāni 'selfish'	anāniyya 'selfishness'

Interestingly, Ryding (2005: 91) considers *yawmiyya* (in MSA) as being derived from a singular noun (apparently *yawm* 'day'), with the meaning 'diary'. The question remains, however, as to whether or not these derived nouns are considered true nouns. In our view, examples similar to (61) are not 'pure' nouns because we believe they still behave like (or they are) relational adjectives modifying an implicit or covert noun (usually understood in the context in which this *–iyya* word is uttered). This is why, for Ryding, the meaning of *yoomiyya* is 'diary' while, for Holes, it means 'daily wage'.

Let us first point out that the *–iyya* suffix in Arabic is ambiguous. Consider the following examples.

(63)Irāq	Irāqi	Irāqiyya 'an Iraqi female; a relational adj.'
(64)ṭāʔifa 'sect'	ṭāʔifi 'sectarian'	ṭāʔifiyya 'sectarianism'
(65)insān 'human'	insāni 'humane'	insāniyya 'humaneness; humanity'
(66)intāğ 'production'	intāği 'productive'	intāğiyya 'productivity'

In these examples we notice that the *–iyya* suffix does not always convert an adjective into an (abstract) noun, as in the example of *irāqiyya* in (63), which is clearly a relational adjective that refers to an Iraqi female. In fact, this is the case for most –iyya derivatives referring to

nationalities, which predicate over individuals (i.e. Iraqi(x), where *x* refers to an individual). In the remaining examples, however, the *–iyya* suffixed words denote abstract nouns. But, still, these derived nouns can also be used as relational adjectives modifying other nouns. Take, for instance, example (65) where *insāniyya* can be used as either an attributive adjective or an abstract noun in the following sentences, respectively:

(67) *aṭ-ṭarīqa* *l-**insāniyya*** *li-ta3āmul* *ma3* *l-Haywān*
the-way.F the-humane.F of-dealing with the-animal
'the humane way of dealing with the animal'

(68) *al-**insāniyya*** *ḍarūriyya*
humaneness necessary
'humaneness is necessary'

Thus, as we see it, the *–iyya* suffix is itself ambiguous; it can generate lexemes that in themselves can be treated as either relational adjectives or derived abstract nouns. This is, in fact, an area of controversy and can also be seen as an area of 'mixed category' which needs genuine investigation, especially between *al-ismu l-mansūb* (in the feminine form, e.g. *anāniyya* 'a selfish female') and *al-maṣdar aṣ-ṣinā3i* (e.g. *anāniyya* 'selfishness') in Arabic. These latter terms can be roughly translated into English as *the relational adjective* and *the manufactured masdar/deadjectival noun*[62], respectively. The traditional distinction between these two concepts in Arabic is mainly dependent on the context in which these 'derived words' occur. However, we further posit that the following criteria can help to distinguish between the two categories. Consider Table (4.10) below.

[62] The word *maṣdar* in Arabic translates into *verbal noun* in English. Here, we are very careful to note that the term 'verbal noun' is misleading because *manufactured maṣdars* are not derived from verbs, but from either nouns or adjectives. The other problem is that the term 'manufactured maṣdar' does not distinguish between –iyya nouns derived from either nouns or adjectives. Thus, to be very precise, we use the term **'manufactured deadjectival noun'**.

Table 4.10: The polysemy of the -iyya suffix: A morphosyntactic distinction

	-iyya SGF derivatives (e.g. racist/racism)	
	Relational adjective	**Deadjectival noun**
Modification by *jiddan* 'very'	Yes	No
Grammatical agreement	Full agreement	Deflected agreement*
Can modify other nouns	Yes	No
Dual form	Yes	No
Numerical modification	Yes	N/A

*The term describes feminine singular agreement with inanimate or non-human plurals. Notice that these –iyya abstract nouns can be pluralized to denote different kinds or manifestations of the same abstract concept. This is also possible in English (e.g. racisms; goodnesses). In this case, since the plural refers to inanimate objects/things, adjective-noun agreement is not strict (cf. Ferguson, 1989). Also, the three criteria of noun modification, duality, and numerical modification will successfully apply. But notice that modification by *jiddan* 'very' will still not apply to them except when they are actually relational adjectives modifying other nouns.

In light of this distinction, it is clear that, unlike deadjectival "nouns" similar to (61) and (63), the *–iyya* deadjectival nouns similar to (62) and (64), for instance, seem to behave in a manner comparable to *–ness* derivatives, as we explain shortly.

Next, we study the logical polysemy of some of these genuine *deadjectival nouns* in Arabic, which always give us a tripartite reading.

The systematic polysemy of the manufactured deadjectival nouns

Like *–ness* deadjectival nouns in English, Arabic deadjectival nouns such as *anāniyya* and *insāniyya* in the following examples have three distinct, predictable meanings: the quality, the factive, and the extent.

(69) a. *l-ʔnāniyyat-u* *ṣifat-un* *maḏmūmat-un*
the-selfishness-NOM virtue-NOM denied-NOM
'selfishness is a vice' **= the quality of being selfish**

b. *ghaḍib-tu* *min-hu* *bi-sabab-i* *anāniyyati-hi*
angry-1SG from-him because (of) selfishness-his
'I got angry with him because of his selfishness' **= the fact/extent to which he was selfish**

(70) a. *l-insāniyyat-u* *ṣifat-un* *nabīlat-un*
the-humaneness property-NOM noble-NOM
'humaneness is a virtue' **= the quality of being humane**

b. *insāniyyat-u-hu* *dafa3a-t-hu* *li* *muwaajahat-i* *ẓ-ẓulm-a*
humaneness.F-NOM-his pushed-it(F)-him to facing-GEN injustice-ACC
'His humaneness pushed him to fight injustice' **= the fact/extent to which he was humane**

Certainly, these are not the only deadjectival nouns that always convey a tripartite reading (the factive, extent, and quality readings). There are many others such as *waṭaniyya* 'nationalism/patriotism', *3unṣuriyya* 'racism', *ṭāʔifiyya* 'sectarianism', and *hamağiyya* 'barbarism', to mention a few. What this suggests is the fact that *al-maṣdar aṣ-ṣinā3ī* (the manufactured deadjectival nouns) in Arabic seems to be the exponent of property nominalizations.

2. Group II: Deadjectival colour nouns

The second group of deadjectival nouns which are property nominalizations in the sense of Aronoff (1976) and Spencer (2013) are those which are used to denote the property of colour. Similar to some of the *–iyya* deadjectival nouns that we have just discussed above, nominals of this group are systematically polysemous between the quality, factive, and extent readings. First, consider the following deadjectival nouns participating in this group.

(71) Humra(t) ~ 'redness'

ṣufra(t) ~ 'yellowness'

xuḍra(t) ~ 'greenness'

zurqa(t) ~ 'blueness'

sawād ~ 'blackness'

bayāḍ ~ 'whiteness'

Notice that the last two colour nouns have a different Form or *wazn* 'measure'. These nouns essentially denote the property reading of their base adjectives. Consider, for instance, the use of *Humra(t)* 'redness' in the following example.

(72) a. *ʔdhašat-ha* *Humrat-u* *l-ward-i*
amazed-her redness-NOM the-rose-GEN
'the redness of the roses amazed her' **=the fact/extent to which it was red**

b. *al-Humrat-u* *laysat* *ṣifat-an* *wirāthiyyat-an*
the-redness not trait genetic
'Redness is not a genetic trait.' **= the quality of being red**

The remaining deadjectival colour nouns in (71) behave in exactly the same manner. Their meaning is *coherent*. The class, although it is very small in number (consisting of only five lexical items), is, nonetheless, fully productive, in the sense of Apresjan (1974) (cf. Chapter 2, section 2.2.1).

On a marginal note, however, it is important to mention that other colour adjectives such as *burtuqāli* 'orange', *ramādi* 'grey', and *bunnī* 'brown', for instance, do not have a noun form in Arabic (or, to be precise, the equivalent *–ness* form in English); thus, they cannot be nominalized. One reason for that is perhaps because these colours adjectives are derived originally from nouns. For example, the adjective *ramādi* 'grey' is derived originally from the noun *ramād* 'ash'.

4.6 Verbal Polysemy: The case of the CAUS/INCHO

Another related aspect to the study of systematic polysemy is the phenomenon of the causative/inchoative alternation in verbs. As we have previously pointed out, Pustejovsky (1991, 1995) and Pustejovsky and Busa (1995) differentiate, though implicitly, between two types of logical polysemy in verbs. The first type concerns the principal view that there is only one 'core' meaning of some verbs (e.g. bake) from which the other non-lexicalised senses are derived (see the discussion in Chapters 2 and 3). As we noted previously in Chapter 2, we do not take this first type *per se* to be polysemous. The second type, which is mainly represented by the causative/inchoative verbs, is different, however. Unlike the 'core' meaning type, this second type actually involves an alternation between two distinct, lexicalised senses that appear in distinct syntactic constructions for each sense. A quick example in English illustrating this point is the following.

(73) a. He *bounced* the ball. (transitive, causative)

b. The ball *bounced*. (intransitive, inchoative)

The example clearly shows that the verb ***bounce*** expresses a distinct reading in each syntactic structure: *process* in (73a) and *result* (73b). The *process* event is brought about by the causer of the action, i.e. the syntactic agent (he) in this example, who caused the patient (the ball) to bounce. On the other hand, the *result* event is brought about by the change of state that caused the ball to become *bounced*. The verb form remains unchanged (i.e. does not undergo any morphological modification [zero morphology]), yet it occurs in two different syntactic structures.

Other examples of this sort, in English, include verbs like *sink, break, melt, bounce, fly,* and *move,* to mention a few. Every verb of this alternation type has two related senses; one expresses the causative meaning and the other (the intransitive) expresses the change-of-state or result meaning.

Turning to Arabic, the question is does the language have this type of alternation in the same way English, for instance, has it? The direct answer is yes, but it is rather constrained, given the fact that the semantics of Arabic verbs is conveyed by the Form (*wazn*) to which a particular verb belongs. Thus, to be able to identify the verbs that participate in the causative/inchoative alternation, it is important to explain, briefly, how the verbal system works in Arabic. However, before doing that, two major concepts, in relation to the study of causative/inchoative verbs, must be explained. These are the concepts of **PASSIVISATION** and **DECAUSATIVISATION**.

PASSIVISATION vs DECAUSATIVIZATION

Passive constructions are different from decausative constructions in that, in passive, there is no elimination but **DEMOTION** of the causer of an event. In other words, a predicate (a verb) retains its underlying argument structure when passivised, but in decausativisation an access to the causer argument is blocked, i.e. inaccessible, rather being demoted. In Sadler and Spencer, passivisation is defined as "a morphosyntactic operation involving the suppression of the external argument, or most prominent argument" (2001: 210). They further add that "a consequence of this in English and many other languages is that the Agent is available semantically, and enjoys certain presence syntactically without necessarily being syntactically expressed" (ibid). Consider the following sentences, which illustrate the minimal difference between passivisation and decausativisation.

(74)James broke the window.

The window was broken (by James).	Passive| Demoted: James
The window broke.	Decausative
The window broke (*by James).	Decausative| Blocked: James

Moreover, there is another crucial difference between the two with respect to the *by-phrase*. In the examples below,

(75)The window broke by itself. Decausative| reflexive pronoun.

*The window was broken by itself.

The decausative structure permits the use of a reflexive pronoun in the by-phrase, whilst it is denied in the passive construction when a reflexive pronoun is used.

Returning to our point of causative/inchoative structure, we argue that: semantically speaking, a causative verb is transitivizing since it involves an addition of an extra argument (a causer) to a verb's structure, whilst an inchoative verb is *intransitive* as it omits the *causer* of a *causative transitive* verb. We can understand the difference if we follow the rule of causation [CAUSE x [BECOME [y STATE]]] as follows:

(1) Causatives are necessarily transitives, but transitives are not necessarily causatives.

Example: *open* is transitive (*open (x,y))* and it is also causative since a change-of-state is involved. Hence, we can omit the agent from its structure, so it becomes (BECOME *open (y)*). However, *allege* is transitive (*allege (x,y))* but not causative since the agent cannot be omitted (*BECOME *alleged (y))*.[63]

(2) Inchoatives are necessarily intransitives, but intransitives are not necessarily inchoatives.

Example: *open* is intransitive if it is semantically represented as *(*BECOME *open (y))*. However, *appear* is intransitive (*appear (x))*, but it is not inchoative since no change-of-state is involved.

With that explained, we now turn to distinguish between the passive voice and the middle voice in Arabic. The middle voice or the medio-passive will be relevant to the investigation of regular polysemy in Arabic verbs.

[63] This example is credited to Dr. Doug Arnold.

4.6.1 The 'pure' passive and middle-voice in Arabic

Before proceeding directly to the study of the Arabic causative/inchoative verbs, it is imperative to make clear the distinction between the apophonic passive (also called the *inflectional passive*) and the inchoative or medio-passive (also called the *derivational passive*) in Arabic. This is an area of confusion for most (non-specialised) non-native speakers of the language as well as for also native users of Arabic.

In relation to polysemy, the significance of this section is twofold: Firstly, to understand the difference between inflectional passive forms and derivational passive forms. As we will shortly explain, the inflectional passive form only exists in MSA and essentially involves no polysemy, since verb's meaning is distinguished by its phonology. Secondly, and most importantly, understanding the derivational passive helps to explain how the morphology of passive Forms contributes to their semantics, and what role it plays in relation to polysemy.

To begin, we have seen that, in English, the crucial difference between the PASS and INCHO concerns the causer (agent) and causee (recipient) of the cause event. In the former, i.e. the PASS, is seen as being 'invisibly' present in the argument of the cause event; however, it becomes shadowed in the background (i.e. demoted) and does not surface to the main structure, but still can appear in the *by-phrase* or the PP (see example (74) above). On the other hand, in the INCHO construction, the picture is different with regard to the agent. The agent (or the causer) of the event in the INCHO structure is neither demoted nor shadowed; rather, it no longer occupies its causer slot in the verb's structure. In other words, it is removed from the argument of the event verb, and thus its position in the argument structure becomes inaccessible. Hence, the whole *by-phrase* is denied from appearing in the structure, except when the reflexive pronoun is used in the *by-phrase* (see earlier example in (75)).

4.6.1.1 The situation in MSA

In Arabic (=MSA), we have to distinguish between the *apophonic passive* (*al-mabnī li-lmaǧhūl*) and *middle-voice* (*al-fi3l al-muṭāwi3*). Understanding the difference is crucial to the understanding of the inchoatives. In what follows, we start with the apophonic 'genuine' passive and then proceed to discuss the inchoative.

1. *Al-mabnī li-lmağhūl* (the passive voice)

In Arabic, whether Classical Arabic (CA) or MSA, *al-mabnī li-lmağhūl* or the PASS is not a copular construction as is the case in English. It is formed by what is called 'stem vocalism' or vowel change. To understand this, consider the first table below which shows how vocalism works, and then consider the next table which shows how an active verb (in the perfective) Form is turned into the passive via this process. Notice that the morphology of this kind of passivisation is internally-formed (i.e. vowel change).

The process of stem vocalism

Root	k t b a a a
Prosodic tier	CVCVCV
Melody tier 'vocalism'	u i

		Perfect Form	
Verb Form	**Meaning**	**Active**	**Apophonic Passive**
I	'to do'; the basic or standard Form	fa3ala	fu3ila
II	Causative or intensive of Form I	fa33ala	fu33ila
III	Associative (transitive) of Form I	fā3ala	fū3ila
IV	Causative of Form I	ʔf3ala	uf3ila
V	Reflexive or medio-passive of Form II	ta-fa33ala	tufu33ila
VI	Reflexive of Form III	ta-fā3ala	tufū3ila
VII	Reflexive and/or medio-passive of Form I	in-fa3ala	*infu3ila
VIII	Reflexive of Form I (often denoting intentional action)	ifta3ala	uftu3ila
IX	Denotes a colour or a physical defect	if3alla	*uf3illa
X	Seeking an action or quality of Form I; also considerative meaning of Form I (i.e. considering/thinking someone/thing to have the quality of Form I)	istaf3ala	Ustuf3ila

Syntactically speaking, the (apophonic) passive assigns a nominative case to the patient of the active structure (the direct object becomes the subject in the passive structure, and the agent of the active structure becomes demoted). This is true for all transitive verbs that are two-place predicates. Consider the following example:

(76) a. kasara Zayd-**un** al-nāfiḏat-**a** **Active voice**
broke Zayd-NOM DEF-window.F-ACC
'Zayd broke the window'

b. kusirat al-nāfiḏat-**u** **Passive voice**
broke.PASS DEF-window.F-NOM
'the window was broken'

2. *Al-fi3l al-muṭāwi3* (the middle voice)

In Arabic, *al-fi3l al-muṭāwi3* corresponds to one of these Forms: V, VI, VII, and VIII. Verbs of these Forms are essentially intransitives (*ʔf3āl lāzima*), except for verbs of Form VIII which can be either transitive or intransitive. Notice that in Arabic there are two types of *al-fi3l al-mutāwi3*: one is derivational which is derived from the active Form (such as *kasara* 'break'→*nkasara* 'become broken') and the other is lexical (such as *ʔ3tā* 'give'→*axaḏa* 'take'). We are only concerned with the derivational one.

In the following table, we pay attention to only these Forms highlighted in blue, which are considered to have encoded the middle meaning. Form VIII is left out since it can alternate between the active and passive voices.

	Perfect Form	
Verb Form	**Active**	**Apophonic Passive**
I	fa3ala	fu3ila
II	Fa33ala	fu33ila
III	Fā3ala	fū3ila
IV	ʔf3ala	uf3ila
V	ta-fa33ala	tufu33ila
VI	ta-fā3ala	tufū3ila
VII	in-fa3ala	***
VIII	ifta3ala	uftu3ila
IX	if3alla	***
X	istaf3ala	ustuf3ila

The semantics of these Forms already carries the passive meaning, though the Form itself is active in shape. Unlike the 'pure' or apophonic passive which is internally-formed via vocalism, the 'passive' in these Forms is externally-formed via 'ta-' and 'in-' prefixation (Form IX is purely inchoative).

4.6.1.2 The situation in JA

JA has mainly lost the *fu3ila* construction, i.e. the apophonic or inflectional passive. However, passive-like meanings are expressed mainly via Forms V and VII, which are exponents of inchoative semantics. The following examples show how the causative/inchoative alternation is expressed in JA.

(77)	**Form I (CAUS)**	**Form VII (INCHO)**
a.	kasar (break)	nkasar (become broken)
b.	katab (write)	nkatab (become written)
c.	3aṣar (squeeze)	n3aṣar (become squeezed)
d.	qata3 (cut)	nqata3 (become cut)
e.	fataH (open)	nfataH (become open)

(78)	**Form II (CAUS)**	**Form V (INCHO)**
a.	kassar (smash)	tkassar (become smashed)
b.	ṣallaH (repair)	tṣallaH (become repaired)
c.	kharrab (damage)	tkharrab (become damaged)
d.	qaṭṭa3 (cut intensively)	tqaṭṭa3 (become intensively cut)
e.	Hammar (grill)	tHammar (become grilled)

4.6.1.3 The verb Form vs polysemy

Having discussed the difference between the inflectional or apophonic passive and the inchoative or derivational passive in Arabic, we now turn to consider the notion of systematic polysemy in relation to these Arabic verb Forms. Here, there are two major points to clarify: Firstly, as we have shown in the tables above, there seems to be less verbal polysemy in Arabic than in English because the causative verbs and the inchoative verbs generally belong to independent Forms. However, in our investigation of the Arabic verbs, we were able to locate polysemous verbs mostly in Form I in MSA. Consider Table 4.11 below.

Table 4.11: The CAUS/INCHO verb Forms vs polysemy

Causatives	**Inchoatives**	**CAUS/INCHO alternation**
Form I	Form I	FI/FI unmarked alternation
Form I	Form VII	FI/FVII marked alternation
Form I	Form IX	Unpredictable!
Form II (GEMIN.)	Form V	FII/FV marked alternation
Form III (rare)	Form VI (rare)	FIII/FVI marked alternation
Form IV	Form I	Unpredictable!

The table above shows the most stable causative/inchoative verb alternations in Arabic (cells in blue and green). The other remaining Form alternations are fuzzy, and hence it is not clear whether these alternations are stable or regular. Furthermore, it is worth noting here that the causative/inchoative alternations in Forms II, III, V, VI, and VII undergo a morphological process. In other words, causatives and inchoatives of these Forms are morphologically marked; leaving the causative of, say, a Form II verb lexically distinguished from a Form V verb. This fact, however, does not hold for causatives and inchoatives of Form I verbs. As the table above also shows (cell in blue), verbs of Form I that can be used to denote both the causative and inchoative meanings are morphologically unmarked; indicating that they are susceptible to polysemy.

With respect to JA, the same facts about the causative/inchoative polysemy of some verbs of Form I in MSA also apply. In addition, as we shall see in section 4.6.3 below, the causative/inchoative polysemy in JA also exists for some verbs of Form II.

We now turn to discuss the causative/inchoative alternation in both MSA and JA in the next sections.

4.6.2 Alternating Form-I verbs in MSA

Despite the fact that Arabic verbs are distinguished by morphology, some verbs of Form I (fa3ala), as we already highlighted, do in fact alternate between the causative and inchoative readings, in exactly the same manner as that in English. For example, the verb *'našafa*' (to dry) alternates[64] between the causative reading (to dry something) and the inchoative reading (a thing becomes dry) without moving into a different Form (e.g. *naššafa* 'Form II', or *ʔnšafa* 'Form IV'). Consider the following example.

(79) a. *našafa* al-thawb-u
INCHO.dry.PERF.3.M.SG DEF-dress.M.SG-NOM
'the dress became dry'

b. *našafa* Zayd-un al-thawb-a
CAUS.break.PERF.3.M.SG Zayd-NOM DEF-dress.M.SG-ACC
'Zayd dried the dress'

[64] This goes against the claim made by Alharbi (2014: 33) who considers the verb *našafa* a non-lexical causative verb. A non-lexical causative verb is that which does not encode the CAUS semantic primitive. He explains the opposite as follows—LCC stands for *Lexical Causative Construction*:

"In the LCC, the CAUS semantic primitive is conflated in the root of the verb" (ibid: 30).

Moreover, and interestingly, this verb, which is already causative, is also permitted to enter Form II *'nashshafa'* and Form IV *'ʔnshafa'* causative constructions without, arguably, adding extra meaning to it (i.e. no intensive meaning). Consider the two sentences in (80) below.

(80) a. *ʔnašafa* Zayd-un al-thawb-a
CAUS.dry.PERF.3.M.SG Zayd-NOM DEF-dress.M.SG-ACC
'Zayd dried the dress'

b. *naššafa* Zayd-un al-thawb-a
CAUS.dry.PERF.3.M.SG Zayd-NOM DEF-dress.M.SG-ACC
'Zayd dried the dress'

Another verb that also expresses causative/inchoative alternation is '*falata*' (to release $_{\text{transitive}}$, to become released), as in:

(81) a. *falata zayd-un al-Himār-a.*
released Zayd the-donkey.
'Zayd released the donkey'.

b. *falata al-Himaar-u.*
released the-donkey.
'The donkey escaped'.

In addition, some cooking verbs such as *ghalā* 'to boil' and *ṭahā* 'to cook' also have this ability of alternating between the two CAUS/INCHO readings, as the following examples clearly demonstrate: [65]

(82) a. ghalā zayd-un al-māʔ-a
boiled Zayd the-water.
'Zayd boiled the water'.

b. ghalā al-māʔ-u.
boiled the-water.
'The water boiled'.

However, one cannot guarantee the predictability of such Form I causative/inchoative alternation since this is not a common case for Form I verbs in MSA. For example, not all cooking verbs (particularly, what Levin (1993: 175) calls *verbs of preparing*) in Arabic participate in the caus/incho alternation, such as the equivalents of the English *fry*, *toast* and *bake*, to mention a few. Nor do these verbs alternate in English, either. This, therefore, might imply that the polysemy of these verbs is more of an exception than a rule, which one could argue to be the

[65] These examples are credited to Fayssal Tayalati.

case. However, it is important not to miss the fact that the causative-inchoative alternation exists in the language, as we have just shown. In fact, more instances of this kind of verbal alternation occur in JA (the dialect) because, as the next section discusses, the polysemy is also present in Form-II verbs.

4.6.3 Alternating Form-I and Form-II verbs in JA

As we noted earlier, the causative/inchoative alternation in JA is found in verbs of Form I and Form II. Similar to the situation in MSA, there are some *roll verbs and cooking verbs* of Form I, which are actually polysemous between the causative and inchoative readings. Consider the following examples.

(83) a. Ahmad *daHal* al-faṭbool
Ahmad rolled down the-ball
'Ahmed rolled the ball (down the hill)'

b. l-faṭbool *daHal*.
the-ball rolled down
'The ball rolled down (the hill)'

(84) a. qā3id bighli aš-šāy.
He is boiling the-tea
'He is boiling the tea'

b. iš-šāy bighli.
the-tea is boiling
'The tea is boiling'

Another example which does not belong to either *roll verbs* or *cooking verbs* are the verbs *fataH* 'to open' and *ṭafa* 'to shut off', as the following example shows.

(85) a. Omar *fataH* l-bāb
Omar *opened* the-door
'Omar opened the door'

b. l-bāb *fataH*
the-door *opened*
'The door opened'

(86) a. l-baladiyyeh *ṭafa*-t l-kahraba
the-municipality.F shut off-F the-lights
'The municipality shut off the lights'

b. l-kahraba *ṭafa*-t
the-lights.F shut off-F
'The lights shut off'

As regards verbs of Form II, some of what we may call the *stop-motion* verbs can be used in exactly the same way as both *roll verbs* and *cooking verbs* are used in the above examples. That is, the same verb form can systematically alternate between the causative meaning and the inchoative meaning. This shows a divergence from the standard use of Form II in the MSA. Consider the following examples.

(87) a. waqqaf-t as-siyyārah[66]
CAUS-Stopped-1SG the-car
I stopped the car

b. waqqaf as-siyyārah (faj'a)
CAUS-Stopped-3SGM the-car (suddenly)
He stopped the car suddenly.

(88) a. waqqaf-at as-siyyārah (la-Hālha, faǧʔa)[67]
INCHO-Stopped-3SGF the-car (by-itself, suddenly)
The car stopped

[66] In the Syrian (Damascene) dialect and in JA too, the two sentences in (62) can be uttered by using a different syntactic structure, as is shown below.

waqqaf-t-ha la-siyyārah
stopped-1SG-it(F) la-car
'I stopped the car'

waqqaf-ha la-siyyārah
Stopped.3SGM-it(F) la-car
'He stopped the car'

In this construction, which has a transitive verb taking one object, an anticipatory pronoun suffix is used (-ha) followed by *la* + definite object. Thanks to Unaisa Khir Eldeen for pointing out this to me.

[67] There is also another way of saying this, at least in JA, which is the following:

as-sayyārah *wiqf*-at
The-car stopped

Il-baas wiqif
the-bus stopped

The same applies to the other example of 'bus', too. However, the legitimate question here is what is the difference in meaning between the use of *waqqaf* and *wiqf* or *wiqif*? The answer is that there seems to be no difference in use (and in meaning) between them. To the best of our knowledge, the two verbs have roughly the same meaning and same implicature in virtually every context of utterance. For example, in the example of *wiqf-at*

b. waqqaf al-bāṣ
INCHO-Stopped-3SGM the-bus
The bus stopped

What these examples show is the fact that the same verb *waqqaf* (lit. 'he stopped' in this context; not 'stood up') expresses two logically related meanings: the causative and the inchoative. Other examples of the polysemous causative/inchoative verbs of Form II include the following: *ṣaffar* 'to empty/ zero out', *waṣṣal* 'to get someone to a place', *xallaṣ* 'to finish/consume (all food)', *sakkar* 'to close'.

4.7 Conclusion

In this chapter, we provided a mainly descriptive account of systematic polysemous patterns existing in the Arabic lexical categories of nouns, adjectives, and verbs. We have seen that nominal alternations behave quite the same as nominal alternations do in English, albeit with some attested differences in the count-to-mass alternations (e.g. the animal/meat pattern) as well as the mass-to-count alternations (e.g. the stuff/portion pattern). The important point to remember in this regard is the fact that, while there seems to be less to no polysemy involved in the mass-to-count nouns, systematic polysemy is prevalent in the count-to-mass alternation, strictly with reference to generic collective nouns. This implies that the *direction* of the nominal alternation in the count/mass dichotomy either (drastically) reduces or increases polysemy. As already emphasised, instances of systematic patterns are seen more occurring when the pattern moves from the direction of count interpretation to the mass interpretation. This is evidenced by the many examples investigated so far.

As for the systematic polysemy of nominalised adjectives in Arabic in examples whose English equivalents include *selfishness*, *redness, etc.*, we have shown that there are at least two main groups of deadjectival nouns that always give us three systematic readings: The *–iyya* deadjectival nouns and the deadjectival colour nouns. As we noted, nouns of these two groups satisfy Aronoff's (1976) notion of *coherence* and, with particular reference to the colour group, Apresjan's (1974) notion of *productivity*. Overall, the two groups include nominals that, as Spencer's (2013) analysis goes, are seen as having one tripartite meaning.

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and *waqqaf-at* above, both mean the same, i.e. the car stopped, and both might imply that the car stopped because of a problem (whether in its engine or any other part that caused it to stop moving).

The chapter also addressed verbal alternations in Arabic. We started by drawing on the distinction between passivisation and decausativisation. Then, we distinguished between *al-mabnī li-lmağHūl* (the inflectional passive) and *al-fi3l al-muṭāwi3* (the inchoative) in Arabic. We have seen that the majority of verbs are morphologically marked, in the sense that the Form of the causative is often independent of the Form of the inchoative. In other words, there are usually two separate verb Forms for the causative and the inchoative. However, several verbs, mostly of Form I in MSA and of Form I and Form II in JA, seem to encode a meaning that is polysemous between the causative and the inchoative senses.

In the next chapter, we provide a GL-based analysis for the phenomena described in this chapter, in an attempt to test the applicability of the GL apparatus to the Arabic data on polysemy and also to develop, where necessary and relevant, certain aspects of the model.

Chapter 5 A Generative Lexicon-based Analysis of Systematic Polysemy in Arabic

5.1 Introduction

This chapter provides a formal analysis of the Arabic systematic polysemy alternations explored in the previous chapter (Chapter 4) in light of the theory of the Generative Lexicon introduced in Chapter 3. The method of analysis is primarily comparative in nature, i.e. it is based on identifying theory-based similarities and/or differences between both Arabic and English, based on the GL's formal treatment of this phenomenon in the English language. The chapter's principal objective is to examine the applicability of the theory in accommodating the whole range of the Arabic regular polysemous alternations identified earlier. To this end, the chapter puts forward the following set of questions: (1) In terms of formal analysis, do we expect the GL theory to handle systematic alternations in Arabic in the same way as it does for the English data? (2) Insofar as the phenomena of property nominalization, count-to-mass nouns and mass-to-count nouns are involved, on what GL grounds could these be analysed?, and finally (3) how do we expect generic collective nouns in Arabic to behave in the GL, given the fact that the logical polysemy of these nouns is dependent on several factors, as noted in the previous chapter?

Before we proceed, it is important to note that we do not aim to offer a fully-matured analysis that deals with the various complexities of the GL theory. However, a (somewhat) simplified analysis that focusses on aspects of lexical representation and generative mechanisms is what will be pursued here.

5.2 Some preliminaries

In this section, we briefly revisit the major components of the GL and discuss what is relevant to the analysis of each nominal, verbal and adjectival alternation. Here we also re-introduce the machinery needed to understand how these analyses are handled in the GL framework.

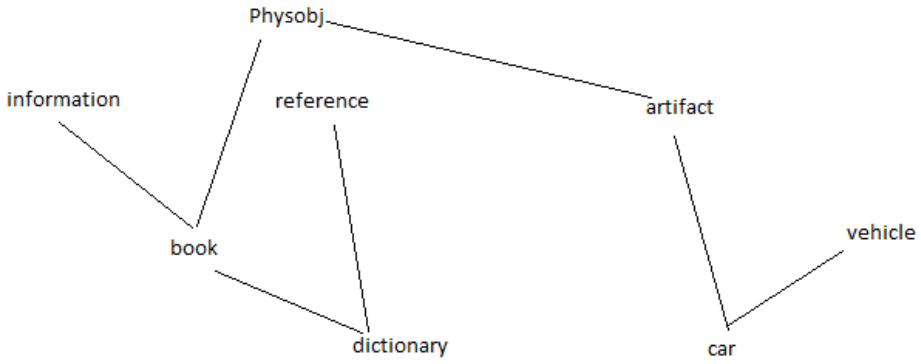
5.2.1 The GL as a typing system

In Chapters 2 and 3, we mentioned that the GL is an alternative to the conventional models of lexical representation that 'heavily' rely on multiple inheritance relations that define how a lexical item inherits information. To clarify this point, let us take the following example.

The example of *play/dictionary*

Conventionally, such nominals have been represented via inheritance relations.[68] For example, *book* is a physical object; *play* is a book; *dictionary* is a book; therefore, *play* and *dictionary* are physical objects. This is best illustrated by the figure below (1995: 142).

Figure 5.1 Conventional representation of inheritance relations—Pustejovsky (1995)



Despite being informative, the problem with models adopting this conventional representation of inheritance relations, i.e. the **is_a** type relation[69], as Pustejovsky notes, is that they "suffer from a very limited notion of lexical structure" (1995: 143). That is, they fail to either (1) "explain how to assign structure to lexical items", or (2) "specify lexical relations between lexical items in terms of links between only certain aspects of their respective lexical structures" (ibid: 143). Therefore, systems that rely on these is_a relations will simply fail to account for how "different aspects of objects become more or less prominent as context varies" (ibid: 142).

To clarify further, consider the table below (ibid: 144).

[68] An inheritance relation is essentially interpreted in this context as an *is_a* relation between classes or types (nominals in our case). In general terms, it can be simply defined as a relationship between a *parent class* and *a child class*. For example, the relationship between *Car* and *Honda* represents an 'inheritance relation' where *car* belongs to the *Parent class* and *Honda* belongs to the *Child class*. Therefore, the connection between *Honda* and *Car* is established via the *is_a* link to mean that a *Honda is a car*.

[69] A crucial point to mention here with respect to the conventional view of inheritance relations is the fact that such inheritance relations do not seem to restrain the *child class* from having all the properties of the *parent class*.

	Play **is_a** book	Dictionary **is_a** book
read	OK	No
buy	OK	OK
consult	No	OK
begin	OK(?)	No

The table shows the two **is_a** relations for *play* and *dictionary*. It also shows that, although both *play* and *dictionary* are of 'book' type, they are distinct, or behave distinctly in terms of the 'activity' they can enter into. What this suggests is the fact that a conventional representation that depends only on is_a relations poses a serious problem to the current inheritance systems of lexical knowledge. As Pustejovsky argues, although it is reasonable to think of *play* and *dictionary* as *books*, these nominals behave differently in terms of selection (i.e. how these nominal are selected) by different relations (1995: 144). Therefore, a single lattice, i.e. an *is-a* hierarchy, for inheritance is "inadequate for capturing the different dimensions of meaning for lexical items" (ibid). Pustejovsky addresses this issue by introducing a separate lattice or hierarchy per role in the qualia structure, i.e. by making the inheritance relationships be obtained through the qualia structure of a lexical item (this is known as *qualia-typed inheritance* or *inheritance through qualia* (cf. Pustejovsky, 1995)). This has the advantage of 'fine-tuning' these inheritance relations by "excluding the unwanted inferences [mentioned in the table above], and allowing only the desired ones" (ibid: 145).

The GL, as type-based theory, deals with the representation of inheritance relations by distinguishing between three different ontological types: natural types, unified types, and complex types (dot objects) (see Chapter 3, section 3.2). With that said, it is important to remember that *complex types* are introduced in the GL to account for logical polysemy.

5.2.2 The machinery

Recall that in Chapter 3 we have discussed two major tenets upon which the theory is built: the levels of representation and the generative mechanisms. As a reminder, the semantic representation of any lexical entry or lexeme in the GL framework comes ready with the following structures: Argument, Event, Qualia, and Lexical inheritance (see the representation of the lexical item *a* below). Of course, not every lexeme in the language has available to it all these four structures. For example, nouns, rationally, do not have an event structure—but of course there are some exceptions as in the case of derivational nouns (e.g. *construction*).

(1) $$\begin{bmatrix} \boldsymbol{\alpha} \\ \dots \\ Argument\ STR = \cdots \\ Event\ STR = \cdots \\ Qualia\ STR = \cdots \\ Lexical\ inheritance\ STR = \cdots \end{bmatrix}$$

Since the last structure (i.e. the lexical inheritance structure) is bound to the global organization of the lexicon (i.e. how a word is related to other concepts in the lexicon), we will have to ignore it in our analysis. However, what is more important are the remaining three structures because they encode the semantic description of a lexical item. We have discussed these in detail in Chapter 3, section 3.3, but we refocus here on the Qualia STR as it is an indispensable component of any lexical representation.

The GL's Qualia Structure

As we mentioned in Chapter 3, the qualia structure is the most important aspect of the GL theory as it captures the conceptual differences in the mental lexicon. To do this, the qualia structure consists of four primary aspects of a word's meaning: the constitutive, formal, telic, and agentive. These four aspects of qualia provide a richer description of meaning and enable capturing the polymorphic behaviour of word-senses (Pustejovsky, 1995; 2001; 2013).

Before we proceed to the analysis, two main points must be emphasised, again, with respect to qualia roles (Pustejovsky, 1995: 76):

(i) Every category expresses a qualia structure;
(ii) Not all lexical items carry a value for each qualia role.

An initial representation for the qualia structure for the lexical item α is given below (ibid: 78):

(2) $$\begin{bmatrix} \boldsymbol{\alpha} \\ \dots \\ QUALIA = \begin{bmatrix} CONST = what\ \boldsymbol{a}\ is\ made\ of \\ FORMAL = what\ \boldsymbol{a}\ is \\ TELIC = function\ or\ purpose\ of\ \boldsymbol{a} \\ AGENT = how\ \boldsymbol{a}\ came\ into\ being \end{bmatrix} \end{bmatrix}$$

Now, let us provide the representation levels and the generative devices that will be used in the analysis of nominal and verbal alternations.

(A) nominal alternations:

Representation levels:
Argument structure

(Event structure; head feature)
Qualia structure

Generative device:
LCP (dotted or complex type) or type coercion

(B) verbal alternations:

Representation levels:
(Argument structure)
Event structure
Head feature

Generative devices:
co-composition

5.3 Analysing nominal alternations

In this section, we will be analysing the Arabic noun alternations as identified in Chapter 4, Section 4.4. First, however, we start by introducing the analysis of some English examples as mentioned in Pustejovsky (1995).

It is important to bear in mind, though, that some nominal alternations that we identified as *simplex alternations* in Chapter 4, such as the *plant/food* and the *place/people*, will not be discussed here. This is because, in terms of formal analysis, most of these alternations behave in exactly the same manner as do the alternations analysed below.

5.3.1 Content/container

This kind of nominal alternation, represented by the example of *book*, has been analysed by using an lcp type constructor; a generative mechanism that we have explained earlier. This means that the logical polysemy of this content/container alternation is handled by *complex typing* (i.e. by turning the noun into a dot object type). In Pustejovsky (1995: 101), *book* is given the following schematic representation:

(3)
$$\begin{bmatrix} \textbf{BOOK} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: information} \\ \text{ARG2} = \text{y: phys\_obj} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{info. phys\_obj\_lcp} \\ \text{FORMAL} = \text{hold (x, y)} \\ \text{TELIC} = \text{read (e, w, x. y)} \\ \text{AGENT} = \text{write (e, v, x. y)} \end{bmatrix} \end{bmatrix}$$

We omit several technical details here. However, the lexical representation above clearly shows that *book* is of **complex type.** As the two senses of *book* are given in the ARGSTR, the *lcp* generative device binds them together; hence, creating a *dot object type*. What remains, however, is to show how the relation between these senses is established. Looking closely at the qualia structure, we notice that The FORMAL quale essentially defines the containment relationship between the two senses of book. That is, *book*, through its FORMAL role which carries the value of 'hold', denotes a containment relationship between the (simple) type 'physical object' and the (simple) type 'information'.

On this view, the Arabic nouns of the content/container pattern examined earlier are no different. We expect them to behave in the exact manner and, thus, to have the same 'templatic' form. That is, they should be formally analysed as nouns of the dot object (or complex) type. For example, take the noun *zuǧaǧa* 'bottle' in Arabic. In contexts such as the ones below, *zuǧaǧa* expresses the sense of 'physical object' and the sense of 'quantity',

(4) ʔṣqaṭa Ahmed l-*zuǧaǧa*
dropped Ahmed the-bottle
'Ahmed dropped the bottle'

(5) šariba Ahmed l-*zuǧaǧa*
drank Ahmed the-bottle
'Ahmed drank the bottle'

And, thus, this noun is better encoded in the lexicon as a complex type. Notice that *zuǧaǧa* is originally an artefactual object, i.e. it already carries a TELIC value (= DRINK, for example).

(6)
$$\begin{bmatrix} \textbf{ZUǦAǦA} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: phys\_obj} \\ \text{ARG2} = \text{y: liquid} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{liquid. phys\_obj\_lcp} \\ \text{FORMAL} = \text{hold (x, y)} \\ \text{TELIC} = \text{drink (e, w, y)} \\ \text{AGENT} = \text{make (e, v, x)} \end{bmatrix} \end{bmatrix}$$

Hence, typing *zuǧaǧa* as a complex object allows it to appear in selectional environments that require the assignment of a particular sense. Therefore, in the example of 'drink' above (example (5)), it would be possible to use *zuǧaǧa* with predicates that require the strict reading of 'quantity' or 'measure', since the semantics of the noun already encodes this particular

reading. The same applies to predicates that require the 'object' reading only (e.g. *break*/*drop* as in (4) above*)*. Secondly, the advantage of treating *zuğağa* as a complex type is also seen in copredicational contexts, where it is completely acceptable to have the following (notice that the following example is in JA, and hence uses the noun *qannīneh* 'bottle'):

(7) Ahmed širib l *qannīneh* w ba3dein kasar-ha
Ahmed drank the-bottle and then broke-it
'Ahmed drank the bottle and, then, broke it'.

But notice that the sequence of the events is crucial in these examples: it would be just unacceptable to say:

(8) ? Ahmed kasar l-*qannīneh* w ba3dein širib-ha.
Ahmed broke the-bottle and then drank-it
'? Ahmed broke the bottle and then drank it'.

5.3.2 Product/producer

With respect to the GL analysis, this type of alternation is not different from the previous one. That is, the *product/producer* alternation can be captured by an lcp. However, we discuss it because it includes the example of *newspaper* which is seen as involving three distinct but related senses. First, consider the examples in the table below.

Product/ Producer Alternations		
Lexical item	**Sense$_1$**	**Sense$_2$**
Honda	Product (obj)	Company
Addustour 'name of a Jordanian newspaper'	Newspaper (obj.info)	Organisation
Microsoft	Product (obj)	Company

The logical polysemy of the two examples of *Honda* and *Microsoft* is clear and, thus, needs no further explanation as both can be analysed as dot object nominals. The example of *newspaper*, however, shows an interesting case. Notice that the first sense of *newspaper* (i.e. obj.info) is similar to that encoded by *book* in the content/container alternation above. That is, *newspaper* (Sense$_1$) is logically polysemous between *information* and *physical object*. What this means is that this first sense is itself a dot object. In addition, *newspaper* also denotes Sense$_2$ (organisation). Combined together, a new lcp construction, which clusters the already dot object

type ($sense_1$) and the organisation sense ($sense_2$), is created. To put it differently, we have a complex type within a larger complex type, which is the product.producer lcp. Consider the following schematic representation (1995: 156).

(9)
$$\begin{bmatrix} \textbf{NEWSPAPER} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: org} \\ \text{ARG2} = \text{y: info. physobj} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{org. info. physobj\_lcp} \\ \text{FORMAL} = \text{y} \\ \text{TELIC} = \text{read (e2, w, y)} \\ \text{AGENT} = \text{publish (e1, x, y)} \end{bmatrix} \end{bmatrix}$$

One important observation about this representation is the fact that "…the dot object itself [i.e. org.info.physobj] does not appear in the qualia except to define the type itself" (ibid: 155). As we notice, the AGENTIVE role refers to the dot element denoting the producer, and the FORMAL quale refers to the dot element denoting the product, and no other quale makes reference to the complete lcp (ibid). This is, in fact, a point which we previously explained in Chapter 3 (see the discussion about *split lexicalisation* in section 3.6.1).

The interesting fact is that this noun in Arabic behaves in exactly the same manner. In other words, it is just impossible to refer to the complete *lcp* product, i.e. the denotation *org.physobj.info* does not exist, which provides further support for Pustejovsky's notion of *split lexicalisation*.

As regards the other nouns in the table above, i.e. the brand names *Honda* and *Microsoft*, they can be analysed in the same fashion, i.e. as complex types.

(10)
$$\begin{bmatrix} \textbf{HONDA} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: company} \\ \text{ARG2} = \text{y: product} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{company. product\_lcp} \\ \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{exist (e2, w, x)} \\ \text{AGENT} = \text{make (e1, x, y)} \end{bmatrix} \end{bmatrix}$$

The consequence of typing 'brand names' as dot objects in the GL is that they do not have to be *coerced* to the type required by a predicate of which these nouns are an argument (i.e. no semantic type-mismatch). To understand this, let us recall the example of *drive* whose argument was the noun *Honda* (see *subtype coercion* in Chapter 3, section 3.4.1). There it was argued that

the verb *drive* requires a complement of the type *vehicle*. *Honda* is a subtype of *car* that is also a subtype of *vehicle*. Hence, according to Pustejovsky's claim, *Honda* is coerced to the type [vehicle] to satisfy the type required by *drive*. But do we really need to rely on coercion every time we encounter similar examples including names such as Bentley for instance?

On this current view, however, the type [vehicle] is already subsumed in ARG2 [product]. Of course, further specification could be added to ARG2 to identify *Honda* as a vehicle, since the type [product] alone is not sufficient to license the type [vehicle]. But this is essentially the task of the inheritance process in the system, whose function is to output the value **y:car[vehicle]** to ARG2. Coercion, thus, would be needed only when the process of inheritance fails to establish any link between the 'producer' and the 'product'. For instance, imagine that someone says 'I am going to drive a Gucci'. In this case, the inheritance process would fail to return the value a:car[vehicle] if Gucci is only recorded as a fashion company in the lexicon or if it is not stored at all; thus, real type coercion is needed to convert 'Gucci' to the type expected by 'drive'. Following this, the GL need not rely on two independent processes (inheritance and coercion) to derive the specific interpretation required by context.

The point not to be missed here is the fact that both Arabic and English nouns of product-producer pattern are better typed as complex types in the GL, especially when nouns of this pattern such as *newspaper* can coordinate without zeugma.

5.3.3 Count-to-mass nouns

In Pustejovsky (1995), the count/mass alternations are seen in the following examples:

- Animal/meat pattern (e.g. *lamb*).
- Object/substance pattern (e.g. *apple*).
- substance/portions pattern (e.g. *coffee*).

Since this classification subsumes the two cases of count-to-mass and mass-to-count nouns, we will deal with the count-to-mass alternation first, and then come to analyse the mass-to-count nouns in Section 5.3.4.

Nouns of the count-to-mass alternation have not been given, so far, a complete formal treatment in the Generative Lexicon. Pustejovsky (1995) mentions that the count/mass nominal alternations are analysable in terms of *dot object typing* (i.e. treated as complex types), similar to the analysis projected for the content/container alternations, using the notion of lcp (ibid: 92).

Although Pustejovsky does not provide a lexical representation for how the argument and qualia structures should look like for nouns of these alternations, we expect these nouns to have a lexical representation similar to the one below. Let us take the example of *lamb* which belongs to the animal/meat pattern.

(11)
$$\begin{bmatrix} \textbf{LAMB} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: animal} \\ \text{ARG2} = \text{y: meat} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{animal. meat\_lcp} \\ \text{FORMAL} = R\ (\text{x}, \text{y}) \\ \text{TELIC} = ?\ (\text{e}, \text{w}, ?) \\ \text{AGENT} = ?\ (\text{e}, \text{v}, ?) \end{bmatrix} \end{bmatrix}$$

There are several points to make here: First, as we see it, treating count-to-mass nouns, especially of the animal/meat alternation, as complex types seems to be somewhat problematic. The problem arises from the fact that animals such as *lamb* are natural kinds, which means that objects of natural kind do not already come with a TELIC and/or AGENTIVE role(s) (see *natural types* above). So, unlike the content/container nouns which are typically artefactual in nature (later turned by the lcp into complex types), we do not expect nouns of originally natural kind to behave in the same fashion. Of course, this does not mean that employing the notion of lcp construction could be wrong, but it seems hard to imagine what value the TELIC and AGENTIVE roles should carry with them (here we mean all natural kind terms, not just livestock). Second, with regard to the FORMAL quale, would it be really appropriate to "re-define" the relationship between the animal and its derived 'parts'? In fact, since animals are of natural kind, in which case only the CONST and FORMAL roles are available to them, we expect the FORMAL role to remain unchanged. Hence, the FORMAL role must be posited as follows:

FORMAL = x (where x refers to the animal type in the 'type hierarchy').

As we see it, though, if the notion of lcp turns out to be problematic for explaining the logical polysemy of nouns of the animal/meat alternation, then we would expect the generative mechanism of *type coercion* to be of some relevance. We return to this point shortly.

Interestingly, however, a different line of analysis, which does not make use of either the lcp or type coercion, seems to be taken. Im and Lee (2013) suggest an analysis that treats some animal

nouns as being essentially of the *functional (or unified) type*. Their justification, which compares between the two examples of *wolf* and *pig*, can be summarised as follows: *wolf* ('nuktay' in Korean) is an example of a carnivorous animal which people do not normally raise for food; hence, it cannot be but of the simple type (i.e. natural kind). For this reason, the lexical representation of *nuktay* 'wolf' is given as follows (2013: 211):

(12)
$$\begin{bmatrix} \textbf{NUKTAY 'wolf'} \\ \text{ARGSTR} = [\text{ARG1} = \text{x: mammal}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \text{x} \\ \text{CONST} = \ldots \\ \text{TELIC} = \emptyset \\ \text{AGENT} = \emptyset \end{bmatrix} \end{bmatrix}$$

One obvious remark in respect of the above schema is that Im and Lee assign 'null' values for the TELIC and AGENT roles. Remember that we have just argued above that it is hard to imagine the values for these particular roles because *wolf* is not livestock.

On the other hand, *pig* ('toayci' in Korean) is different from *wolf* because people eat it and raise it for food. Thus, for Im and Lee, *toayci* 'pig' is a functional type word and is given the following lexical representation (ibid: 212):

(13)
$$\begin{bmatrix} \textbf{TOAYCI 'pig'} \\ \text{ARGSTR} = [\text{ARG1} = \text{x: mammal\_livestock\_foodstuff}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \text{x} \\ \text{CONST} = \ldots \\ \text{TELIC} = \text{eat (x)} \\ \text{AGENT} = \text{raise (x)} \end{bmatrix} \end{bmatrix}$$

There is, in fact, much to be said about Im and Lee's proposal of treating animal nouns similar to that of *pig* as functional or unified types. However, we restrict our discussion to their given lexical representation and their idea about functional types. First, with respect to the lexical representation of *pig* above, we wonder why *pig* is given only one argument (i.e. one 'multifaceted' sense) in the ARGTSTR. This seems to be an actual lcp construction. In addition, the event *raise (x)* in the AGENT role refers to the complete "lcp" type in the ARGSTR, which obviously cannot be correct. Second, as for treating *pig* as a functional type word, how would this allow for the already lexicalised meat-denoting words such as *pork*, for instance, to 'take

over' in contexts where the intended meaning is only the 'meat' sense? A functional (unified) type is very different from a complex type because the unified type fundamentally involves a logical conjunction of types and, thus, defines those non-polysemous objects (see Pustejovsky 1995: 145). Even more, if *pig* is to be treated as a unified type, then there is no actual need, in at least Korean, for attaching the suffix *koki* 'meat' to the noun *toayci* 'pig'. But, as they argue, *koki* is needed to attach to animal nouns such as *pig* and *cow* whenever their meat sense (i.e. mass interpretation) is intended in context (ibid).

This situation in Korean where *koki* 'meat' is affixed to, say, *toayci* 'pig' to denote pig-meat only seems very much similar to that in Arabic. As we have explained in the previous chapter, the Arabic language makes use of the lexeme *laHm* 'meat' in contexts where only the meat sense of an animal is intended (see Chapter 4, section 4.4.3 for full discussion of the intricacies of the count/mass animal nouns). We return to analyse the Arabic examples in the next subsection.

So far, there seems to be no satisfactory way of formalizing the polysemous animal/meat alternations in the GL. Perhaps, a lexical rule similar to that of Copestake and Briscoe's 'meat grinding rule' or a different generative mechanism such as *coercion* is desired. This indeed requires further investigation, which we return to shortly. Nonetheless, the idea of turning these natural kinds into complex types may still apply, but the qualia structure, specifically qualia roles, may need to be stretched further.

Interestingly enough, Pustejovsky mentions in a very late note that polysemous count-to-mass nouns such as *haddock*, could actually be represented as dot objects, i.e. complex types (1995: 264-5; note 2). He gives the following lexical representation for *haddock* (ibid: 265).

(14)
$$\begin{bmatrix} \textbf{HADDOCK} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: ind\_animal} \\ \text{ARG2} = \text{y: food\_stuff} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{ind\_animal.food\_lcp} \\ \text{FORMAL} = \text{R (x, y)} \\ \text{TELIC} = \text{ eat (e, w, y)} \\ \ldots \end{bmatrix} \end{bmatrix}$$

As he argues, the TELIC role in the qualia structure makes reference only to the mass reading, i.e. *foodstuff*. This is because only the type *food* has a TELIC value (ibid).

Comparing Pustejovsky's representation with that of Im and Lee above, we notice that in both lexical representations, disregarding the note about functional types in Im and Lee's schema, the TELIC role refers to the mass reading. Of course, this is only true of livestock animals, but it can also apply to wild animals such as *wolf,* where, say, it is possible in a community to raise *wolves* for food. But in either case, the rule seems very problematic because it seriously overlooks the role of morphology and its interaction with the concept of polysemy. Consider the following examples in English:[70]

(15) We have eaten four chickens/cabbages.

(16) In that country, they eat chickens/chicken
cabbages/cabbage
dogs/? dog/ dog-meat
locusts/*locust/ locust-meat

What these examples show us is the fact that when the object of 'eat' is both in the plural and does not have a generic interpretation, then the object noun does not have a 'for eating' TELIC quale (as in example (15)). On the other hand, when the plural has a generic interpretation, because it is in a generic sentence, then it has the same interpretation as the mass 'meat' examples of *haddock* and *pig*. But notice that the mass quantifier *much* is only used with *chicken*, for instance, but not with the generic plural *chickens* in (16).

The generic plural can always be used, but most animal/plant names *do not* allow conversion to mass (food) term (e.g. dog, locust, leaf, nut, etc.). This takes us back to the possibility of employing the mechanism of *coercion*. These animal/plant names can often be coerced into a mass reading but not when the 'for eating' TELIC is crucial, as in the following example:

(17) There's *locust* in this oriental salad.

Now, the real question is this: what implications do these facts have for the GL formalism regarding the animal/meat alternation, given the complexity of the situation in relation to morphology? Here, we suggest two possible answers.

Firstly, the GL might ignore the issue about noun morphology, in which case the mass interpretation is produced via coercion only. We have seen how complex typing works in the example of *haddock* above. What we haven't seen, however, is how coercion works in this

[70] These examples, and the idea about the 'for eating' TELIC quale in relation to the English examples, are credited to Prof. Andrew Spencer.

situation. Let us assume that all animal nouns have the structure given by Im and Lee for *wolf*, i.e. all animals (both wild and farm animals) lack TELIC and AGENTIVE roles. Thus, the only available information for *wolf* is that it is an animal. In that case, *wolf* and *wolves* denote the animal reading. No mass reading is available, whatsoever. If this line of analysis is pursued, then *coercion* (type-shift) is triggered to resolve the type mismatch between the predicate and its argument. This is seen in example (17) above, where *locust* is used in the mass 'meat' sense. One possible advantage of this analysis is that it would work for all examples of coercion and it would resolve the issue regarding the TELIC value for non-livestock animals. As a matter of fact, this seems to be the right treatment offered for the animal/food nominals in Pustejovsky (2005), where he views nouns such as *rabbit*, for example, as *pseudo-dot objects* that do not satisfy the notion of inherent polysemy present in canonical dot objects such as *book* or *university*. But one problem associated with this rule, in the absence of syntactic information, is that it will convert all countable animal nouns to mass nouns, which seems to yield undesired results in certain contexts (consider the use of *dog* and *locust* in example (16) above).

Secondly, the GL should not ignore the issue about noun morphology, in which case the mass interpretation is encoded as relevant to the singular/plural distinction. This kind of analysis is what we will attempt in the next subsection, in relation to the count-to-mass alternation in Arabic, with particular reference to the generic collective nouns.

5.3.3.1 Generic collective nouns

To the best of our knowledge, only collective nouns (individual entities vs group) seem to have been given a formal treatment based on Complex Lexical Typing (i.e. dot object typing) in the GL (cf. Caudal 1998). Caudal proposes a dot object representation for these nouns in order to account for their polysemous nature. Consider the representation of his example of *police* below (Caudal, 1998: 158).

(18)
$$\begin{bmatrix} \textbf{POLICE} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: police\_force} \\ \text{ARG2} = \text{y: policeman} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{police\_force. policeman} - \textbf{lcp} \\ \text{CONST} = \text{x. y} \wedge \text{i} - \text{part(y, x)} \\ \text{FORMAL} = \text{join(y, x)} \end{bmatrix} \end{bmatrix}$$

There is one point to explain about Caudal's schema above, which is the notation used in the CONST quale. The value given here is based on the meronymic[71] relationship established between police (as a force) and police officer (as the part of this force), as suggested by Caudal. Hence, for Caudal, the best way, he believes, to capture the relatedness of both the group sense and the individual sense is by typing 'police' as a meronymy-based complex type, which thus explains the use of the notation (^i—part). But this is a point irrelevant to the analysis of generic collective nouns.

Now we turn to Arabic. In Chapter 4, we have studied generic collective nouns only; therefore, no formal analysis will be attempted for Arabic collective nouns since they are morphologically disambiguated and hence do not belong to the class of logical polysemy, whatsoever. In addition, we need to understand that generic collective nouns are different from collective nouns (see Table 4.7 in Chapter 4, Section 4.4.2). As we have shown earlier, a generic collective noun such as *daǧāǧ* 'chickens' can refer to the animal collectively or denote the mass reading of the animal (i.e. meat sense). This is, in fact, something that is more related to the analysis of the count-to-mass alternations above than to the analysis of collective nouns here, since in the latter case (i.e. collective nouns) the noun remains in the countable form but denotes either an individual or collective reading, as is shown in the example of *police* above. Generic collective nouns do not belong to this category. This means, in terms of the GL analysis, generic collective nouns can be represented as complex types or can be coerced to denote the mass reading (as suggested in the previous discussion above). But the analysis in terms of complex typing or type coercion cannot be carried out easily, especially in Arabic. What we mean is that the theory needs to decide when a generic collective noun receives either a countable interpretation or a mass interpretation in context. To clarify this point, consider the following example.

(19)	JA:	ʔkal-na	***baṭ***	3ala	l-3aša
		ate-we	ducks	for	the-dinner
		'We ate ducks/duck-meat for dinner'			

There are two readings available for the generic noun *batt* 'ducks' in (19): it can be interpreted as either ducks collectively (count) or duck-meat (mass). This, of course, depends on the context in which this example is used. But let us take Pustejovsky's analysis for *haddock*. Recall that

[71] Remember that in Chapter 2 we briefly mentioned that meronymy defines a part-to-whole relationship (e.g. door).

Pustejovsky argued that the TELIC role in the qualia structure must make reference to the mass interpretation only. Now let us build a similar lexical representation for *baṭ* ‘ducks’, as in (20).

(20)
$$\begin{bmatrix} \textbf{BATT} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: coll\_animal} \\ \text{ARG2} = \text{y: meat} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{coll\_animal. meat\_lcp} \\ \text{FORMAL} = \text{R}(\text{x}, \text{y}) \\ \text{TELIC} = \text{eat}(\text{e}, \text{w}, \text{y}) \\ \ldots \end{bmatrix} \end{bmatrix}$$

As we see it, this schematic representation is (partially) problematic for the Arabic generic collective nouns: First, there is no reason to assume that the TELIC role refers only to the mass interpretation (i.e. foodstuff/meat) because: (i) the eating activity can refer to both interpretations even though *batt* ‘ducks’ has, arguably, no TELIC value because it is a natural kind, and (ii) unlike the example of *haddock* where the English count/mass syntax (e.g. the use of determiners) can help disambiguate which sense is being referred to, the Arabic count/mass syntax is of no help in this case. This, of course, does not deny the fact that there are clear cases which specify the sense being selected in context (see Chapter 4, Section 4.4.3 for further discussion).

One possible way to solve this problem, however, is to allow the TELIC value to refer to the complete lcp product as follows:

TELIC = eat (e,w,**x.y**)

But it must be remembered, in relation to the Arabic data, that the GL cannot assign a ‘mass’ structure to either the singular form or the sound plural form of the noun, since singular and sound plural nouns *always* denote a countable interpretation in Arabic. Only the generic collective plural form of the lexeme can be provided with this structure. Hence, what is needed to be done in the GL is to add the value [number] to the representation of these nouns, as follows:

(21)
$$\begin{bmatrix} \textbf{\textit{noun}} \\ \text{MORPH} = [\text{NUMBER: } \textbf{generic coll} - \textbf{PL}] \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: coll} - \text{count} \\ \text{ARG2} = \text{y: coll} - \text{mass} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{count. mass\_lcp} \\ \text{FORMAL} = \text{R (x, y)} \\ \text{TELIC} = P\ (\text{e, w, x. y}) \\ \text{AGENT} = P'(e, z, x) \\ \dots \end{bmatrix} \end{bmatrix}$$

The outcome of this is a more abstract semantic structure from which one may derive collective or mass readings.

As regards the process of coercion, however, it is very problematic for the Arabic examples for one major reason: the noun morphology, as explained above. In other words, the process cannot take any count noun and convert it to the mass reading because (i) only the generic collective plural nouns admit this alternation between the count and mass readings, (ii) the count reading with this particular form of nouns is not completely cancelled out in certain contexts (see example (8) above, for instance). On top of that, there is another major reason, which is the use of the lexeme *laHm* 'meat' with animal nouns (in the animal/meat alternation) that are big in size, even though they have the generic collective plural form.

5.3.4 Mass-to-count nouns

In section 5.3.3 above, a proposed formal analysis for the count-to-mass nouns that rests on the notion of lcp is given, in which case any animal-denoting noun of the natural kind is converted to a complex or dot object type, so as to allow for the polysemous interpretation of nouns of the animal/meat alternation to be encoded directly into their given qualia structures.

In this section, however, a similar treatment to that projected for the count-to-mass alternations is pursued. In fact, as we mentioned in Section 5.3.3, Pustejovsky treats all these alternations as belonging to the broad category of count/mass alternations, regardless of the direction of the alternation itself. This indicates, on Pustejovsky's view, that what works for the count-to-mass alternations is expected to work for the mass-to-count alternations, too. In other words, there could be no distinct generative mechanism to operate for each alternation type. But as we saw in the previous section, one single mechanism, such as type coercion, cannot work for similar examples across different languages, at least in Arabic, as we have demonstrated.

To repeat, examples of the mass-to-count alternation include nouns such as *cheese*, *coffee*, *etc.* These nouns can be used in the countable form to denote a distinct but related meaning (often, the quantity reading). The example we have used throughout the study is that of *coffee*, where it can refer to either the mass (substance) reading or the count (quantity) reading, depending on the context in which it is used.

To begin, consider the example of *beer* below, as mentioned in Pustejovsky (1995: 17).

(22) a. Texans drink a lot of **beer**

b. Patsy relished every **beer** she drank.

Example (22a) denotes the 'mass' interpretation of *beer* whereas (22b) denotes the 'quantity/count' interpretation. As regards the GL analysis, Pustejovsky gives the following representation for *beer* (1995: 100):

(23)
$$\begin{bmatrix} \textbf{BEER} \\ \text{ARGSTR} = [\text{ARG1} = \text{x: liquid}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{drink (e, y, x)} \end{bmatrix} \end{bmatrix}$$

Pustejovsky, however, does not show us how we could arrive at the countable interpretation from the given representation of *beer* above. In fact, this lexical representation of *beer* is given in the discussion of the TELIC role, where Pustejovsky explains what the function of the TELIC role is. But, as we already stated in Section 5.3.3 above, the count/mass alternation, in general, is not offered a thorough analysis in this framework. Nonetheless, as we see it, examples of the mass-to-count alternation could be offered two ways of analysis; both seem to work fine, to a certain extent: (i) by using the generative mechanism of type coercion, in which case a mass noun such as *coffee*, for instance, does not have to encode a countable reading as part of its qualia structure, and, thus, the shift in meaning to the count interpretation of *coffee* is carried out by the predicate of the sentence of which the mass noun is an argument, due to the resulting type error or mismatch, or (ii) by typing mass nouns as complex types.

The first mechanism is straightforward, as no rich lexical information is needed to be encoded in the structure of the mass noun, in which case the noun *beer*, for instance, will have the following schema:

(24)
$$\begin{bmatrix} \textbf{BEER} \\ \text{ARGSTR} = [\text{ARG1} = \text{x: mass\_liquid}] \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \text{x} \\ \dots \end{bmatrix} \end{bmatrix}$$

Thus, in the light of example (22) above, the mechanism of coercion is only triggered in sentence (22b), where the count interpretation is required, aided with the syntactic information (the count quantifier *every*).

The second mechanism of complex typing, however, requires building the structure of *beer* with rich lexical information, as follows:

(25)
$$\begin{bmatrix} \textbf{BEER} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: mass\_liquid} \\ \text{ARG2} = \text{y: count\_quantity} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \boldsymbol{packaging\ lcp} \\ \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{drink (e, z, x. y)} \\ \text{AGENT} = \text{brew (e, w, x)} \end{bmatrix} \end{bmatrix}$$

Unlike the representation given in (24), what (25) gives us is an ambiguous entry for *beer*, where the noun itself can denote either a mass or count interpretation that is dependent on context. But which representation is needed or is sufficient for explaining the mass-to-count polysemy? Or do we need both of them, in which case we are faced with redundant or conflicting procedures?

While, on the face of it, both mechanisms may appear to run successfully, there are some known examples that are better given only either the dot object structure in (25) or the simple unambiguous structure in (24). These include the examples of *coffee* and *chocolate*, for instance. The noun *coffee* in English is ambiguous between the 'beans/powder' reading and the 'drink made from infusing beans/powder with hot liquid' reading. In both readings, the mass interpretation is the primary one. Hence, the countable interpretation in examples such as *I want three coffees* is clearly coerced to mean that *I want three cups of coffee* but not *I want three packets of (identical) coffee beans*. In this case, the simple structure in (24) seems more appropriate to use.

In the case of *chocolate*, however, the situation is not clear, as *chocolate* is genuinely ambiguous between the mass interpretation (e.g. *James likes white chocolate*) and the countable interpretation (e.g. *there are three chocolates left in the box*). In fact, this is what Wierzbicka

(1985, 1988) refers to as *solids with a double status*, i.e. substances which can occur in the form of individual objects. Other nouns of this sort include *cake* and *sausage*, for example. Thus, regarding the GL formalism, these nouns are best treated as complex types, and so their lexical structure would be similar to that given in (25) above.

As regards the Arabic data, the situation is highly constrained, as there seems to be less to no polysemy involved. Hence, either mechanism cannot successfully apply to mass terms, except perhaps when the mass noun is highly lexicalized in the language, as we have shown in the example of *qahwa* 'coffee' in JA only (note here that the word *qahwa* in JA is ambiguous just like *coffee* in English is). But one should remember that, even with this *coffee* example in JA, the situation is still not clear because the plural morphology with the count interpretation is not permitted (see Chapter 4, section 4.4.4 for further discussion). In consequence, the two mechanisms of *coercion* and *complex typing* are bound to fail, or will simply fail because if, for instance, we attempt to type *qahwa* as a dot object as follows,

(26)
$$\begin{bmatrix} \textbf{QAHWA} \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: mass\_liquid} \\ \text{ARG2} = \text{y: mass\_beans} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \boldsymbol{\neg lcp} \\ \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{drink (e, z, x)} \\ \text{AGENT} = \text{roast (e, w, y)} \end{bmatrix} \end{bmatrix}$$

Then, there is no need to employ the type clustering mechanism (the *lcp*) to account for the polysemy involved, since the two senses of *qahwa* still denote a mass reading—which explains the use of the notation (¬*lcp*) in (26) above. In that case, type clustering cannot apply because the two arguments of *qahwa* are of the same semantic type (i.e. mass types). What we have in (26) instead is a functional structure, not a complex one. This perhaps explains the reason why *coffee* is listed as an example of functional or unified types in Figure 3.1 (see page 79).

In summary, the main point to stress in relation to mass-to-count formalism is that, since this form of polysemy is rare or absent, the GL need not treat Arabic mass nouns as complex types or dot objects nor is there any need for type coercion to apply.

5.4 Analysing property nominalisations

Deadjectival nouns are not studied nor given a formal analysis in the framework of the Generative Lexicon yet. However, we believe, they could be offered an analysis in terms of lcp complex typing. First consider some of the examples we studied in the previous chapter, repeated below for convenience.

(27) a. *l-anāniyyat*-u ṣifat-un maḏmūmat-un
the-selfishness-NOM virtue-NOM denied-NOM
'selfishness is a vice' **= the quality of being selfish**

b. ghaḍib-tu min-hu bi-sabab-i *anāniyyati*-hi
angry-1SG from-him because (of) selfishness-his
'I got angry with him because of his selfishness' **= the fact/extent to which he was selfish**

(28) a. ʔdhašat-ha *Humrat*-u l-ward-i
amazed-her redness-NOM the-rose-GEN
'the redness of the roses amazed her' **=the fact/extent to which it was red**

b. *al-Humrat*-u laysat ṣifat-an wirāthiyyat-an
the-redness not trait genetic
'Redness is not a genetic trait.' **= the quality of being red**

Following Spencer (2013), the meaning of a deadjectival noun (or nominalised adjective) depends mainly on the predicate in which this nominal occurs. For example, the meaning of the nominalised adjectives, *anāniyya(t)* in (27) and *Humra(t)* in (28), is determined by the predicate of the sentence of which the nominalized adjective is an argument. Remember that Spencer (2013) sees these nominalised adjectives as having one tripartite or vague reading. This essentially means that, in the context of the GL analysis, these polysemous nominals could be analysed by treating them as dot objects.

But the question is: how can this be formalized in the GL framework, given the complexity of both property nominalisations and the distinction between the manufactured deadjectival nouns and the –iyya adjectives (in the feminine form) in Arabic? A possible answer would be that the GL has to posit two separate structures; one for the deadjectival nominal and one for the –iyya feminine adjectives. This, in practice, has the repercussion of increasing the size of the lexicon

by creating duplicate lexical entries that are clearly a result of a polysemous word formation rule, which runs against the spirit of the GL's approach. Nevertheless, the distinction is important and is needed to account for the logical polysemy of –iyya deadjectival nominals.

Regardless of the issue, deadjectival nouns can be treated as belonging to complex types; hence, they would have the following representation, which is given in (29) for *anāniyya* 'selfishness'.

(29)
$$\begin{bmatrix} \textbf{anaaniyya} \\ \text{CAT} = [\text{deadjectival noun}] \\ \text{ARGSTR} = \begin{bmatrix} \text{ARG1} = \text{x: quality} \\ \text{ARG2} = \text{y: fact/extent} \end{bmatrix} \\ \text{QUALIA} = \begin{bmatrix} \textbf{quality. fact. extent\_lcp} \\ \text{FORMAL} = \text{abstract entity} \\ \text{TELIC} = \emptyset \\ \text{AGENT} = \emptyset \end{bmatrix} \end{bmatrix}$$

Here, *anāniyya* is labelled as a deadjectival noun and is characterized by an argument structure carrying the different interpretations of the noun. The lcp, which creates a complex type carrying the three senses, is assigned to the lexical item *anāniyya*. Notice that the behaviour of the lcp for this deadjectival noun (and, in fact, for all deadjectival nouns of this sort) is in a way similar to that of the *newspaper*'s discussed in section 5.3.2 above. That is, deadjectival nouns might not denote the complete dot object, as examples (27) and (28) above show. A final remark about the lexical representation in (29) concerns the value of ARG2: the use of the slash (/) is to indicate that the meaning is *vague* with respect to factive and extent interpretations.

One obvious limitation of treating abstract nouns as complex types, at least in this example, is perhaps related to the complexity involved in working out their qualia structure. The pressing question is how informative would the qualia structure be in this regard? Not much is the answer. But typing abstract nominals as complex objects would allow the theory to proceed in the direction of sense selection in context, which seems to be the right approach because the predicates in the examples above do not *coerce* but, rather, select the appropriate interpretation. In fact, coercion would be a wrong choice for that there exists no semantic type mismatch between the predicate and its deadjectival argument.

As for the second group of deadjectival nouns, i.e. the colour group, the same reservations apply to their qualia structure. Consider (30) below.

(30)
$$\begin{bmatrix} \textbf{Humra(t)} \\ \\ \text{CAT} = [\text{deadjectival noun}] \\ \\ \text{ARGSTR} = \begin{matrix}[\text{ARG1} = \text{x: property of } [\text{colour: red}]] \\ \text{ARG2} = \text{y: fact/extent}\end{matrix} \\ \\ \text{QUALIA} = \begin{bmatrix} \text{FORMAL} = \text{Concept Colour} \\ \text{TELIC} = \emptyset \\ \text{AGENT} = \emptyset \end{bmatrix} \end{bmatrix}$$

In summary, we argue that, despite the limitations identified here, the logical polysemy of Arabic deadjectival nouns can be accounted for in terms of the GL's mechanism of complex typing.

5.5 Analysing the causative/inchoative alternation

In this section, we analyse the polysemy of the causative/inchoative verbs in Arabic; following Pustejovsky (1995) and Pustejovsky and Busa's (1995) proposed notion of event headedness in relation to the concept of event underspecification.

5.5.1 Lexical underspecification

According to Pustejovsky and Busa, the "causative/inchoative alternation can be analysed as a systematic form of polyadicity, not restricted to lexical forms alone, but by viewing this alternation as an instance of logical polysemy" (1995: 159). To paraphrase, this kind of alternation "requires neither multiple listing of the entries (as in Levin & Rappaport, 1992, 1995) nor lexical rules (as in Copestake, 1993)" (Pustejovsky, 1995: 189; and Pustejovsky and Busa, 1995). Consider the following example.

(31) a. the enemy *sank* the boat.
b. the boat *sank*.

Following Pustejovsky and Busa's main argument, the two forms of the verb 'sink' (i.e. both the causative and the inchoative) project an underspecified lexical entry. In other words, 'sink' has an event structure that encodes two sub-events, but neither of them is the "head" event, leaving the event structure of 'sink' underspecified. This case of event under-specification gives rise to phenomenon of systematic polysemy (or *logical polysemy* in Pustejovsky's terminology).

The GL analysis of the causative/inchoative alternation relies, crucially, on the notion of "event headedness" (Pustejovsky and Busa, 1995: 160; also see Chapter 3). Generally, as we have mentioned earlier in Chapter 3, events are sub-classified into at least three types: *processes*,

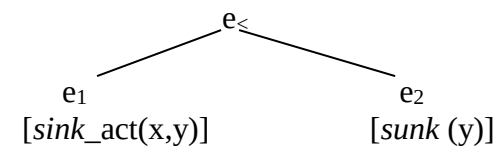
states, and *transitions* (ibid, pp. 163). The distinction between them is further guided by *headedness* in the GL framework. To repeat, *headedness*, according to Pustejovsky and Busa, is "a property for all event sorts, but acts to distinguish the set of transitions, specifying what part of the matrix event is being focused by the lexical item selected" (1995: 164). That is, the role of the HEAD marker (annotated as e*) is to indicate "prominence and distinction". Remember that Pustejovsky (1995), by employing the notion of event headedness, posited twelve possible head configurations; however, consider the following three below (Pustejovsky and Busa, 1995: 164).

(32) a. build—[e^T e_1* < e_2] (Head= e_1) (e_2 shadowed)
b. arrive—[e^T e_1 < e_2*] (Head= e_2) (e_1 shadowed)
c. break—[e^T e_1 < e_2] (Head= Φ)—underspecified

As is shown, all these verbs encode two sub-events in their relevant event structure. The first three verbs in (32a-b) have one main event marked with headedness, i.e. there is one event which is the head and the other is shadowed. The head event is the one that is available, by default, for use in any given (syntactic) structure. For example, the verb 'build' will always have the "process" reading (e_1) as the default event appearing in constructions in which the *agent* is present; thus, making the "state" (e_2) reading shadowed or "backgrounded" in the event structure. On the other hand, 'arrive' in (32b) has the "state" event (e_2) as the head event, while (e_1) is backgrounded, yet shadowing the *agentive* element in the structure.

However, example (32c) defines the case that corresponds to the causative/inchoative alternation in the present analysis. As noticed, verbs of this type like 'break' in (32c), do not have a marked head event in the event structure, which means that the two events (e_1 and e_2) are simultaneously competing for use because the verb is lexically underspecified (i.e. has headless events); giving rise to a polysemous reading . Unheaded or headless event structure of this sort can be viewed as follows (Pustejovsky, 1995: 189):

(33)



The semantics of both constructions is translated as:

(e_1): [x ACT] [CAUSE x [BECOME [y SUNK]]]]
(e_2): [BECOME [y SUNK]]

In the GL, the semantics of this alternation is expressed mainly via the AGENTIVE and FORMAL roles (Pustejovsky and Busa, 1995: 166). For example, the verb *break* can be schematically represented as (adapted from Pustejovsky, 1995: 80).

(34)
$$\begin{bmatrix} \textbf{BREAK} \\ \text{EVENTSTR}= \begin{bmatrix} \text{E1= x:process} \\ \text{E2= y:state} \\ \text{RESTR= <} \\ \text{HEAD= } \phi \end{bmatrix} \\ \text{QUALIA}= \begin{bmatrix} \text{FORMAL=}\textbf{broken}\ (\textbf{e2, y}) \\ \text{AGENTIVE=}\textbf{break-act}\ (\textbf{e1, x, y}) \\ \textbf{...} \end{bmatrix} \end{bmatrix}$$

The causative reading of 'break' is derived from the AGENTIVE role, which makes reference to the *process* event (e_1), while the inchoative reading is derived from the FORMAL role, which defines the state event (e_2).

As regards the Arabic data discussed in the previous chapter, the same line of analysis can be applied. The causative-inchoative verbs of Form I in MSA and of Form I and Form II in JA are treated as lexically underspecified; thus, they will have the same lexical structure given for *break* above. Take for example the verb *ghalā* 'to boil' in both MSA and JA.

(35)
$$\begin{bmatrix} \textbf{GHALĀ} \\ \text{EVENTSTR}= \begin{bmatrix} \text{E}_1 = \mathbf{e_1}\text{: PROCESS} \\ \text{E}_2 = \mathbf{e_2}\text{: STATE} \\ \text{RESTR= <} \\ \text{HEAD= } \phi \end{bmatrix} \\ \text{QUALIA}= \begin{bmatrix} \text{FORMAL=}\textbf{boiled}\ (\mathbf{e_2, y}) \\ \text{AGENTIVE=}\textbf{boil-act}\ (\mathbf{e_1, x, y}) \\ \textbf{...} \end{bmatrix} \end{bmatrix}$$

As shown in (35), the FORMAL quale defines the inchoative reading of 'boil' as it makes reference to the *state* event, whereas the causative reading is derived from the AGENTIVE quale, which makes reference to the *process* event.

5.6 Conclusion

In this chapter, we have presented a formal analysis of cases of systematic polysemy in Arabic within Pustejovsky's Generative Lexicon. What we have observed can be summarised in two key points: First, there are these straightforward cases which follow directly from the GL analysis of similar examples in English (e.g. the content/container nominal alternations and the causative/inchoative verbal alternations); and second, there are these intricate cases which remain to receive a complete GL analysis in both English and Arabic (e.g. count-to-mass and

mass-to-count alternations). Regarding the first point, nominal (the simple alternation type) as well as verbal polysemy pose no challenge to the theory, as they can be easily maintained by the current GL apparatus. As for the second point, however, which largely concerns the polysemy of the *count-to-mass* nouns, namely the *generic collective nouns* in Arabic, and the polysemy of deadjectival nominals, it is still not clear to us how these challenges can be fully addressed. It is true that, as we have argued, Arabic generic collective nouns are best typed as dot objects, this treatment still suffers from a few known limitations; the most important one concerns the 'size' factor, which appears to play a significant role in the animal/meat polysemy. Although this factor can be further enriched within the FORMAL quale in the lexical structure of the noun, there is little doubt that the concept of 'size' is notoriously vague and, thus, seems very difficult to implement, given the current resources available for handling the noun polysemy in the GL. But one must remember again that the idiosyncratic behaviour of some nouns in the animal/meat pattern in Arabic is not linguistically-motivated: the explanation in terms of 'size' undoubtedly depends on pragmatic inferences. This, in effect, disturbs the default rule that we tried to formulate in this chapter; preventing it from applying to the entire animal/meat pattern.

After all, the animal/meat pattern is not the only polysemous pattern under the count-to-mass alternations. The other regular pattern we considered is the object/stuff pattern (e.g. *tuffāha(t)—tuffāh*, 'an apple—apples'). Together, these two regular patterns share the fact that nouns belonging to either of them must be used in the generic collective form to denote a mass interpretation. The difference, however, is that while nouns in the animal/meat pattern are not entirely rule-governed, nouns participating in the object/stuff pattern are fully rule-governed; hence, fully productive in the sense that for every generic collective noun denoting a countable reading, there is always a mass reading denoted by that noun.

Thus, in answer to Questions (2) and (3) at the outset of the chapter, and disregarding the complexity of the notion of 'size' in the animal/meat pattern, the GL's formal treatment for generic collective nouns in Arabic is best achieved via complex typing, where the representational structure of these nouns encodes a distinction between the singular, sound plural, and generic plural forms. As for property nominalizations (e.g. *anāniyya* 'selfishness' and *Humra(t)* 'redness'), where coercion is not an option, complex typing seems to be the right choice that the GL should employ for systematic alternations of this case. Finally, in answer to Question (1), we have shown that what works for the English data, in terms of formal analysis, does not necessarily have to work for the Arabic data in the exact same way. The formalism we

provided for the Arabic count/mass alternations, in relation to polysemy, is an important example here.

Overall, the main objective of this chapter has been to determine the extent to which the GL framework is applicable to the Arabic data on polysemy. We believe much work remains to be done but, at the same time, also believe that the GL is flexible enough to adapt to the issues raised in this chapter.

Chapter 6 Conclusion

This chapter closes the current study with a summary of the main findings and contribution to the descriptive literature on systematic polysemy and to the existing model of the GL theory.

6.1 Research questions and main findings

This thesis was set out to study the linguistic phenomenon of systematic polysemy in Arabic; identify the polysemous patterns extant in the major word categories of nouns, verbs and adjectives; and examine the pervasiveness of this phenomenon in the language. The overall objective was set to answer the following major research questions:

(1) Given the fact that systematic polysemy exists in Arabic, what are the major patterns that reveal this kind of regularity?

(2) In what ways are these patterns identified in Arabic similar to or different from these identified in other languages, especially English?

(3) Regarding (formal) analysis, how could these regularities be analysed within the framework of the Generative Lexicon?

With respect to Question 1, and following the discussion laid out in Chapter 4, we have shown that patterns of systematic polysemy in Arabic are found in nouns, verbs, and adjectives. In nouns, systematic polysemy is identified in the following nominal alternations:

1. Container/content
2. Count/mass:
    a) Animal/meat
    b) Object/stuff
    c) Stuff/portion
3. Plant/food
4. Place/people
5. Figure/ground reversals

At the descriptive level, the *count/mass* nominals (which belong to what we have termed ‘complex alternations’) stand different from the other nominal alternations discussed in this

study, as they involve complexities at both morphosemantic and/or morphosyntactic levels, particularly with reference to the *generic collective form* in Arabic. Firstly, we stressed the significance of the fact that the direction of the alternation itself, i.e. either from *count-to-mass* or from *mass-to-count*, is a major player in the study of (systematic) polysemy. While *mass* nouns (e.g. *tea*) are mostly non-polysemous, in which case the *mass-to-count* alternation is rarely found, *count* nouns are often prone to polysemous interpretations; hence, polysemy is widespread in *count-to-mass* alternations. Secondly, the concept of systematic polysemy per se appears to be governed by non-linguistic factors (e.g. animal's size), insofar as *generic collective* nouns are concerned. This particular finding raises an important observation in respect of the long-standing controversy between the linguistic vs. non-linguistic nature of the phenomenon. While Pustejovsky (1995, 2013) claims a strong distinction between semantic and pragmatic ambiguity, there is little doubt that his statement cannot be entirely maintained, given the analysis provided for the animal/meat alternation in Arabic. This should not be interpreted as that the polysemy present in the animal/meat pattern is not lexically driven, because it is, and we have shown many examples supporting this fact. The point is there is a pragmatic element that prevents the general lexical rule from applying to all target expressions.

Also, polysemy is found in deadjectival nouns (*al-maṣdar aṣ-ṣinā3i*; 'the manufactured deadjectival nouns'), especially property nominalisations such as those explored by Aronoff (1976) and Spencer (2013). As far as we investigated, there are two main groups of deadjectival nouns in Arabic where property nominalisations are found: the –iyya group and the colour group nominals. These two groups include adjective-derived nouns whose meaning is both *coherent* and *predictable*; thus, and in comparison to English, they are regular polysemies in the sense of at least Apresjan (1974).

As for verbs, we mainly focussed on the CAUS/INCHO alternations in Arabic and found that, although most verbs of this type are morphologically distinguished in that they are realised by distinct Forms 'i.e. measures', some verbs of Form I in MSA and of Form I and Form II in JA systematically alternate between the CAUS and the INCHO readings. Examples include verbs such as *falata* 'to release' and *našafa* 'to dry'; cooking verbs such as *ghalā* 'to boil' in both MSA and JA; roll verbs (e.g. daHal 'to roll down') in JA only, and what we called stop-motion verbs of Form II in JA only (e.g. waqqaf 'to stop'). The most important observation here is the fact that the sense regularity involved in the CAUS/INCHO alternations is syntactically realised, where distinct syntactic structures are required for each occurrence of the CAUS/INCHO verb in question.

At the analytic level, the patterns identified in verbs and in nouns, excluding the complex animal/meat pattern, can be easily accounted for in the GL. As we have shown in the previous chapter, instances of the polysemous causative/inchoative verbs in Arabic can be analysed as being lexically underspecified, following Pustejovsky (1995) and Pustejovsky and Busa's (1995) treatment of similar examples in English. On other hand, polysemous nouns are typed as dot objects in the GL. However, the animal/meat nouns as well as property nominalizations poses serious questions for the GL framework, as we highlight in answer to Q3 below.

With respect to Question 2, the similarities and differences, in comparison to English in particular, are already pointed out. To emphasise the differences, the mass-to-count alternation in English (e.g. coffee—coffees) is very restricted in Arabic and hence does not seem to constitute a regular polysemy pattern similar to that of stuff/portion, which is widely present in English. In addition, in the animal/meat alternation, we saw that Arabic behaves differently in the way it conveys the mass reading, as it resorts to the use of the generic collective nouns when the mass sense of an animal is intended, and when it is not lexicalised and hence is not blocked by a well-established lexeme carrying the same mass interpretation. These differences, especially with respect to the animal/meat discussion, have significant bearings on whether the phenomenon of systematic polysemy is grounded in cognition, and thus expected to be found cross-linguistically, or whether it is a socio-cultural phenomenon, i.e. pertaining to a particular language. Although we have made it clear in the comparative discussion of English and Arabic that the phenomenon cannot be entirely linguistic in nature due to these differences we found, there is no denying that the regularity identified in the other nominal and verbal patterns is lexically motivated, and therefore cannot be rightly claimed that it exists due to socio-cultural factors leading to this phenomenon.

Finally, in answer to Question 3, we have shown how it is possible for the GL to handle the various nominal and verbal alternations; hence, its applicability in accounting for most of the Arabic data examined in Chapter 4. However, some remarks are worth mentioning in the contexts of count-to-mass alternations and property nominalizations. These include the following: How can the factor of 'size of animal' be incorporated in the theory, if at all? If not, then how could the theory formally distinguish between lexemes referring to animals that are relatively big in size and animals that are small, which, consequently, could affect the way these lexemes are encoded? Of course, the 'rule' of using the generic collective nouns cannot be overlooked in relation to size. This also casts further complications on how all these generic nouns could be handled in the Lexicon. As we have demonstrated, the most effective method is

to type generic collective nouns as dot objects. The mechanism of *coercion* is, however, problematic for the reasons explained earlier in Chapter 5. Finally, as regards property nominalizations, how could the theory account for abstract nominals in the absence of rich lexical information in their qualia structure, and how could that work in composition?

6.2 Future research

This study raises several opportunities for future research that can advance knowledge in this area and can potentially have important contributions to the present GL model.

Firstly, the classes of generic collective nouns and property nominalizations that we have studied extensively in this work draw attention to a bigger picture that is perhaps lacking in the GL discussion: derivational morphology and (logical) polysemy. This is an important field of enquiry, which is at the interface of morphology and lexical semantics. Although we are aware that some attempts are made to account for this situation, most notably in Lieber (2004) and Melloni (2007), much work remains to be done in the context of Generative Lexicon Theory. Arabic, we believe, provides a rich domain for investigation.

A second line of research, which follows from Chapters 2 and 4, concerns the study of metonymy. We have discussed metonymy, namely *'referential polysemy'*, in passing in a few places that mainly target the English language. Metonymy is, indeed, a huge topic under which there exist several subtypes. Although Chapter 4 provided many examples of the Arabic nominal alternations that are metonymically triggered, still, however, we have not discussed metonymy in depth nor have we provided a comprehensive account of it in Arabic in relation to the phenomenon of systematic polysemy. This topic deserves independent research work. Another interrelated topic following from Chapter 4 is to investigate whether or not systematic polysemy patterns could be found in the mass-to-count nouns not only in other varieties of Arabic, but also in other world languages. This would have important consequences for the claim we made regarding the *direction* of the count/mass alternation in either reducing or increasing nominal polysemy.

In addition, the lexical category of prepositions in Arabic has not been investigated in the light of this phenomenon, and hence future research should attempt to address it.

In conclusion, it is hoped that this research provides a foundation for future investigations and developments that centres on the Arabic language and its varieties.

References

Alharbi, M. M. (2014). *The second language acquisition of the morphosynchratic realisation of causative and inchoative events in English and Arabic*. Ph.D. Thesis. University of Essex.

Almaany Team. (2015). *Almaany.com*. Retrieved September 30, 2015, from http://www.almaany.com.

Antunes, S., & Chaves, R. P. (2003). On the licensing conditions of co-predication. In Bouillon, P. & Kanzaki, K. (eds.), *Proceedings of the 2nd International Workshop on Generative Approaches to the Lexicon*, pp. 161–168. Geneva: University of Geneva.

Apresjan, J. (1974). Regular Polysemy. *Linguistics*, *12 (142)*, 5-32.

———. (1992). *Lexical semantics: User's guide to contemporary Russian vocabulary*. Ann Arbor, MI: Karoma.

Aronoff, Mark. (1976). *Word formation in generative grammar*. Cambridge, MA: The MIT Press.

Asher, N., & Pustejovsky, J. (2013). A Type Composition Logic for Generative Lexicon. In Pustejovsky, J. *et al*. (eds.), *Advances in generative lexicon theory*, pp. 39-66. Dordrecht: Springer Science + Business Media.

Asher, N., Van de Cruys, T., & Abrusán, M. (2016). Lexical semantics today. In Allan, K. (ed.), *The Routledge handbook of linguistics*, pp. 169-186. London: Routledge.

Asher, N. (2011). *Lexical meaning in context. A web of words*. Cambridge: Cambridge University Press.

Atkins, B. T. S., & Rundell, M. (2008). *The Oxford Guide to Practical Lexicography*. Oxford: Oxford University Press.

Barcelona, A., Benczes, R., & Ruiz, M. I. F. J. (2011). *Defining metonymy in cognitive linguistics: Towards a consensus view*. Amsterdam: John Benjamins Publishing.

Barque, L. & Chaumartin, F. R. (2006). *Regular polysemy in WordNet*. Retrieved September 01, 2015, from https://www.proxem.com/Download/Research/BarqueChaumartin_GSCL_2008.pdf.

Bauer, L. (1983). *English word-formation*. Cambridge: Cambridge University Press.

Beretta, A., Fiorentino, A., & Poeppel, D. (2005). The effects of homonymy and polysemy on lexical access: An MEG study. *Cognitive Brain Research*, *24 (1)*, 57-65. Blank, A. (1999). *Polysemy in the lexicon*. Retrieved August 26, 2016, from http://gerlin.phil-fak.uni-koeln.de/kvh/pub/pub00/meaning/ap106_03.pdf.

Blutner, R. (2002). Lexical semantics and pragmatics. *Linguistische Berichte*, *10*, 27-58.

Brdar, M., & Brdar-Szabo, R. (2013). Translating (by means of) metonymy. In Rojo, A., & Ibarretxe-Antunano, I. (eds.), *Cognitive linguistics and translation: Advances in some theoretical models and applications*, pp. 199-226. Berlin: De Gruyter.

Buitelaar, P. (1998). *CoreLex: Systematic polysemy and underspecification*. Ph.D. Thesis. Brandeis University.

Carston, R. (2001). Relevance theory and the saying/implicating distinction. *UCL Working Papers in Linguistics, 13*, 1–35.

———. (2002). *Thoughts and utterances: The pragmatics of explicit communication*. Oxford: Blackwell.

———. (2010). Lexical pragmatics, ad hoc concepts and metaphor: from a relevance theory perspective. *Italian Journal of Linguistics, 22(1)*, 153-180.

———. (2012). Word meaning and concept expressed. *The Linguistic Review, 29(4)*, 607-623.

Caudal, P. (1998). Using complex lexical types to model the polysemy of collective nouns within the Generative Lexicon. In *Proceedings of the Ninth International Workshop on Database and Expert Systems Applications*, pp.154-159. Austria: Vienna.

Chierchia, G. (1998a). Plurality of Mass Nouns and the Notion of Semantic Parameter. in Rothstein, S. (ed.), *Events and grammar*, pp. 53-103. Dordrecht: Kluwer.

———. (1998b). Reference to Kinds across Languages. *Natural Language Semantics, 6*, 339-405.

Clark, B. (2013). *Relevance theory*. Cambridge: Cambridge University Press.

Clark, E. V. and Clark, H. H. (1979). When nouns surface as verbs. *Language, 55 (4)*, 767-811.

Comrie, B. (1989). *Language universals and linguistic typology*. 2nd ed. Oxford: Blackwell.

Copestake, A. (2013). The semi-generative lexicon: Limits on productivity. In Pustejovsky, J. *et al.* (eds.), *Advances in generative lexicon theory*, pp. 455-473. Dordrecht: Springer Science + Business Media.

Copestake, A. & Briscoe, T. (1995). Semi-productive Polysemy and Sense Extension. *Journal of Semantics, 12(1)*, 15-67.

Cruse, D. A. (1986). *Lexical semantics*. Cambridge: Cambridge University Press.

———. (2000). Aspects of the Micro-structure of Word Meanings. In Ravin, Y. and Leacock, C. (eds.), Polysemy*: Theoretical and computational approaches*, pp. 30-51. Oxford: Oxford University Press.

———. (2000). *Meaning in language: An introduction to semantics and pragmatics*. Oxford: Oxford University Press.

———. (2001). The lexicon. In Aronoff, M., & Rees-Miller, J. (ed.), *The handbook of linguistics*, pp. 238-264. Malden, Mass: Blackwell Publishers.

———. (2006). *A glossary of semantics and pragmatics*. Edinburgh: Edinburgh University Press.

Deane, P. D. (1988). Polysemy and congnition. *Lingua, 75(4),* 325-361.

Dölling, J. (to appear). Systematic polysemy. In Matthewson, L., Meier, C., Rullmann, H. & Zimmermann, T. E. (eds.), *The Blackwell companion to semantics*. Malden: Blackwell.

Dooly, M. (2006). *Semantics and pragmatics of English: Teaching English as a foreign language*. Bellaterra: Universitat Autònoma de Barcelona, Servei de Publicacions.

Evans, V. (2004a). *The structure of time: Language, meaning, and temporal cognition*. Amsterdam: John Benjamins.

———. (2005). The meaning of time: polysemy, the lexicon and conceptual structure. *Journal of Linguistics, 41*, 33-75.

———. (2006). Lexical concepts, cognitive models and meaning-construction. *Cognitive Linguistics, 17(4),* 491–534.

———. (2009). *How words mean: Lexical concepts, cognitive models, and meaning construction*. Oxford: Oxford University Press.

———. (2010). Cognitive linguistics. In Cummings, L. (ed.), *The Routledge pragmatics encyclopedia*, pp. 46-49. New York: Routledge.

———. (2010). Word Meaning. In Hogan, P. (ed.), *Cambridge encyclopedia of the language sciences*, pp. 917-919. Cambridge, MA: Cambridge University Press.

———. (2015). A unified account of polysemy within LCCM Theory. *Lingua, 157*, 100-123.

———. (2015). *Conceptual vs. inter-lexical polysemy: An LCCM theory approach*. Retrieved September 01, 2015, from http://www.vyvevans.net/Russian.pdf.

Evans, V., & Green, M. (2006). *Cognitive linguistics: An introduction*. Edinburgh: Edinburgh University.

Falkum, I. L. (2007). Generativity, relevance and the problem of polysemy. *UCL Working Papers in Linguistics, 19*, 205-234.

———. (2011). The semantics and pragmatics of polysemy: A relevance-theoretic account. Ph.D. Thesis. London: University College London.

Fellbaum, C. (2000). Autotroponymy. In Ravin, Y. and Leacock, C. (eds.), *Polysemy: Theoretical and computational approaches*, pp. 52-67. Oxford: Oxford University Press.

Ferguson, C. A. (1989). Grammatical agreement in Classical Arabic and the modern dialects: A response to Versteegh's pidginization hypothesis. *Al-'Arabiyya, 22* (1/2), 5-17.

Fodor, J.A. & Lepore, E. (1998). The emptiness of the lexicon: reflections on James Pustejovsky's 'The generative lexicon'. *Linguistic Inquiry, 29*, 269-288.

Gévaudan, P. (1997). La polysémie verticale: Hypothèses, analyses et interprétations. *PhiN. Philologie im Netz2/1997*, 1-22.

Holes, C. (1990). *Gulf Arabic*. London: Routledge.

Ježek, E. (2008). *Polysemy of Italian event nominals*. Retrieved August 25, 2016, from http://host.uniroma3.it/laboratori/triple/Pubblicazioni_Publications_files/Jezek_Polysemy_event_nominals.pdf

Ježek, E., & Melloni, C. (2011). Nominals, polysemy, and co-predication. *Journal of Cognitive Science, 22*, 1–31.

Killean, C. G. (1967). *On two types of nominalization in Arabic*. *An-Nashr*a,*1(2)*, 2-6.

Klein, D. E., & Murphy, G. L. (2002). Paper has been my ruin: Conceptual relations of polysemous senses. *Journal of Memory and Language, 47(4)*, 548-570.

Klepousniotou, E. (2002). The processing of lexical ambiguity: Homonymy and polysemy in the mental lexicon. *Brain and Language, 81(1-3)*, 205-223.

Klepousniotou, E., Pike, G. B., Steinhauer, K., & Gracco, V. (2012). Not all ambiguous words are created equal: An EEG investigation of homonymy and polysemy. *Brain and Language, 123(1)*, 11-21.

Lakoff, G. (1987). *Women, fire, and dangerous things: What categories reveal about the mind*. Chicago: University of Chicago Press.

Langacker, R. W. (1987). *Foundations of cognitive grammar, Vol. 1*. Stanford, CA: Stanford University Press.

———. (2000). *Grammar and conceptualization*. Berlin, New York: Mouton de Gruyter.

Lapata, M. (2001). *The acquisition and modeling of lexical knowledge: A corpus-based investigation of systematic polysemy*. Ph.D. Thesis. Edinburgh: University of Edinburgh.

Lascarides, A. (n.d.). *Semantics and pragmatics of NLP lexical semantics: polysemy*. Retrieved June 26, 2015, from http://www.inf.ed.ac.uk/teaching/courses/spnlp/lectureslides/09.slides.pdf.

Levin, B. (1993). *English verb classes and alternations: A preliminary investigation*. Chicago, IL: University of Chicago Press.

Levin, B., & Rappaport Hovav, M. (1995). *Unaccusativity: At the syntax-lexical semantics interface*. Cambridge, Mass: MIT Press.

Lieber, R. (2004). *Morphology and lexical semantics*. Cambridge: Cambridge University Press.

Lyons, J. (1977). *Semantics, Vol. 1*. Cambridge: Cambridge University Press.

Massam, D. (2012). *Count and mass across languages*. Oxford: Oxford University Press.

Melloni, C. (2006). Logical polysemy in word formation: E and R suffixes. *Lingue e Linguaggio, 5(2)*, 281− 308.

———. (2007). *Polysemy in word formation: The case of deverbal nominals*. Ph.D. Thesis. Italy: Verona University.

Murphy, M. L. (2010). *Lexical meaning*. Cambridge: Cambridge University Press.

Murphy, M. L., & Koskela, A. (2010). *Key terms in semantics*. London: Continuum.

Nightingale, S. (1999). *Polysemy and homonymy in Japanese verbal alternations*. Ph.D. Thesis. Edinburgh: University of Edinburgh.

Nunberg, G. (1996). Transfers of meaning. In Pustejovsky, J., & Boguraev, B. (eds.), *Lexical semantics: The problem of polysemy*, pp. 109-132. Oxford: Clarendon Press.

Ostler, N., & Atkins, B. T. S. (1992). In Pustejovsky, J. & Bergler, S. (eds.), *Lexical semantics and knowledge representation: First SIGLEX Workshop, Berkeley, CA, USA, June 17, 1991: Proceedings*, pp. 87-100. Berlin: Springer-Verlag.

Parkinson, D. B. (2015). *Arabic corpus tool*. Retrieved September 30, 2015, from http://arabicorpus.byu.edu.

Pelletier, F. J. (2012). Lexical nouns are both + mass and + count, but they are neither + mass nor + count. In Massam, D. (ed.), *Count and mass across languages*, pp. 9-26. Oxford: Oxford University Press.

Pethö, G. (2001b): What is polysemy? – A survey of current research and results. In Németh, E. T., & Bibok, K. (eds.), *Pragmatics and flexibility of word meaning*, pp. 175-224. Amsterdam: Elsevier.

Piñón, C. (2001). A finer look at the causative-inchoative alternation. In Hastings, R. *et al*. (eds.), *Proceedings of semantics and linguistic theory 11*, pp. 346-64. Ithaca, NY: CLC Publications.

Pustejovsky, J. (1991). The generative lexicon. *Computational Linguistics, 17(4)*, 409-441.

———. (1991). The syntax of event structure. *Cognition, 41*, 47-81.

———. (1995). *The generative lexicon*. Cambridge, Mass: MIT Press.

———. (1998a). Generativity and explanation in semantics: A reply to Fodor and Lepore. *Linguistic Inquiry, 29*, 289-311.

———. (1998b). The semantics of lexical underspecification. *Folia Linguistica, 32 (3-4)*, 323-347.

———. (2001). Type construction and the logic of concepts. In Bouillon, P., & Busa, F. (eds.), *The language of word meaning*, pp. 91-123. Cambridge: Cambridge University Press.

———. (2005). *A survey of dot objects*. Manuscript.

Pustejovsky, J., & Anick, P. (1988). On the semantic interpretation of nominals. In *Proceedings of COLING-1988*, pp. 518-523. Budapest.

Pustejovsky, J., Bouillon, P., Isahara, H., Kanzaki, K., & Lee, C. (2013). *Advances in generative lexicon theory*. Dordrecht: Springer Science + Business Media.

Pustejovsky, J., & Busa, F. (1995). Unaccusativity and event composition. In Bertinetto, P. M. *et al*. (eds.), *Temporal reference aspect and actionality, Vol. 1: Semantic and syntactic perspectives*, pp. 159-193. Torino: Rosenberg & Sellier.

Ravin, Y., & Leacock, C. (2000). *Polysemy: Theoretical and computational approaches*. Oxford: Oxford University Press.

Roy, I. (2010). Deadjectival nominalizations and the structure of the adjective. In Alexiadou, A., & Rathert, M. (eds.), *The syntax of nominalizations across languages and frameworks*, pp. 129–158. Berlin: Walter de Gruyter.

Ryding, K. C. (2005). *A reference grammar of Modern Standard Arabic*. Cambridge: Cambridge University Press.

Sadler, L. & Spencer, A. (2001). Morphology and argument structure. In Spencer, A., & Zwicky, A. M. (ed.), *The handbook of morphology*, pp. 206-236. Oxford: Blackwell.

Schulz, E. (2004). *A student grammar of Modern Standard Arabic*. Cambridge: Cambridge University Press.

Sībawahy (1988). Al-Kitāb: Kitāb-u Sībawayh, Vol. 1. 3rd ed. Al-Khāngi Bookshop: Cairo, Egypt.

Spencer, A. (2013). *Lexical relatedness: A paradigm-based model*. Oxford: Oxford University Press.

Sperber, D., & Wilson, D. (1995 [1986]). *Relevance: Communication and cognition*. 2nd ed. Oxford, Cambridge: Blackwell Publishers.

———. (1997). The mapping between the mental and the public lexicon. *UCL Working Papers in Linguistics, 9*, 107–125.

Srinivasan, M., & Rabagliati, H. (2015). How concepts and conventions structure the lexicon: Cross-linguistic evidence from polysemy. *Lingua, 157*, 124-152.

Stallard, D. (1993). Two kinds of metonymy. In *Proceedings of the 31st annual meeting of the association for computational linguistics*, pp. 87-94. Columbus, Ohio: Association for Computational Linguistics.

Thackston, W.M.I. (1994). A*n introduction to Koranic and Classical Arabic: An elementary grammar of the language*. Bethesda, Maryland: IBEX Publishers.

Thalji, A. M. I. (1982). *Structure and function in Arabic*. Ph.D. Thesis. Edinburgh: University of Edinburgh.

Tyler, A., & Evans, V. (2001b). Reconsidering prepositional polysemy networks: The case of over. *Language, 77(4)*, 724–765.

———. (2003). *The semantics of English prepositions: Spatial scenes, embodied meaning, and cognition*. Cambridge: Cambridge University Press.

Vendler, Z. (1967). *Linguistics in Philosophy*. Ithaca: Cornell University Press.

Wałaszewska, E. (2008). Polysemy in relevance theory. In Mioduszewska, E., & Piskorska, A. (eds.), *Relevance Round Table I*, pp. 123-134. Warszawa: Warsaw University Press.

Wechsler, S. (2015). *Word meaning and syntax: Approaches to the interface*. Oxford: Oxford University Press.

Wehr, H., & Cowan, J. M. (1976). *A dictionary of Modern Written Arabic: (Arabic-English)*. 3rd ed. U.S.: Spoken Language Services, Inc.

Weinreich, U. (1964). Webster's Third: A critique of its semantics. *International Journal of American Linguistics, 30(4)*, 405-409.

Wierzbicka, A. (1985). Oats and wheat: The fallacy of arbitrariness. In Haiman, J. (ed.), *Iconicity in syntax: Proceedings of a symposium on iconicity in syntax, Stanford, June 24-6, 1983*, pp. 311-342. Amsterdam: J. Benjamins.

———. (1988). *The semantics of grammar*. Amsterdam: John Benjamins Publishing Company.

Wilson, D. (2004). Relevance and lexical pragmatics. *UCL Working Papers in Linguistics, 16*, 343-360.

Wilson, D., & Carston, R. (2007). A unitary approach to lexical pragmatics: relevance, inference and ad hoc concepts. In Burton-Roberts, N. (ed.), *Pragmatics*, pp. 230-259. Hampshire: Palgrave Macmillan.

Wilson, D., & Sperber, D. (2012). *Meaning and relevance*. Cambridge: Cambridge University Press.

Xue, T., & Luo, Z. (2012). Dot-types and their implementation. In Béchet, D., & Dikovsky, A. (eds.), *Logical aspects of computational linguistics: 7th International Conference, LACL 2012, Nantes, France, July 2-4, 2012. Proceedings*, pp. 234-249. Berlin: Springer.

Arabic References

Al-Farāhīdi, Al-khalīl ibn Ahmad. (2003). *Kitāb al-'Ayn*. Beirut, Lebanon: Dar al-Kotob al-ilmiyya.

Al-Mubarrad, Abu'l 'Abbas. (1350 H [1931]). *Ma ittafaqa lafzuhu wa ixtalafa ma3nāhu min al-Qur'an al-majeed*. Cairo, Egypt: al-Matba'a as-Salafiyya.

Anīs, I. (1984). *Dalālat-u l-?lfāẓ* [semantics]. 5th ed. Cairo, Egypt: The Anglo Egyptian Bookshop.

Ibn Durustuwayh. (2004). *taṣHīH al-faṣīH wa sharHu-hu*. Cairo, Egypt: Al-majlis al-a3lā li-lshu'u:n al-islāmiyyah, wizārat al-awqāf.

Ibn Fāris. (1997). *Aṣ-ṢāHibi: fī fiqh al-lugha al-3arabiyya wa masā'ilihā wa sunani al-3arabi fī kalāmiha*. Beirut, Lebanon: Dar Al-Kotob Al-ilmiyah.

Ibn Jinnī, Abu l-Fath. (2006). *Al-Khasā'is*. Beirut, Lebanon: 'Alam al-Kutub.

Ibn Manzur. (2000). *Lisān al-Arab*. 3rd ed. Beirut, Lebanon: Dar Ṣaader.

Omar, A. M. (1998). *3ilm-u ad-dalālat-i*. 5th ed. Cairo, Egypt: 3ālam-u-l-kutubi.

———. (2008). *Mu3jam al-lugha al-3arabiyya al-mu3āṣira*. Cairo, Egypt: Alam al-kutub.

The Academy of the Arabic Language in Cairo. (2004). *Al-Mu3jam al-Waseet*. 4th ed. Cairo, Egypt: Maktabat al-Shuruq al-Duwaliyya.

Zafinkī, Ṣāfīyah. (2010). *Al-Manāhij al-muṣṭalaḥīyah, mushkilātuhā al-taṭbīqīyah wa-nahj mu'ālajatihā*. Dimashq: Wizārat al-Thaqāfah.