The Acquisition of Morphosyntactic Properties of English

Compounding and Transitivity Alternations

by L1 Speakers of Libyan Arabic

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Abstract

Three central topics that have been at the heart of research into second language (L2) acquisition over the past 30 years are the extent to which properties of a speaker's first language (L1) transfer into their L2 mental grammars, the extent to which L2 learners' mental grammars are constrained by an innate language faculty (Universal Grammar (UG)), and the nature of the development of grammatical knowledge. Much of the evidence bearing on these topics has come from the investigation of the acquisition of syntactic properties. There have been comparatively fewer studies of these topics in other domains of the grammar. This thesis investigates the role of L1 transfer and UG in the acquisition of two pre-syntactic properties in English by L1 speakers of Libyan Arabic: noun compounding (a lexical operation) and argument structure realization (a property at the semantics-syntax interface). The participants were selected at different stages of learning English in the classroom to provide a measure of possible development. Using elicited production and a grammaticality judgement task, results suggest some possible evidence of L1 influence on plural marking in noun compounds and knowledge of the morphological marking of constructions realizing argument structure. But in the latter case L1 influence appears to lead to a general problem with the realization of intransitive verbs, rather than direct transfer of L1 properties into the L2. There is also some evidence of the influence of UG on the representation of unaccusative versus unergative verbs, but no evidence of UG influence in other areas investigated (constraints on number marking in noun compounds and on the the linking of thematic arguments to syntactic positions). Little development was observed across the two groups investigated. Broadly, the results are consistent with

an L1 transfer/access to UG view of the L2 acquisition of pre-syntactic properties, without providing strong support for this position.

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KEY TO TRANSCRIPTIONS

Consonants

Arabic Letter	Symbol	Phonological Transcriptions
ء	ʾ	glottal stop
ب	b	voiced bilabial stop
ت	t	voiced alveolar fricative
ث	Ɵ	voiceless interdental fricative. It is uncommon in Libyan Arabic.
ج	j	voiced palatal affricate
ح	ħ	voiceless pharyngeal fricative
خ	x	voiceless uvular fricative
د	d	voiced alveolar stop
ذ	ð	voiced dental fricative. It is uncommon in Libyan Arabic.
ر	r	voiced alveolar flap
ز	z	voiced alveolar fricative
س	s	voiceless alveolar fricative
ش	ʃ	voiceless palato-alveolar fricative
ص	ṣ	emphatic s
ض	ḍ	voiced velarized alveolar stop
ط	ṭ	emphatic t
ظ	ḍ	voiced velarized dental fricative
ع	ʕ	voiced pharyngeal fricative
غ	ġ	voiced uvular fricative

ف	**f**	voiceless labiodental fricative
ق	**q**	voiceless uvular plosive
ق	**g**	voiced velar plosive
ك	**k**	voiceless velar stop
ل	**l**	voiced alveolar lateral
م	**m**	voiced bilabial nasal
ن	**n**	voiced alveolar nasal
ه	**h**	voiceless glottal fricative
و	**w**	voiced bilabial semi vowel
ي	**y**	voiced palatal glide

Vowels

Vowels	**Short**	**Long**
Central Open	**a**	**a:**
Front Closed	**i**	**i:**
Back Closed Rounded	**u**	**u:**

Diphthongs

aw

ay

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CHAPTER 1

INTRODUCTION

Three of the topics that have been central to linguistically-oriented research in second language acquisition (SLA) over the past 30 years are (a) the extent to which a speaker's first language (L1) (or other acquired languages) influence(s) the development of knowledge of the target language; (b) the extent to which second language (L2) learners draw on knowledge of language that does not appear to be derived either from the L1 or the L2 (and that may derive from innate linguistic knowledge: Universal Grammar (UG)); (c) the form that development takes from first experience with the target language through transitional states of knowledge to a steady state L2 grammar.

A recent example of (a) is provided in a study by Ionin, Zubizarreta and Bautista Maldonado (2008) of the acquisition of the English articles *the/a* by speakers of an L1 that lacks articles (Russian) and speakers of a language that has articles (Spanish). In a forced-choice elicitation task where participants had to fill gaps in short stories, around a quarter of the Russian speakers' responses allowed *the* to occur in contexts where only indefinite *a* was possible for native speaker control participants, while the Spanish speakers allowed *the* in fewer than 2% of these contexts (2008: 564-565). Given that participants in the study were matched for general proficiency in English, the discrepancy in the use of English articles by the Russian and Spanish speakers appears to be a direct result of the influence of their L1s.

The same study also offers an example of L2 learners drawing on linguistic knowledge not available either in the L1 or the L2. Although the Russian speakers were overusing *the* in indefinite contexts, they were not doing so randomly. Overuse occurred primarily in indefinite contexts with specific reference (cases like *He wants to meet an actor*, where 'actor' has a specific reference, e.g. Brad Pitt – 24% of responses were of *the* in such contexts). Overuse of *the* was only 2% in indefinite non-specific contexts (cases where 'actor' has non-specific reference: *He wants to meet an actor (but it doesn't matter which one*)). This suggests that the Russian learners of English are drawing a distinction between specific and non-specific as possible interpretations of English articles, a property that is not encoded by *the/a*, and is not available in Russian, which lacks articles. Ionin et al. argue that the contrast comes from UG: [definite] and [specific] are two semantic features in a universal inventory from which languages draw in constructing lexical items. The Russian learners are drawing on this contrast in developing their L2 English grammars, even though it is a contrast that is not relevant for articles in the target grammar.

The third topic, the nature of development, is concerned with why L2 learners show the patterns of change in knowledge over time that they do, and not other possible patterns. For example, it is generally observed that L2 learners of German acquire the 'verb separation' property of main clauses (where non-finite parts of a verbal complex appear at the end of the clause: *Johann hat ein Buch gekauft* (lit. Johann has a book bought, 'Johann bought a book')) before they acquire the 'verb second' property (where the finite verb appears in second position in the clause: *Heute hat Johann ein Buch gekauft* (lit. Today has Johann a book bought, 'Today

Johann bought a book')) (DuPlessis, Solin, Travis & White, 1987; Ellis, 1989). But why this order, rather than verb-second first followed by verb separation?

It is important to recognise that L1 influence, access to innate knowledge and patterns of development may impact L2 knowledge differently depending on the linguistic level being investigated (phonetics/phonology, syntax, morphology, lexicon, semantics). In principle, L1 influence may have less effect on semantics than on syntax (or vice versa), access to properties of UG may be more visible in the lexicon than in morphology (or vice versa), and so on.

The present thesis focuses on the effects of L1 influence, possible access to innate knowledge and patterns of development in the lexicon and at the semantics-syntax interface. A study is reported of the acquisition of English synthetic and root compound nouns (e.g. *dishwasher* (synthetic), *book repository* (root)) and argument structure realisation (e.g. *The window broke/John broke the window,* but not *The rabbit disappeared/*The magician disappeared the rabbit*, or *The electrician cut the wire/*The wire cut*) by L1 speakers of Libyan Arabic. Noun compounding is a process that occurs in the lexicon, while the realisation of argument structure involves both semantics and morpho-syntax. The interest of this comparison is in whether differences will emerge in the way that nominal and verbal properties are acquired by the same group of L2 learners. The aim of the study is to contribute to the general understanding of how L1 properties and possible innate knowledge contribute to the construction of L2 grammars.

The thesis is organised as follows. Chapter 2 sets the scene by outlining the claims of different theories of SLA in relation to L1 influence, access to UG and the

drivers of development. Chapter 3 describes the properties of noun compounding in English and Arabic, and reviews a number of studies of the L1 and L2 acquisition of compound nouns. Chapter 4 reports the findings of a study of the acquisition of English compound nouns by L1 speakers of Libyan Arabic. Chapter 5 switches to the acquisition of argument structure realisation, describes differences between English and Arabic in argument realisation, and outlines the findings of a number of studies of the L2 acquisition of argument realisation. Chapter 6 reports a study of the acquisition of argument structure realisation in English by L1 speakers of Libyan Arabic. Chapter 7 compares the findings in chapters 4 and 6 and draws implications for our understanding of L1 effects and possible effects of innate linguistic knowledge on the developing grammars of L2 learners.

CHAPTER 2
THEORETICAL PERSPECTIVES ON L1 INFLUENCE, ACCESS TO UG AND L2 DEVELOPMENT

Words are often complex entities that result from derivational or inflectional morphological operations. Derivational operations often create new, but related, words from a given base. For example, from *read* the related words *reader, readership, readable*, etc are derived. Inflectional operations, on the other hand, modify the base form of a given word. Such operations are required "...primarily to satisfy a formal requirement of the syntactic machinery of the language" (Haspelmath, 2002: 15). Typical inflections express grammatical features such as number (singular/plural) and tense (present/past**)**. For example, count nouns are pluralized by adding *-s* as in *rat, rats*; and the past tense is formed by adding the suffix spelled *–ed work, worked*. However, if we consider irregular forms such as *mouse* and *go,* it is easy to realise that this is not always the case as the plural of *mouse* is *mice*, not *mouses*, and the past tense of *go* is *went* and not *goed.* As the examples show, regular forms differ from irregulars in that while regulars are productive, predictable and can be analysed into stems/roots and affixes, irregular forms are "idiosyncratic and opaque in form" (Clahsen, Lueck & Hahne, 2007: 3). A number of studies have argued that regular and irregular forms are stored differently in memory by mature native speakers, and are acquired differently by L1 and L2 learners (for more details, see chapters 3 & 4).

Several studies have shown that L2 learners have problems with morphological properties at initial stages (Adjémian, 1983; Larsen-Freeman & Long, 1991) and even in end-state grammar (Lardiere, 1998a; 1998b). For example,

inflectional morphemes that are associated with functional categories (e.g., AgrP, TP) are not only omitted but also overgeneralized (Oshita, 2000; Toth, 2000) or spelled out erroneously (Lardiere & Schwartz, 1997). The examples in (1) show three types of omission of inflection by child L1 Russian speakers who are L2 learners of English:

(1) a. Third person -*s*

Girl play with toy (DA, sample 1, 9; 7)

b. Past tense *ed*

One time I watch this movie (AY, sample 2, 10; 4)

[I watched this movie once]

c. *Be* copula

Mary so funny (OL, sample 1, 6; 10)

(Examples from Ionin & Wexler, 2002: 106)

There have been many attempts to account for this phenomenon. Some researchers (e.g., Meisel, 1991; 1997; Eubank, 1993, 1994; Eubank, Bischof, Huffstutler, Leek & West 1997; Beck, 1998) attribute the use of non-finite forms by L2 learners to an impairment (or a deficit) in functional categories and/or features in the grammar itself. Other researchers (such as Epstein, Flynn & Martohardjono, 1996; Haznedar & Schwartz, 1997; Lardiere, 1998a; 1998b; 2000; Prevost & White, 1999; 2000) argue that L2 learners can have access to abstract categories and features of functional categories, even those not present in the L1, but they might have problems in mapping from the abstract features to the corresponding surface morphology. This

view has come to be known as the Missing Surface Inflectional Hypothesis (MSIH). In contrast to Eubank (1993, 1994), Schwartz and Sprouse's (1996: 40-41) Full Transfer/ Full Access hypothesis claims that "the initial state of L2 acquisition is the final state of L1 acquisition". This means that the L1 features are specified from the beginning and that errors result from spelling out these L1-specified features with English affixes with which they are compatible.

In the remainder of this chapter, we outline the claims of different theories of SLA in relation to L1 influence, access to UG and the drivers of development.

2.1 INTERPRETING L2 LEARNERS' ERRORS

Since Corder's (1967) seminal article discussing the "significance" of L2 learners' errors, closely followed by the work of the "morpheme studies" in the 1970s (Dulay, Burt & Krashen, 1982) which argued that L2 learners "creatively construct" mental grammars for the target L2, there has been a debate in generative approaches to SLA about the role that L1 influence and general mental organising principles play in the acquisition of the target language. Although there have been a number of advocates of "no transfer" (of L1 grammatical knowledge) into L2 grammars (Epstein, Flynn & Martohardjono, 1996), or "partial transfer" (of lexical but not functional grammatical properties) (Vainikka & Young-Scholten, 1996; 1998), the weight of evidence has been tipping in favour of the view that properties of the L1 are influential in both lexical and functional domains in L2 acquisition. The real question is the extent to which this is the case, and the extent to which mental organising principles and innate linguistic knowledge might override or be overridden by such

transfer. In the study by Ionin et al. (2008), referred to in chapter 1, of the acquisition of English articles by L2 learners, it is argued that the presence of articles in Spanish overrides the appeal to the semantic universals [definite], [specific] by Spanish speakers when they learn English. This study was conducted with a group of adult learners. A study by Zdorenko and Paradis (2008) of Spanish-speaking child L2 learners of English argues that semantic universals override L1 transfer, suggesting that mental organising principles may have a stronger influence in child L2 acquisition than adult L2 acquisition.

2.2 THE FULL TRANSFER/FULL ACCESS HYPOTHESIS ABOUT L2 LEARNER DEVELOPMENT

The Ionin et al. results are consistent with a "Full Transfer" view of the L1. This is a view that was argued for early on in generative studies of SLA by Schwartz and Sprouse (1994). On the basis of evidence from an L1 speaker of Turkish learning German as an L2, Schwartz and Sprouse argue that the L2 initial state is the grammar of the L1 (minus lexical items).

Turkish is a Subject-Object-Verb (SOV) language, where the finite verb appears rigidly in clause final position in both main and subordinate clauses, as illustrated in (2).

(2) Ahmet bu kitabi Berna'ya **vermis**

Ahmet this book to-Berna give-PAST

'Ahmet gave this book to Berna.'

German is also an SOV language, but finite verbs only appear in clause final position in embedded clauses, as illustrated in (3):

(3) a. Der Mann **liest** heute den Roman

The-nom man read-3SG today the-acc novel

b. Hans sagt, dass der Mann den Roman heute **liest**

Hans say-3SG that the-nom man the-acc novel today read-3SG

'John says the man is reading the novel today.'

Schwartz and Sprouse adopt the claim that in main clauses in German the finite verb raises to the head of a Complementizer Phrase (CP) that heads the clause. A sentence constituent (whether the subject, object or some modifying phrase) obligatorily moves into the specifier position of this CP.

The task facing a Turkish learner of German is to establish that it is a verb-final language (like Turkish), but that in main clauses there is an operation that moves the finite verb to C, and some other sentence constituent into the specifier of CP (unlike Turkish). If the L2 initial state is the grammar of the L1, it is expected that a Turkish learner of German will initially assume that German is an OV language (because Turkish is), and diverge from native speakers on word order in main clauses until that learner has established that the verb and some other constituent move to CP.

The findings from their study are that in the earliest stages of acquisition, four to eight months after exposure to German began, their participant was producing two kinds of word order involving verbs: both SOV_{-fin} order, like L1 Turkish, and

$SV_{+fin}(X)/(X)SV_{+fin}$ order, unlike L1 Turkish. The SOV_{-fin} order, Schwartz and Sprouse (1994: 335) claim, is evidence that the OV pattern of the L1 has been transferred: "this stage provides clear evidence of an SOV system". Typical examples are given in (4).

(4) a. *der Mann seine Frau* ***geküßt***
the man his wife kissed
'The man kissed his wife.'

b. *falsches Wage ein-****gesteige***
wrong car in+climbed
'got into the wrong car'

c. *der ist aus-****steigen***
he is out+climb (ed)
'He got out.'

The $SV_{+fin}(X)$ and $(X)SV_{+fin}$ patterns (illustrated in 5) are examples of their participant's knowledge beginning to develop away from the initial state on the basis of increasing exposure to German. Schwartz and Sprouse's view of this development is that it is a consequence of the learner's failure to parse input on the basis of current grammatical knowledge. A rigid verb-final grammar cannot assign a structural analysis to clauses where the finite verb appears in second position in the clause. Such "parsing failure" drives change in the learner's grammar.

(5) a. *der Chef* ***hat gesag*** *[der Zug fährt ab]*

the boss has said the train goes away

b***.*** *jetzt er* ***hat*** *Gesicht [das is falsches Wagen]*

now he has face that is wrong car

'Now he makes a face (that) that is the wrong car.'

An important aspect of restructuring for Schwartz and Sprouse is that it is constrained by the properties of UG, so that the kinds of hypotheses learners entertain are only those that fall within the hypothesis space defined by UG. This view combines both L1 transfer and access to UG and has been known since that 1994 article as the "Full Transfer/Full Access" hypothesis.

More recent Full Transfer theories are the Prosodic Transfer Hypothesis (Goad & White, 2006) and the Feature Reassembly Hypothesis (Lardiere, 2009). Both hypotheses assume full transfer (and full access to UG) and neither assumes that syntactic knowledge is defective. However, both argue that inconsistency of morphological production is attributable to L1 effects. The Prosodic Transfer Hypothesis proposes that different L1 prosodic structures cause difficulties for learners in realising L2 morphology in speech. The Feature Reassembly Hypothesis claims that problems with realising inflectional properties result from a failure to organise the appropriate features in target L2 morphemes, often because this requires a different distribution from the L1. Both assume that development away from the inappropriate transferred properties is the result of conflict between the current L2

grammar and the input that is encountered. These two hypotheses are discussed in detail hereafter.

A recent account that has settled on functional features as a valid unit for comparing languages is the Feature Reassembly Hypothesis (Lardiere, 2009). Extending Schwartz and Sprouse's (1994, 1996) Full Transfer/Full Access model, Lardiere (2005, 2008, 2009) proposed that successful L2 acquisition is determined by the reconfiguring or reamapping of features of the L2 which already exist in the L1 into new functional categories and lexical items. Consequently, convergence is determined by whether L1 features have the same morpholexical expressions in the L2 and whether learners are able to remap them when features are different. Following this line of argument, Lardiere (2009: 175) argues that learners face some challenges in the process of reassembling of features of the L2. These include:

- With which functional categories are the selected features associated in the syntax, and how might this distribution differ from the feature matrices of functional categories in the L1?
- In which lexical items of the L2 are the selected features expressed, clustered in combination with what other features?
- Are certain forms optional or obligatory, and what constitutes an obligatory context? More specifically, what are the particular factors that condition the realization of a certain form (such as an inflection) and are these phonological, morphosyntactic, semantic or discourse linked?

(Lardiere, 2009: 175)

Recently, there have been some studies whose findings are claimed to be in line with the Feature Reassembly Hypothesis (e.g., Domínguez, Arche & Myles,

2011; Renaud, 2011; Spinner, 2013; Hwang & Lardiere, 2013). For example, Domínguez et al. (2011) tested the predictions of this hypothesis by examining the acquisition of Spanish imperfect morphology by English native speakers. Aspectual morphology is represented differently in these two languages as shown in the following table:

Table 1. Relevant properties of perfective and imperfective aspect

Meaning	**Status**	**Examples**
Perfective	Finished	He was sick all day El **estuvo** enfermo todo el dia
(Imperfect) continuous	Unfinished	He was sick when I saw him El **estaba** enfermo cuando lo vi
(Imperfect) Habitual	Period unfinished. Each instance finished	He used to walk in the park El **caminaba** por el parque
(Imperfect) Progressive	Unfinished	He was walking in the park El **caminaba** por el parque

(Taken and adapted from Table 3 in Domínguez *et al*., 2011)

Table 1 shows that although both English and Spanish have aspectual features, the perfective and imperfective aspects are expressed differently in these languages. Spanish draws a consistent morphological contrast between perfective and imperfective but the suffix *–aba* can be used to express the three different meanings of the imperfect aspect (continuous, habitual, and progressive). In contrast, English uses the same past tense form for both the perfective and imperfective (continuous) but it uses different forms for habitual and progressive meanings. Thus, when acquiring aspectual morphology, English speakers will have to learn that even though features related to the aspectual distinction are available in both languages, Spanish draws a conststent morpholoigical contrast between and finished and unfinished events.

60 L1 English learners of Spanish (20 beginners, 20 intermediate and 20 advanced) took part in a sentence interpretation task. Learners were presented with an introductory English sentence representing a particular viewpoint context. For example, a habitual action (6), along with two Spanish test sentences. They were asked to rate the appropriateness of each sentence using a 5-point Likert scale (-2, -1, 0, +1, +2). The focus was on the three interpretations that are encoded by Spanish imperfect morphology: continuous, habitual and progressive.

As predicted, the results showed that the sentences with the continuous meaning, the only meaning requiring re-assembly, proved to be the most problematic for L2 speakers. Even advanced learners behaved significantly differently from natives in interpreting the continuous reading of the imperfect. Overall, these results are consistent with the claim of the Feature-Reassembly Approach, since it appears that problems with the imperfect are selective: "…success in the acquisition of Spanish aspectual morphology seems to be determined by whether features need to be reconfigured to accommodate the target grammar" (Domínguez et al., 2011: 12).

In another study, Renaud (2011) examined the acquisition of the French verbal paradigm by L1 English speakers focusing on subject-auxiliary agreement and past-participle agreement. She states that the auxiliary *to have* in English differs from the French auxiliary *avoir* "to have" in that in English only the third person singular form *he/she/it has* is realized differently at spell-out whereas all other forms are spelled out as *have* (Renaud, 2011: 132). In French, however, most of the forms of *avoir* have a different realization at spell-out: e.g., *j'ai* "I have," *tu as* "you have," *nous avons* "we have". Therefore, she argues that the feature matrices on T are similar in English and French but feature bundles differ in their assembly, triggering

different morphophonological realizations. As for the past participle, although French and English select similar feature matrices on T for subject-verb agreement, T in English does not include [*u*Gender] because there is no subject [or object]-verb agreement with respect to gender. French, on other hand, has [*u*Gender] in T: there is both subject and object-agreement. With the auxiliary *avoir* "to have", Renaud (2011: 132) argues that "... this agreement is only possible with the direct object when it occurs before the auxiliary—that is, after movement"—as shown in (6) and (7).

(6) La robe verte, Jean l' a offer**te** à Julie.
the dress green-FEM Jean it has offered-FEM to Julie
"The green dress, Jean offered it to Julie."

(7) La robe verte, Julie l' a acheté**e** hier.
the dress green-FEM Julie it has bought-FEM yesterday
"The green dress, Julie bought it yesterday."

Thus, the task of L2 learners in the case of French past participles is to reassemble the abstract features including the ones that are not selected in their L1. Three groups of American learners of French (second-semester (n =25), fourth-semester (n = 12), and advanced learners (n = 11)) took part in an acceptability judgment task.

The results of the acceptability judgement task show that the performance of the lower proficiency learners was different from native speakers of French. This indicates that the two agreement structures have not been acquired by these learners. The advanced learners, however, show native-like acceptance patterns on the two structures (i.e. subject-auxiliary agreement and past-participle agreement), suggesting that the [*u*Gender] feature has been successfully acquired in spite of the fact that it is not selected in their L1. These results led her to conclude that the feature-reassembly

hypothesis appears to provide a fine-grained account for the data in the verbal domain in L2 French.

Turning to another Full Transfer theory, we now consider the effect of L1 phonology on the production of grammatical morphemes. Languages differ as to how they prosodify functional elements and this observation underlies the Prosodic Transfer Hypothesis (Goad, White & Steele, 2003; Goad & White, 2004; Goad & White, 2006) which states that aspects of syntatic knowledge can be acquired but interlanguage performance is constrained by phonological transfer effects of the L1 prosodic system "...hence limiting IL production of inflectional morphology and function words" (Goad & White, 2006: 2). To investigate this, Goad, White and Steele (2003) examined production data from 12 Mandarin-speaking learners of English focusing on verbal agreement and past tense morphology. Oral production data were elicited by a picture description task in which participants had to describe two sets of pictures illustrating sequences of events. The authors predicted that L1 prosodic structure cannot be overcome: learners would either delete the inflection entirely or supply it variably.

The results show that learners either deleted morphophonological material or supplied it variably: suppliance was higher for irregular past (78%) than for regular past (57%). Goad et al.'s analysis of the data was based on Prosodic Phonology and Optimality Theory. A key idea from Prosodic Phonology that they adopt is the Strict Layer Hypothesis (SLH) (Nespor & Vogel, 1986; Selkirk, 1986). This hypothesis ensures that prosodic constituents are dominated by the immediate higher category.

The researchers adopt the following hierarchical structure:

(8) Prosodic constituents:

Phonological Phrase (PPh)

Prosodic word (PWd)

Foot (Ft)

Syllable (σ)

(Adapted from Goad, White & Steele, 2003: 247)

Goad et al. explain that although the SLH was first held to be inviolable, Selkirk (1997) proposes that the SLH should be understood as a set of four violable constraints , and two of those constraints are relevant for Goad et al.'s proposal as shown in 9 below:

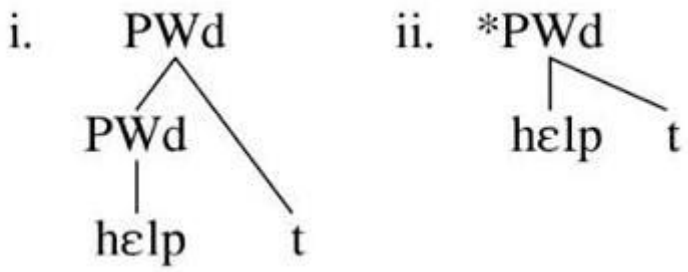
(9)

a. EXHAUSTIVITY (EXHAUST): No C^i immediately dominates a constituent C^j, $j < i-1$ (e.g., no PWd immediately dominates a σ);
b. NONRECURSIVITY (NONREC): No C^i dominates C^j, $j = i$ (e.g., no PWd dominates a PWd).

(Taken from Goad, White & Steele, 2003: 247):

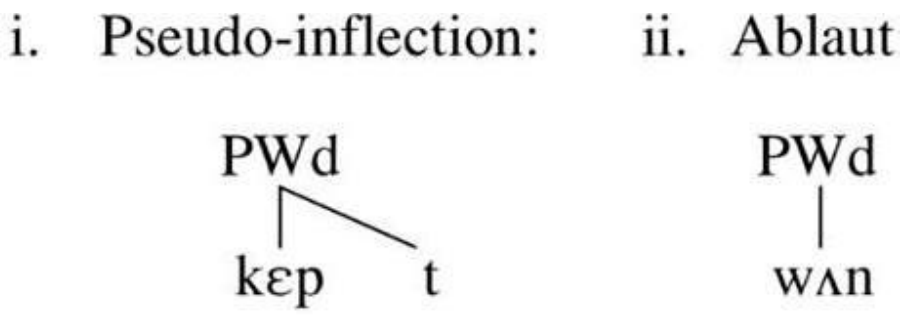
The idea that the SLH can be violated is essential for Goad, White and Steele's (2003) and Goad and White's (2006) hypothesis because they argue that that English inflection is adjoined directly to the PWd, violating both the EXHAUST and NONREC constraints, as shown in (10 a.i) for 'helped'; and "…it is not incorporated into the PWd of the stem to which it attaches" as shown in the illicit (10a.ii)(Goad & White, 2006: 3):

(10a) Regular past inflection



In contrast, irregular inflection is attached PWd-internally whether it is 'pseudo-inflection' as in 'kept' (10b.i) or ablaut as in 'won' (10b.ii):

(10b) Irregular inflection:

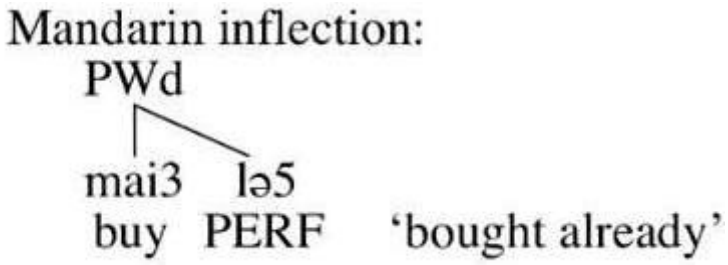


(Taken from Goad & White, 2006: 3)

In conclusion, it is argued that regular inflection (for both past tense and past participles) in English is organized PWd-externally violating two constraints (NONREC and EXHAUST). In contrast to regulars, these constraints are not violated in the case of irregular inflection.

Goad et al., (2003) also argue that functional morphology is prosodified differently in English and Mandarin. They argue that the only inflection that is overtly realized in Mandarin is aspect, and this inflection is not adjoined to the PWd. Instead, it is organized PWd-internally as illustrated below. This is similar to how pseudo-inflected irregulars are organized in English (see 10b.i above).

(11) Mandarin inflection:



(From Duanmu, 2000: 81 cited in Goad & White, 2006: 4)

Thus, L2 learners of English are expected to have difficulties constructing prosodic representations which are disallowed in their L1. Goad et al. also predicted that some L2 learners of English might represent monomorphemic forms such as *weld* and *yelled* in the same fashion: without PWd adjunction, these forms would have the same phonological representation so that the inflection is incorporated into the PWd, just as in monomorphemic forms, and not adjoined to the PWd. Finally, Goad et al. concluded that the L2 data from Mandarin-speaking learners of English support their

hypothesis that inflectional morphology is organized differently in the two languages and that L1 prosodic transfer does have an effect on inflectional morphology.

In another study, Goad and White (2006) provide further evidence for the Prosodic Transfer Hypothesis by examining the production of past tense marking by 10 L1 Mandarin speakers using a sentence completion task. On a computer screen, participants were presented with the beginning of a sentence, setting up a present, past or perfective context, followed by two endings. They were given 12 seconds to choose and memorize the ending they considered most appropriate to the context as shown in the example below (Goad & White, 2006: 7):

(12) Last night after dinner…

you show me photos of your daughter

you showed me photos of your daughter

The results showed that the suppliance rates for past tense morphology are high (above 90% of the time). This finding is not in line with Goad et al.'s previous study in which it was found that Mandarin speakers of English could not supply the morpheme in contexts requiring adjunction structure: they were confined to a PWd-internal analysis of English inflection. This finding led Goad and White to argue that the Mandarin speakers can acquire the English adjunction structure. That is, "…target-like prosodic representations are ultimately attainable for at least some functional material which is absent from the L1" (2006: 15).

2.3 THE MINIMAL TREES HYPOTHESIS ABOUT LANGUAGE DEVELOPMENT

In contrast to the Full Transfer hypothesis, the Minimal Trees hypothesis of Vainikka and Young-Scholten (1996a; b; 1998) (re-labelled 'Organic Grammar' in a 2009 article) proposes that L2 learners do not initially transfer all L1 grammatical properties (although Minimal Trees does assume Full Access to UG). L2 learners' grammars are initially lexical in nature, lacking functional categories like tense, agreement, determiner, complementizer, etc. While properties of L1 lexical structure can influence early L2 grammars (such as head direction), functional categories 'grow' on the basis of interaction between input and the properties of UG. This growth proceeds in steps, with the lexical VP first merging with a minimally specified F(unctional) P(hrase), which then becomes specified for tense and agreement features, finally merging with a CP.

The kinds of evidence that Vainikka and Young-Scholten cite for this come from the L2 acquisition of languages with relatively rich morphological structure like German and French. In the very early stages of acquiring these languages learners do not produce tense or agreement morphology, and their utterances lack auxiliary verbs. This leads Vainikka and Young-Scholten to conclude that the functional categories that support these forms are absent from the underlying grammar.

However, this view has been questioned by proponents of the Full Transfer/Full Access hypothesis. They point out that there appears to be a dissociation between the acquisition of underlying syntactic structure and the acquisition of surface morphological forms. L2 learners typically acquire core syntactic properties early, but surface morphological forms much later. Since

syntactic operations depend on the presence of functional categories, those categories must be present and appropriately specified at an abstract level of representation from early on in L2 development.

2.4 NO ACCESS AND PARTIAL ACCESS TO UG HYPOTHESES ABOUT LANGUAGE DEVELOPMENT

In contrast to the Full Access hypothesis, the Fundamental Difference Hypothesis of Bley-Vroman (1989) and Meisel (2011) proposes that once an L1 grammar has been acquired, L2 learners lose access to the properties of UG and construct mental representations for a target language either on the basis of the properties of their L1 or, where those in the L2 differ, by using general problem solving mechanisms. The implication of this account is that while learners may 'approximate' representations of the target language, they will never achieve the same representations as native speakers. Evidence claimed as support for this view is the observation that L2 learners, even with long immersion in the target language, almost always show 'differences' in their use of or intuitions about the target language from native speakers.

A weaker version of the fundamental difference hypothesis claims that some properties of UG remain accessible to adult L2 learners while others disappear, so that there is a deficit in their representations. This view has come be known as the Representational Deficit Hypothesis (Hawkins & Chan 1997; Hawkins & Franceschina, 2004). Proponents of this Hypothesis claim that linguistic features that are not instantiated in the L1 can no longer be acquired by adult L2 learners (Hawkins & Chan, 1997; Hawkins & Franceschina, 2004; Hawkins & Hattori, 2006; Tsimpli &

Dimitrakopoulou, 2007). This means that L2 speakers can never acquire functional categories or features that are absent in the L1. Hawkins and Hattori (2006) make a more explicit claim about the representational deficit in L2 grammars. Following Tsimpli and Dimitrakopoulou (2007), they claim that uninterpretable syntactic features that have not been selected during the acquisition of L1 will no longer be available for L2 grammar construction. Interpretable syntatic features, on the other hand, remain available even those not selected during the acquisition of the L1.

To test this proposal, Hawkins and Hattori (2006) conducted a study to investigate advanced Japanese speakers' L2 acquisition of the uninterpretable feature that forces wh-movement in interrogatives in English. Japanese is a wh-in-situ language and therefore it lacks the movement-forcing feature. 19 Japanese speakers of English, and a control group of native speakers, took part in the study. The Japanese speakers of English were asked to interpret bi-clausal multiple wh-questions in English like "*where did the professor say the students studied when*?" The Japanese speakers' responses were compared with a native speaker control group. The results show that the Japanese speakers are not significantly different in their judgements of grammatical and ungrammatical sentences. Moreover, while the Japanese speakers are not significantly different from native controls in judging grammatical sentences, they show significant differences in their acceptance of ungrammatical sentences. These results, Hawkins and Hattori argue, support the Interpretability Hypothesis. It seems that the Japanese speakers have failed to acquire the uninterpretable feature forcing wh-movement in English interrogatives which is present in native grammars of English but has not been selected by Japanese learners because it has disappeared from the UG feature inventory following a critical period that ended at some point before these speakers encountered the relevant English

input. Hawkins and Hattori (2006: 273) argue that "...there is a permanent 'loss of capacity to acquire' in this domain".

In another study, Tsimpli and Dimitrakopoulou (2007) investigated the use of subject and object resumptive pronouns in L2 English wh-interrogatives by intermediate (n=21) and advanced (n=27) Greek learners of English, using a bi-modal acceptability judgement task. Learners were required to indicate their judgement through a Likert scale of -2 to +2. There were 51 sentences consisting of 30 test items and 21 fillers. English, unlike Modern Greek, does not allow resumptive pronouns with subject and object wh-questions. The overall results show that that while interpretable features of animacy and discourse-linking, realized on the L2 but not on the L1, can be acquired by Greek-speaking learners of English from early stages of development, their L1 specification of resumptive pronouns "...as clusters of uninterpretable Case and Agreement features resists resetting" (Tsimpli & Dimitrakopoulou, 2007: 216). These results led Tsimpli and Dimitrakopoulou to argue that interpretable features are acquirable in L2 acquisition even if they are not available in L1 but uninterpretable features available in L1 but not in L2, or vice versa, pose a learning problem for L2 learners.

2.5 TRANSFER AND ACCESS TO THE PROPERTIES OF UG IN LEXICAL AND PRE-SYNTACTIC PROCESSES

The present thesis reports a study of two phenomena that involve grammatical processes that occur before syntactic operations apply. Since the hypotheses outlined in sections 2.2-2.4 were formulated primarily on the basis of observations about the L2 acquisition of syntactic processes, it is important to establish how they might be

tested on pre-syntactic processes. The two phenomena are firstly synthetic and root compound nouns, in cases like *dishwasher* and *book repository*, and secondly argument structure realization in cases like *John broke the window/The window broke/The rabbit disappeared/*The magician disappeared the rabbit*.

In standard analyses of synthetic compound nouns it is assumed that they are derived from VP-like structures – [$_{VP}$ wash dish] – through a process of argument incorporation into the V and the addition of the nominalizing affix *–er*: [$_{N}$ [$_{V}$ [$_{N}$ dish] wash] –er]. Root compounds are normally claimed to be derived from the merger of two nouns: [$_{N}$ [$_{N}$ book] [$_{N}$ repository]]. (See chapter 3 for detailed discussion).

In standard analyses of argument structure realization, semantic primitives like ACT, GO, STATE are conflated into what are known as Lexical Conceptual Structures (LCS) (Jackendoff, 2002) which are then mapped by linking rules to a predicate argument structure (PAS) which is the input to syntactic operations. For example, *John broke the window* might be derived from the LCS:

ACT_{John} [GO_{window} [$STATE_{break}$]]

which is then mapped onto the PAS *break (John, window)* which is in turn the input to syntactic operations that produce *John broke the window*. *The window broke* is derived from an LCS where the ACT primitive and its argument are absent:

GO_{window} [$STATE_{break}$]

This LCS is then mapped onto the PAS *break (window)*. (See chapter 5 for more detailed discussion).

Crucially, languages differ in how they form compound nouns, and in how they both conflate semantic primitives into LCS and realize PAS morpho-

syntactically (Juffs, 2009). For example, Arabic does not allow arguments to incorporate into the V in forming compound nouns. The Arabic equivalent of 'dishwasher' is *ġassa:lat 'aṭba:q* literally 'washer dishes'. Similarly, while in English the two predicate argument structures illustrated above map to their syntactic realizations without any requirement for morphological modification – the form of the verb *break* is the same in both cases - in Arabic, the absence of the ACT primitive must be signalled by a prefix to the verb: *k*asar*a* 'broke' (transitive), *in-k*asar*a* 'broke' (intransitive).

Because languages differ, the question of whether L2 learners transfer the properties of their L1 initially into their L2 grammars arises. Since these differences are lexical/pre-syntactic, both the Full Transfer and Minimal Trees hypotheses predict that they will. Recall that the Full Transfer/Full Access hypothesis (Schwartz & Sprouse, 1994; 1996) states that the entire L1 grammar constitutes the initial state of L2 acquisition. Therefore, Arabic-speaking learners would be predicted to allow synthetic compounds like *washer dishes*,and would be predicted to prefer intransitive constructions involving verbs like *break* which have some kind of morphological marking like *The window was broken* over the morphologically unmarked *The window broke*. Furthermore, it is predicted that learners would incorrectly accept sentences like (**the man laughed the old lady/*the man arrived the old lady*) because some of these verbs do alternate in Arabic. This is, however, the initial state expectation. In contrast to the Interpretability Hypothesis, as learners improve in their L2 proficiency, it is expected that they would be able to reset features of the target language based on L2 input and UG access. The prediction, therefore, is that less proficient learners are more likely to be affected by the L1 than more proficient learners who may overcome the L1 effect via UG access and L2 input.

Because languages differ, the question of whether L2 learners transfer the properties of their L1 initially into their L2 grammars arises. Since these differences are lexical/pre-syntactic, both the Full Transfer and Minimal Trees hypotheses predict that they will. Arabic-speaking learners would be predicted to allow synthetic compounds like *washer dishes,* and would be predicted to prefer intransitive constructions involving verbs like *break* which have some kind of morphological marking like *The window was broken* over the morphologically unmarked *The window broke*.

Universal Grammar is also potentially involved in these pre-syntactic contexts. Note that in the case of synthetic compound nouns in English, regular plural marking appears to be disallowed on the incorporated argument: *dishwasher/*disheswasher, stamp-collector/*stamps-collector, rat-catcher/*rats-catcher.* However, arguments that have irregular plurals tend to be somewhat better in synthetic compounds: *mouse-catcher/?mice-catcher, tooth-cleaner/?teeth-cleaner*. One account of this is that there is a universal constraint on the ordering of linguistic processes: synthetic compound noun formation involves stems drawn from the lexicon of rote-learned forms (including irregular noun plural forms) and applies before regular inflectional processes like plural marking. If L2 learners mental grammars are constrained by universal properties like this, they should be sensitive to the ungrammaticality of regular plurals inside compound nouns as soon as they start acquiring those compound nouns. (For full discussion of the empirical facts and proposals concerning universal constraints on compounding, see chapter 3).

2.6 FROM PRINCIPLES AND PARAMETERS OF UG TO PRINCIPLES AND A UNIVERSAL FEATURE INVENTORY

In early generative work on language, it was assumed that UG has two types of properties: those that are fundamental design features of language that every individual language obeys – the principles of UG – and those that allow limited variation in the way that the design features are implemented, and can vary across languages: the parameters (Chomsky, 1986).

Typical early examples of principles are (a) structure dependency; (b) subjacency. Structure dependency requires that every syntactic operation is specified in terms of the structural description of constituents, and not their linear ordering. For example, yes/no questions in English are formed by an operation that involves a root complementizer attracting the structurally closest, rather than linearly closest, Tense category that it c-commands. This accounts for why *The man who is tall is here* gives rise to the yes/no question *Is the man who is here tall?* and not **Is the man who tall is here*? (where the linearly closest Tense (realized by *is*) is moved to the front of the sentence). Subjacency, which requires that syntactic operations not involve constituents separated by more than one 'blocking category' (where a blocking category was held to be a Tense/Inflection Phrase or a Determiner Phrase), accounts for why *What did John expect that Mary would buy?* is a grammatical sentence of English while **What did John expect when Mary would buy*? is not. In the latter case, *what* is linked to the object position of *buy* (traditionally through movement) crossing two Tense/Inflection Phrases, one in the embedded clause and one in the main clause. In the former sentence, a trace of *what* can occupy an intermediate position in the

specifier of the embedded clause complementizer, so *what* only crosses one blocking category at a time.

Early examples of parameters are (a) the null subject parameter that allows a language to leave subjects phonologically unspecified if their meaning is recoverable from either morphological properties of the verb (in languages like Spanish and Italian) or discourse context (in languages like Chinese and Japanese); (b) the verb-raising parameter that distinguishes a "strong" from a "weak" Tense/Inflection category. Languages that have a strong T/Infl category attract lexical verbs out of the verb phrase, moving over VP adverbs and negation, as in French: *Elle lit pas de romans* (lit. She reads not of novels) 'She doesn't read novels'. Languages with a weak Tense/Inflection category like English fail to attract lexical verbs out of the VP. When a negation is present a supporting *do* verb is required to host the features of Tense/Inflection.

In the case of the pre-syntactic processes of interest in the present study, an example of an early principle is the claim that derivational word-formation processes operate before inflectional processes (the 'level ordering' hypothesis – see chapter 3). This principle predicts that the formation of synthetic compounds like *dishwasher* will occur before the application of an inflectional process like number marking. The result is that plural marking can apply to the whole compound (*dishwashers*) but not internally (**disheswasher*).

A parameter of variation is also involved in the formation of synthetic compounds. While English productively uses synthetic compounds, Arabic does not. This fact can be captured by hypothesizing an incorporation parameter where English has the value [+incorporation] and allows verbs to incorporate their noun

complements in forming deverbal nominals, and Arabic has the negative value [-incorporation], which disallows the formation of synthetic compounds.

In more recent work (e.g. Chomsky, 1995; Adger, 2003), while the notion of principle remains very much the same as in the early work, parameters are viewed not as global statements about variation in language ('languages will allow null subjects or they won't', 'languages will allow noun incorporation or they won't), but rather as languages selecting particular subsets of features from a universal inventory of features offered by UG, which then have particular consequences in the grammar of the language. For example, the possibility of null subjects in a language like Arabic results from Arabic having selected interpretable person and number features as part of the specification of the Tense category. Because the morphological realization of these features permits the subject of a clause to be uniquely identified, the subject does not need to be spelled out phonologically. The English Tense category, by contrast, has selected uninterpretable person and number features which need to be valued by a subject that is phonologically spelled out.

A similar feature-based account could be given of the fact that English allows incorporation in synthetic compound noun formation, while Arabic does not, and of the differences between conflation patterns and morphological realization of argument structure. However, since most of the work on the L2 acquisition of noun compounding and argument structure realization has been formulated in terms of the earlier approach to parameters, the present study will remain neutral about the specific formulation of parameters, focusing more on the influence of the L1 on the acquisition of L2 properties determined by different parameter settings and the development of learners' knowledge of those properties.

2.7 PRINCIPLES AND PARAMETERS AS A SOURCE OF EXPLANATION FOR L2 LEARNER DEVELOPMENT

The goal of this study is to use the general framework of the principles and parameters model to investigate the L2 acquisition of the pre-syntactic processes of noun-compounding and argument structure realization, to determine the extent to which hypotheses relating to L1 transfer, the role that UG plays, and the nature of developmental restructuring are valid. The source language is Libyan Arabic and the target L2 is English. As already alluded to, there are parametric differences between the two languages that lead to differences in the formation of compound nouns and in the realization of argument structure. Two studies are reported, one involving the acquisition of English synthetic and root compound nouns, the other involving the acquisition of transitive and intransitive constructions. We begin with the study of noun compounding. Chapter 3 provides a descriptive background to this study by comparing compound nouns in the two languages.

CHAPTER 3
COMPOUND NOUNS IN ENGLISH AND ARABIC

3.0 INTRODUCTION

Chapter 2 outlined a number of hypotheses that have been formulated about the role of the L1 and the role of UG in the development of the mental grammars of L2 speakers. Most of these were proposed to account for observations about L2 knowledge of syntactic processes. It was suggested in chapter 1, however, that the role of the L1 and of UG might vary depending on the level of linguistic representation that is being investigated. For example, L1 influence might be greater or lesser in the development of lexical knowledge than in the development of syntactic knowledge. One of the contributions of the present thesis to our understanding of these issues is that it focuses on the development of L2 speaker knowledge of pre-syntactic linguistic operations: noun compounding (a lexical word formation process) and the realization of argument structure (a mapping from lexical conceptual structure to syntactic structure). The L1 in question is Libyan Arabic and the L2 English. Each differs in the form that noun compounding and argument structure realization takes, allowing the testing of the role of the L1. And both noun compounding and argument structure realization are subject to universal constraints, allowing the testing of whether L2 grammars develop under the constraints of UG.

The purpose of this chapter is to provide an overview of the linguistic properties of root and synthetic compounds in English (section 3.1). Section 3.2 focuses on one of the most striking properties of English compound nouns: the constraints that prohibit (regular) plurals from occurring inside them. In sections 3.3

and 3.4, two models of the representation of compound nouns in native speakers that have been widely discussed are evaluated: level ordering and the dual mechanism model. Subsequently, section 3.5 provides an overview of previous studies that claim to have found evidence for level-ordering. This is followed by section 3.6 in which problems with level-ordering are highlighted and section 3.7 in which a number of L2 studies on the acquisitional evidence for level-ordering are reviewed. Following this, alternative theories of inflection in compounds are presented in section 3.8. A comparison of compounds in English and Arabic is made in sections 3.9 and 3.10. Finally, the analysis that will be assumed for the purposes of a study of Arabic speakers' knowledge of English compound nouns is presented in section 3.11, followed by a brief summary of the chapter.

3.1. THE GENERAL PROPERTIES OF SYNTHETIC AND ROOT COMPOUND NOUNS IN ENGLISH

Compounding is the process of forming new words by combining two (or more) existing full words. English compounds, for instance, can be formed using several types of combinations of different word-classes: *noun (N)*, *adjective (A)*, *verb (V)*, and *preposition (P)* (Haspelmath, 2002: 85). The examples in (1) and (2) illustrate noun, adjective and verb compounds formed from the combination of different lexical classes:

(1) Compound nouns

N + N	*lipstick*
V+ N	*drawbridge*
A+N	*hardware*
N+P+N	*mother-in-law*

(2) Compound adjectives and verbs

N+A	*lead-free*
A+A	*bitter-sweet*
N+V	*babysit*
A+V	*sweet-talk*

As the above examples illustrate, a compound can be made up of two or more free morphemes that can function as a single unit with respect to syntax. However, like derivational rules in general, not all compounding rules are productive. For example, the N + N pattern for forming compound nouns is productive in English (*lipstick, bookcase, craft fair*, etc) while the V + N pattern is not (*drawbridge*, but **shade-lamp, *pick-teeth, *wipe-hands*, etc).

From the point of view of semantics, the first element of compound nouns is typically used to modify the second element. Thus, a *dishwasher* denotes a subcategory of *washer* rather than a subcategory of *dish*. The subcategory of the compound that carries the core meaning of the compound is referred to as the ***head*****,** whereas the first element is called the *non-head* (or *dependent*). The head of a compound is similar to the head of a phrase, and projects its categorial status to the

whole compound (Fabb, 1998: 67). For example, *drawbridge* is a kind of *bridge* and not a kind of *draw,* and since *bridge* is a noun, then it follows that *drawbridge* is a noun and not a verb.

There are two sorts of compounding which have been the subject of research in studies of L2 acquisition (Lardiere, 1995a; 1995b; Lardiere & Schwartz, 1997; Murphy, 2000; García Mayo, 2006): *root* (also called *primary*) compounds and *synthetic* (*verbal*) compounds.[1] In the former, the word consists of more than one lexeme stem and neither of the lexeme stems is an argument of the other, as in (3):

(3) a. Lipstick

b. Student film society

c. Boyfriend

d. Truck-man

As the examples show, root compounds do not have deverbal heads and the precise interpretation of the relationship between the two roots is not always transparent. While a *snow ball* is a ball made of snow, a *field mouse* is not a mouse

[1] It should be noted that the term "synthetic" compounding in English is often confusing as there are some researchers (e.g., Botha, 1984) who distinguish between *synthetic* and *verbal* compounds while others do not (e.g. Selkirk, 1982). Furthermore, although some researchers (e.g., Roeper & Siegel, 1978) use the term *"verbal*" compound to refer only to the morphological structure with the affixes –**ing, -er, or -ed/-en** (e.g., *peace-making, truck-driver, home-made, hand-woven, nice-sounding, etc.),* others regard the following as synthetic compounds: *Snow remov**al**, slum clear**ance**, air pol**lution,** task assign**ment**, blood press**ure*** (examples from Marchand, 1969; & Selkirk, 1982). Throughout this thesis, we refer to compounds with the affix **-er** as synthetic compounds. The focus of this thesis will be on these two types of compounds: *synthetic* compounds and *root* compounds (type **N+N** only).

made of fields, rather it is a mouse which lives in a field. Often, the interpretation depends on pragmatic factors (Yamashita, 1997; Roeper, Snyder & Hiramatsu, 2002). For instance, the compounds in (4) may have a range of meanings:

(4) a. truck-man = a man who drives/repairs/sells/buys ... trucks

b. fish-man = a man who catches/keeps/sells ... fish

c. TV-man = a man who installs/sells/maintains/repairs ... TVs

Synthetic compounds (that is, compounds derived from verbs) differ from root compounds in that there is a clear semantic relationship between the head and the non-head: the non-head must be a word that can appear immediately after the verb in the corresponding verb phrase. In other words, the non-head word must fill an argument position in the head's valence (Haspelmath, 2002: 275). The examples in (5-6) illustrate this point:

(5) a. truck driver

b. car washer

(6) a. drive trucks → truck driver.

b. wash cars → car washer.

In these examples, the non-heads *(truck, car*) are the syntactic arguments of the deverbal heads *(driver, washer),* and carry a thematic role assigned by the head. In this case, *truck* is assigned the THEME role by *drive* as shown in (7):

(7) drive truck → truck driver

(verb) (THEME) (THEME)

There are two different ways of analysing the structure of these compounds. For example, the compound *book-seller* can have the structure in (8a) or in (8b):

(8) a. [[book sell] –er]

b. [book [sell -er]]

In (8a), the compound is split up into two words to which the suffix –er is added (Lieber, 1983; Fabb, 1984; Sproat, 1985). The second possibility is that the suffix –er is added to a verb which is then merged with the non-head noun (Di Sciullo & Williams, 1987; Lieber, 1992; Plag, 2003). Plag (2003) argues that (8b) is more appropriate for analysing the synthetic compound structure because **book-sell* cannot be used as a free form, whereas *seller* can: a *seller (of books).*

Since synthetic compounds have deverbal heads, their interpretation is considered less opaque than root compounds. Thus, a *truck driver* can only be interpreted as *someone who drives trucks.*

It is noteworthy that the examples of compound nouns used so far lack internal surface inflectional morphology (*truck driver*, not **trucks driver* or **truck drover*). At the same time, there are some compound nouns that do allow internal surface inflectional morphological marking (*weapons inspector, drinks cabinet*). The next section presents different explanations for the constraints on inflectional

morphology inside compound nouns, and discusses why the phenomenon has been the subject of research interest both in first and second language acquisition research.

3.2. COMPOUNDING AND PLURAL FORMATION IN ENGLISH

Despite their productivity, the vast majority of English compound nouns conform to a principle that constrains compounding processes throughout most of the world's languages: the non-head noun component cannot be morphologically marked. This holds true even for non-productive compounds that consist of a V+N, having a verb as a modifier, like *drawbridge*. Thus, in a V+N compound such as *drawbridge,* we will never find internally inflected forms such as **drawsbridge* or **drewbridge.* Although with *-ing participles* we can find some inflected compound forms *driving cars* or *writing stories*, these forms, as Spencer (2011) argues, are not VN compounds but rather they are interpreted as **NN** compounds.

The constraint affects regular and irregular plurals in compounds differently. Consider the following examples (where (*) indicates that the item is ungrammatical while (?) indicates that the item is marginally acceptable:

(9) Root compounds

a. Rat trap rat traps *rats trap

b. Mouse trap mouse traps ?mice trap

(10) Synthetic compounds

a. Rat catcher rat catchers *rats catcher

b. Mouse catcher mouse catchers ?mice catcher

As the above examples show, regular plurals with an [-s] inflection inside compounds (9a, 10a) are not allowed while irregular plurals (9b, 10b) may be. What might be the explanation for this asymmetry, and how do language learners (both first and second) acquire it?

There have been two types of approach to explaining the asymmetry: the **level-ordering model** (Kiparsky, 1982) and the **dual-mechanism model** (Pinker & Prince, 1992). Both models predict that irregular plurals are represented and processed differently from regular plurals. Furthermore, these models claim that "... (child) learners do not have to rely entirely on the input to fully develop the representational system to form a productive grammatical system" (Murphy 2000: 155-156). Gordon (1985), for example, has argued that the frequency of plurals inside compounds is low in the input that language learners receive, and is insufficient to allow them to infer the contrast in the distribution of regular and irregular forms. If they are successful in acquiring that distribution, compound formation must be constrained by an innate morphological constraint. In this chapter, these two models will be assessed in terms of their potential for accounting for the development of L2 grammars. It is an overview of these two models to which we now turn.

3.3 LEVEL-ORDERING MODEL (KIPARSKY, 1982):

This approach is based on ideas taken and developed from other independent approaches such as the theory of morphology and the lexicon (e.g., Aronoff, 1976), and was elaborated by Siegel (1974, 1977), Allen (1978) and others (Kiparsky, 1982: 3). It should be noted that while there are different theories of level-ordering, this thesis is concerned with Kiparsky's work only. In particular, the focus will be on the issue of compounding, derivation and inflection. The basic insight of level-ordered morphology is that derivational and inflectional processes of a language are applied at successive levels in a particular order as shown in (11):

(11)

Level 1: Bare forms and irregular inflection (comprising derivational suffixes such as *–al, -ous, -ity, -th,*; and inflectional suffixes such as those in *kept, teeth, lice*)

Level 2: derivation and compounding (including derivational suffixes such as *–hood, -ness, -er, -ism, -ist).*

Level 3: regular inflection (for example, *leap**ed**, book**s**, conundrums*, etc.)

(Taken and adapted from Kiparsky, 1982: 3)

The organization of the morphological rules depicted in (11) can be illustrated with the two compound nouns *rat catcher* and *mouse catcher* in (12):

(12) Level 1: *mouse, mice, rat, catch*

Level 2: *mouse catcher, mice catcher, rat catcher*

Level 3: *mouse catchers, mice catchers, rat catchers*

Since compounding occurs at level 2, before the application of regular inflectional affixes at level 3, regular plural inflection is not allowed inside compounds, **rats catchers*, while irregular inflection may be allowed: *mice catcher*. It should be noted that pluralizing the first element of the irregular compound (*mice*) here is optional as adults rarely, if ever, use the plural form. According to Kiparsky (1982), the formation of regular plurals differs from irregular in that the irregular plural form is assumed to be stored along with the singular form in the lexicon, and so may appear inside compounds as part of the noun stem.

However, while level-ordering apparently provides an attractive account of the data in (9-10), the adequacy of this theory has been questioned on both empirical and theoretical grounds, as shall be seen in section 3.6. Before discussing arguments against the level ordering hypothesis, let us turn to another account that has been proposed to solve the puzzle.

3.4 DUAL MECHANISMS (PINKER, 1991; 1999; PINKER & PRINCE, 1992):

Pinker and Prince (1992) propose an account which shares the same assumptions as the level-ordering model, but focuses on the processing of compound nouns during production. They propose a lexicon which is divided into two distinct parts: (a) a store of rote-learned stems between which there may be associative links.

Word roots and irregular forms are stored here (*mouse, mice, rat, catch, go, went*, etc); (b) a rule-based component which takes appropriate stems from the associative lexicon and applies regular morphological processes to them. For example, regular past tense formation (*walk + ed → walked)*, and regular plural formation *(rat + s → rats*) are implemented in this component. This corresponds to the traditional distinction between "rule" and "rote": "rules for regulars, rote for irregulars" (Pinker & Prince 1992: 231).

Extending the traditional rule and rote approach, Pinker and Prince argue that regular and irregular inflections are processed by two different systems (the "dual mechanism model"). Regulars are formed by a rule of grammar, by adding an affix to the stem. Irregulars are stored in the rote lexicon, along with the related root form. Thus root and irregular form are memorized pairs of words, and "...the linkage between the pair members [has] certain connectionist-like properties" (Pinker & Prince 1992: 233). Thus while "...*string* and *strung* are represented as separate, linked words, the mental representation of the pair overlaps in part with similar forms like *shrink* and *bring* so that the learning of *shrunk* is rendered easier given a constant number of learning trials, and analogies like *brung* occur with nonzero probability" (Pinker & Prince, 1991: 233).

In short, this account assumes that since regulars are computed on-line, English speakers need to store only the singular form of the noun *book* and not the plural form *books* as it is generated by an application of a rule. With irregular plurals, however, both forms need to be memorized: a noun such as *mouse* needs to be memorized together with its irregular plural form *mice.*

Evidence used to support the dual-mechanism model comes from a variety of sources. Irregular forms tend to be more susceptible to frequency effects than regular forms (e.g., Bybee & Slobin, 1982; Kim, Pinker, Prince & Prasada, 1991). Furthermore, previous studies have found that children with particular forms of second language impairment (SLI) and Williams Syndrome (WS) seem to have difficulty either with regular or irregular forms (e.g., Clahsen & Almazan 1998; Ullman & Gopnik, 1999; Gopnik & Crago, 1991) suggesting that the two processes are different. For example, Zukowski (2005) examined the formation of synthetic noun-noun compounds in a group of 12 children and adolescents with WS, using an elicited production task. There was also a control group of 12 typically developing children and 18 adult college students. The results showed that the WS group did not produce regular plurals inside compounds most of the time but they did produce irregular plurals, similar to typically developing children and adults. This dissociation between the use of irregular plurals in non-head positions compared to regulars has often been considered as evidence for the dual-mechanism model (Pinker & Prince, 1992; Marcus et al. 1995). Another piece of evidence consistent with the dual mechanism model is a study carried out by Jaeger et al. (1996). They investigated the representation and processing of nonsense regular and irregular past tense forms in English by examining the areas of activation in the brain using positron emission tomography scans. They reported that the nonce irregular past tense forms resulted in far greater brain activation than the nonce regular past tense forms, suggesting that the two types of inflection are represented differently in the brain.

To summarize, the dual mechanism account is similar to Kiparsky's level-ordering model in that both assume that the formation of compound nouns occurs

before the application of regular inflectional processes, precluding the possibility of regular plurals inside compounds.

Furthermore, the assumptions about the way that linguistic knowledge is organised are, by hypothesis, part of a learner's body of innate knowledge. It is important to note that whilst the above accounts may differ in their precise characterization of the distinction between regular and irregular plurals inside compounds, what is common to them is that the use of plurals inside compounds is determined by a distinction between different types of morphological objects. As such, the constraint against regular but not irregular plurals inside compounds will be referred to here as a *morphological constraint on compound formation*. In the next section, evidence claimed to support level-ordering/the dual mechanism model will be reviewed.

3.5 ACQUISITION EVIDENCE FOR THE LEVEL-ORDERING MODEL IN L1

In this section, some of the studies that claim to find evidence for the level-ordering model in L1 are discussed: a study of child learners of L1 English by Gordon (1985); a study of child learners of German (Clahsen et al., 1996) and three studies of native English-speaking children and teenagers with specific language impairment (Oetting & Rice, 1993; Van der Lely & Christian, 2000; Grela et al., 2005).

3.5.1 GORDON (1985)

To examine the claim of the level-ordering model, Gordon (1985) asked 33 English-speaking children (3- to 5-year-olds) to create novel compounds. He used an

elicited-production task in which children were, first, introduced to a cookie monster puppet and were asked the following questions:

> Do you know who this is? . . . It's the Cookie Monster.
>
> Do you know what he likes to eat? (Expected answer: Cookies.)
>
> Yes-and do you know what else he likes to eat?
>
> He likes to eat all sorts of things (Gordon, 1985: 79)

After that, children were shown other objects and were asked if Cookie Monster would like to eat X (X refers to the name of the stimulus). Then, they were asked "what do you call someone who eats X?" where the expected answer is an X-eater (Gordon, 1985: 79).

The main test items included 18 pluralizable count nouns (6 regulars, 6 irregulars and 6 pluralia tantum nouns, e.g. *scissors, clothes*). The results showed that children allowed irregular plurals inside synthetic compounds like *mice-eater* (90%) but they rarely produced regular plurals inside compounds such as **rats-eater* (only 2%) even in the production of the youngest ones. As for the pluralia tantum nouns, Gordon predicted that these should optionally occur inside compounds in their plural form; however, the results showed that some nouns were reduced to a singular form *(scissor eater, glass-eater),* and others were not reduced *(clothes-eater, pants-eater).* Overall, the results seem to be compatible with the level-ordering hypothesis, especially in the case of regular and irregular compounds.

Given that there are virtually no compounds containing irregular plurals in the input that children hear (e.g. they are more likely to hear *mouse eater* than *mice eater*), the data collected by Gordon suggest that children's lexicons are "... richly structured in terms of the way in which rules are applied" (Gordon, 1985: 87), and

that compound production must be governed by an innate morphological constraint. (See Pinker (1999) and Pinker & Prince (1988) for a similar suggestion). However, one might argue that this dissociation between regular and irregular in English may not result from innate morphological constraints but rather from the fact that there is a structural distinction between the two, given the fact that English regulars are marked with a suffix –s whereas irregulars are suffix-less, and children notice the fact that only suffix-less forms appear as the non-head noun in compounds. Clahsen, Marcus, Bartke and Wiese (1996) tested this issue by examining German in which both regular and irregulars are marked with a suffix.

3.5.2 CLAHSEN, MARCUS, BARTKE AND WIESE (1996):

In an attempt to replicate Gordon's results, Clahsen, Marcus, Bartke and Wiese (1996) conducted two different elicited production tasks, with 66 children learning German as an L1 (aged 3;1 to 8;11). The first task was similar to Gordon's (1985) study and the aim was to compare Gordon's results on English with those on German. Modern standard German has five plural suffixes, including -(e)n, -s, -e, -er and –ø. Although the plural -s, is infrequent (-(e)n is more frequent), it nevertheless seems to be the default plural form in adult German: "the use of -s is not restricted by properties of the stem/root to which it is assigned" (Clahsen et al., 1996: 121).

As for plurals inside compounds, Clahsen et al. argue that while the irregular plural inflections can occur inside compounds (e.g., *Frau+en+laden* meaning '*Women's centre'*), the regular plural -s cannot (**Parksverwaltung* meaning '*parks administration'*). Thus, German is similar to English in that only irregular plural nouns may occur in non-head positions. But it is different from English in that both regular and irregular nouns are marked with a suffix. Results showed that the German

children selectively excluded regular plurals from inside compounds, similar to Gordon's (1985) results on English.

In their first experiment, Clahsen et al. used the single target deverbal head *Fresser* 'eater' in their stimulus materials. In the second experiment, they employed a different technique in which the head of the compound was not uniquely *Fresser* to "rule out potential artifacts that might stem from the particular technique of Gordon's experiment" (Clahsen et al., 1996: 133). Despite this methodological difference, as well as the L1 difference (German), the results were again similar to Gordon's. Children optionally produced irregular plurals within compounds, but consistently excluded regulars from inside compounds. This led them to conclude that level-ordering does constrain children's acquisition of compound nouns.

This morphological constraint against regular but not irregular plurals was further examined by Clahsen, Rothweiler, Woest and Marcus (1992) in a corpus study of the first language acquisition of German. They found that German children allowed irregular but not regular plurals within compounds. In this study, both dysphasic and unimpaired children were also found to obey the level-ordering constraint.

Similar findings have been reported in other studies of children with language impairments. Oetting and Rice (1993) examined children aged between 2 and 5 with specific language impairment (SLI), controlling for mean length of utterance (MLU) and the presence of compounding and inflection. They found that children with SLI, like normally developing children, adhere to the constraint that prohibits regular plurals but not irregulars from inside compounds. Van der Lely and Christian (2000) replicated these findings for children aged from five to eight, and adolescents aged from 14 to 17. The above-described results are taken to support (a) Kiparsky's (1982)

model of level-ordering and (b) the notion that regular and irregular inflection are dissociated in (at least) both English and German-speaking children.

Furthermore, Grela et al. (2005) tested both the syntactic and semantic constraints on the production of novel root compounds. They asked ten English speakers with SLI (ages 4;8 to 7;0) to invent names for pictures of 24 pairs of contrasting fantasy objects such as a car shaped like a shoe. They pointed out three potential challenges for the children with SLI. What is important here is their examination of the order of the compound components. Note that the modifier occurs before the head (e.g., "a *hat* made of *rocks* is a *rock hat*, not a *hat rock*"). They also examined the children's adherence to the constraint that prohibits plurals inside compounds. The results revealed that, as in previous studies (e.g., Oetting and Rice 1993), the SLI group behaved as a normal comparison group, who were an average of 8 months younger, in that they did not produce regular plurals inside compounds. It should be noted that while the children with SLI were more prone to make word-order errors in their production of novel compounds (producing for example, *car shoe* instead of *shoe car*) these children did seem to have some knowledge about the correct word-order of compound nouns as their performance was significantly above chance (Grela et al., 2005).

In another study, however, Nicoladis and Murphy (2004: 488) examined English-speaking children's (36 from Britain and 36 from Canada) production of ungrammatical compounds (i.e., compound forms that are not productive). In the process of acquiring English synthetic compounds, Nicoladis and Murphy pointed out that children generate several ungrammatical forms of synthetic compounds. They identified two types of these ungrammatical compounds: verb-object (VO) (e.g., *break-bottle* referring to something or someone breaking bottles); and verb-er-object

(V-er-O) (e.g., *breaker-bottle* referring to something or someone breaking bottles). The purpose of the study was to examine whether children produce plurals in ungrammatical compounds (VO and V-er-O). They hypothesized that if level-ordering was an innate property of the language faculty as Gordon (1985) claimed, learners should not generate regular plurals inside either grammatical or ungrammatical compounds.

All children were required to complete two tasks: a standardized vocabulary test and a novel compound production task. In the latter, they showed children 10 pictures of machines acting on multiple objects and asked the children to name the machine. The task was introduced with "here is a machine ringing bells. What could you call it?" Expected answer: *bell ringer* (Nicoladis & Murphy, 2004: 490). The results showed that children did produce some regular plurals in ungrammatical compounds (e.g., *ring-bells*, in reference to a *bell-ringer*). More specifically, although regular plurals inside grammatical compounds (e.g., **bells ringer*) were never allowed, regulars were included in ungrammatical compounds (e.g., ring-bells) 58% of the time. This led them to argue that level-ordering appears not to constrain children's compound production. Otherwise, children should not produce regular plurals inside ungrammatical compounds. Nicoladis (2005) replicated these findings in a group of English monolingual children and another group of French-English child bilinguals.

However, since these results were obtained from ungrammatical compounds, one should be cautious in taking them as evidence against level-ordering: these non-target-like forms cannot be used as a potential testing ground for level-ordering.

In contrast to the findings of the studies presented here, a number of researchers have argued that the level-ordering theory has some technical and

empirical difficulties (Selkirk, 1982; Spencer, 1991), and therefore the idea of level-ordering has been rejected by many morphologists and even certain lexical phonologists (Spencer, 1991: 179). In the next section, some of the problems that might render the level-ordering theory inadequate are highlighted.

3.6 PROBLEMS WITH LEVEL-ORDERING

Although all the findings of the above studies are consistent with the predictions of the level-ordering account, there are a number of problems associated with this model. In this section, we briefly review some of the problems with this approach.

Firstly, there are a number of exceptional compounds in which the non-head is regularly inflected. For example, cases such as *parks commissioner, human resources manager, awards ceremony, pilots union, weapons inspector, events coordinator* and many others are perfectly grammatical (taken from Selkirk, 1982; Haskell et al., 2003). These examples should not occur if there is an innate grammatical constraint on regular plurals inside compounds. While some researchers argue that these cases are counterexamples to the level-ordering account, others have attempted to explain them by claiming that there are some semantic, and probably syntactic, factors that permit these exceptions (Kiparsky, 1982; Pinker, 1999).

One possibility is that regularly inflected non-heads in these cases tend to be semantically idiosyncratic lexical items (Kiparsky, 1982: 9; also Gordon, 1985). For example, the noun *drink* in *drinks cabinet* refers to alcoholic drinks only, and not to any old drinks. Thus, their meanings "cannot be derived in a straightforward way from the meaning of the singular" and they are stored in the mental lexicon just as

pluralia tantum nouns (Haskell et al., 2003: 123). According to the theory of level-ordering, these cases could easily be explained as idiosyncratic lexical items occurring at level 1 before the formation of compound nouns at level 2. Haskell et al. (2003: 123) argue that "although this analysis was consistent with some of the exceptions, it was not specific enough to explain why plurals such as *pilots* qualify as idiosyncratic, whereas plurals such as *rats* do not".

Moreover, Kiparsky (1982) and Alegre and Gordon (1996a: 69) have suggested that these cases might be phrasal compounds licensed by a recursive loop from syntax back into morphology. According to this proposal, a compound like *red rat eater* can be generated in two ways: recursively as in fig. 1(a), or non-recursively, as in Fig. 1(b):

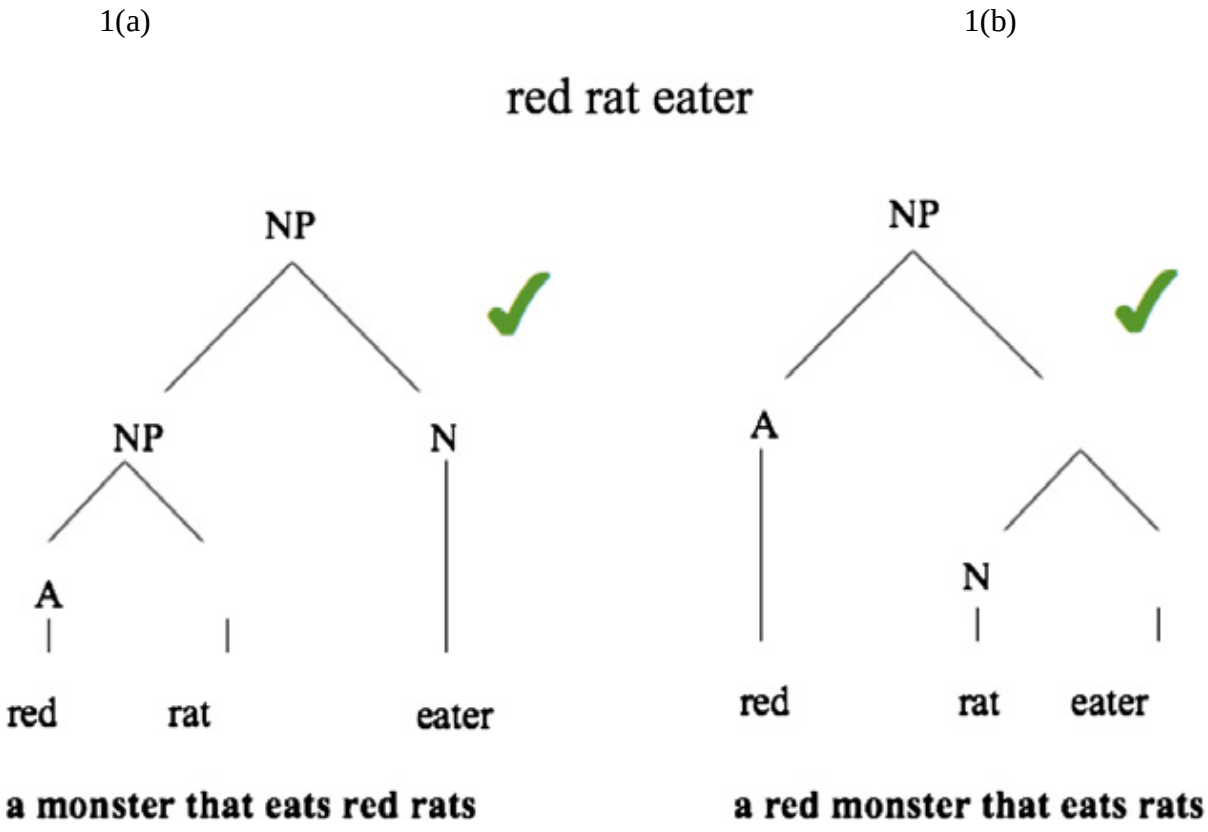


Fig. 1. The two possible ways of parsing *red rat eater* – ‘‘a monster that eats red rats’’ or a ‘‘red monster that eats rats’’ (taken from Ramscar & Dye, 2010: 4, based on Alegre & Gordon, 1996a).

The tree in figure 1(b) shows a regular N-N lexical compound modified by the adjective *red*; whereas the tree in figure 1(a) shows that the adjective modifies the non-head noun and the NP formed from the merger of *red* and *rat* is the projection involved in compound formation. This means that *red rat* in 1(a) is a noun phrase (NP) formed in the syntax and which has been recursively fed back into morphology for the compound formation (Algere & Gordon, 1996a: 69-70). Note that in 1(b) the *eater* is *red* whereas in 1(a) the *rat* is *red*. According to this proposal, regular plurals inside compounds are initially disallowed, but may be allowed through syntactic recursion.

To test this proposal, Alegre and Gordon (1996a) examined noun-noun compounds where the non-head is pluralized. They used a picture-identification experiment in which 36 children, aged 3 to 5, were tested to see how they interpret compounds that were preceded by an adjective (e.g. *red rat eater* vs. *red rats eater*). Children were presented with pairs of pictures representing an animal of some sort (e.g., *monster, fish*) eating various living things (e.g., *rats, flowers*). In each pair, one has *the eater* (e.g., *monster*) painted red and things being eaten (e.g., *rats*) painted blue; and in the other picture *the rat* was *red* and the *monster* was *blue*. Half of the children were presented with plural forms and the other half were presented with singular forms. For example, children tested with singular forms were asked: "can you point to the picture that shows a *red rat eater*?" while children tested with plural forms were asked: "can you point to the picture that shows a *red rats eater*?" (Alegre & Gordon, 1996a: 72).

They found that in the plural condition children preferred the recursive interpretation [[red *rats*] *eater*]: the picture where the *rats* were *red* to the one in which the *eater* was *red* [*red* [*rats eater*]. When children were asked to point to a *red rat eater*, the non-recursive interpretation was preferred: the one in which the adjective modifies the compound as a whole [*red* [*rat* [*eater*]]] as shown in Fig. 1(b) above. The results indicate that children chose a recursive-syntactic interpretation when the noun was plural, but a non-recursive interpretation when the noun was singular. This finding suggests that "...children's word formation processes allow complex interactions between grammatical systems from early in acquisition" (Alegre & Gordon, 1996a: 65). The same results were replicated by Clahsen and Almazan (2001) who compared noun pluralisation in WS-children to that in SLI-children; and also by Senghas, Kim and Pinker (2005) in adults.

Although this account can explain why regular plurals inside compounds that are preceded by an adjective are permissible, the adequacy of this account is still questionable as there are some compound nouns which are not preceded by an adjective but still contain regular plurals (e.g. *awards ceremony, weapons inspector*). One possible explanation for this is that "these too are phrasal compounds, constructed recursively" as in figure 2 (Pinker, 1999: 184).

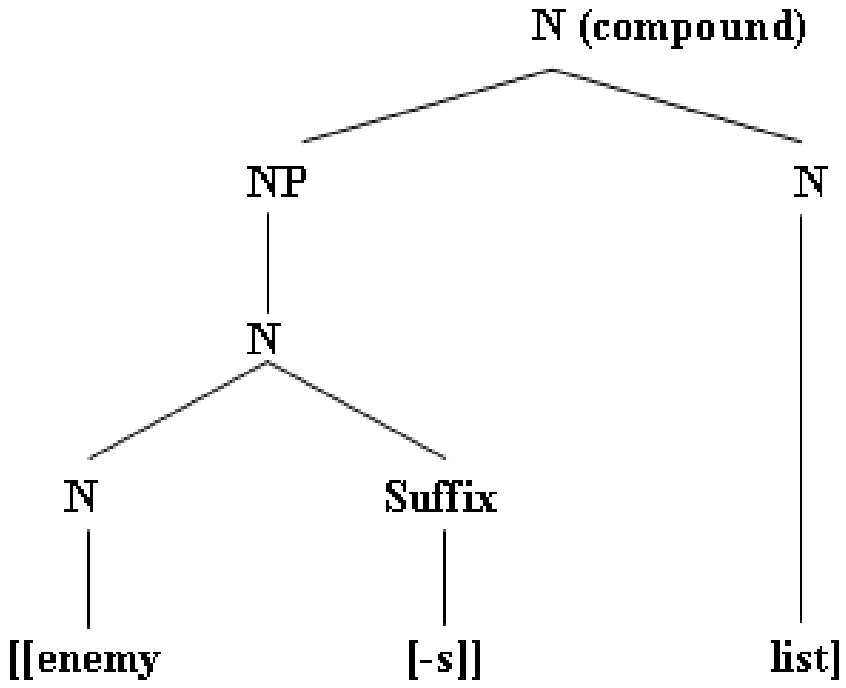


Fig. 2 Phrasal analysis of a compound that contains a plural non-head (Taken from Pinker, 1999: 184)

Following this analysis, the non-head element (that is, the noun *enemies*) is derived by the application of the regular rule in the syntax, and then recursively fed back into the lexicon for the compounding procedure. However, it is important to

note that while this analysis can account for the exceptions to the compounding restriction, Pinker (1999) points out it potentially loses the original generalization made against the occurrence of regular plurals inside compounds. If a singular or irregular plural appears inside a compound, it should be considered a word, but if a regular plural occurs inside a compound, it is posited to be a one-word phrase. Therefore, Pinker pointed out that there needs to be some independent justification that the acceptable regular plurals inside compounds are considered one-word noun phrases, and not simply words. This can be done by identifying the differences in meaning between a word and a phrase (Pinker, 1999; Cunnings, 2003).

Another explanation is provided by Alegre and Gordon (1996b) in which they argue that all the exceptions have some semantic properties in common, and not idiosyncratic meanings as Kiparsky (1982) suggested. According to Algere and Gordon, *injuries report* and *injury report* differ in that the use of the plural form refers to multiple kinds rather than multiple instances. They believe that plural non-heads in these exceptions promote heterogeneity (many types, rather than many tokens): the use of regular plurals is licensed by heterogeneity. For instance, **claws marks* indicate multiple instances rather than indicating multiple kinds. Moreover, they also noted that the accepted regular plural modifiers tend to be abstract in meaning. For example, in *publications catalogue*, the non-head *publications* indicates a variety of different types of publications, and not multiple instances of the same type (Haskell et al., 2003). Furthermore, *publications* is highly abstract in contrast to *books* and *magazines*. Since a compound such as *publications catalogue* is both heterogeneous and abstract, it is acceptable; whereas a compound such as **claws marks* does not satisfy the criteria set by Algere and Gordon: it is neither heterogeneous nor abstract.

Under this analysis, only compounds that satisfy both of these properties should be acceptable. To test this proposal, they investigated a group of native English speakers using an acceptability judgement task. They reported results that were in line with this proposal. They found that regular plurals were rated acceptable only if they were both heterogeneous and abstract. This account, however, still cannot explain the fact that there are some plural non-heads inside compounds which are neither abstract nor heterogeneous but they are still allowed in nonhead positions, like *parks commissioner, pilots union*.

Furthermore, there is crosslinguistic evidence showing that the dual-mechanism and level-ordering models' predictions are not always borne out. Firstly, there are languages that allow regular plurals internally (see section 3.10 for more details). Secondly, other inflections such as the possessive -s do occur word internally in English and other languages as well: *Adam's apple.* A further problem with these models (e.g., the level-ordering and the dual mechanism) is that they do not distinguish between root and synthetic compounds (Lardiere, 1995b). Lardiere noted that when children produce regular plurals in compounds, these instances occur only in root compounds and not in synthetic compounds. Yet, these models have no facility to accommodate such a distinction (cf. Senghas, Kim, Pinker & Collins, 1991).

In short, this section has focused on potentially problematic cases for the level-ordering/dual mechanism models and the accounts that have been proposed to accommodate the exceptions. The focus of the discussion so far has been only on studies investigating native speakers' acquisition of compounding and inflection. The next section presents an overview of previous research on L2 learning regarding level-ordering and compounding. As shall be discussed, previous studies with adult

and adolescent second language learners raise some doubts about whether level-ordering/the dual-mechanism constrain the acquisition of compounding by L2 learners.

3.7 ACQUISITION EVIDENCE FOR THE LEVEL-ORDERING MODEL IN L2

In this section, a number of studies are presented that have investigated whether adult L2 learners adhere to the constraint on the appearance of regular plurals inside compounds. As we shall see, Clahsen (1995) claims that L2 learners do obey the constraint against regular plurals inside compounds. Other studies, however, suggest that level-ordering does not constrain L2 learners' compound production, as both regular and irregular plurals are used productively inside compounds.

Clahsen (1995) claimed to find evidence that L2 learners do obey the constraint against regular plurals inside compounds. He investigated the acquisition of the German plural system in 11 adult second language learners whose native languages were Romance (Portuguese, Italian and Spanish). Using longitudinal corpus data, (consisting of informal taped interviews), he argued that L2 learners of German have two distinct systems of plurals as they allow irregular but not regular plurals inside compounds. This led him to conclude that these results are in line with both the dual-mechanism and the level-ordering models. Since there were no significant developmental changes in the use of the noun plurals and plurals inside compounds, these results are consistent with Gordon's (1985) claim in L1 acquisition that "...the two models of inflection and the constraints on the interaction of compounding and inflection are present from the beginning of the acquisition of

morphology" (Clahsen, 1995: 136). However, other studies have shown that this is not always the case with L2 learners.

Lardiere (1995a; 1995b) argues that this constraint is questionable not only on theoretical grounds but also on empirical grounds. She investigated whether the L2 acquisition of synthetic compounds is constrained by the level-ordering model by eliciting English synthetic compound nouns from native speakers of Spanish (15) and Chinese (11). It is important to note that Spanish differs from Chinese in compound formation in that while Spanish deverbal compounds do allow regular plurals inside compounds as shown in (13), Chinese does not have plural inflection at all.

(13)

	Spanish	English
a.	un lavaplatos	a dishwasher
	un lav -a plato -s	
	a wash -3sg plate -pl	
	`a dishwasher'	
b.	un abrelatas	a can-opener
	un abr -e lata -s	
	an open -3sg can -pl	
	`a can-opener'	

(Taken from Lardiere & Schwartz, 1997: 329).

This contrast, Lardiere argued, can in principle show whether the formation of compounds is universally and innately constrained by level-ordering. Since Spanish allows non-head regular nouns to be plural, if Spanish learners of English produce

equivalent English compound nouns where the non-head, regular noun is not pluralised, this would be consistent with an awareness that English compounds are formed at a level before inflectional morphology applies. As in Gordon's (1985) study, subjects were required to produce synthetic compounds in response to the following question: "what could you call a person who cleans shoes/protects children/wears pants?" (Lardiere, 1995a: 40). The test contained 5 irregular plurals, 3 pluralia tantum nouns and 8 regular plurals.

The results were significantly different from those obtained by Gordon (1985) with L1 Learners. In Gordon's study, the overall rate of correct omissions of -s among L1 learners was 161/164 (98%), whereas the overall rate of omission in this study was 102/199 (51%). Data showed that thirteen out of 15 Spanish speakers of English allowed the regular plural -s in their compound production. They also produced irregular plurals inside compounds (77%) of the time. As for the Chinese speakers, they produced significantly fewer regular plurals inside compounds than the Spanish speakers: the regular plurals inside compounds were allowed only 30%. However, it is important to note that both groups of L2 learners allowed irregular plurals inside compounds more often than regular plurals.

Lardiere argued that the results were incompatible with the prediction of level ordering as: i) both groups of participants produced regular plurals within their compounds ii) if the claims for the universally innate availability of level-ordering to language learners are right, then there should not be a group difference: Chinese and Spanish speakers should have performed similarly on the task.

As for the significant difference between Chinese and Spanish learners, Lardiere assumed that this is a result of L1 influence (recall that the non-head is

always plural in Spanish). Thus, it appears that the level-ordering model is not available in L2 acquisition.

Marcus (1995), however, carried out a further statistical analysis on Lardiere's data and claimed that these results could be interpreted differently. He claimed that a statistical tendency to generate more irregular than regular plurals in compounds should be considered as a piece of evidence for, rather than against, the level-ordering model. However, we agree with Lardiere (1995b: 268) that "this type of statistical approach... reflects a fundamental misconception of the level-ordering framework as an acquisitional model, and constitutes an inappropriate test not only for the proposed innateness of the model itself but also for an optimally informative interpretation of the data".

As discussed above, the inclusion of irregular plurals in non-head positions can neither confirm nor disconfirm the prediction of the level-ordering theory as irregular plurals are optional within compounds. As for regular plurals, however, "the level-ordering theory does make a very strong, testable prediction: regular plurals in compounds should never be allowed. In other words, the acquisitional model may be falsified if empirical evidence demonstrates that regular plurals are indeed allowed in compounds by language acquirers" (Lardiere, 1995b: 268). Since the rate of inclusion of regular plurals inside compounds was high in this study, this suggests that level-ordering does not constrain L2 learners' acquisition of compound nouns.

Murphy (2000) further explored these issues in L2 acquisition. 100 adolescent Francophone ESL learners and 15 adult native-speaker controls were tested on the compounding task. The non-native speakers were divided into three groups based on

their school's in-house proficiency test. These groups were chosen to investigate whether proficiency might influence their compound generation. Unlike Gordon's (1985) and Lardiere's (1995a) studies, participants in this study were asked to write the compounds, and not to produce them orally. Since compound formation in French is somewhat similar to English in that regular plurals inside compounds are very rare, one would expect that the French learners would not produce regular plurals inside compounds. The results showed that the native speakers allowed irregular plurals inside compounds 28% of the time but they only generated regular plurals 1.7% of the time. With the non-native speakers, however, a completely different pattern of results was obtained. In contrast to the native speakers' results, data showed that learners did allow regular plurals inside compounds, approximately 46% of the time (81 out of 100 participants allowed regular plurals within compounds at least once). As for the irregular plurals, learners allowed them over 70% of the time. As for the participants' proficiency in English, it seems that it did not have an effect on their compound generation. Although there were more irregular plurals inside compounds than regulars, Murphy argued that the prediction of level-ordering was not supported as participants produced regular plurals within their compounds 46% of the time. It is also noteworthy that although the methodology used here is slightly different from Lardiere (1995a), the results were similar to Lardiere's. In short, while the non-native speakers' results are inconsistent with Clahsen's study (1995) in the domain of SLA, the native speakers' results seem to be consistent with Gordon's (1985) results.

In another study, Lardiere and Schwartz (1997) elicited English synthetic compounds from 34 native Spanish speakers divided into three proficiency levels: Low (n=10), intermediate (n=12) and advanced (n=12). There were also 12 native English speakers serving as a control group. This study was not concerned with level-

ordering but it, nonetheless, obtained results relevant to our discussion as it was also concerned with the issue of a proficiency effect on compound formation. Recall that Murphy (2000) found that performance on synthetic compound production was not influenced by the learners' proficiency level.

The task Lardiere and Schwartz used was similar to Gordon's in several respects. It involved giving subjects 16 shuffled cards, each card contained "a drawing of a cartoon 'creature' acting in some way upon a set of objects". Then subjects were asked to describe "what the creature was doing in the picture, and then asked what name could be given to that creature based on what he/she was doing..."(Lardiere & Schwartz, 1997: 334). The results showed that there were two types of errors found in the interlanguage compounds: verb-object (VO**)** word order (inverted word order *eater flies, washing hands, wash hands*) and the "ING error". The latter involves compounds in which the verbal suffix –ing is used in contexts obligatorily requiring the (agentive) –er suffix (*washing hands, hand(s) washing*. As for the VO error, subjects in the low proficiency group produced 58.42% of errorful compounds compared to 52.56% by intermediates and 12.50% by subjects in the high proficiency group. Thus, it is clear that this type of error decreases over time, disappearing at the most advanced level. In an attempt to explain why L2 learners produce the nominalising -er or -ing affix on the verb in conjunction with the VO word order, they suggested that since the verb in Spanish compounds seems to have 3SG features of verbal inflection, L2 learners select the –er and –ing in an attempt to spell out the [3SG]. It should be noted that even at the most advanced stages L2 learners still pluralize objects in the compounds (52.2%).

To summarize, the major findings of previous elicited production studies discussed above indicate that child, adolescent and adult native speakers of English

generate more irregular plurals inside compounds than regulars (in fact, in some studies regulars inside compounds were not included at all). This dissociation has been attributed to the level-ordering (or dual mechanism) model which prohibits regular plurals from occurring inside compounds. With L2 learners, however, this constraint is not respected. Although L2 learners allow more irregular plurals inside compounds than regulars, the fact that they allow regular plurals inside compounds more than 50% of the time whilst native English speakers do not, has meant that claims about whether level ordering constrains L2 learners' mental grammars remain controversial. This theory seems to provide an elegant account with regard to the examples given in 9-10 above, but, as discussed earlier "...When a broader range of data is considered...the theory runs into difficulties that seem to require fundamental changes to the theory or an entirely different type of account" (Haskell et al., 2003: 124). Thus, a variety of different approaches has been proposed to account for the dissociation between regular and irregular plurals and this is the focus of the following section in which these approaches are evaluated.

3.8 ALTERNATIVE THEORIES OF INFLECTION IN COMPOUNDS

As discussed in the previous section, the claim that level-ordering constrains the formation of compounds appears to be violated in L2 acquisition, and possibly L1 acquisition as well. While it is clear that regular plurals inside compounds are disfavoured relative to irregulars, the fact that regulars are sometimes included needs to be explained. Therefore, a number of alternative analyses have been proposed to explain the formation of compounding (see section 3.9 for a theoretical account of this).

The experimental studies cited above all used elicited production tasks in particular variants of Gordon's (1985) study. Elicited production, however, might have an effect on the learners' performance via priming. Recall that in Gordon's study participants were asked the following question "*what do you call someone that eats mice?"* This might lead participants to use *mice* rather than *mouse*. Therefore, this section presents results of eye-movement tasks (Cunnings & Clahsen 2007; Silva et al., 2013) and acceptability judgement studies (e.g., Haskell et al., 2003; Senghas, Kim & Pinker, 2005). As shall be seen, results from these studies show that irregular plurals inside compounds are significantly more acceptable than regular plurals (a finding which has been replicated in elicited production studies). However, Haskell et al. (2003) and also Senghas et al.'s (2005) results have highlighted an important issue which had been disregarded by studies claiming to find support for the level-ordering. That is the three-way distinction between regular and irregular plurals, and singular non-heads inside compounds. These researchers found that whilst participants rated regular plurals inside compounds as the least acceptable, they also favoured singular non-heads over irregular plurals (irregular plurals were rated marginally acceptable).

Haskell et al. (2003) argue that the dissociation between regular and irregular plurals inside compounds results from phonological and semantic, rather than morphological, constraints. They used the parsed version of the Brown Corpus (Marcus, Santiorini & Marcinkiewiczto, 1993) to see how often regular and irregular plurals were used in non-head positions in English and found that the percentage of singular uses was 70%. It is clear, then, that most nouns that occur in non-head positions with compounds are singular nouns. However, these data are somewhat inconsistent with the prediction of level-ordering: "... there appears to be a bias (but not a prohibition) against plural modifiers of all types, and this bias seems to be

stronger for regular than irregular plurals. Thus, the level-ordering account misses two important generalizations: that there is a dispreference for all plural modifiers (irregular as well as regular), and that this dispreference is probabilistic rather than absolute" (Haskell et al., 2003: 127).

To further investigate the findings of the corpus analysis (that plural modifiers inside compounds are dispreferred in general), they conducted a graded grammaticality judgement task. As in the corpus analysis, results showed that all plural non-head nouns appear to be dispreferred inside compounds. Therefore, Haskell et al. took these observations as evidence against the level-ordering account and this led them to develop an alternative account to explain these data.

They proposed that the well-formedness of compound nouns is determined by "... a constraint satisfaction process modulated by semantic, phonological and other factors" (Haskell et al., 2003: 119). To provide evidence for the phonological constraint against regular plurals, they conducted an acceptability judgement experiment in which they examined the acceptability of bifurcate pluralia tantum nouns. These are nouns with joined symmetrical parts such as *pants, scissors, binoculars*, etc. (Haskell et al., 2003: 132). According to level-ordering, these nouns are stored in the mental lexicon just as irregular plurals and therefore they are expected to pattern with the singular. However, they found that, contrary to the level-ordering account and as with irregular plurals, pluralia tantum nouns were significantly more acceptable than regular plurals but they were significantly less acceptable than singular non-heads. Therefore, they propose that their data suggest that modifier acceptability may be better explained in terms of their semantic and phonological properties. As table (2) shows, Haskell et al. argue that irregular plurals and pluralia tantum nouns may optionally appear inside compounds because they

violate one constraint only, either the semantic or the phonological constraints. Thus, these are preferred over regular plurals because regulars violate both constraints.

Table 2. Prediction of modifier acceptability by semantic and phonological factors (Adapted from Haskell et al., 2003: 131)

Example	Semantically plural?	Phonologically plural?	Acceptability
Rat, Mouse	No	No	Acceptable
Mice	Yes	No	Marginal
scissors	No	Yes	Dispreferred
Rats	Yes	Yes	Dispreferred

Contrary to Gordon's claim about the innateness of linguistic knowledge, Haskell et al. claim that the semantic and phonological constraints could be learned from information available to children in the input they receive: "...the constraints that are relevant to compound formation are not specially about the formation of compounds; rather they are inherited from more general properties of pluralisation and compounding that are exemplified many times over in the input to the child" (Haskell et al., 2003: 136-137). They argue that both noun-noun compounds such as *toy box* and pre-nominal modifiers such as adjective noun phrases like *big box* do not have number semantics. In *big box*, the adjective is neither singular nor plural. Therefore, they propose that there is a strong tendency for modifiers to lack inflection, "...including but not limited to modifiers in noun compounds" (Haskell et al., 2003: 138). The idea that the input learners receive might affect children's

compound production is also consistent with Murphy and Nicoladis' (2006: 687) study in which they found that "even low-frequency items in the input can influence the kind of compounds children produce". Furthermore, since it is very rare for prenominal modifiers to have phonological characteristics similar to that of regular plurals *(-s, -z)*, the regular-sounding compounds and not regularity could lead learners to disallow regular plurals inside compounds (Haskell et al., 2003).

These findings have also been replicated by Banga, Hanssen, Neijt and Schreuder (2013). Banga et al. examined the relationship between conceptual plurality and the occurrence of a plural morpheme in a novel Dutch and English noun-noun compounds. It should be noted that regular plurals inside compounds are quite common in Dutch: *boek 'book' + kast 'case'= boekenkast*, with *en* as linking element (Banga et al., 2013: 54). This linking element *en* is homophonous with the Dutch plural suffix –en (Hanssen et al., 2012). Banga et al. (2013: 59) used a picture-naming task in which they compared the naming responses of native Dutch speakers and native English speakers to pictures presenting one or multiple instances of the relevant object. Two groups of participants took part in the study: 40 native English speakers and 40 Dutch English speakers. The results revealed that while the speakers of both languages most frequently generated novel compounds containing a singular non-head noun, they did produce plurals inside compounds. Firstly, both the Dutch and English speakers generated more compounds containing a plural modifier when describing pictures depicting several instances of an object than when describing pictures depicting one instance of the object. Thus, these results contradict the semantic constraints for compounding put forth by Alegre and Gordon (1996). The results have also shown that speakers of English did produce regular plurals inside compounds, in contrast to the prediction of level-ordering (e.g., Kiparsky, 1982).

Therefore, Banga et al. conclude that their findings are compatible with the acceptability constraints put forth by Haskell et al. (2003). That is, singular modifiers were produced most often followed by irregular plurals, and regular plurals were less preferred but still acceptable inside compounds.

However, the finding that phonology and not regularity is the cause of the unacceptability of regular plurals inside compounds is problematic. Haskell et al. claim that pluralia tantum nouns as well as voicing-change plurals (these are nouns such as *knife-knives*) are disfavoured inside compounds because of their regular-sounding phonology. This, however, could have an alternative explanation. With regard to pluralia tantum nouns, it is clear that these nouns are grammatically plural and have the regular plural suffix and therefore the marginal acceptability of pluralia tantum nouns might be due to their morphological properties rather than their phonological characteristics (Berent & Pinker, 2007). Note that pluralia tantum nouns require plural rather than singular subject verb agreement. Berent and Pinker (2007: 133) cited a study by Bock, Eberhard, Cutting, Meyer and Schriefers (2001) investigating the speech errors in which learners make a verb agree in number with a local noun rather than the head noun (e.g., *the advertisement for the razors were* ...), and results showed that agreement errors occur when pluralia tantum nouns are close to a verb (e.g., *the advertisement for the scissors were* ...) more often than do singular nouns (e.g., *the advertisement for the razor were...*). Furthermore, previous studies have found that some pluralia tantum nouns are sometimes reduced (e.g., *scissor eater*) (Gordon, 1985) whereas nouns such as *news* which are grammatically singular but phonologically plural were not reduced (Senghas, Kim, Pinker, & Collins, 1991). This suggests that pluralia tantum nouns are disfavoured inside

compounds because of their morphological properties rather than their phonological frequency.

Another piece of evidence against the phonological constraint comes from the fact that there are a number of compounds with singular nonheads that resemble regular plurals but they are perfectly acceptable inside compounds: *fox hole, rose garden, praiseworthy, prize-fight, Katz paper, six-gallon jar, corpse counting* (Berent & Pinker, 2007). Furthermore, Berent and Pinker tested Haskell et al.'s proposal by examining whether singular non-heads that sound like regular plurals (such as *hose installer*) would be rated unacceptable relative to compounds that are singular but not regular sounding (e.g., *pipe installer*). Results showed that regular-sounding singulars *hose installer* did not taint the acceptability of compound nouns compared to semantically and frequency-matched controls *pipe installer*.

Moreover, Haskell et al. claim that the rarity of prenominal modifiers (nonheads including adjectives and nouns) with the phonological properties of regular plurals in the input could lead children to make the generalization that regular-sounding nonheads cannot occur inside compounds. However, this is not possible as adjective-noun sequences differ from noun-noun compounds. Berent and Pinker (2007) argue that adjective noun sequences and noun compounds have different stress patterns. A *black board* is different from a *blackboard.* Secondly, these two constituents have different syntactic properties: most adjectives can occur as predicates (e.g. *the tall man* and *the man is tall*) whereas nonheads inside compounds cannot as in a *chocolate lover* and **this lover is chocolate*. This raises the question of why, if learners generalize the statistical properties of adjectives to noun-noun sequences, only some properties would be generalized but not others.

Therefore, we follow Berent and Pinker (2007: 129) who argue that the dispreference for regular plurals inside compounds compared to irregular plurals "...hinges on the morphological distinction between irregular and regular forms and it is irreducible to phonological familiarity". To show this morphological effect, Berent and Pinker conducted two experiments in which they used pairs of novel nouns with homophonous regular and irregular plurals such as *gleek- gleeks and gloox- gleex*. These pairs differed only in their singular forms and spellings. They hypothesized that if phonological properties, and not morphological properties, taint the acceptability of regular relative to irregular plurals in compounds, then learners should rate these homophonous regular and irregular forms as equally acceptable. The results showed that regular plural nonwords (e.g., *gleeks hunter,* plural of *gleek*) were rated less acceptable than irregular plurals which were phonologically identical to regulars (e.g., *breex-container,* plural of *broox*) (Berent & Pinker 2007: 151). Therefore, they conclude that phonological frequency cannot account for the dissociation between regular and irregular modifiers of noun-noun compounds whereas the morphological account does.

In relation to this, Seidenberg, MacDonald and Haskell (2007) examined Berent and Pinker's (2007) studies and claim that the first three experiments of Berent and Pinker tested hypotheses that were incorrectly ascribed to Haskell et al. (2003). For example, Seidenberg et al. claim that Berent and Pinker's first experiment was about words that are phonologically deviant relative to all other words in the language whereas their experiment is about words that are phonologically deviant relative to other modifiers. Seidenberg et al. argue that their claim could not be based on the frequencies of occurrence in the language as a whole because there are a number of words that end in /s/ or /z/: the CMU (Carnegie Mellon University)

pronouncing dictionary indicates that /z/ is the second most common word-final phoneme, and /s/ is the fifth. Thus, Seidenberg et al. (2007: 290) claim that "mere "phonological familiarity" would predict that plurals, being highly familiar, should be highly acceptable modifiers. Our theory explicitly makes the opposite prediction; hence Berent and Pinker's characterization of it is incorrect".

According to this claim, stimuli such as *leevk* and *loovk* cannot distinguish between the two theories as a sound pattern such as *LEEVK* does not occur very often in the language and therefore necessarily also cannot be used as a modifier. Following discussions of many other details of both theories, Seidenberg et al. (2007: 287) claim that contrary to the morphological accounts, "there are phonological effects on modifier acceptability that cannot be subsumed by a grammatical rule". In reply to these objections, Berent and Pinker (2008: 184-185) argue that Seidenberg et al.'s computation model "has nothing to do with compounds or their phonological, semantic or grammatical properties". They conclude that "regardless of what the best theory of interaction between regularity and compounding turns out to be, the effect of morphological regularity is genuine, and is not reducible to phonology or semantics" (Berent & Pinker, 2008: 185). Based on the above discussion, it is thus upheld that the avoidance of regular but not irregular plurals inside compounds in the elicited production paradigm is best characterised in terms of a *morphological* distinction between regular and irregular plural inflection (Berent & Pinker, 2008).

As we have seen, previous studies on modifier constraints for compounds have largely relied on off-line acceptability judgements (e.g. Haskell et al., 2003) and off-line elicited production tasks (e.g., Gordon, 1985). It would be interesting to see how the compounding constraint against plurals inside compounds affects the time

course of language processing. This question has recently been investigated by Cunnings and Clahsen (2007). In an eye-movement study, Cunnings and Clahsen examined how morphological and semantic information become available over time during the processing of a compound by recording participants' eye-movements during reading. Two experiments were conducted: an acceptability judgement task to examine the role of morphological and semantic constraints in an offline task; and an eye-movement task which measured eye movements during reading to examine the time course of these constraints. The results of the first experiment were in line with previous findings from acceptability judgement tasks (e.g., Haskell et al., 2003) indicating a three-way distinction between the different types of non-head noun. Both regular and irregular plurals were judged less acceptable inside compounds than singulars, whilst regular plurals were less acceptable than irregular plurals. In the second experiment, participants were asked to read a series of short paragraphs containing the compounds from experiment 1, whilst their eye movements were measured. The results of this experiment also revealed a preference for singular non-heads inside compounds; and a dispreference for regular plurals inside compounds relative to irregular plural or singular non-heads. However, it is important to note that these results were not compatible with the accounts of Kiparsky (1982) or Pinker (1999) as participants did include regular plurals inside compounds.

Another study that might be relevant to our discussion of the dispreference of inflected forms inside compound nouns is Cunnings and Clahsen's (2008) in which they examined the effects of the compounding constraints on inflections inside derivations in English. More specifically, Cunnings and Clahsen investigated derived word forms containing regular and irregular plurals in order to see whether the constraints that prohibit regular plurals inside compounds have any general

significant beyond compounding. Clearly, there are a number of constraints in English that govern the way derivational affixes combine with each other. For instance, the suffixes *–less* and *–ness*, and *–ice* and *–ity* can be combined together as in *atom-less-ness, atom-ic-ity*. However, the combination *–less* + *–ity* is not well-formed in English, compare **atom-less-ity* with *atom-less-ness* (Cunnings & Clahsen 2008: 5). It appears that these combinatorial properties are subject to affix-specific selectional restrictions (Fabb, 1988; Plag, 1996; 1999; 2002). Furthermore, derivational processes are also subject to a general restriction that prohibits inflected forms inside derived words as in *flealess* vs. **fleasless*; *louseless* vs. ?*liceless* (Cunnings & Clahsen, 2008: 6). Cunnings and Clahsen point out that when native speakers of English are informally asked to choose between a regular or an irregular plural inside a derived form (e.g., **fleasless* vs.?*liceless),* they tend to prefer the latter to the former. As mentioned before, the nature of this constraint is controversial. Some researchers (e.g., Haskell et al., 2003) have argued that the dispreference of regular relative to irregular plurals inside compounds is due to the surface form properties of regular plurals, e.g., the dispreference of compound internal modifiers that end in *s* or *z* (Haskell et al., 2003). Berent and Pinker (2007), on the other hand, pointed out that there are a number of uninflected bare nouns that sound just like regular plurals, e.g., fox, box, hose, tax, etc. but they are perfectly acceptable inside compounds. Cunnings and Clahsen (2008: 7) argue that "the same contrast seems to hold for derived words. Compare, for example, **dogless* vs. *wolfless* and *foxless*, of which the latter two appear to be equally acceptable even though *foxless* has the same stem-final phonology as the ungrammatical regular plural (*dogs*) inside the derived word".

Two experiments were used to see how inflectional and derivational processes interact. Experiment 1 was an offline acceptability judgment task examining whether inflected forms inside derivations exhibit the same contrasts that have been found for plurals inside compounds. Precisely, the aim of this experiment was to investigate whether forms such as (i) *flealess*/*louseless*, (ii) *liceless*, (iii) *fleasless* exhibit the same distinctions in acceptability ratings that have previously been found for inflected and non-inflected forms inside compounds and whether the distinction between the regular and irregular forms is best characterized in morphological or phonological terms. 40 native English speakers took part in this experiment which was similar to the acceptability rating task from previous studies of compounding (e.g., Haskell et al., 2003; Berent & Pinker, 2007). Experiment 2 was an eye-movement task measuring eye movements during reading derived words containing regular and irregular plurals and uninflected base nouns. In this experiment, 24 participants were asked to read a series of paragraphs containing derived words similar to those tested in experiment 1 whilst their eye-movements were measured. The results from both experiments suggest that the constraint against plurals, especially regular plurals, inside compounds generalizes to derived words. In particular, the findings show that derived words containing singular base nouns (e.g., *ratless*) are preferred over those with plural ones. The results also showed derived words with regular plurals as base nouns (e.g., *ratsless*) were rated significantly worse than those with irregular plurals (e.g., *liceless).* Given these data, Cunnings and Clahsen argued that the contrast between regular and irregular plurals inside compounds and derived forms cannot be explained in phonological terms.

An alternative account is offered by Ramscar and Dye (2010) who argued that children (and adults) are claimed to dislike both regular and irregular plurals inside

compounds because they do not hear them in the input. As discussed above, results of previous studies (e.g., Alegre & Gordon, 1996) have shown that both adult and child English speakers prefer the non-recursive interpretation for compounds containing singulars (e.g., *red rat eater*) but they prefer the recursive reading for compounds with regular plural non-heads (e.g., *red rats eater*). This contrast has been attributed to the morphological constraint against regular plurals inside compounds, which prohibits the non-recursive interpretation but allows the recursive one (Alegre & Gordon, 1996; Clahsen & Almazan, 2001). This account, however, has been criticised by Ramscar and Dye (2010). They pointed out that in Alegre and Gordon's study children were only presented with multiple items depicting the non-head noun and single objects for the head: in the case of *red rats eater*, there were multiple *rats* and only a single *eater*. Therefore, Ramscar and Dye argued that this may have caused bias towards the recursive interpretation in the plural condition. Ramscar and Dye (2010) conducted four offline experiments with a similar design as Alegre and Gordon's (1996) original study, but with some modifications. It is important to note that Alegre and Gordon examined how children interpreted regular plurals in adjective-noun-noun compounds but they did not examine whether these same children interpreted irregular plurals any differently. Therefore, Ramscar and Dye investigated whether the interpretations of *red rats*/*rat eater* differ qualitatively from the interpretations of *red mice*/*mouse eater* by including picture stimuli with single items for the non-head noun and compounds with irregular plural non-heads (*mice eater*), rather than just regular and singular nouns.

Results revealed that 3-to-5-year-old children did show a preference for recursive interpretation for compounds with plural (relative to singular) non-heads. Contrary to the predictions of level-ordering, the results indicate that the irregular

plurals inside compounds are not processed and interpreted qualitatively differently from regular plurals inside compounds by English speakers. That is, the regularity of nouns does not determine the acceptability of their plural forms in compounds. These results led Ramscar and Dye to argue that the modifier interpretation preference for compounds is due to 'conventions' that are directly learned from the input that disallow both regular and irregular plurals from compounds.

This account, however, is still unconvincing as it cannot explain why regular plurals are rated worse than singulars and irregular plurals inside compounds (Silva et al., 2013). Furthermore, Ramscar and Dye (2010) do not provide an explanation for why regular plurals are not permitted inside compounds.

Finally, the assumption that learners generalize properties of modifiers to nonhead nouns was further examined using possessive constructions in English because Haskell et al. (2003) suggested that the homophony of the plural and possessive forms might account for the relative acceptability of the plural marking of non-head nouns such as *pilots union*. Haskell et al. (2003) claimed that the semantic properties proposed by Alegre and Gordon (1996, 1999) cannot explain why compounds such as *pilots union* are acceptable whereas compounds such as *rats eater* are not. Therefore, they claimed that since English possessive constructions are similar to regular plurals inside compounds (e.g., *dogs* and *dog's*), learners often hear forms that might be indistinguishable from a plural modifier (e.g., the *dog's leash* versus the *dogs leash*). However, Haskell et al. predicted that as the use of the possessive form is largely limited to animate nouns (and usually humans), the homophony between the English possessive and regular plural suffixes could increase the acceptability of regular plural animate nouns as non-heads inside compounds. That is, plural non-heads inside compounds will be more acceptable if they are

animate. Since English speakers are sometimes exposed to non-plural but plural-sounding forms in the modifier position, Haskell et al. argued that such experience may make plural-sounding prenominal modifiers somewhat less atypical, and thereby more acceptable. While this proposal can provide an explanation for the acceptability of a compound noun such as *pilots union*, it should be noted that Haskell et al. and Senghas et al. (2005) themselves used animate non-heads in their list of experimental items (e.g., *rats, ducks, boys, leaders* etc), and the results showed that these nouns were similar to other regular plural nouns, disfavoured inside compounds (Cunnings, 2008). Following this discussion, we argue that morphology (i.e. the regularity) is more likely to taint the acceptability of a compound than phonology (regular-sounding nouns).

After this overview of off-line acceptability judgements (e.g., Haskell et al., 2003), off-line elicited production tasks (e.g., Gordon 1985), and eye-movement tasks (e.g., Cunnings & Clahsen, 2007), we conclude that Haskell et al.'s proposal appears to be insufficient to explain the compounding facts. This, however, does not mean that level-ordering is supported. It is clear that plural non-heads of all types appear to be disfavoured (not prohibited) inside compounds, although irregular plurals inside compounds are more acceptable than regulars. It remains controversial, however, why there seems to be a distinction between regular and irregular plurals. Thus, this thesis will further address these issues by testing a group of L2 learners using two tasks. Before that, however, we briefly discuss the different theories that have been proposed to account for the different pluralisation properties of synthetic and root compounds. In addition, we outline our assumptions about synthetic and root compounding in Arabic and English.

3.9 THE DERIVATION OF COMPOUND NOUNS IN ENGLISH AND ARABIC

In this section, we discuss the theoretical approach that will be adopted in analysing synthetic compounds. Before that, an overview is given of recent accounts of these compounds in Arabic and English. It is important to note that there is no general consensus on whether synthetic and root compounding is a syntactic or lexical phenomenon (see Spencer, 1991; and Lardiere, 1994 for many references). Within the framework of Generative Grammar, two groups of theories have been proposed to explain the compounding facts: transformationalist theories and lexicalist theories (see Spencer (1991) for a detailed review of these approaches).

Lees (1960) proposes an account of nominal compounds within the early Transformational Grammar framework. Lees suggests that English nominal compounds are generated from kernel sentences by a sequence of transformations. Thus, this account is built around the grammatical relation between the compound components: the modifying noun and the head noun. The example in (14) shows how this kernel-based approach works:

(14) puppydog: ..... dog which is a puppy
..... dog which is puppy ...
..... puppy dog ....

This type of compound corresponds to a subject-predicate sentence. It could also correspond to a subject-object sentence as in the example in (15):

(15) onion peel: the onion has a peel

... the onion's peel ....

... the peel of the onion ....

... the onion peel ....

(Taken from Lees, 1960: 123)

Lees also maintains that if the meaning of a compound is ambiguous, it can be derived in a number of different ways. For instance, *snake poison* can be derived from at least three different sentences: 'the *poison* is from the *snake*'; 'the *snake* has the *poison';* 'the *poison* is for the *snake'.* This approach, however, received fierce criticism because the rules for deriving compound nouns from underlying structures by transformations appear to be arbitrary. There may be an indefinite number of verbs that could have been deleted before generating a compound noun. For instance, is *police dog* derived from an underlying "the *dog* serves the *police*", "the *police* use the *dog"*, "the *dog* works with the *police*", "*the police* work with *the dog*" or from other different sentences? (Bauer, 1983: 160). Thus, it is sometimes possible for a compound noun to have more than one function or predicate. In addition, Allen (1978) indicated that "many of Lees' sentences are not paraphrases of the derived compounds, for example, a *blackboard* need not be black as might follow from the kernel sentence 'the board is black". Likewise, *blackmail* is not a *mail* which is *black*, *easy chair* is not a *chair* that is *easy*, *short bread* is not *bread* that is *short*. This shows that transformations are not meaning preserving. A further problem with Lee's approach is that it requires a good deal of deletion of constituents which might not have been there in the first place (Allen, 1978). For example, to derive *windmill* from

the underlying sentence *wind powers the mill*, the verb *power* has to be deleted, while to form the compound *car thief*, the verb *steal* has to be deleted.

Levi (1978) proposed a different account based on a set of predicates. Unlike Lees, Levi distinguishes between root and synthetic compounds and argues that all compound nouns can be derived from an underlying predicate (relative clauses or complement structures) by means of two syntactic processes: predicate deletion and predicate nominalization. Levi claims that synthetic compounds are derived by the predicate nominalization process in which the verb is nominalised. For example, *"X drives trucks*" ⇨ *truck driver.* As for the root compounds, she assumes that they are derived by the predicate deletion process in which an underlying relative clause is transformed into a nominal compound by means of a set of nine recoverably deletable predications: CAUSE, HAVE, MAKE, USE, BE, IN, FOR, FROM and ABOUT. These predicates are deleted from the underlying relative clause when forming the compound. *Field mouse* is derived from a *mouse* which is in the *field*, by predicate deletion of *in*. *Picture book* is derived from a *book* which has *pictures*, by predicate deletion of *has*.

This account, however, was criticised for the fact that it cannot be applied universally as the idea of a limited set of predicates cannot account for all compound cases, like exocentric compounds for instance. Exocentric compounds are connections of two lexemes that do not consist of a head and a dependent (i.e., lacking a head) as in *egghead, pickpocket, sell-out* ...etc. As we have said earlier, the interpretation of root compounds is not transparent and therefore it is difficult to identify the relationship between the compound components based on this set of recoverably deletable predications. Coulson (2001) notes that the predicates Levi proposes are so general in meaning that they do not denote unitary concepts. Thus,

while *headache pills* and *fertility pills* entail the predicate *for,* they have different interpretations: *fertility pills* can help increase fertility; *headache pills* are taken to relieve the headache (Benczes, 2006: 27).

As for the lexicalist theories, these are represented by the works of Roeper and Siegel (1978), Selkirk (1982), Lieber (1983), and Di Sciullo and Williams (1987) which were influenced by Chomsky's (1970) 'nominalization' hypothesis. This hypothesis states that only lexical rules, not transformational rules, are involved in the formation of complex and compound words. Roeper and Siegel (1978: 208), for example, proposed that compounds like *truck driver* can be derived from the underlying lexical representation of *drive trucks* by means of a lexical transformational rule, which operates on subcategorization frames, and, in the case of synthetic compounds, obeys the following principle:

(16) **First Sister (FS) Principle:**

All verbal compounds are formed by incorporation of a word in first sister position of the verb.

That is, if a noun, adjective or adverb is an acceptable complement to a verb when it occurs in a sentence, the same noun, adjective or adverb will be acceptable as a first stem when the verb occurs in a synthetic compound: *he made peace→ peacemaker*, but **he thought peace → *peacethinker*.

Having discussed different analyses that have been proposed to account for compounding in English, in the following section we present an overview of the

compounding facts in Libyan Arabic, comparing them with English, and then the analysis that will be assumed for the formation of root and synthetic compounds in both languages will be presented.

3.10 COMPOUNDS IN ENGLISH AND ARABIC

Selkirk (1982) notes that most of the English (endocentric) compounds are right-headed. According to Selkirk, the head of a compound noun can be determined by the Right-hand Head Rule (RHR), a modified version of the rule that was first proposed by Williams (1981). It states that:

(17) **Right-hand Head Rule:**

In morphology, we define the head of a morphologically complex word to be the right-hand member of that word (Williams, 1981: 248).

However, Selkirk herself points out that the RHR is not universal as it applies to English compounds, but probably to few other languages. Thus, compounds in other languages may exhibit other morphological properties. For example, while in English the head is usually the second element (few compounds are left-headed), in other languages such as Spanish (18) and Modern Standard Arabic (19) the head is the first element.[2]

[2] For the present purposes, compounds in English will still be considered to be right-headed whilst Arabic compounds are left-headed because all the English compounds used in the experimental items are clearly right-headed.

(18)

	Spanish	English
a.	un lavaplatos	a dishwasher
	un lav -a plato -s	
	a wash -3sg plate -pl	
	`a dishwasher'	
b.	un abrelatas	a can-opener
	un abr -e lata -s	
	an open -3sg can -pl	
	`a can-opener'	
c.	un pierdeplumas	a pen-loser
	un pierd -e pluma -s	
	a lose -3sg pen -pl	
	`a pen-loser'	

(Taken from Lardiere & Schwartz, 1997: 329).

(19)

	Modern Standard Arabic		English
a.	ġassa:lat ’aṭba:q		dish washer
	Washer-sing dishes-pl		
	‘dish-washer’		
b.	du:la:b	’aħdiyah	shoe cupboard
	cupboard-sing	shoes-pl	
	‘shoe cupboard’		

As the examples in (19) show, in Arabic a noun may be added to another noun in a relationship where the second noun modifies the first and thus the two nouns function as one phrase or syntatic unit (Ryding, 2005). Arab grammarians use the term /*id*a:*f*a/ to describe this process. Some researchers (e.g., Wehr, 1994) use different English words for the term */id*a:*f*a/'annexation' or genitive construct. The first noun, the head, is referred to as / a*l-mu:d*a:*f*/ 'annexed' and the second noun, the non-head, is referred to as /a*l-mu:d*a:*f il*a*yh*/ 'annexing'. Furthermore, the first noun (as in (19a)) /*ġ*a*ss*a:*l*a*t* / 'washer' never takes the definite article because it is in an "annexed" state, determined by the second noun (Ryding, 2005: 205).

In English, the equivalents to the Arabic genitive construct might be structures where two nouns occur together with one defining the other: *coffee cup, university library, school bus* (Ryding, 2005). Another English equivalent to the Arabic construct phrase is the 'of' construction (e.g., /*kit*a:*bu* a-*rr*a*ju*l*i*/ 'the book of the man') or the possessive suffix /-'s/ (e.g., */kit*a:*bu* a-*rr*a*ju*l*i* / 'the man's book'). It should be noted that the most common way of describing possession in Arabic is close to the 'of' construction in that the word for "*book*" would come first followed by the word for "*man*". The difference is that the two words are put directly together (the meaning of "of" is understood) and only the last word can be marked either with indefiniteness or definiteness (with the article /-al/ 'the').

As in Modern standard Arabic (MSA), compound nouns in Libyan Arabic are left-headed as shown in (20):

(20)	Libyan Arabic		English
a.	ġassa:lit	ṣwa:ni	dishwasher
	Washer-sing	dishes-pl	
	‘dish-washer’		
b.	du:la:b	’aħdiya	shoe cupboard
	cupboard-sing	shoes-pl	
	‘shoe cupboard’		

In both languages (Libyan Arabic and English), synthetic compounds are deverbal nominalizations consisting of a head (e.g., ġassa:lit/*washer*) and a direct object (ṣwa:ni*/dishes*). However, in English the non-head word does not have a definite reference: it is always generic denoting a type of entity rather than a specific entity (Di Sciullo & Williams, 1987). In Arabic, the non-head noun can have the definite article /-al/ ‘the’ as shown in the examples in (21b):

(21) a. du:la:b ’aħdiya

cupboard-sing shoes-pl

‘shoe cupboard’

b. du:la:b al-’aħdiya

cupboard-sing the-shoes-pl

‘dish washer’

Furthermore, in synthetic compounds, the head is derived by affixation from a verb. For example, in English *dish washer* has the interpretation of "something that washes dishes"; the whole compound refers to the person or implement which does the action of the predicate. Arabic synthetic compounds function in an identical manner. For example, the compound *word ġassa:lat ʾaṭba:q* 'dish washer' consists of a noun and a derived noun out of the verb *ġasala* 'washed'. It should be noted that Arabic synthetic compounds are formed by adding some class changing affixes to the root (which is often triliteral) (m, w, x, a, t) *qatala* 'killed'; *qa:til* / 'killer'. Furthermore, compounds in Libyan Arabic differ from English in that the non-head object is pluralized in most cases:

(22) a. furʃit snu:n
brush- sing teeth-pl
"toothbrush"

b. * furʃit sin
brush.sing tooth-sing
'toothbrush'

It is also noteworthy that while compounding is productive in English, Arabic makes very limited use of compounding: there are many types of English compounds which have no equivalents in Arabic. However, the *ida:fa* might be used as the equivalent of a compound noun.

As discussed above, synthetic compounds are only those compounds in which the non-head satisfies the head's argument structure (Roeper & Siegel, 1978; Selkirk, 1982). Furthermore, following proposals by Roeper (1988) and Keyser and Roeper (1992), we assume that the non-head moves into the verb and this movement "takes the form of incorporation' (Keyser & Roeper, 1992: 104). This process of incorporation will lead to the deletion of the plural inflection of the noun (Keyser & Roeper, 1992: 101). As for irregular plurals, we assume that since they are represented as stored words in the lexicon, not formed by a rule as regular plurals, they may optionally occur inside compounds (Pinker & Prince, 1992; 1999). In the formation of the Arabic synthetic compounds- in contrast to what happens in English- the first sister of the verb does not move to incorporate into the head:

(23) a. ġasala al-'aṭba:q Modern Standard Arabic
(he) washed the-dishes-pl

'he washed the dishes'

b. ġassa:lat 'aṭba:q
Washer-sing dishes-pl
'dish-washer'

Therefore, plurals are allowed to attach to the non-head noun in Arabic synthetic compounds.

With regard to root compounds, Roeper, Snyder and Hiramatsu (2002), following Chomsky (1970), Baker (1988) and Lieber (1992), assume that it occurs in

the syntax and productive root compounding is generated by “set merger” (one of Chomsky’s (1998) proposed minimalist syntactic operations) which is applied to a pair of non-maximal projections. In other words, they are formed by merging two open-class words. It should be noted, however, that this is not a universal of human language as the production of root compounds is subject to cross-linguistic variation. Bauer (1978), for example, argues that French compounds differ from English in that they are not productive and are only “...limited to frozen forms and self-conscious coinages”. In English, *frog man* can be used in a lexical sense (‘undersea diver’) and it can have novel “alternative readings”, according to context, as illustrated in (24a). In contrast, compounds in French and Arabic have only the lexical sense (24b-c) and the novel sense “would require a deliberate, self-conscious act of coinage”.

(24) a. English: frog man [= 'undersea diver', or 'man who collects frogs', or 'man resembling a frog', or 'man who sells statues of frogs', etc., ad infinitum]

b. French: homme grenouille (lit. 'man frog') [= 'undersea diver']

c. Arabic: ḍifdaʕ baʃari (lit. frog human) [= undersea diver]

Therefore, Roeper et al. (2002: 2) propose a Root Compounding Parameter (RCP) to account for the fact that while in some of the world’s languages root compounding is productive ,in others it is not:

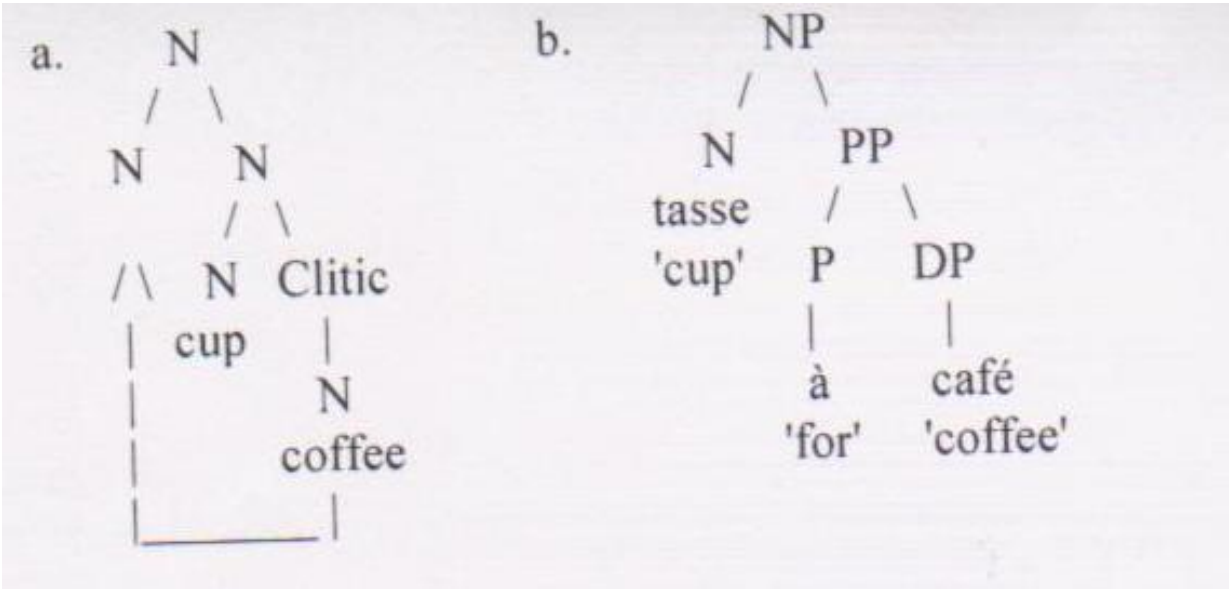
(25) **Root Compounding Parameter** RCP:
Set-merger can (not) combine non-maximal projections.

The RCP is a morphological parameter stating that some languages permit set-merger (Chomsky, 1998; 2000; 2001) of two lexical items *a* and *b,* where *a* is the head and b

is the complement. According to Roeper et al., in languages where the RCP receives a positive value (non-maximal projections can be combined by set-merger to create NN compounds) this is implemented through merging one of the nouns with an 'abstract clitic'. It should be noted that the term 'clitic' is used in a different sense here (this term is related to Keyser and Roeper's (1992: 89) Abstract Clitic hypothesis).

Thus, a two-member root compound noun such as *coffee cup* can be formed as shown in (27). Set merger first produces a structure similar to the French phrasal expression *tasse à café* (lit. 'cup for coffee'). However, because nouns cannot directly license complements, and there is no preposition in English to license *coffee* as a complement to *cup*, it moves from the clitic position to attach to the N node. The trace of *coffee* is deleted as it has no semantic content:

(27)

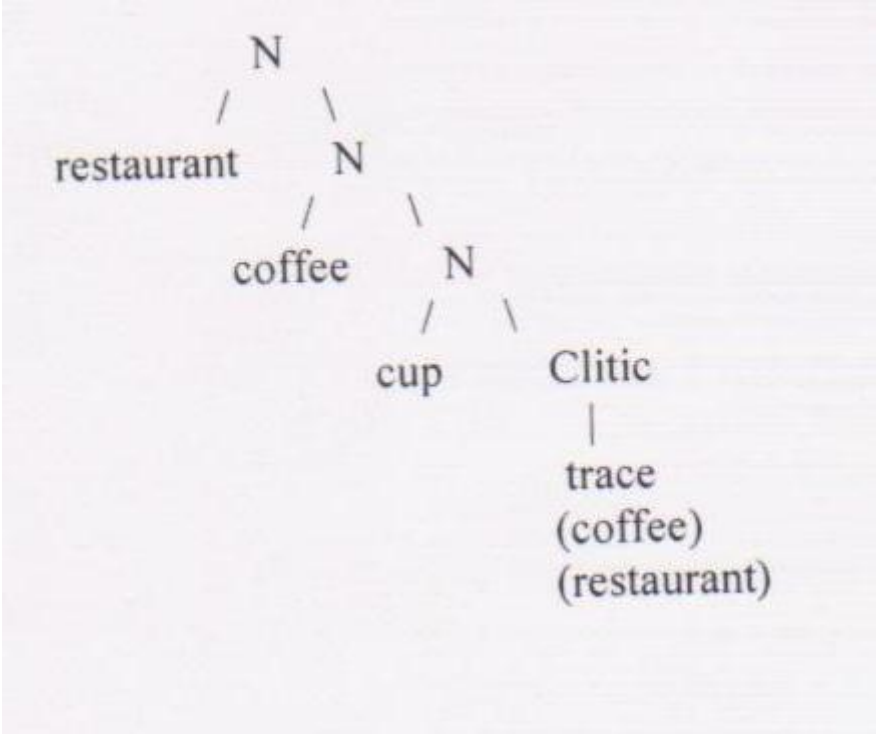


(Taken from Roeper et al., 2002: 7)

To form a compound consisting of three constituents headed by *a*, a new lexical item *c* is inserted in the position of the trace *b* after deleting the trace, and then

the new lexical item is merged with the compound word already derived. Insertion of a new lexical item in the clitic position, such as restaurant, derives the new compound word *restaurant coffee cup*, as in (28):

(28)



(Taken from Roeper et al., 2002: 7)

As shown in the tree in (28), the trace of *coffee* is deleted first and then the other lexical item, *restaurant,* is entered in the Clitic position and moved to a higher position to make another projection. According to this account, since the Root Compounding Parameter is positive in English, recursive compound words with an unlimited number of lexical items are allowed as long as they are nouns. That is, only nouns can be deleted as they, unlike other lexical items such as verbs, are not theta-marked.

One criticism to this approach is that it does not tell us anything about regular plurals inside compounds (e.g., *Christmas-es cookie) (Mukai, 2004). However, a possible solution to this problem is to assume that the lexical element in the clitic position is only a root, not a stem with an inflection marker (Mukai, 2004). In Arabic, unlike English, there is no movement to derive a root compound word.

To sum up, the formation of compound words in Libyan Arabic and English differs. In English synthetic compound nouns, the first sister to a verb is incorporated by that verb when it is nominalized, and becomes a non-head modifier. The non-head is preferentially singular, but irregular plurals (like *mice eater*) are also acceptable. Regular plurals (like **cars washer*) are strongly dispreferred because incorporation occurs in the grammar before inflectional rules apply. Arabic synthetic compounds are not formed by incorporation. The first sister to the verb remains in postverbal position, and when the first sister is a noun that noun can take a plural inflection. In the case of root compound nouns, in English this process is productive with the compounds thus created having a range of potential meanings (e.g. *frog-man* 'diver/man who breeds frogs/man who writes about frogs/man who resembles frogs', etc). The non-head noun in such compounds may take a regular plural inflection (e.g. *pilots union, drinks cabinet*). According to Roeper, Snyder and Hiramatsu (2002), such compounds result from set-merger of non-maximal projections, the result of a morphological abstract clitic. In Arabic, root compounds are non-productive, and when they do occur they have conventionalised meanings and do not allow a range of potential other meanings (e.g. ḍifdaʕ baʃari (lit. frog human) = 'undersea diver' only).

3.11 THE ANALYSIS THAT WILL BE ASSUMED FOR THE STUDY OF THE L2 ACQUISITION OF ENGLISH BY ARABIC SPEAKERS

Having discussed the properties of root and synthetic compounds in English and Arabic, it will be assumed here, for the purposes of the investigation of L1 influence and the role of UG in SLA on lexical processes, that the differences between Arabic and English in the structure of their nominal compounds can be characterised by parameterized options which English and Arabic have set differently. The formation of synthetic compounds is regulated by a parametric version of the First Sister Principle:

Incorporation of First Sister Parameter:

Deverbal compound nouns can(not) be formed by incorporation of the verb's first sister.

English has set the parameter to the 'can' value, Arabic has set the parameter to the 'cannot' value.

The formation of root compounds is regulated by the Root Compound Parameter, as discussed above. In this case, English has set the value of the parameter to 'can' (combine non-maximal projections through set-merger), Arabic has set the value to 'cannot'.

By assuming that the differences in noun compounding between English and Arabic are determined by parametric choices allows the investigation both of L1 transfer and UG-constrained development of grammatical knowledge. If L1 transfer is involved in early L2 development, we would expect to see Arabic-speaking

learners of English allowing types of compounding that occur in Arabic and disallowing types of compounding that occur in English. If development of knowledge with proficiency is constrained by UG, as learners begin to acquire the types of compound nouns that occur in English, we would expect their grammars to show evidence that they are constrained by UG, specifically that singular non-heads are the preferred option in synthetic compounds and regular plurals are disallowed (with some limited acceptance of irregular plurals). Furthermore, one of type of evidence that demonstrates the possible implication of UG in the development of interlanguage grammars is "resetting a parameter to a new value". If Arabic learners of English have access to UG, they should eventually acquire the properties of English synthetic and root compounds as a result of resetting the values of the Incorporation of First Sister Parameter and the Root Compounding Parameter.

CHAPTER 4
TESTING THE ACQUISITION OF ENGLISH PLURAL FORMATION AND COMPOUNDING BY L1 SPEAKERS OF LIBYAN ARABIC

4.0 INTRODUCTION

The study reported in this chapter aims to explore further the apparent discrepancy between L1 and L2 acquisition with respect to compounding and inflection. As discussed in the previous chapter, there is clear evidence that plural modifiers in general cannot freely occur inside compounds in English, and some other languages as well. More specifically, it seems that regular plurals are disfavoured inside compounds relative to irregular plurals. However, a number of studies (e.g., Lardiere, 1995; Murphy, 2000) have found that both regular and irregular plurals are allowed inside compounds by L2 learners. In this chapter, we further investigate this issue by examining the acquisition of English plurality and compound formation by L1 speakers of Libyan Arabic to find out : i) whether they produce plurals inside compounds; ii) whether they treat regular and irregular plurals differently when generating synthetic compounds; iii) whether there is a difference in the marking of the non-head between root and synthetic compounds; and iv) whether proficiency affects the kinds of English compound nouns that Libyan Arabic speakers produce.

Two tasks were designed. The aim of the first experiment was to elicit spontaneously-produced English compounds from participants. It is carried out along the lines of Gordon's (1985) study so that we can compare Gordon's results for L1 speakers with our results on L2 speakers. The second experiment was a forced-choice gap-filling task whose aim was to elicit intuitions about the form that compounds take

in English. Each task tests the acquisition of English plural formation and compounding by Arabic native speakers from different perspectives. The idea of using two tasks was to discover whether participants' comprehension knowledge of the structure of compounds differed from their use of such forms in production, and whether this relationship changes with proficiency. As White (2003: 17) puts it "when results from different tasks and different groups of learners show the same trends, this suggests that we are indeed gaining insight (indirectly) into the nature of the underlying linguistic competence".

The chapter is divided as follows. Section 4.1 gives a summary of compounding facts in Arabic and English. In section 4.1.1, we lay out the research questions and general hypotheses underlying the study. Sections 4.2 and 4.2.1 present the first experiment: an elicited production task. They describe participants, procedure, and materials. Section 4.2.2 presents the results of the first experiment. The second experiment, forced-choice gap-filling task, is presented in sections 4.3 and 4.3.1, including subjects, test procedure, and materials. The results of this experiment are presented in 4.3.2. A comparison is made between the results of both tasks in 4.4.

4.1 SUMMARY OF COMPOUND FORMATION IN ARABIC AND ENGLISH

Before formulating the general hypotheses underlying the two experiments, the compounding facts in Arabic and English are summarized in table (3) (see chapter 3.10 for examples):

Table 3. Compounding facts in Arabic and English

Feature	**Root**		**Synthetic**	
	English	**Arabic**	**English**	**Arabic**
Non-head word	Mostly singular	Mostly plural	Mostly singular	Mostly plural
Generic	Yes	Yes	Yes	Yes
Productivity	Yes	No	Yes	No
Headedness	Right-headed	Left-headed	Right-headed	Left-headed

4.1.1 RESEARCH QUESTIONS AND HYPOTHESES

The experiment is designed to test Arabic speakers' acquisition of inflectional morphology and compounding. Following our discussion of L1 and L2 research on compounding and plurality, four research questions arise:

(i) Will Arabic-speaking learners transfer the structure of compound nouns in Arabic into their L2 English grammars?

(ii) Do Arabic learners of English differ from native speakers in the degree to which they allow regular plurals to appear in English synthetic and root compounds?

(iii) Do Arabic learners and native speakers treat English regular and irregular plurals differently when producing synthetic compounds?

(iv) Does proficiency play a role in determining the kinds of English compounds allowed by Arabic-speaking learners?

Hypothesis 1:

Since the non-head in Arabic compounds is often plural and the canonical word order is also different, if there is L1 transfer Arabic-speaking learners of English are predicted to transfer the word order from their L1 and produce compounds such as "**washer dishes*" suggesting that they have acquired neither the inflectional properties nor the syntactic structure of compounds in English.

In accordance with the claim of level-ordering as a universal (and possibly innate) property of the language faculty (e.g., Gordon, 1985; Pinker, 1999), once L1 speakers of Arabic acquire the target structure of English synthetic compounds, they should obey level-ordering and disallow non-head nouns marked for regular plural. According to this view, then, L2 learners will be able to observe the difference between English and Arabic in terms of compound formation and will behave as L1 learners do.

It is predicted that less proficient learners are more likely to be affected by the L1 than more proficient learners who may overcome the L1 effect via UG access and L2 input. Recall that Lardiere & Schwartz (1997) have found that this type of error decreases over time, disappearing at the most advanced level. In short, native speakers are expected to produce the required response 100%, and L2 learners are expected to have some difficulties with the English word-order but more proficient learners will be more accurate than less proficient.

Hypothesis 2:

Since by hypothesis irregular plural nouns are stored along with noun stems, both should be available as non-heads in compound formation. It is predicted that both native speakers and L2 learners will be more likely to allow irregular than regular plurals inside compounds. Previous studies (e.g., Lardiere, 1995a; Murphy, 2000) have shown that although learners include regular plurals inside compounds, they also allow more irregular plurals than regulars.

Hypothesis 3:

Lardiere (1995b) noted that when children produce regular plurals inside compounds, these instances occur only in root compounds and not in synthetic compounds, since root compound formation does not involve level-ordering. If L2 learners are sensitive to level-ordering it is predicted that Arabic-speaking learners will also allow more regular plurals in root compounds than in synthetic compounds.

4.2 EXPERIMENT 1: ELICITED PRODUCTION TASK

This study tests the acquisition of English plural formation and compounding by L1 speakers of Libyan Arabic. Participant groups were chosen to potentially represent different levels of proficiency. The lower proficiency group needed to have had enough exposure to English to have encountered compounds, but not enough to have acquired target-like representations. This would allow us to track the development of knowledge of these forms, assess the influence of the L1 and access to principles of UG (such as level ordering). As for the task, a variant of Gordon's

(1985) elicited production task was used and the aim was to compare Gordon's results on L1 speakers of English with those on L2 speakers.

4.2.1 METHOD

Participants

39 undergraduate college students participated in the study. They were all native speakers of Libyan Arabic and they were studying English in the department of English at Almergeb University. There were 21 first-year students: 9 males and 12 females; and 18 fourth-year students: 6 males, 12 females. The mean age was (19.3) for the first year students and (21.2) for the fourth-year. There was also a control group of 10 native speakers of English who were students at the University of Essex with little to no training in linguistics. The non-native speakers' proficiency level was determined based on their university course results and their teachers' evaluation report. Furthermore, students had to pass an entry test in order to be accepted in the department of English. We had a copy of this test and made sure to choose only the subjects who scored 75-85% from first-year students and 85-100% from fourth-year students (the rationale being that students with a score of 75-85% would have encountered compound nouns already, and that students with a test entry score of 85-100% in the fourth year of a degree programme would be likely to be noticeably more proficient than the other group). None of the participants had dyslexia or sight problems. Of the 39 Arabic- speaking learners, 1 participant reported that they spoke foreign languages other than English (Italian). The learners had started learning English, on average, around the age of 12 in a classroom setting but none of them

reported having lived in an English-speaking country prior to the test. Most of these learners reported taking extra English lessons in private language institutes, on top of their full-time regular English instruction offered at the university.[3] The lecturers were native Arabic speakers but the language of instruction was English. Arabic was used only occasionally. All participants had no idea about the ultimate purpose of the study. The Arabic participants were not paid but they were offered feedback on their performance. As for the native speakers, they were given a sum of money. It should be noted that three first-year students were dropped because one could not complete the test and two because of poor performance.

Materials

This task consisted of 28 pictures depicting people, animals or objects in various situations that could potentially be described by compounds, for example someone washing cars (*car-washer*), something catching mice (*mouse-/mice-catcher*), somewhere to put plates (*plate cupboard*) and so on. The experimenter introduced the task to participants by saying: "I am going to show you some pictures of some things or people and I will ask you to give a name to the person or thing in the picture". The pictures were selected to elicit three types of compounds:

[3] Prior to the test, participants were asked to fill in a questionnaire about their language learning and background in order to see if there was any effect of their language background on their performance. It turned out that there was no particular effect of it. Thus, the data is not included in the analysis. The linguistic background questionnaire can be checked in appendix A.

(i) Synthetic compounds (k = 12)

This group of pictures was subdivided into those intended to elicit compounds with a non-head noun that has a regular plural form, and those intended to elicit compounds with a non-head noun that has an irregular plural form. Recall that whereas the regular plural form is impossible inside compounds, irregular plural forms are optionally allowed. The pictures used in the test described situations that correspond to the following compounds:

a. Regular compounds

car washer	stamp collector	dog handler
story teller	shoe polisher	can opener

b. Irregular compounds:

mouse catcher	louse hater	child lover
goose chaser	mouse killer	goose shooter

(ii) Root compounds (k = 6)

plate cupboard	shoe cupboard	key cupboard
letter box	pen box	toy box

(iii) Fillers (k = 10)

a. Pluralia tantum compounds

Munitions box	jeans maker	goods box

b. Deverbal and root compounds with mass non-head nouns (K=7)

pottery collector	beer drinker	salad lover
chocolate lover	cutlery seller	jewellery box
post box		

The pictures were randomised. Following the general introduction to the test, participants were shown pictures one by one (See appendix B for all the pictures that were used in the test). For each picture, the experimenter said "Do you know what this is?" and the participants were required to say what was depicted in the picture. To ensure that the participant correctly identified the situation, the experimenter said "Well, so we have a picture of someone …" where "… " was the specific situation depicted in each picture. Following this, the experimenter asked a further question. In the case of synthetic compounds the question was: "What could you call someone who collects stamps?" The expected answer was a synthetic compound noun. In the case of the other compounds the question was "What do you call a … in which you put …?", again where "… " refers to the particular situation depicted in the picture. The expected answer was a root compound. Two example items are given below. The first is a picture intended to elicit a synthetic compound response (1a), the second a root compound response (1b).

For example, while the experimenter showed them a picture of someone collecting stamps, with a question below the picture:

(1) a.

What could you call someone who collects stamps?

And the required response from the participants was:

"stamp collector"

With *root* and *non-count* compounds, the experimenter would ask the following question:

(1) b.

"What do you call a box in which you put toys?"

And again the required response was:

"toy box"

The materials used in the experiment are a mixture of both novel and existing lexical compounds. Novel compounds are words formed by a speaker to give a name to items that have no existing label. For instance, it is possible to refer to a person who chases geese as a *goose chaser*. Since there is no other lexical item to describe what this person does, a novel compound can be created (Grela et al., 2005). Lexical compounds, on the other hand, are existing lexical items (i.e., items, such as *bookshelf*, that have become an accepted part of the language). The presence of both existing and novel compounds provides a measure of the productivity of the compounding processes used by participants.

Procedure

Prior to the test, subjects were given all the non-head items that were used in the test to check whether there were any unfamiliar words to them and they were also given a copy of the test questions with pictures to look at while the experimenter read them aloud, to avoid potential comprehension problems. Initially, participants were trained to produce the required compounds using some examples. All the training items were non-count nouns: *Coke, coffee, wine, grass,* and all the test items were presented randomly to both groups. In order to minimize the possibility, noted by Gordon, that participants might become aware of the fact that plurality was the relevant variable, we varied the compound heads. Recall that Gordon used the synthetic head *eater* exclusively. Following Clark et al. (1986), Lardiere (1995a) and Clahsen et al. (1996), the head nouns used here were varied to include (*washer, collector,* etc.). The L2 learners were tested individually in a language lab and the native speakers were tested in a quiet room in the University of Essex. Subjects were required to respond to the experimenter's questions orally and their answers were audio recorded. It should be noted that the participants were not given corrective feedback on their performance during the experimental task. The test took about 30 minutes.

4.2.2 RESULTS

The purpose of the study was to investigate whether i) Libyan-Arabic-speaking learners of English will transfer the structure of compound nouns in Arabic into their L2 grammars for English; ii) native and non-native speakers differ in the degree to which they allow regular plurals to appear in English synthetic and root

compounds; iii) native and non-native speakers treat regular and irregular compounds differently in synthetic compounds; iv) proficiency plays a role in determining the kinds of compounds that Arabic-speaking L2 learners of English allow.

Response types to the stimulus items targeting regular plurals in synthetic compounds are presented in table 4, and root items in table 5:

Table 4. Results on test items eliciting synthetic compounds with regular non-heads

Stimulus sentence: What do you call someone who	Response type	1st years (N= 18)	4th years (N=18)	Native speakers (N= 10)
…washes cars (k=6)	Nsing-Ver Car washer	29/108 (27%)	30/108 (28%)	60/60 (100%)
	*Nplur-Ver *cars washer	67/108 (62%)	71/108 (66%)	0/60 (0%)
	*washer cars	12/108 (11%)	7/108 (6%)	0/60 (0%)

Table 5. Results on test items eliciting root compounds with regular non-heads

Stimulus sentence: What could you call	Response type	1st years (N=18)	4th years (N=18)	Native speakers (N=10)
…a cupboard in which you put plates (k=6)	Nsing-N Plate cupboard	9/108 (8%)	18/108 (17%)	60/60 100%
	*Nplur-N *plates cupboard	82/108 (76%)	89/108 (82%)	0/60 (0%)
	*cupboard plates	17/108 (16%)	1/108 (1%)	0/60 (0%)

As hypothesized, the native speakers produced the correct non-head+head form of the compounds 100% of the time. Surprisingly, the non-native speakers also produced the required nonhead+head form the majority of the time. (Surprising because it was predicted that Libyan Arabic speakers might transfer the structural form of Arabic compounds (head + non-head: *washer cars*) at lower proficiency levels). A Kruskal-Wallis test comparing the three groups (1st year, 4th year and native speaker controls) was carried out and yielded the following result: *washer cars* (χ^2 = 5.130, df, = 2, p = .077). As table 4 shows, there were few or no such cases in the sample: forms such as **washer cars* were produced 12/108 times compared to 7/108 by fourth- year students. This suggests that the Arabic-speaking participants are aware that in English deverbal synthetic compounds the first sister to the verb moves to a pre-verbal position.

If the non-head+head structure of English synthetic compounds involves incorporation of the non-head into the head, the level-ordering model would predict that participants should consistently produce singular forms inside compounds (e.g., *car washer)* and compounds of the form **cars washer* should not be found. Table 4 shows that native speakers produced no cases of regular plurals inside synthetic compounds (**cars washer)*. In contrast, regular plurals were frequently produced by L2 learners. An independent-samples Kruskal-Wallis test comparing the three groups (1st year, 4th year and native speaker controls) showed significant differences for regular synthetic compounds with the word order object verb (OV) *car washer* (χ^2 = 23.782, df, = 2, p < .001), *cars washer* (χ^2 = 23.839, df, = 2, p < .001).

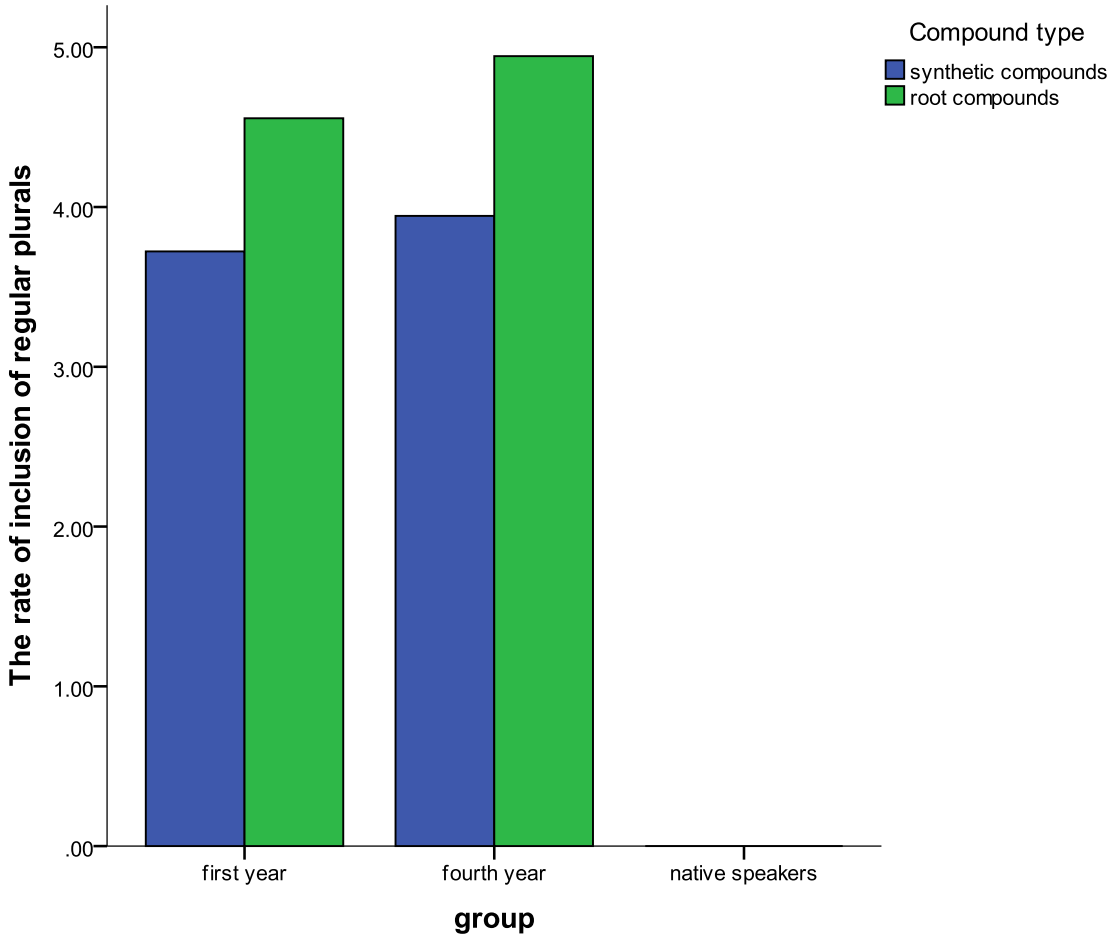
Furthermore, Mann-Whitney U-tests for two independent samples comparing (a) 1st years with native speakers, (b) 4th years with native speakers, (c) 1st years with 4th years found that the significant differences in all cases are between the Arabic-speaking group and the native speakers. The native speaker group produced no cases of plural inflection inside synthetic compounds but the Arabic-speaking group did. The absence of differences between the two Arabic-speaking groups on the Mann-Whitney U-test suggests no development of knowledge of the properties of synthetic compounds between 1st year and 4th year university level.

With root compounds, data from the native speakers showed that they did not include regulars inside compounds at all (see table 5). In contrast, both groups of L2 learners produced regular plurals inside root compounds. An independent-samples Kruskal-Wallis test comparing the three groups was carried out and found significant differences (*Plate cupboard* (χ^2 = 25.540, df, = 2, p < .001); *Plates cupboard* (χ^2 = 21.637, df, = 2, p < .001)). However, no significant differences were found between the two Arabic-speaking groups on Mann-Whitney U-tests for two independent samples.

As for the compounds with head + non-head order (e.g., *cupboard plates)*, there were no significant differences between the three groups on a Kruskal-Wallis test (χ^2 = 11.880, df, = 2, p = .003)). However, the least proficient L2 group (the first years) produced more compounds of the **cupboard plates* type (17/108) than the fourth year students (1/108). This might be a legacy of an earlier stage of transfer of the construction from the L1.

To summarize, Fig.3 shows that the native speakers never included a regular plural inside either type of compound. In contrast, the L2 learners produced regular plurals inside root and synthetic compounds. Furthermore, while there was no significant difference between the two groups of L2 learners, there were significant differences between the control group and the non-native speakers. The results also indicate that the L2 learners were more accurate with synthetic compounds than root compounds.

Fig. 3. The rate of inclusion of regular plurals inside root and synthetic compounds for native speakers and L2 learners



The third research question asks whether Arabic learners and native speakers treat regular and irregular plurals differently when producing synthetic compounds. Production of the two types of compounds is compared in table 6.

Table 6. Results on test items eliciting regular and irregular non-heads in synthetic compounds

Stimulus sentence: What do you call someone who	Response type	1st years (N= 18)	4th years (N=18)	Native speakers (N= 10)
…washes cars (k=6)	Nsing-Ver Car washer	29/108 (27%)	30/108 (28%)	60/60 (100%)
	*Nplur-Ver *cars washer	67/108 (62%)	71/108 (66%)	0/60 (0%)
	*washer cars	12/108 (11%)	7/108 (6 %)	0/60 (0%)
…catches mice (k=6)	Nsing-Ver Mouse catcher	0/108 (0%)	0/108 (0%)	47/60 (78%)
	Nplur-Ver Mice catcher	93/108 (86%)	105/108 (97%)	13/60 (22%)
	*Catcher mice	15/108 (14%)	3/108 (2.7%)	0/108 (0%)

It is clear that all three groups are producing more non-head irregular plurals proportionately than regular plurals, although the Arabic groups are producing many more examples than the native speakers. Non-parametric repeated-measures Wilcoxon signed-ranks tests were used to compare the rate of production of regular plurals to irregulars. The results show that there was a significant difference for every

group. That is, each group produced more irregular plurals than regular plurals in synthetic compounds: 1st years (z = 2.852, N-Ties = 16, p = .004); 4th years (z = 3.210, N-Ties = 13, p = .001) and native speakers (z = 2.739, N-Ties = 8, p = .006). Interestingly, the L2 learners did not produce any irregular singulars (e.g., *mouse catcher)* at all. As in the case of root compounds, the first year group produced more cases of head + non-head compounds, suggesting a lingering effect of the L1 construction in their L2 grammars.

In summary, Fig.4 shows that both native and non-native speakers allowed more irregular plurals in synthetic compounds than regular plurals, although in the case of the natives they categorically disallowed regular plurals, while both regular and irregular plurals predominate in the case of the L2 learners.

Fig. 4. The rate of inclusion of regular and irregular plurals inside synthetic compounds for native speakers and L2 learners

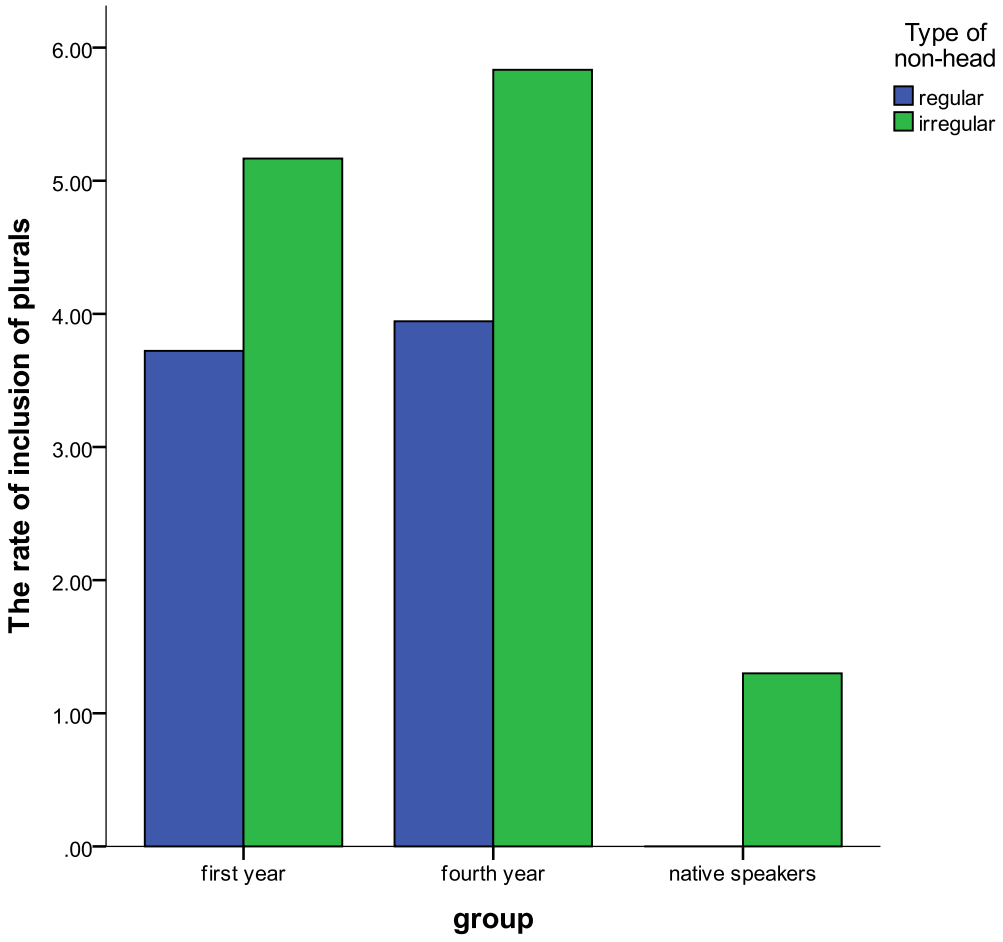
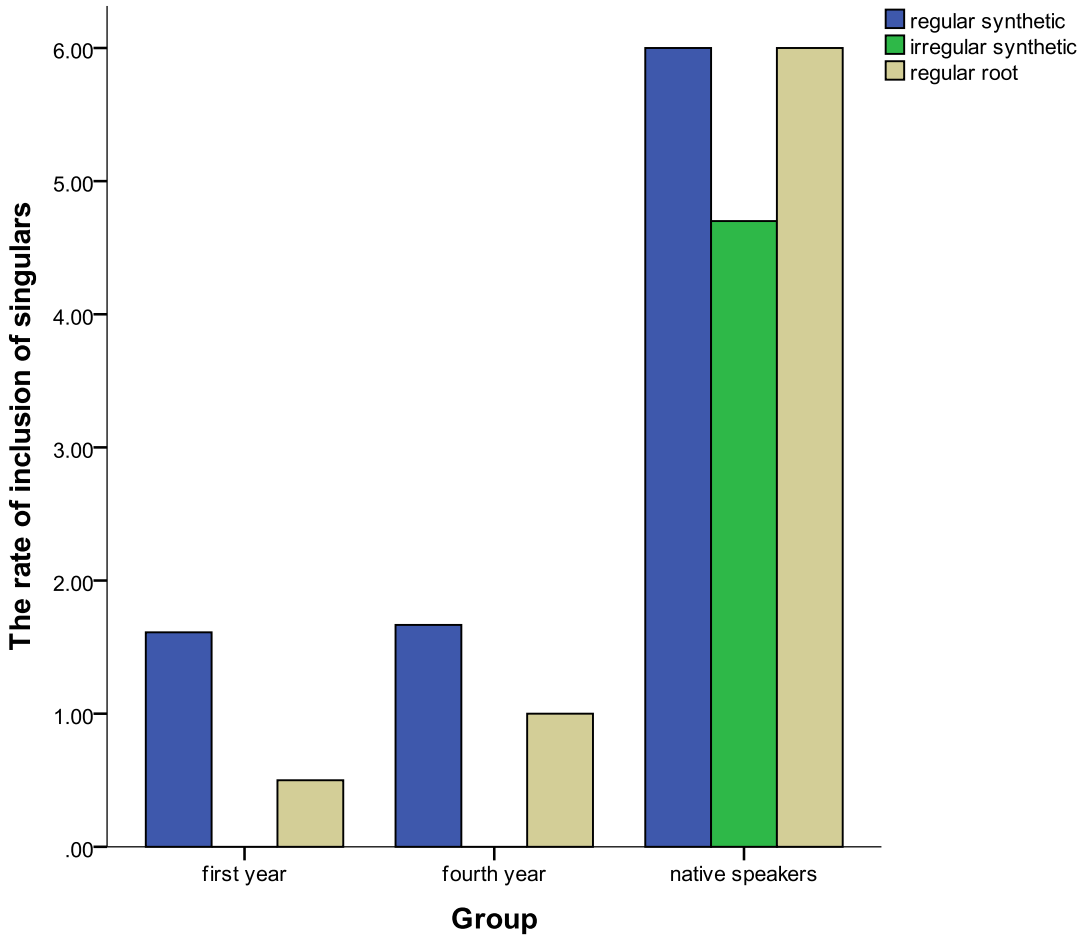


Figure 5 turns the data around and shows how many *singular* non-head nouns were allowed inside all the types of compounds by the native and non-native speakers.

Fig. 5. The rate of inclusion of singulars inside synthetic and root compounds for native speakers and L2 learners



As the graph shows, the native speakers did not include any regular plurals inside either root or synthetic compounds but they allowed a few irregulars. The L2 learners, however, produced fewer compounds with singular non-heads: they preferred compounds containing plural non-heads, with a greater tendency to produce a plural if it is irregular than if it is regular.

In relation to the fourth research question, it seems that proficiency had little effect on performance, as the inclusion of plurals inside compounds did not decrease significantly with proficiency. There were more cases of Arabic-like word-order -

**catcher mice* – in the less proficient first-year group, perhaps suggesting a persistent effect of L1 influence, but the difference was not significant.

Before discussing the implications of these findings, to control for possible task effects a second experiment was conducted using a different methodology. This is reported in the next section.

4.3. EXPERIMENT 2: FORCED-CHOICE GAP-FILLING TASK

To further explore the knowledge of compounds by L2 speakers, a different task was administered to two different groups of participants: native speakers of English and L1 speakers of Libyan Arabic. The purpose of this task was to rule out any artefacts that might stem from the particular technique of the first experiment. (Recall that in Gordon's study subjects were presented with plural non-heads, "what do you call someone who eats RATS?" and this could have influenced their responses). It should be noted that this task is similar to that used by Berent and Pinker (2007).

4.3.1 METHOD

Participants

Participants were 36 native speakers of Libyan Arabic, all undergraduate college students, studying English in the department of English at Almergeb University. They were divided into two groups: 18 first-year students: 8 males and 10 females; and 18 fourth-year students: 6 males, 12 females. The mean age was (19.6)

for the first year students and (21.2) for the fourth-year. There was also a control group of 10 native speakers of English: 4 females and 6 males (mean age 20.7). They were students at the University of Leeds with little to no training in linguistics. As in the first task, the non-native speakers' proficiency level was determined by scores received in the placement test, their university course results and their teachers' evaluation report. None of the participants had dyslexia or sight problems. Of the 36 Arabic- speaking learners, 3 participants reported that they spoke foreign languages other than English (Italian). The learners had started learning English on average, around the age of 12 in a classroom setting but none of them reported having lived in an English-speaking country prior to the test. The lecturers were native Arabic speakers but the language of instruction was English: Arabic is used only occasionally. None of the participants had any idea about the ultimate purpose of the study. The Arabic participants were not paid but they were offered feedback on their performance. As for the native speakers, they were given a sum of money. Finally, it should be noted that these participants also took part in the argument structure study as shall be explained in chapter 6.

Materials

As mentioned above, the central aim of this study was to investigate the acquisition of English root and synthetic compounds by L1 speakers of Libyan Arabic. In this task, participants were given a pair of sentences. The first sentence introduced some activity that a person did, or an object that had a particular purpose, as in (2) and (3). The second sentence was incomplete, but offered three possible expressions to complete the sentence. Participants were asked to read the sentences and choose the expression that could describe the action/or the purpose of the device

mentioned in the first sentence. The test instrument consisted of 32 sentences (See appendix C for the experimental items used in this study). Furthermore, it should be noted that the task contained the same experimental items that were used in the first test except one item *munitions box* which was replaced by *cheese box*. Four left-headed compounds were also added: *lily of the valley, mother-in-law, lady-in-waiting, editor- in-chief.*

(2) a. John likes eating salad.

b. I call him the..... (salad eater- salads eater- eater salad).

→

b'. I call him the..... (salad eater- salads eater- eater salad).

(3) a. This shed is used for storing wood.

b. I call it the…….. (shed wood – woods shed – wood shed)

→

b'. I call it the…….. (shed wood – woods shed – wood shed)

Procedure

Participants were divided into two groups and there were two testing sessions. Session one was intended to test the first-year students and took place in a language lab. This was followed by the second session in which the fourth-year students were tested. The native speakers were tested in a quiet office in the University of Leeds. The experimental items and fillers were pseudo-randomized such that no two items from the same type of compound appeared adjacent to each other. To illustrate the

task, participants were first presented with some practice items. The experiment lasted approximately 25 minutes.

Scoring

The number of OV compounds selected with an uninflected non-head noun (*e.g., story teller*), the number of OV compounds selected with a non-head noun inflected for plural (e.g., **stories teller*) and the number of VO compounds selected (e.g., **teller stories)* were counted.

4.3.2 RESULTS

Regular synthetic compounds vs. regular root compounds

The first research question of interest in the present study is whether the L2 participants show any evidence of selecting VO compounds, similar to the structure of Arabic compounds. As table 7 shows, in the case of synthetic compounds the L2 learners select very few sentence completions with VO order.

In the case of regular plurals inside OV compounds, while the native speakers rarely selected the compound with a non-head plural (**cars washer)* (only 3 cases), non-head plurals predominate for the Arabic speakers.

Table 7. Results on test items eliciting synthetic compounds

This man likes washing cars. I call him	1st years (N= 18)	4th years (N=18)	Native speakers (N= 10)
Nsing-Ver: Car washer	27/108 (25%)	41/108 (38%)	57/60 (95%)
*Nplur-Ver Cars washer	77/108 (71%)	65/108 (60%)	3/60 (5%)
*washer cars	4/108 (3.70%)	2/108 (1.85%)	0/60 (0%)

An independent-samples Kruskal-Wallis test was carried out to compare the three groups (1st year, 4th year and native speaker controls). The results showed significant differences for regular synthetic compounds with the OV word order: *car washer* (χ^2 = 23.026, df, = 2, p < .001) and *cars washer* (χ^2 = 22.340, df, = 2, p < .001). This difference resulted entirely from the difference between the Arabic and the native speaker controls. There were no significant differences between the 1st years and 4th years on Mann Whitney U tests.

With root compounds, (e.g., *cupboard plates)*, there were again very few selections of VO sentence completions, and no statistically significant differences between the three groups (Kruskal-Wallis test χ^2 = 5.101, df, = 2, p = .078)). However, the L2 participants showed a strong tendency to select compounds with regular plural non-heads as shown in table 8 below.

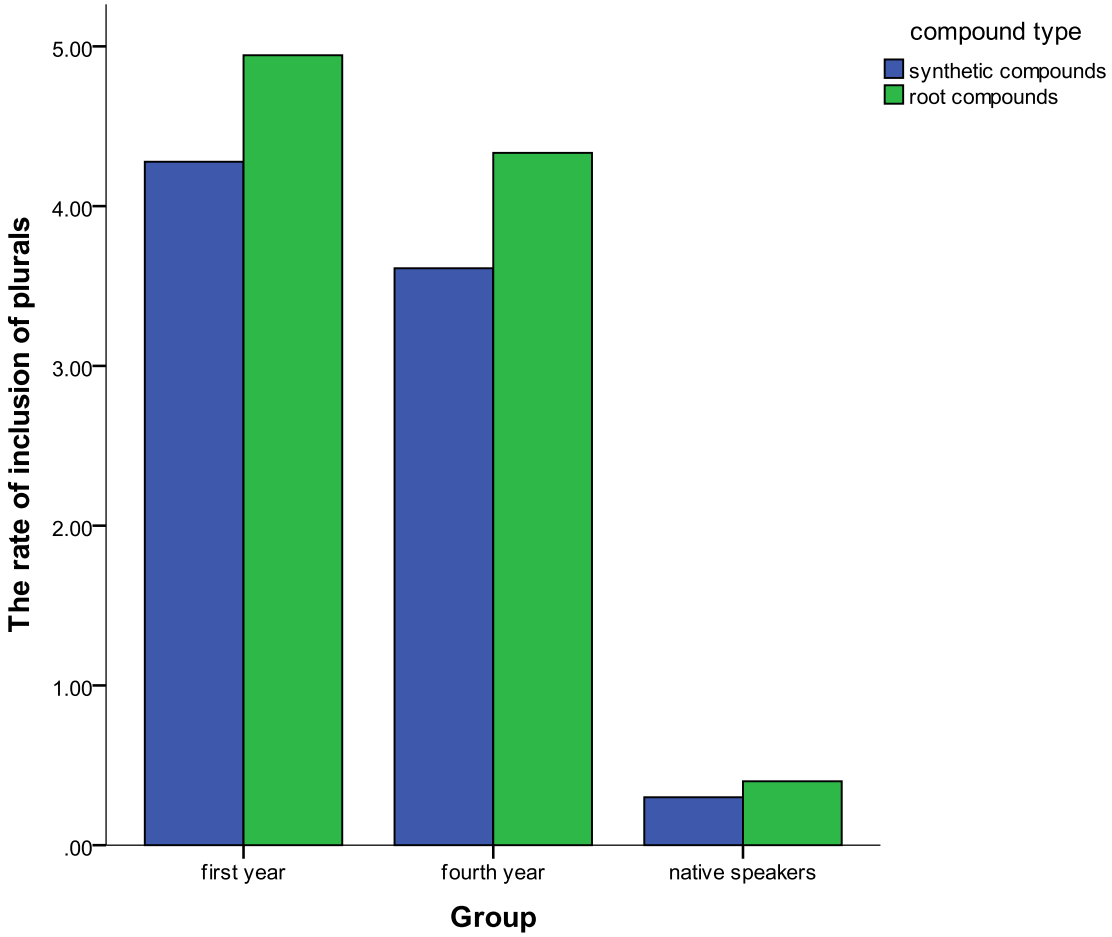
Table 8. Results on test items eliciting root compounds

This cupboard is used to put plates in. I call it	1st years (N=18)	4th years (N=18)	Native speakers (N=10)
Nsing-Ver Plate cupboard	11/108 (10%)	25/108 (23%)	56/60 (93%)
*Nplur-Ver Plates cupboard	89/108 (82%)	78/108 (72%)	4/60 (7%)
*cupboard plates	8/108 (7%)	5/108 (4%)	0/60 (0%)

An independent-samples Kruskal-Wallis test comparing the three groups revealed significant differences between the Arabic-speaking groups and the native speakers for regular root compounds (*plate cupboard* (χ^2 = 25.570, df, = 2, p < .001); *plates cupboard* (χ^2 = 23.359, df, = 2, p < .001)) but there were no significant differences between the non-native speaker groups themselves. 15 participants (10 first year and 5 fourth year) produced regular plurals inside compounds almost all of the time.

Comparing the proportions of non-head plurals allowed in synthetic and root compounds (figure 6), all three groups tend to allow more plurals in root than in synthetic compounds, consistent with earlier findings with native speakers (Lardiere, 1995a).

Fig. 6. Rate of inclusion of regular plurals inside synthetic and root compounds for native speakers and L2 learners



Regular vs. irregular synthetic compounds

Recall that the third research question asks whether Arabic learners and native speakers treat regular and irregular plurals differently when producing synthetic compounds. Table 9 compares the selections made by participants in the forced-choice elicitation task.

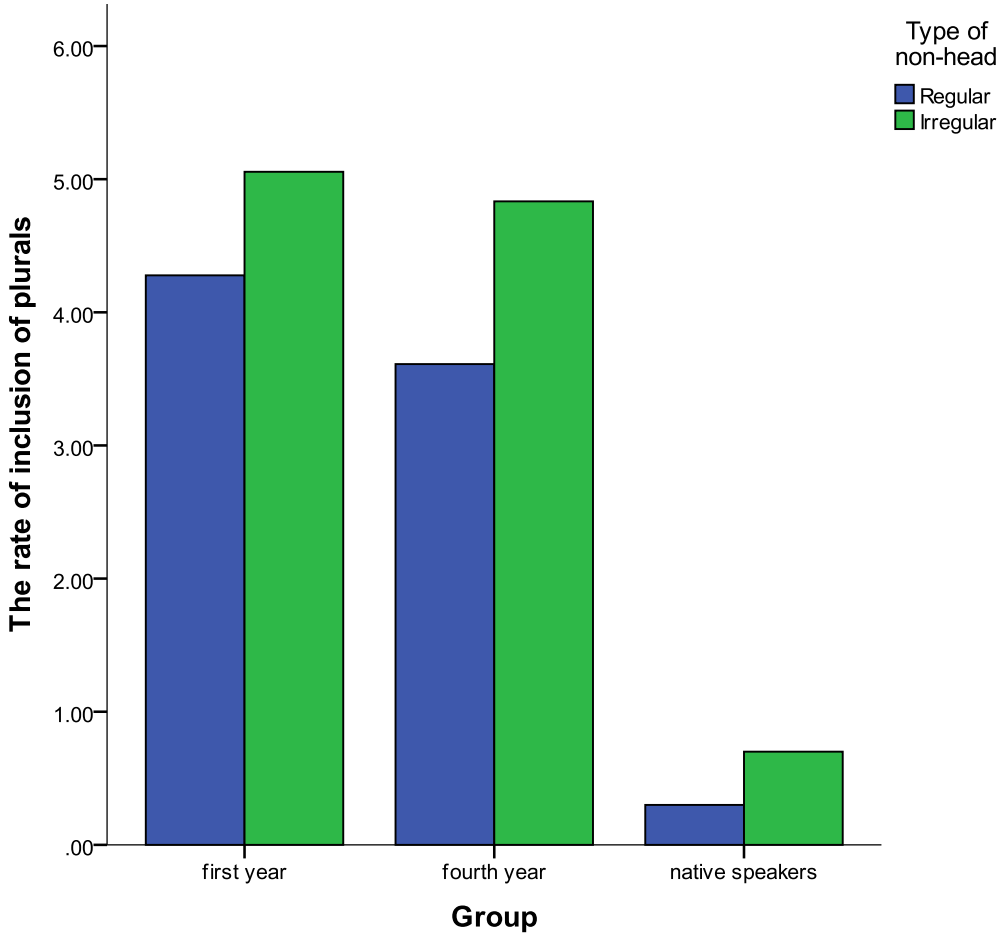
Table 9. Comparison of regular and irregular plural selection in synthetic compounds

This man likes washing cars. I call him a	1st years (N= 18)	4th years (N=18)	Native speakers (N= 10)
Nsing-Ver: Car washer	27/108 (25%)	41/108 (38%)	57/60 (95%)
*Nplur-Ver Cars washer	77/108 (71%)	65/108 (60%)	3/60 (5%)
*washer cars	4/108 (3.70%)	2/108 (1.85%)	0/60 (0%)
Nsing-Ver: Mouse catcher	14/108 (13%)	21/108 (19%)	53/60 (88%)
Nplur-Ver: Mice catcher	91/108 (84%)	87/108 (80%)	7/60 (11%)
*Catcher mice	3/108 (2.77%)	0/108 (0%)	0/60 (0%)

As in the first study, neither of the L2 groups showed any great tendency to select compounds with VO word order, the form that compounds take in Arabic.

Figure 7 presents graphically the difference in the choice of plurals in OV compounds where regular non-heads are involved and where irregular plurals are involved. It can be seen that all three groups are more likely to select irregular plural non-heads than regular ones.

Fig. 7. the rate of inclusion of regular and irregular plurals inside synthetic compounds for native speakers and L2 learners



An independent-samples Kruskal-Wallis test comparing the three groups (1st year, 4th year and native speaker controls) on their selection of compounds with OV word order showed significant differences between selection of irregular singulars and irregular plurals: *mouse catcher* (χ^2 = 21.756, df, = 2, p < .001); *mice catcher* (χ^2 = 23.023, df, = 2, p < .001). The L2 speakers were selecting many more plurals than singulars while the native controls were selecting many more singulars than plurals.

Furthermore, the non-parametric repeated-measures Wilcoxon signed-ranks test was used to compare the rate of selection of sentence completions involving regular plurals to irregulars. The results show that the differences were just significant at the 5% level for 1st years (z = 1.968, N-Ties = 13, p = .049); significant for 4th

years (z = 2.444, N-Ties = 14, p = .015) and were not significant for natives (z = 1.134, N-Ties = 4, p = .257). Although the L2 learners appear to be violating level-ordering by allowing a high proportion of regular plurals inside compounds, nevertheless they appear to be sensitive to the difference between regular and irregular plural forms in selecting more sentence completions with irregular plurals.

Effects of proficiency

As for the proficiency effect, it is clear that proficiency did not have an effect on compound production: the two groups did not differ significantly in terms of the number of regular and irregular plurals they generated in their compounds.

4.4. COMPARING THE ACCEPTANCE OF PLURALS IN COMPOUNDS IN THE FIRST AND SECOND TESTS

Regular and irregular plurals in synthetic compounds

Table 10 compares the performance of the (different) participants in the first and second studies on regular and irregular plurals in synthetic compounds with an OV structure. The patterns are very similar. Each group allows more irregular plurals inside OV compounds than regulars, although the L2 learners allow considerably more plurals in general than the native speaker controls. The fact that different groups of participants undertaking different test types (elicited production in the first test, elicited comprehension in the second) nevertheless show similar patterns of response, speaks to the robustness of the findings.

Table 10. Proportions of regular and irregular plurals inside synthetic compounds produced by the three groups:

First test	Regulars *cars washer	Irregulars Mice catcher	Second test	Regulars *cars washer	Irregulars Mice catcher
First-year learners	(62%)	(86%)	First-year learners	(71%)	(84%)
Fourth-year learners	(66%)	(97%)	Fourth-year learners	(60%)	(80%)
Native speakers	(0%)	(22%)	Native speakers	(5%)	(11%)

Regular plurals in root compounds

Again, the pattern of production/selection of root compounds involving regular plural non-heads in root compounds is very similar across the two tests, suggesting the robustness of the findings. Although the native speaker controls did not produce plurals in root compounds in the first test, their selection of plural non-heads in 7% of cases in the second test is consistent with the assumption that root compounds are formed through merger, rather than incorporation, and are not subject to level-ordering.

Table 11. Proportions of regular plurals inside root compounds produced by the three groups

First test	Plural (%) *plates cupboard	Second test	Plural (%) *plates cupboard
First-year learners	(76%)	First-year learners	(82%)
Fourth-year learners	(82%)	Fourth-year learners	(72%)
Native speakers	(0%)	Native speakers	(7%)

4.5 SUMMARY OF THE FINDINGS

The questions that were addressed in the two studies of compound noun formation reported in this chapter relate to L1 transfer, the potential involvement of UG in constraining the grammars that L2 learners construct, and the form that development takes, all at a pre-syntactic level of linguistic representation, a relatively under-researched area. There was little evidence of the Libyan-Arabic-speaking participants having transferred the VO order of Arabic compounds into English. Although the 1st year university groups in the study accepted more such cases than the 4th year groups, the difference was not significant. The presence at all of such constructions might suggest that there is an earlier phase in less proficient learners where the Arabic construction is transferred, but has been rapidly eliminated. Alternatively, less proficient speakers may be as unlikely to produce/allow the Arabic construction as the participants in the present study, suggesting that the structure of compound nouns is not transferred from the L1. Further investigation with less proficient learners would be necessary to test this.

If, when learners accept English synthetic compounds with an OV order, they have constructed grammars where the object has been incorporated into the

compound, they should obey the level-ordering principle of UG that is hypothesized to explain why native speakers of English rarely, if ever, allow regular plurals as non-heads in synthetic compounds (as was found in the present study). The L2 learners who participated in the present study clearly *prefer* non-head plurals to singulars in synthetic compounds. This either means that their grammars are not constrained by level-ordering, or that their OV compounds do not involve incorporation. This is an issue that will be taken up in the final chapter.

Since root compounds do not involve incorporation of an argument, but merger of two unrelated nouns, they are not necessarily subject to level-ordering. They may be formed after inflectional processes have applied. The native speaker controls in the second of the studies reported here did select some root compounds with non-head regular plurals, although the proportion was small (7%). The L2 learners allowed more regular plurals in root than synthetic compounds, suggesting that they may be sensitive to a difference between synthetic and root compounds. But because the numbers of regular plurals in the synthetic compounds that they produced/selected were so large, it is likely that the source of the sensitivity is different from native speakers. Again, this will be taken up in the final chapter.

The possibility of irregular plurals inside synthetic compounds is consistent with level-ordering if irregulars are stored as rote-learned forms in the lexicon along with ordinary singular noun stems. Irregular plurals will be available at the point where incorporation occurs, and prior to the application of inflectional processes. The native speaker groups in the study allowed irregular plural non-heads in synthetic compounds significantly more than regulars, consistent with their different structural status. Interestingly, the L2 speakers made a clear distinction between regular and irregular plurals, allowing more irregulars than regulars. This suggests that they are

sensitive to the distinction, but since they allowed so many regular plurals in synthetic compounds, the distinction is unlikely to be attributable to level-ordering. Again, this is taken up in the final chapter.

Although the groups of L2 learners who participated in the two studies represented what was thought to be distinct proficiency levels, there was little evidence of difference in their treatment of English compounds. This could be because the acquisition of the constraints on plural marking are persistently problematic for speakers of an L1 that does not have compounds of the English type (and therefore more advanced speakers are no more target-like in their use than less advanced learners), or because the two groups are not sufficiently distinct in proficiency to identify developmental changes. Further testing with less proficient and more proficient Arabic-speaking learners of English would be necessary to determine this.

4.6 FURTHER TESTING OF L1 TRANSFER, UG CONSTRAINTS AND DEVELOPMENT AT PRE-SYNTACTIC LEVELS OF REPRESENTATION

The focus of this chapter has been on L1 transfer, a UG constraint on grammar building (level-ordering) and development in the acquisition of noun compounding, a process that occurs in the lexicon. The following chapter will look at another area of pre-syntactic linguistic representation that involves verbs- argument structure realization – and addresses the same questions, with the focus on Libyan-Arabic-speaking learners of L2 English. The aim is to build a picture of the processes that shape the knowledge of L2 speakers of properties at pre-syntactic levels of representation.

CHAPTER 5
TRANSITIVITY ALTERNATIONS AND THE EFFECTS OF ARGUMENT-CHANGING MORPHOLOGY

5.0 INTRODUCTION

Having investigated the effects of L1 influence and considered the role that UG might play in the acquisition of noun compounding by L2 learners of English with L1 Libyan Arabic, a process that occurs in the lexicon, the aim of this chapter is to investigate the effects of the L1 and the role of UG in another pre-syntactic domain: the L2 acquisition of the mapping of Lexical Conceptual Structure and Predicate Argument Structure to morphosyntactic structure in English by L1 speakers of Libyan Arabic. It should be noted that participants in this study are the same ones who took part in the second experiment reported in chapter 4. This will allow us to make a comparison between the two groups and see whether there are any differences in the way that pre-syntactic nominal and verbal properties are acquired by the same group of learners.

Thus, the purpose of this chapter is to highlight some of the problems that L2 learners face when acquiring argument structure properties (section 5.1). Section 5.2 focuses on transitivity alternations and morphological realization of the following classes of verbs: change of state verbs, unaccusative/unergative verbs and psych verbs. Subsequently, section 5.3 reviews the literature on the acquisition of argument structure. This includes literature on L1 and L2 acquisition of transitivity alternations in English as well as other languages. Finally, a summary is given in section 5.4.

5.1 PROBLEMS WITH ARGUMENT STRUCTURE AND ITS MORPHOSYNTACTIC REALIZATIONS

A transitivity alternation is a grammatical phenomenon that involves a change in a verb's valency (i.e. the number of accompanying arguments). In English, it is well-known that some verbs like *break* can be used in transitive (1a) and intransitive constructions (1b):

(1) a. The thief broke the window.

b. The window broke.

In contrast, a verb such as *frighten* does not alternate in the same way. It can only occur in the transitive construction (2a):

(2) a. The dog frightened the boy.

b. *The boy frightened.

Other verbs such as *arrive* and *laugh* can only appear in the intransitive construction ((3b) and (4b)):

(3) a. *The magician appeared the rabbit.

b. The rabbit appeared.

(4) a. *The man laughed the boy.

b. The boy laughed.

In other languages, however, apparently equivalent verbs can differ from English in terms of their argument structure realization. In Modern Standard Arabic

(MSA), for instance, the equivalents of the English examples in (3a) and (4a) are grammatical as shown in (5a&6a) (El-Nabih, 2010):

(5) a. ’a-ḍhara a-ssa:hir-u al-’arnab-a
prefix-appeared the-magician-NOM the-rabbit-ACC
“The magician made the rabbit appear”

b. ḍahara al-’arnab-u
appeared the-rabbit-NOM
“The rabbit appeared”

(6) a. ’aḍhaka a-rrajul-u al-walad-a
laughed the-man-NOM the-boy-ACC
“The man made the boy laugh”

b. ḍahika al-walad-u
laughed the-boy-NOM
“The boy laughed”

Furthermore, languages vary with respect to the way transitivity alternations are expressed. For example, while the verb in (1b) is not marked morphologically in English, the same verb has to be marked with an overt morphological marker in some other languages. In Spanish, for instance, it must be marked by the clitic *se* as shown in (7b) and the sentence would be ungrammatical without *se* (7c):

(7) a. Maria rompió los vasos. (causative)

‘Mary broke the glasses.’

b. Los vasos se rompieron (inchoative)

The glasses cli broke

c.*Los vasos rompieron.

The glasses broke

‘The glasses broke.’

(Examples adapted from Montrul, 1997: 44)

To complicate matters further, in other languages an overt causative morpheme is employed in the transitive use of the verb as shown in the Turkish example in (8b):

(8) a. Gemi bat-mış (inchoative)

Ship sink-past

‘The ship sank.’

b. Düşman gemi-yi bat-ır -mış (causative)

enemy ship-acc sink- caus-past

‘The enemy sank the ship’.

(From Montrul, 1997: 42)

Given this crosslinguistic variation in the transitivity alternation and the realization of argument structure, it is not surprising that this topic has recently received a great deal of attention from researchers working on L2 acquisition (Zobl, 1989: Moore, 1993; Yip, 1995; Montrul, 1999; 2000a; 2000b; 2001; Cabrera & Zubizarreta, 2003, Kondo, 2005, among others). Questions that have often been the focus of this investigation are how L2 learners acquire properties of argument structure and their morphological expression in the target language. In particular, if L1 and L2 differ in the morphological realization of arguments, will this be problematic for L2 learners?

Based on these facts, L2 learners need to be aware that certain verb classes differ syntactically and semantically from one language to another. They have to observe the differences and similarities between these verb classes on the basis of the input they receive. Thus, with respect to argument structure alternations that are universal or found in most languages (e.g., the causative/inchoative alternation), Montrul (1997; 2001) claimed that Schwartz and Sprouse's (1994; 1996) Full Transfer/Full Access Hypothesis would predict that L2 learners would have no difficulty distinguishing verbs that can alternate from verbs that cannot alternate from the early stages of learning. However, since languages also differ in the way they mark the alternation morphologically, L2 learners would transfer their L1 morphological patterns into English, using L1 morphological spell-outs (overt and zero) in the L2 even where these are contextually infelicitous (Montrul, 2001; Kondo, 2005). However, because Full Transfer explicitly excludes the transfer of L1 phonetic matrices, the forms that L2 learners use to spell out overt morphemes will be drawn from the target L2. For example, since most change of state verbs in Arabic differ

from English in that overt morphology is required to derive the intransitive form (see section 5.2), Arabic learners will prefer the passive to the bare form of the verb in the intransitive construction (e.g. preferring *The glass was broken* to *The glass broke*). As for argument structure alternations that are restricted to specific languages (e.g., the unaccusative and unergative alternations in Arabic), Arabic learners may, or may not, overgeneralize the causative alternations to unaccusative and unergative verbs. If Arabic learners fail to observe that English does not allow the alternation, one could argue that the L1 grammar in its entirety is involved at this stage as these errors can be traced back to the L1 of the learners.

As mentioned earlier, the second part of this thesis will investigate the acquisition of argument structure and its morphosyntactic instantiation in English by Libyan Arabic speakers. It examines the role of universal principles and L1 knowledge in interlanguage grammar. The focus will be on four types of verbs: change-of-state verbs (e,g. *break*); psych verbs (e.g. *frighten*); unaccusative verbs (e.g. *appear*); and unergative verbs (e.g. *laugh*).[4] As discussed above, languages may differ in terms of transitivity alternation as well as the way they encode the alternation morphologically. For example, in English, verbs like (*break, open)* can be used in a 'causative' construction (9a) and an 'inchoative' construction (9b) without morphological marking (known as 'zero morphology'). In MSA, the causative form is similar to English in that it is not marked morphologically but the inchoative form is, in most cases, only possible with the prefix (*in*) as shown in (10) (El-Nabih, 2010):

[4] Change of state verbs are sometimes referred to as alternating unaccusative because they are considered a sub-type of unaccusative verbs. Throughout this thesis, however, they will be referred to as change of state verbs.

(9) a. John broke the door.

b. The door broke.

(10) a. fataħa al-walad-u al-ba:b-a MSA

opened the-boy-NOM the-door-ACC

"The boy opened the door"

b. in-fataħa al-ba:b-u.

prefix-opened the-door-NOM

"The door opened"

c. *fataħa al-ba:b-u.

opened the-door-NOM

"The door opened"

Furthermore, other verbs like *escape* do not alternate in transitivity in English; *escape* cannot normally be used in the causative construction (11b), but the causative form is, in most cases, grammatical in Libyan Arabic (12b). It should be noted that this alternation sometimes involves a morphological change as shall be explained in section 5.2:

(11) a. The man escaped.

*b.**The guard escaped the man.

(12) a. al-ħa:ris harrab al-wilid. LA

the-guard escape-past the-boy

"The guard helped the boy escape"

b. al-wilid harab.

the-boy escape-past.

"The boy escaped".

This difference in the realisation of the argument structure between English and Arabic constitutes a problem for Libyan learners as they have to identify how properties of argument structure are expressed morphosytactically in English. In order to examine the role of the L1 in the L2 acquisition of transitivity alternations, we have tested structures in which English and Arabic have the same properties and those in which these languages differ (as shall become clear in section 5.2). The central aim was to see 1) whether Arabic-speaking learners of English know which verbs alternate in transitivity and which do not; 2) whether they transfer their L1 morphological patterns into English; 3) whether UG plays a role in the acquisition of argument structure alternations; 4) whether L2 learners can attain native-like competence in the domain of argument-structure changing morphology.

In the next section, we examine the characteristics of the four classes of verbs in Arabic and English to understand the learning task that faces the L2 learners tested in this study.

5.2 TRANSITIVITY ALTERNATIONS AND EFFECTS OF ARGUMENT-CHANGING MORPHOLOGY IN ENGLISH AND ARABIC

This section is concerned with the transitivity alternations and morphological realization of the four classes of verbs that will be used in the experiment.

Change of State verbs:

Change of state verbs like *break* participate in the causative/inchoative alternation as the examples in (13) show:

(13) a. The thief broke the window.

b. The window broke.

As mentioned above, while this causative/inchoative alteration is universal, languages differ in terms of how they realize it morphologically. Haspelmath (1993) did a typological survey of the causative/inchoative alternation (31 alternating pairs) in 21 languages. Since it is clear that languages vary greatly in their ways of marking the relationship between causative and inchoative verbs, Haspelmath distinguishes three types: causative, anticausative, and non-directed alternations which are further subdivided into equipollent, suppletive, and labile. In the causative alternation, the inchoative verb is basic and the causative is morphologically derived. A few verbs in MSA belong to this pattern (El-Nabih, 2010):

(14) a. ða:ba a-ΘΘalj-u MSA

melted-ACC the-snow-NOM

“The snow melted”

b. ’a-ða:ba, a-rrajul-u a-ΘΘalj-a

prefix-melted the-man-NOM the-snow-ACC

‘The man melted the snow’.

In the anticausative alternation, the inchoative is morphologically derived while the causative form is basic. As noted earlier, most change of state verbs in MSA (15) and Libyan Arabic (LA) (16) are anticausative:

(15) a. fataħa al-walad-u al-ba:b-a MSA

opened the-boy-NOM the-door-ACC

“The boy opened the door”

b. in-fataħa al-ba:b-u.

prefix-opened the-door-NOM

“The door opened”

c. * fataħa al-ba:b-u

opened the-door-NOM

“The door opened”

(Adapted from El-Nabih, 2010)

(16) a. al-wilid ftaħ al-ba:b LA

the-boy opened the-door

'The boy opened the door'

b. al-ba:b in-ftaħ

the-door opened

'The door opened'

c. *al-ba:b ftaħ

the-door opened

'The door opened'

As for the labile pattern, it has no overt morphology: the same verb form is used in the causative and inchoative. This form is found in English, Greek (17a), Tunisian Arabic (17b), and Libyan Arabic (17c):

(17) a. spao break (transitive) Greek

spao break (intransitive)

b. zid increased (transitive) Tunisian Arabic

zid increased (intransitive)

(Taken from Letuchiy, 2010: 238)

c. za:d increased (transitive) Libyan Arabic

za:d increased (intransitive)

In the equipollent alternations (derived from a common stem), both the causative and inchoative have overt morphology. That is, both forms are derived from the same stem but they are expressed by means of different affixes (Haspelmath, 1993: 91). A representative example of this form is found in Japanese (18):

(18) tok-ero melt (intr) Japanese

tok-*asu* melt (tra)

(Taken from Montrul, 1997: 43)

Finally, in suppletive alternations, two different verb roots are used as in Finnish (19), Libyan Arabic (20) and English:

(19) *Kuolla* 'die (intransitive)' Finnish

tappa 'kill (transitive)'

(Taken from Montrul, 1997: 44)

(20) a. ma:t a-rra:jil Libyan Arabic

died the-man

"The man died"

b. al-kalb gtal a-rra:jil

the-dog killed the-man

"The dog killed the man"

Haspelmath's typological survey of the causative/inchoative alternation reveals that "most languages tend to prefer one pattern over another... and... that of the five types of alternations depicted above even two or three patterns can be found in a single language" (Montrul, 1997: 44). For example, while the predominant pattern in English is labile, suppletive verbs can be found as well (21):

(21) kill-die come-bring fall-drop

Thus, this survey shows that where English has zero morphology, other languages may have different patterns. For example, Turkish has both causative and anticausative morphology, while Spanish has anticausative morphology (Montrul, 2001). Arabic, on the other hand, is predominantly anticausative: it prefers to derive the inchoative form from the causative (Comrie, 2006; El-Nabih, 2010). However, Arabic does have causative morphology as well.

Firstly, and as mentioned earlier, there is a morphological distinction between the inchoative form and the causative form in Libyan Arabic: the inchoative form, for most verbs, is marked with prefixes "*in*" (22b) or "*t*a" as in (23b) whereas the transitive form is not marked with overt morphology as shown in (22a-23a):

(22) a. al-wilid ftaħ al-ba:b. Libyan Arabic
the-boy opened the-door
'The boy opened the door'
b. al-ba:b in-ftaħ.
the-door prefix-opened
'The door opened'

c. *al-ba:b ftaħ

the-door opened

'The door opened'

(23) a. al-wilid jammid al-ħu:ta

the-boy froze the-fish

"The boy froze the fish"

b. al-ħu:ta ta-jammdi-t.

the-fish prefix-froze-3F

"The fish froze"

Secondly, with a few change of state verbs in Arabic, an overt causative morpheme is employed in the transitive use of the verb, as shown in (24):

(24) a. ða:ba a-ΘΘalj-u MSA

melted-ACC the-snow-NOM

"The snow melted"

b. 'a-ða:ba a-rrajul-u a-ΘΘalj-a

prefix-melted the-man-NOM the-snow-ACC

'The man melted the snow'.

In Libyan Arabic, causative verbs may also be marked by stem modification as shown in (25):

(25) a. a-ϴϴilij da:b Libyan Arabic

the-snow melted

"The snow melted"

b. a-rrajil dawwib a-ϴϴilij

the-man melted the-snow

'The man melted the snow'.

Libyan Arabic and English are similar in that change of state verbs can be used in the passive form. In Libyan Arabic as well as Palestinian Arabic, however, the inchoative and the passive forms are identical as shown in the examples in (26-27). It should be noted that passive sentences in Arabic are not formed by configurational restructuring of the sentence, but rather by morphological inflection of verbs.

(26) a. Kasar l-walad l-finja:n-a Palestinian Arabic

broke the-boy the-cup

"The boy broke the cup"

b. (i)n-Kasar l-finja:n

broke-PASS the-cup

"The cup was broken"

c. (i)n-Kasar l-finja:n

ANTICAUS-broke the-cup

"The cup broke"

(adapted from El-Nabih, 2010)

(27) a. kaṣṣar al-wilid al-finja:n Libyan Arabic

broke the-boy the-cup

"The boy broke the cup"

b. al-finja:n in-kṣar

the-cup prefix-broke

"The cup was broken"

c. al-finja:n in-kṣar

the-cup prefix-broke

"The cup broke"

It is clear from the examples above that the passive and the inchoative forms are identical in Libyan Arabic. To illustrate this, the structures in (26-27) can be tested using phrases such as *by its own* or by using an agent in the passive structure as illustrated in (28):

(28) a. kaṣṣar al-wilid al-finja:n LA

broke the-boy the-cup

"The boy broke the cup"

b. al-finja:n in-kṣar bru:ħa intransitive

the-cup prefix-broke by itself

"The cup broke by itself"

c. al-finja:n in-kṣar min a-rri:ħ passive

the-cup prefix-broke from the-wind

"The cup was broken by the wind"

As for the learners' task in the acquisition of change of state verbs, Arabic learners need to be aware of the differences as well as the similarities between Libyan Arabic and English verbs. Learners need to be aware that while the English causative verb and its inchoative counterpart have an identical form, Arabic has two major morphological patterns to distinguish between the two forms: most verbs follow the anticausative pattern. That is, overt morphology is required to derive the inchoative form: verbs such as *kaṣṣar* 'broke' are anticausative and therefore an overt morphological marker must be added to derive the intransitive form *in-kṣar* 'broke'. However, verbs such as *da*:*b,* the inchoative form of *melted,* follow the causative pattern: the causative/transitive form is morphologically derived (e.g., *dawwib* 'melted') from its inchoative/intransitive counterpart. Based on these facts, and as shall be made clear in the general hypotheses of the study in chapter 6, we assume

that Arabic learners will have less difficulty with transitive constructions, which are similar to Arabic, than intransitive constructions.

Having discussed the characteristics of change of state verbs in English and Arabic, now we turn to a discussion of other verb classes that will be used in the experiment: unaccusative and unergative verbs.

THE UNACCUSATIVE/UNERGATIVE DISTINCTION AND THE UNACCUSATIVE HYPOTHESIS

The Unaccusative Hypothesis, which was originally proposed by Perlmutter (1978) within the context of Relational Grammar, states that intransitive verbs are classified into two major subclasses: unaccusatives (e.g., *happen, arrive*) and unergatives (e.g., *laugh, dance*). Moreover, unaccusative verbs are further subclassified into: alternating unaccusatives, or change-of-state verbs, (e.g. *break, freeze, melt,* etc.) and non-alternating unaccusative verbs (e.g. *appear, arrive,* etc.). Within a transformational/minimalist framework (Chomsky, 1995), the general approach has been to assume that while intransitive verbs have an S-V (Subject-Verb) structure on the surface, the surface construction conceals a difference in the underlying structure of unaccusatives and unergatives. According to the Unaccusative Hypothesis, the sole argument of an unaccusative is a Theme or a Patient originating in an object position in argument structure which moves to the subject position, whereas the sole argument of the unergative is Agentive and is merged directly in the subject position in underlying structure (Burzio, 1986; Levin & Rappaport Hovav, 1995; Perlmutter, 1978):

(29) a. unergative: [DP [$_{VP}$ V]]

b. unaccusative: [$_{VP}$ V DP]

Since intransitive verbs cannot assign accusative case to the underlying object, the object has to move to the specifier position to be assigned Nominative Case. In contrast, the argument of an unergative verb does not have to move to be assigned case as it originates in the subject position (Burzio, 1986; Perlmutter, 1978). An example illustrating the difference between the initial and surface structures of the unaccusative verb *arrive* and unergative verb *laugh* is given in (30)-(31):

(30) a. [$_{TP}$ e past [$_{VP}$ arrive Tom]] (unaccusative)

b. [$_{TP}$ e past [$_{VP}$ Tom laugh]] (unergative)

(31) a. [$_{TP}$ Tom past [$_{VP}$ arrive t]]

b. [$_{TP}$ Tom past [$_{VP}$ t laugh]]

Moreover, it has been claimed that unaccusative verbs differ from unergatives in that the unaccusative verbs such as *arrive, leave* involve events (movement, existence, coming into existence) "over which the participant does not have 'volitional control" whereas unergative verbs such as *dance, laugh* involve volitional (or semi-volitional) acts (Hawkins, 2001: 183). The list in (32 & 33) below presents some of the general factors that are involved in determining the unergative/unaccusative distinction (Perlmutter, 1978: 162-163). It should be noted that this unergativity vs. unaccusativity distinction in (32 & 33) below is based on the meaning of the verb.

(32) **Predicates determining initially unergative clauses**

a.**Predicates describing willed or volitional acts**

*work, play, speak, talk, smile, grin, frown, grimace, think, meditate, cogitate, daydream, skate, ski, swim, hunt, bicycle, walk, skip (*voluntary*), jog, quarrel, fight, wrestle, etc.*

Manner of speaking verbs: *whisper, shout, mumble, growl, bellow, blurt out,*etc.

b.**Certain involuntary bodily processes**: *cough, sneeze, hiccough, belch, burp, vomit, defecate, urinate, sleep, cry, etc.*

(33) **Predicates determining initially unaccusative clauses**

a.**Inchoatives:** *melt, freeze, evaporate, vaporize, solidify, crystallize, dim, brighten, ridden, darken, yellow, rot, decompose, germinate, sprout, disappear etc.*

b. **Predicates of existing and happening:**

exist, happen, transpire, occur, take place, and various inchoatives such as *arise, ensue, result, shop up, end up, turn up, pop up, vanish, disappear, etc.*

c. **Non-voluntary emission of stimuli that impinge on the senses** (light, noise, smell, etc.): *shine, sparkle, glitter, glisten, glow, jingle, clink, clang, snap (*involuntary), *crackle, pop, smell, stink, etc.*

d. **Aspectual predicates:**

begin, start, stop, cease, continue, end, etc.

e. **Duratives:**

last, remain, stay, survive, etc.

Having discussed the semantic differences between the unaccusative and unergative verbs (difference in terms of their theta roles), it appears that this

unaccusative/unergative distinction is widely recognized and several syntactic diagnostics have been proposed to support it. There are a number of general diagnostics which differentiate between unaccusative verbs and other types of verbs. The unaccusative diagnostics are of two types: i) diagnostics of surface unaccusativity; ii) diagnostics of deep unaccusativity[5]. Deep unaccusativity refers to a representation where the argument of an unaccusative verb is in object position at D-S (such as Auxiliary selection in Italian); whereas surface unaccusativity refers to a situation where the sole argument of an unaccusative verb remains in an object position at surface structure (for example, in *there*-constructions and *ne*-cliticization in Italian) (Levin & Rappaport Hovav, 1995; Bresnan & Zaenen, 1990). Thus, it is argued that the *there*-construction can count as a diagnostic of surface unaccusativity. Consider the following examples:

(34) a. *There *broke* three doors.

b. *There melted lots of snow.

c. There arrived three men.

d. There appeared a man in the shop.

e.*There laughed some ladies.

f. *There cried a baby.

[5] For further discussion see Radford (1994); and for additional syntactic differences in other languages: e.g., Italian (Burzio, 1986), diagnostics for unaccusativity in Dutch (Perlmutter, 1978: 170).

What these examples indicate is that whereas *arrive* and *appear* are allowed in the context of the *there*-construction, other verbs such as *break, melt, laugh, cry* are not. Thus, the *there*-construction seems to be restricted to a subclass of unaccusative verbs, namely non-alternating unaccusatives, provided that the subject is indefinite (Haegeman & Gueron, 1999). Change of state verbs and unergative verbs, however, are not compatible with *there*.

As for the diagnostics of deep unaccusativity, one of the structures that is relevant to deep unaccusativity is auxiliary selection in Italian (Burzio, 1986; Grimshaw, 1990; among others). In Italian there are two different auxiliaries: *essere* "to be" and *avere* "to have". It is generally assumed that unaccusative verbs take *essere* as in (35a) whereas unergative verbs generally take the auxiliary *avere* 'have' as shown in (35b) (Burzio, 1986: 20):

(35) a. Grovanni **è** arrivato. (with *essere*)

Giovanni has arrived.

b. Giovanni **ha** telefonato (with *avere*)

Giovanni has telephoned. (Burzio, 1986: 53)

Another piece of evidence for positing that unaccusative verbs are syntactically different from other types of verbs comes from the adjectival use of their perfect-participle forms. As the examples in (36-37) show, perfect-participle (-n/-d) forms of verbs can be used adjectivally only with unaccusative verbs, not with transitive verbs or unergative verbs (Radford, 2004: 257):

(36) a. The train arrived at platform 4 is the delayed 8.28 for London Euston.

b. Several facts recently come to light point to his guilt.

c. Brigadier Bungle is something of a fallen hero.

(37) a. *The man committed suicide was a neighbour of mine.

b. *The thief stolen the jewels was never captured.

c. *The yawned student eventually fell asleep in class.

So far, we have shown that intransitive verbs are classified into unaccusative and unergative verbs and we have presented some general diagnostics that support this distinction. These diagnostics clearly suggest that there are some differences between English and Arabic with respect to the unaccusative/unergative distinction. Therefore, it is worth discussing these differences, and/or similarities, so as to determine the learning task facing Arabic-speaking learners.

Firstly, it should be noted that there are multiple ways to derive a causative form from a basic verb root in Arabic. A causative form is derived from what is called the trilateral verb root which consists of three consonants that have a general lexical-semantic representation. A number of forms can be derived from this form by inflecting the root with short vowels, long vowels and specific consonantal affixes (Scheindlin, 2007). Thus, some causative verbs may be marked by an affix (38) or by stem modification (39) (El-Nabih, 2014)

(38) a. ḍahara al-waħʃ-u MSA

appeared the-monster-NOM

“The monster appeared”

b. ʾa-ḍhara a-ssa:ħir-u al-waħʃ-a

prefix-appeared the-magician-NOM the-monster-ACC

"The magician made the monster appear"

(39) a. istaqa:la a-rrajul-u MSA

resigned the-man-NOM

"The man resigned"

b. ʾaqa:la al-mu:di:r-u a-rrajul-a

sacked the-manager-NOM the-man-ACC

"The manager sacked the man"

Furthermore, unaccusative and unergative verbs in English cannot alternate in transitivity: they can only be used in the intransitive construction as shown in the following examples:

(40) a. The man arrived.

b. *The driver arrived the man.

In Arabic, however, these verbs do alternate as the following examples illustrate:

(41) a. a-rrajil waṣal. LA

the-man arrived

"The man arrived"

b. a-ssawwag waṣṣil a-rrajil

the-driver arrived the man

"The diver gave the man a lift"

Furthermore, it should be noted that some verbs might alternate via suppletion as shown in the examples in (42):

(42) a. a-rrajil ma:t LA

the-man died

'the man died'

b. * al-xa:nib ma:t a-rrajil

the-thief died the-man

'The thief died the man'

c. al-xa:nib gtal a-rrajil

the-thief killed the-man

'The thief killed the man'

As for unergative verbs (e.g., *laugh, cry*), while English unergative verbs can only be used in the intransitive form as shown in (43), these verbs, as noted earlier,

can have transitive counterparts in Arabic as the examples in (44) illustrate (El-Nabih, 2014). However, it should be noted that not all unergative verbs can alternate in transitivity in Arabic (45):

(43) a. The boy laughed.

b. *The old man laughed the boy.

(44) a. al-wilid ḍaħak LA

the-boy laugh-past

"The boy laughed"

b. a-rrajil ḍaħik al-wilid

the-man laugh-past the-boy

"The man made the boy laugh"

(45) a. al-wilid kaħ

the-boy coughed

"The boy coughed"

b. * a-dduxa:n kaħ al-wilid

the-smoke coughed the-boy

"The smoke made the boy cough"

Similar to English, (45b) would only be possible with the periphrastic causative verb *'xal*a' (meaning 'make'):

(46) a. The smoke made the boy cough.

b. a-dduxa:n xala al-wilid i-kuħ LA

the-smoke made the-boy 3M.IMP-cough

"The smoke made the boy cough"

Finally, it is important to note that unaccusative and unergative verbs in Libyan Arabic may have SV/VS orders in transitive and intransitive constructions:

(47) a. al-wilid ḍaħak LA

the-boy laughed

"The boy laughed"

b. ḍaħak al-wilid

laughed the-boy

"The boy laughed"

(48) a. a-rrajil ḍaħik al-wilid

the-man laughed the-boy

"The man made the boy laugh"

b. ḍaħik a-rrajil al-wilid

laughed the-man the-boy

"The man made the boy laugh"

To summarize, the examples given above show that unaccusative and unergative verbs in English do not share the same syntatic and semantic behaviour with their Arabic counterparts. As we have seen, while English unaccusative verbs do not alternate in transitivity, Arabic unaccusatives do alternate, yet this alternation is marked morphologically in most verbs. Similarly, the examples above show that while English unergative verbs do not have transitive counterparts, some Arabic unergatives do alternate in transitivity. Following this discussion, Arabic learners have to acquire the knowledge that unaccusative and unergative verbs in English do not alternate in transitivity and can only be used in the intransitive form. Furthermore, since unaccusative and unergative verbs in English have different underlying representations, Arabic learners need to acquire how theta roles and arguments (internal or external) map to syntactic positions.

Psych verbs, thematic hierarchies and Uniformity of Theta Assignment Hypothesis (UTAH)

Psych verbs are dyadic verbs that contain two arguments, Theme and Experiencer. These verbs can be classified into two main classes: Object-experiencer psych verbs in which the Experiencer surfaces in the object position like *frighten*; and subject-experiencer psych verbs in which the experiencer appears in the subject position like *fear (*Grimshaw, 1990; Perlmutter & Postal, 1984; Pesetsky, 1995) as shown in (49):

(49) a. Dogs frighten children.

b. Children fear dogs.

What makes psych verbs like *fear* interesting is that they seem to violate "...the overwhelming generalization observed cross-linguistically that the more agent-like argument must be linked to the most prominent grammatical relation (subject) in simple declarative active sentences" (Piñango, 2000: 331). In (49a) the theme-like *dogs* is linked to the subject position, while the experiencer *children* occupies the object position.

In this case, psych verbs are similar to unaccusative verbs in that they do not have an agent argument. Nevertheless, the examples in (49) raise the question of whether the mapping of arguments to syntax is arbitrary, or whether arguments are mapped to fixed positions which are subsequently re-arranged by the syntax. Crosslinguistically, there is evidence for a universal linking rule for the canonical mapping of agent and patient to subject and object (Park & Lakshmanan, 2007: 329). As the examples in (50) show, the agent argument maps to the subject position whether a theme argument is present or not.

(50) a. The thief broke the door [transitive]

[Agent] [Theme]

b. John laughed [unergative]

[Agent]

To capture the idea that thematic roles have privileged mappings to grammatical functions, several researchers have proposed a universal implicational hierarchy of thematic roles, where the first role is mapped to subject position, the second role to object position, and so on. One example is Jackendoff's (1990)

Thematic Hierarchy in which thematic roles are arranged on the basis of their thematic prominence (Belletti & Rizzi, 1988; Grimshaw, 1990; Jackendoff, 1990; Montrul, 1997; 2001) as shown in (51) below:

(51) **Thematic Hierarchy** (Jackendoff 1990: 258)

(Agent (Experiencer (Goal/Source/Location (Theme)))

This hierarchy shows that Agents are ranked higher (more prominent) than Experiencers; Experiencers are more prominent than Goals; and Goals are ranked higher than Themes.

However, a linking that maps an Experiencer argument to subject position and a Theme argument to object position cannot account for the example in (49a). It can only explain (49b), where the experiencer is ranked in a higher syntactic position than the theme. Furthermore, in the case of unaccusative verbs (52), there also appears to be a mismatch between the theta role borne by the sole argument (theme) and the position it occupies in syntactic structure (subject):

(52) John arrived [unaccusative]

[Theme]

An attempt to explain this mismatch between the grammatical structure and theta roles of unaccusative and psych verbs is Baker's (1988: 46) Uniformity of Theta Assignment Hypothesis (53).

(53) **Uniformity of Theta Assignment Hypothesis** (commonly called UTAH)
Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-Structure.

If we assume that the examples in (49) involve identical theta roles (theme and experiencer), UTAH necessitates that "... the argument structure for both verbs is identical; and ... that the theme at D-structure is an internal argument, with movement to subject position occurring in the syntax (rather like passives, in other words)" (White, 2003: 225). See the next section for previous studies showing that interlanguage grammars are constrained by universal mapping principles like UTAH and the unaccusative hypothesis.

This thesis is concerned with object-experiencer psych verbs only (for more details on both types of psych verbs, see Belletti & Rizzi, 1988; Pesetsky, 1995). These verbs are a subclass of change of state verbs and express a psychological or emotional state (Montrul, 2001):

(54) The lion frightened the hunter. [*x* CAUSE [*y* BECOME state]]

(Adapted from Montrul, 2001: 148)

The verb *frighten* here means that something caused the *hunter* to get into a state of being frightened or to become frightened: the verb *frighten* can include or conflate CAUSE and STATE (White, 2003: 219). As mentioned before, psych verbs differ from change of state verbs in their thematic role composition and the mapping of arguments to syntactic positions (Montrul, 2001). Psych verbs "...subcategorize for

a theme (or stimulus) (*x*), which causes the mental state, and an experiencer (*y*), the recipient of the state" (Montrul, 2001: 148). As we have seen, psych verbs, unlike change of state verbs which have agentive subjects, exhibit a misalignment problem because the most prominent role (experiencer) surfaces in a lower syntactic position (object), while the causer - the theme (or stimulus) - surfaces in subject position (Montrul, 2001: 148).

In contrast to change of state verbs, while psych verbs participate in the causative-inchoative alternations in most languages, only a few verbs do so in English (e.g., *worry*, *gladden*) (Levin, 1993: 30; Montrul, 2001: 150). It is important to note that the inchoative form with most verbs is expressed periphrastically with the verb *become*, as in (55c):

(55) a. The lion frightened the hunter.

b.* The hunter frightened.

c. The hunter became frightened.

In Arabic, most psych verbs are similar to the agentive change of state verbs in that they have anticausative morphology. For example, in Hijazi Arabic (a Gulf dialect spoken in the Westeren Province of Saudi Arabia), the passive as well as the inchoative form is marked with the prefix *in* as shown in (55) (Alotaibi et al., 2013: 12):

(55) a. al-bint in-fajaʕ-at

the-girl prefix-frightened- 3SGF

"The girl became frightened"

b. al-bint in-fajaʕ-at min al-film.

the-girl PASS-frightened-3SGF from the-film

"The girl was frightened by the film"

In Libyan Arabic, most psych verbs are similar to the agentive change of state verbs in that they have anticausative morphology. That is, they require the prefixes *in*- (56b), a- (57b) or *t*a- (58b) in the intransitive form. The sentence would be ungrammatical without the prefixes as shown below.

(56) a. al-kalb xlaʕ al-wilid LA

the-dog frightened the-boy

"The dog frightened the boy"

b. al-wilid in-xlaʕ

the-boy Prefix-frightened

"The boy became frightened"

c. *al-wilid xlaʕ

the-boy frightened

"The boy became frightened"

(57) a. a-ṣṣaġa:r ḍa:yig-u a-rrajil LA

the-boys annoyed-3PL the-man

"The boys annoyed the man"

b. a-rrajil a-ḍḍa:yig

the-man prefix-annoyed

"The man became annoyed"

c. *a-rrajil ḍa:yig

the-man annoyed

"The man became annoyed"

(58) a. a-rrajil faja: al-wilid LA

the-man surprised the-boy

"The teacher surprised the boy"

b. al-wilid ta-faja:

the-boy Prefix-surprised

"The boy became surprised"

c. *al-wilid faja:

the-boy surprised

"The boy became surprised"

In short, psych verbs in Libyan Arabic can alternate in transitivity (i.e., they can participate in the causative inchoative alternation) but they are generally not eligible to undergo this alternation in English. Furthermore, whilst object-experiencer psych verbs in Libyan Arabic and English belong to the anticausative pattern (i.e.,

they have overt morphology on the inchoative form), the inchoative form in English can only be expressed periphrastically with the verb *become.*

As for the task facing Arabic learners in the acquisition of object-experiencer psych verbs, since the inchoative form of psych verbs is morphologically marked as its Arabic counterparts, this should not cause difficulty to Arabic learners. However, there might be a potential learnability problem with this class of verbs. Since these verbs exhibit a misalignment problem (the theme surfaces in subject position and the experiencer in object position), it is not clear how to map thematic roles to syntactic positions.

Having discussed transitivity alternations and effects of argument-changing morphology, we, as noted earlier, propose that the differences between Arabic and English in the way they realize argument structure properties morphologically (specifically, transitivity alterations) can be characterized by a set of parameterized options which English and Arabic have set differently. Thus, we argue that there is a thematic role linking parameter and a transitivity parameter. In particular, we assume that there is +/-'overt anti-causative marker' parameter (Arabic +, English -); and a +/- 'link-theme-to-subject' parameter in the case of psych verbs (+ in English, - in Arabic). As for the unaccusative and unergative verbs, we assume that there is a +/- transitivity parameter: [+transitive] in Arabic and [-transitive] in English. As mentioned before, by investigating the acquisition of the realization of transitivity alternations in terms of the influence of L1 parameter settings and the ability of learners to reset parameters, it will be possible to provide a principled account of

development, ultimate attainment and the role that Universal Grammar (UG) might play in L2 acquisition (see the general discussion chapter for more details).

To summarize, this section introduced the morphosyntactic characteristics of the four types of verbs that will be used in the experiment. The examples above suggest that there are some differences in the morphosyntactic realisation of transitivity alternations between English and Libyan Arabic. While transitivity alternations are not marked morphologically in English, most verbs in Libyan Arabic have some morphosyntactic markers not only in the intransitive form but also in the causative form for a few verbs. As we have seen, there is an overt anticausative morpheme which marks the intransitive form of change of state verbs. That is, the inchoative must be marked by means of some affixes such as *-in, -a*. As for the object-experiencer psych verbs, Libyan Arabic is similar to English in that it has anticausative morphology. That is, only the inchoative form is marked morphologically. With respect to the unaccusative/unergative verbs, we have argued that these verbs are similar on the surface in English in that they take a single argument realized as the external argument (subject). However, these verbs differ in that their arguments are represented differently in the syntax: the sole argument of unaccusative verbs originating in the object position whereas the sole argument of unergative verbs is an agent (Burzio 1986; Levin and Rappaport-Hovav 1995; Perlmutter 1978). Therefore, we assume that if the distinction between unaccusative/ unergative verbs is related to universal mapping principles such as UTAH or the Unaccusative Hypothesis, the L2 learners should show sensitivity to the distinction between the two classes of intransitive verbs (unaccusative and unergative), regardless of how these are represented in their L1. This would constitute support for

the claim that the argument structures of unaccusatives and unergatives are represented differently in the interlanguage grammar. However, L1 morphology might be involved as well. As we shall see in the next section, a number of studies have investigated the role of L1 morphology in the acquisition of argument structure and have found that the presence of overt morphology in the L1 and absence of such morphology in L2 may cause difficulty to L2 learners. Since most unaccusative/unergative verbs in Libyan Arabic can alternate in transitivity, and this alternation is encoded morphologically in most cases, this might have an effect on the learners' responses. See chapter 6 for a summary of the characteristics of these verbs in English and Arabic; and for the general hypotheses of the study.

5.3 L1 AND L2 ACQUISITION OF ARGUMENT-STRUCTURE-CHANGING MORPHOLOGY

There is an important body of research on the acquisition of argument structure alternations in L1 and L2 acquisition. In this section, we review some of the existing literature on the L1 and L2 acquisition of change of state and psych verbs as well as unaccusative and unergative verbs. It begins by presenting some L1 acquisition studies to see the types of errors that children make when they acquire argument structure alternations. Subsequently, a number of studies of the L2 acquisition of argument-structure-changing morphology are reviewed.

As for studies on the L1 acquisition of transitivity alternations, Bowerman (1974; 1982) observed her own daughter's spontaneous speech and noted that children start overgeneralizing the causative alternation by the ages of 2 and 3. She observed that her daughter Christy created novel causative verbs from existing non-

causative verbs to express a meaning for which an adult would have used a periphrastic causative. Examples she recorded include:

(59) a. Daddy *go me around.

b.You *cried her.

c.I'm gonna put the washrag and *disappear sth under the washrag.

d. See, she can't eat. But I can't *eat her (= make her eat).

Bowerman found that her daughter produced novel transitives more often than novel intransitives. She claims that based on their experience with optionally transitive verbs like *break*, children assume that any intransitive verb can be used in a transitive frame to express causativity. She further claims that children make causative errors because English does not have overt morphology on the verb. Hence, if a verb like *break* can be used transitively and intransitively, then other verbs such as *laugh, disappear* can too. This results in errors such as **you cried her* instead of *you made her cry*. According to Bowerman's explanation, children whose languages mark the causative/inchoative alternation morphologically should not make these errors. However, a number of studies (e.g., Berman, 1993; Borer, 1997) have shown that these patterns of causative overgeneralizations that were found in English were also found even in languages in which the causative/inchoative alternation is morphologically marked, as we shall see below. Furthermore, children have been found to omit or overgeneralize the relevant morphology. For instance, the overapplication of the causative suffix in Turkish to verbs that are already causative-transitive as shown in (60) with the verb *Kesmek* ('to cut') :

(60) *Ben kes –tir -di -m.
I cut caus past 1sg
'I had someone cut it' intended: kesdim 'I cut it'
(Taken from Montrul, 2001: 154)

While some studies have found that children overextend both intransitives to transitives and transitives to intransitives (Lord, 1979), the majority of evidence from data elicitation studies (as well as diary data) indicate that children tend to overextend intransitive verbs to transitive contexts more than vice versa (Hochberg, 1986; Maratsos et al., 1987; Braine et al., 1990). It is clear then that children do make overgeneralization errors with argument structure and with argument structure changing morphology.

Turning to studies of L2 acquisition, several have focused on the overgeneralization of causatives in the adult L2 acquisition of English and Spanish (e.g., Moore, 1993; Montrul, 1999; 2000; 2001a; 2001b; Cabrera & Zubizarreta, 2003), on the dative alternation (for example, Hawkins, 1987; White. 1987; 1991); and on the locative alternation (e.g., Juffs, 1996). In this section, we first report on previous studies on transitivity alternations in English (Zobl, 1989; Yip, 1995; Balcom, 1997; Oshita, 1997; Juffs, 1996); in Japanese (Hirakawa, 1999; 2000; 2001). As shall be seen, the findings of these studies indicate that L2 learners are aware of the unaccusative/unergative distinction. Subsequently, we present two studies: Ju (2000) and also Kondo's (2005) replication of this study in which they examined the effects of cognitive factors on overpassivization errors. Finally, we report on a series of studies by Montrul (1997; 2000; 2001) and Kondo (2005) who argue that the way

the causative alternation is realized morphologically in the L1 might affect learners' expectations about morphosyntactic reflexes of argument structure in the L2.

With respect to overpassivization errors, it is clear that unaccusative verbs and passive verbs are, as noted earlier, similar in that "...the internal argument moves from an object position in argument structure to a subject position in the syntax" (Kondo, 2005: 129). However, they differ in that "...when a Theme argument of an unaccusative verb moves to the subject position, there is no morphological reflex of this movement. By contrast, when a Theme object moves as a result of passivization, there is a morphological reflex, the be + en form" (Kondo, 2005: 130) as shown in the examples in (61):

(61) a. Tom arrived

b. The door was broken.

It seems that the similarities between unaccusative verbs and passive verbs make speakers of some L1s overgeneralize passive morphology to intransitive verbs. However, it has been found that L2 learners are more likely to overgeneralize passive morphology to intransitive unaccusatives (e.g., **the accident was happened*) than intransitive unergatives (e.g.,**the lady was laughed*). Since overpassivization of unaccusative does not occur in English native speakers' speech, some researchers argue that this is not a random phenomenon and it seems that L2 learners are aware of the syntactic movement involved in English unaccusatives and passives: unaccusative and passive verbs share the property of a surface subject that originates in the object position and then moves to the subject position. "That is, their construction of an

interlanguage grammar for English is drawing on linguistic knowledge not directly inferable from target language input, an example of the so-called poverty of stimulus" (Kondo, 2005: 130; see also Balcom, 1997; Oshita, 2002; Hirakawa, 1999; and Zobl, 1989).

The phenomenon of overpassivization has been discussed by many L2 researchers (e.g., Yip, 1995; Hirakawa, 1995; Balcom, 1997; Izumi & Lakshmanan, 1998) but Zobl (1989) was the first to observe that L2 learners from a variety of L1 backgrounds produce and accept errors with unaccusative verbs in passive constructions, such as in (62) (the first two examples from Zobl, 1989: 204):

(62) a. The most memorable experience of my life was happened fifteen years ago.

b. *My mother was died when I was just a baby.

c. *He was arrived early. (Burt & Kiparsky, 1972)

d. *This problem is existed for many years. (Hubbard, 1994)

Zobl (and a number of subsequent researchers: Yip, 1995; Hirakawa, 1995; Balcom, 1997; Oshita, 2000, among others) have found that L2 learners are considerably less likely to passivize unergative verbs. This observation led Zobl to suggest that unaccusativity was the cause of these errors. That is, the distinction in overpassivization between unergative and unaccusative verbs suggests that these verbs are clearly different as stated by the unaccusative hypothesis (e.g., Perlmutter, 1978; Burzio, 1981). Similar errors were observed by Yip (1995). She tested Chinese learners of English on the acquisition of passive unaccusatives using a spontaneous production task. Her findings were similar to Zobl (1989) in that L2 learners

produced errors with unaccusative verbs in passive constructions (e.g., *my mother was died when I was just a baby*).

Another study on passive unaccusatives with L1 Chinese speakers of English is Balcom's (1997). Balcom tested 38 advanced Chinese university students together with a control group of native speakers using a grammaticality judgment task. The task consisted of sentences with different classes of unaccusatives, alternating ones and middle constructions, but it did not include unergative nor active verbs. Results showed that L2 learners had a tendency to accept passive unaccusatives significantly more often with change of state verbs. Thus, it seems that Zobl's findings were replicated here with another subclass of unaccusative verbs (i.e., alternating unaccusative or change of state verbs) and different participants (Balcom, 1997).

Furthermore, Oshita (2000: 312) used data from the Longman learners' corpus, which is a computerized database of written English produced by native speakers of different L1s. 10 unaccusative verbs and 10 unergatives were preselected based on their common appearance in the passive construction in interlanguage English. A total of 941 tokens of unaccusatives were obtained. Of these 941, there were 38 tokens of passive unaccusatives (e.g., *they were happened a few days ago*). As for the unergative verbs, there were 640 token sentences. Among these, only one error of a passive structure was found (e.g., *he has been walked since last month*). These results support Zobl's (1989) claim that overpassivization is the result of unaccusativity (see also Hubbard, 1983; 1994 for a similar observation).

To see whether the same pattern of results can be obtained using a different method, Hirakawa (1995) investigated the L2 acquisition of unaccusativity in English. She tested 22 intermediate Japanese-speaking learners of English using

judgment and production tasks. In the elicited production, participants were presented with a series of stories with missing blanks and were asked to fill in the blank in each story with the correct form of the verb. In the judgment task, subjects were presented with stories again but this time they were asked to judge sentences that appeared at the end of each story using a 5-point scale (from -2 to +2). There were four types of sentences in each story: (long) passives, short passives, transitive and intransitive. The tests included 5 change of state verbs (e.g. *break*), 5 unaccusatives (e.g. *appear)*, and 5 unergatives (e.g., *cry*). It should be mentioned that the change of state verbs in Japanese are the only class of verbs that have overt morphology in both forms (the causative and the inchoative).

Results of the production task showed that Japanese learners' production of passive and unaccusative verbs was accurate. The grammaticality judgment task showed that there were significant differences between the control group and the L2 learners on the acceptance of transitive and inchoative forms; because the Japanese-speaking learners preferred short passives *(the snow was melted*) to the inchoative forms (*the snow melted*). According to Juffs' (1996) interpretation of these results, learners accept the short passives because the inchoative form in Japanese has overt morphology and passives are morphologically marked in English (i.e. be +ed/en). However, this view cannot fully explain these results. Firstly, as Montrul (1997: 139) pointed out, this might not be the case with the transitive sentences and the only way to find out is to test whether the Japanese learners of English would also "prefer sentences with periphrastic causatives (*the sun made the snow melt*) over transitive ones (*the sun melted the snow*)", but Hirakawa did not include these in the task. As for the unaccusative and unergative verbs, Hirakawa found that L2 learners "...*were less accurate at rejecting transitive unaccusative (*Mary fell down Jane)* than

transitive unergatives *(*John cried Bill*)". This led her to conclude that L2 learners are distinguishing between unaccusatives and unergatives.

The findings of the above studies suggest that L2 learners of English show sensitivity to the distinction between unaccusative and unergative verbs, supporting the claim that the arguments of these two classes of verbs are represented differently. However, to test the universality of the unaccusative/unergative distinction it is important to see whether L2 learners show a similar pattern in learning languages in which there is more structural difference between unaccusative and unergative verbs.

Hirakawa (1999, 2001) investigated whether L2 learners of Japanese are aware of the distinction between unaccusative and unergative verbs. In one construction, for instance, Hirakawa (1999:91) noted that the adverb, *takusan* ('a lot') can modify any internal argument "object" but not an external argument "subject". Consider the following examples:

(63) Takusan yon-da
a lot read-PAST
'He'she/they etc. read a lot (of things).

(64) a. Takusan tsui-ta
a lot arrive-PAST
' a lot of people arrived'

b. Takusan nai-ta
a lot cry-PAST
'we/they/he/she cried a lot'

(Hirakawa, 1999: 92)

In sentence (63), the transitive verb is used with a null subject and a null object but here the adverb *takusan* modifies the object only. Thus, the sentence means that "somebody read a lot of things", modifying the null object and it cannot mean "a lot of people read something". In (64a) *takusan* can modify the subject of the unaccusative verb; whilst in (64b) *Takusan* cannot modify the subject of the unergative verb. Thus, the sentence can only mean somebody cried a lot and not a lot of people cried. Consistent with the Unaccusative Hypothesis, this led Hirakawa (2001) to conclude that the sole argument of an unaccusative is a Theme or a Patient originating in an object position in argument structure, whereas the sole argument of the unergative is Agentive mapped onto the subject position. Hirakawa (1999) tested whether 13 English-speaking and 16 Chinese-speaking learners of Japanese were aware of the distinction between unaccusativity and unergativity. She used a truth value judgment task where participants had to decide whether sentences involving *takusan* matched a given picture.

Results showed that L2 learners of Japanese did not accept *takusan* with a subject-modifying meaning with unergatives (like 64b), but did accept it with a subject-modifying meaning, as in (64a). Therefore, Hirakawa (1999: 107) argues that L2 learners universally have underlying representations for unaccusative verbs where the single argument is merged in an object position, while for unergative verbs the single argument is merged in a subject position.

The studies reported so far suggest that L2 learners of English and Japanese observed the unergative/unaccusative distinction, supporting the claim that these two classes of verbs differ in their predicate argument structures. If they did not have

different representations for these verbs classes they would not make overpassivization errors with unaccusative verbs only, or distinguish the different modificational possibilities of Japanese *takusan*. Furthermore, errors with unaccusative verbs do not seem to be an effect of L1 as several studies have shown that speakers of a variety of languages make the same errors with unaccusatives (For instance, Chinese (Balcom, 1997; Yip, 1995); Japanese (Hirakawa, 1999; 2001)). These errors were reported in production tasks as well as elicited production tasks and grammaticality-judgment tasks. Before discussing the effect of morphology on the realization of argument structure, we report on two recent studies (Ju, 2000; and Kondo, 2005) that examined overpassivization errors by L2 learners of English.

The main focus of Ju's (2000) study was on the effects of conceptualizable agents in discourse. Ju examined overpassivization errors in L2 English claiming that presence of conceptualizable agents in the discourse context affects overpassivization. She argues that learners are more likely to overpassivize unaccusative verbs in externally caused contexts (65) in which the source of causation is clear than in internally caused events (66) in which the cause or the causer is not explicit:

(65) A fighter jet shot at the ship.
The ship sank slowly.

(66) The rusty old ship started breaking up.
The ship sank slowly, (Taken from Ju, 2000: 92)

31 advanced Chinese learners of English together with 10 native English speakers took part in a forced-choice task in which learners were asked to read a pair of sentences in which the first sentence (priming sentence) sets up a context for the

event in the second sentence (the target one).[6] Learners were required to choose the form in the second sentence ,active or passive, which they consider more grammatical as shown in (67) below (example from Ju, 2000: 95)

(67) A fighter jet shot at the ship.

The ship (sank/was sunk) slowly.

Ju hypothesized that L2 learners tend to passivize unaccusatives verbs in externally caused events more than in internally caused events. Moreover, L2 learners are more likely to overpassivize unaccusative with transitive counterpart (change of state verbs) than those without. The first hypothesis was confirmed as the results showed that L2 learners accepted overpassivized sentences in externally caused events more than in internally caused events. This led Ju to suggest that learners' overpassivization occurs significantly more often when a conceptualizable agent is available in the context than when it is not. As for the difference between unaccusative verbs with transitive counterparts and those without, there was no significant difference between them. According to Ju, this finding is in line with Perlmutter's (1978) unaccusative hypothesis that "...unaccusatives fall within a single category despite a lexicosyntactic difference in whether or not they allow transitive counterparts" (Ju, 2000: 102).

Since unaccusative verbs in Chinese do not have a morphological marker and given that the overpassivization phenomenon has been observed among L2 learners of typologically different L1s, Ju assumes that overpassivization errors do not purely stem either from a lack of L2 structural knowledge or from L1 influence. She suggests that these errors are language universal rather than language specific (Ju,

[6] Chinese unaccusative verbs are similar to English in that they cannot be used in the passive constructions.

2000: 86). However it is important to test whether L2 learners also overpassivize unergative verbs before Ju's claim is adopted. (None were included in her study). It is to a study of this nature to which we now turn.

Kondo (2005) investigated overpassivization errors with unaccusative and unergative verbs and she also examined Ju's claim that the source of overpassivization errors is due to the presence of conceptualizable agents in the discourse context. 18 subjects, 11 Japanese speakers and 7 Spanish speakers of English, took part in this study (as well as 5 native controls). Kondo predicted that L2 learners would passivize unaccusative verbs but not unergative verbs; and would be more likely to passivize unaccusatives in externally caused events than in internally caused events. Furthermore, L2 learners would passivise unaccusatives with transitive counterparts (change of state verbs) more than those without. Materials, procedures and the task were similar to those used in Ju (2000). This study, however, was different in that Kondo reduced the number of alternating unaccusative to almost half (6) and she also added ten sentences with unergative verbs. Furthermore, Kondo assumes that some of Ju's test items are "problematic" because "...they appear to give rise to an ambiguity between a possible intransitive unaccusative reading of the second sentence and a true passive reading of the second sentence" (Kondo, 2005: 144) as shown in the following examples:

(68) I pushed the door

The door (closed/was closed) immediately. (Ju, 2000: 110)

Kondo pointed out that while many participants chose the passive form in the above sentence, the passive would be ungrammatical if participants interpreted the sentence as "the door was closed immediately by someone'. "There is a potential

confound here in interpreting the results if speakers are assuming that there is an implied Agent in cases like [68]. Therefore, in order to eliminate the potential ambiguity in the present study, a prepositional phrase which forces an unaccusative reading such as *by itself* was incorporated into the sentence" (Kondo, 2005: 144). Consider the following example:

(69) I pushed the door.

The door (closed/was closed) by itself. (From Kondo, 2005: 144)

Unlike Ju's study, the results showed that there was no significant difference between test sentences involving external causation and test sentences involving internal causation in the rate of overpassivization errors. Kondo (2005: 154) suggests that this difference between Ju's study and her study seems to result from "...the potential ambiguity of certain test contexts in Ju's study". Furthermore, there was an important difference between the two groups in the rate of overpassivization of unaccusative verbs with transitive counterparts and those without. In Ju's study, learners overpassivized unaccusative verbs no matter whether they had transitive counterpart or not. In this study; however, only Japanese speakers overpassivized both types of unaccusative verbs. As for the Spanish speakers, they overpassivized verbs with transitive counterpart (*close*, *freeze*) more significantly than those without (*die*, *appear*). As in Montrul's (1999; 2000; 2001) studies, Kondo (2005: 155) suggests that this difference in the rate of overpassivization between unaccusative with transitive counterparts and those without is due to L1 morphological properties: only unaccusatives with transitive counterparts have the reflexive morpheme in Spanish. As for the unaccusative vs unergative verbs, the results showed that L2

learners were sensitive to the distinction between unaccusative and unergative verbs as they passivized unaccusative verbs only.

Thus, all the studies reviewed above suggest that L2 learners from various L1 backgrounds overgeneralize the passive construction with unaccusative verbs. However, those studies do not consider whether explicit morphology impinges on the realization of arguments as they claim that these argument structure errors are due to misalignment of arguments and/or pragmatic factors. However, we follow Kondo's assumption that "if there is any difference in overpassivization with unaccusative verbs across speakers of different L1s, and if the difference can be linked to L1 morphological patterns, it can be said that overpassivization is not only due to the misalignment of arguments but also to L1 morphological influence on the L2 grammar" (Kondo, 2005: 142). We finally review some of the studies that investigated whether explicit morphology has an effect on the realization of arguments. This possibility was examined by Montrul (1999; 2000; 2001) and also Kondo (2005). It is to an overview of these studies that we now turn.

In a series of there related experimental studies, Montrul (1997; 1999a; 2000a) investigated transitivity alternations in the L2 acquisition of English, Spanish and Turkish using a picture judgment task. The task included a pair of sentences and a picture. Participants were required to judge each sentence, in the context provided by the picture in terms of both grammaticality and meaning, using a 7-point scale ranging from 3 to -3. Half of the pictures involved only one participant as shown in the examples in (70-72) (e.g., the *window* as Theme), and the other half involved two participants (e.g. *the window* as Theme and *the thief* as Agent) as the examples in (73-75) illustrate:

(70) a. The window broke. English

b. The window got broken.

(71) a. *La ventana rompió. Spanish

"The window broke"

b. La ventana se rompió.

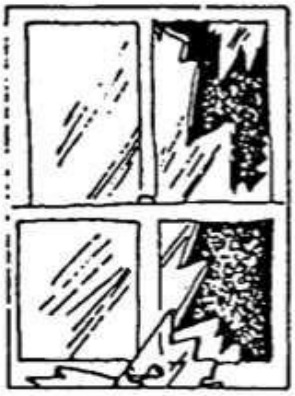
"The window broke"

(72) a. *Pencere [kır-dı]. Turkish

"The window broke"

b. Pencere [kır-ıl-dı].

"The window broke."



The window broke.	-3	-2	-1	0	1	2	(3)
The window got broken.	(-3)	-2	-1	0	1	2	3
La ventana rompió.							
La ventana se rompió.							
Pencere kır-mış.							
Pencere kır-ıl- mış.							

Picture with intransitive sentence pairs (taken from Montrul, 2000a: 251)

(73) a. The thief broke the window. English

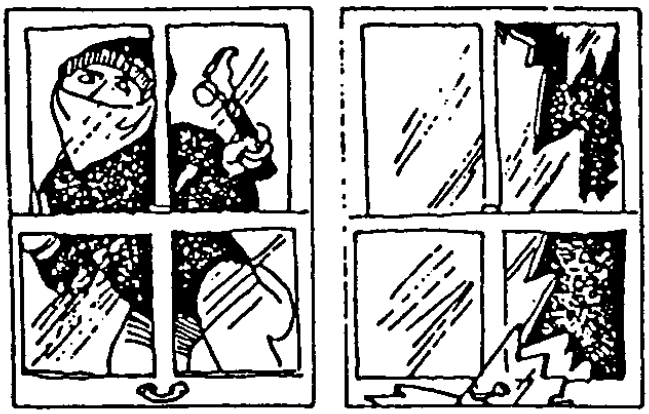
b. The thief made the window break.

(74) a. El ladrón rompió la ventana.

b. El ladrón hizo romper la ventana

(75) a. Hırsız pencere-yi kır-dı.

b. Hırsız pencere-yi kır-dı.



The thief broke the window.	-3	-2	-1	0	1	2	(3)
The thief made the window break.	(-3)	-2	-1	0	1	2	3

El ladrón rompió la ventana.

El ladrón hizo romper la ventana.

Hırsız pencere-yi kır-mış.

Hırsız pencere-yi kır-dır-mış.

Picture with transitive sentence pairs (taken from Montrul 2000a: 251)

In the L2 English study, 66 participants took part in this study, 12 high-intermediate level Spanish speakers, 17 intermediate level Spanish speakers and 19 native speakers. Since state verbs in Spanish has anticausative morphology and Turkish has both causative and anticausative morphology, Montrul (1997) hypothesized that Spanish learners might have more difficulty than Turkish with the intransitive form. The results of the alternating verbs in the L2 English study are summarized in table 12 (taken and adapted from Montrul, 1997: 307, table 1 in appendix A).

Table 12. English study. Mean scores on alternating unaccusatives (Montrul, 1997) (Max:3 =gram, min -3 = ungram)

Language/proficiency	Transitive	*Transitive (make)	Intransitive	Intransitive (get)
Native (N=19)	2.92 (.23)	-.09 (1.280)	2.78 (.33)	.22 (1.68)
L1 Turkish (N=18) Low-intermediate	2.45 (.58)	-.89 (1.65)	.95 (1.79)	-.33 (2.16)
L1 Spanish (n=17) Intermediate	2.14 (.63)	-.5 (1.48)	-.43 (2)	1.83 (1.48)
L1 Spanish (N=12) High intermediate	2.63 (.51)	-.19 (1.51)	-.06 (1.64)	1.69 (1.8)

The results showed that the predictions of morphological L1 influence were confirmed in this study. With intransitive forms (*the window broke*), results showed that the native speakers were significantly more accurate than the two Spanish groups and the Turkish group but there were no significant differences between the two Spanish groups and the Turkish group. As for the intransitive, patterns with *get*, the results showed significant differences because of the two Spanish groups who rated the periphrastic forms more acceptable than the Turkish group and the control group. As for the results of transitive sentences (*the thief broke the window*), they were similar across groups.

In the Spanish study, she predicted that English speakers would have more difficulty with the reflexive clitic of intransitive forms (*la ventana se rompió* 'the window broke') than Turkish speakers because this anticausative marker is available in Turkish. That is, English speakers will incorrectly accept zero-derived forms in the inchoative (* *la ventana rompió* 'the window broke') instead of the correct forms with the reflexive clitic *se*. Table (13) shows the results of the alternating verbs in the Spanish study (Taken and adapted from Montrul 1997: 331, table 1 appendix C).

Table 13. Spanish study. Mean scores on alternating unaccusatives

Language/proficiency	Transitive	*Transitive *(hacer)*	Intransitive	Intransitive with *se*
Natives (N=20)	2.77	-1.49	-2.81	2.85
L1 Turkish (N=19) Intermediate	2.57	-1.42	-2.03	2.37
L1 English (N=15) Intermediate	2.73	-.86	1.82	.07
L1 English (N=12) High intermediate	2.32	-.87	1.29	.88

The three groups were very accurate with transitive verbs: they all correctly accepted sentences without *hacer* ('make'). With the intransitive sentences without *se*, the two English speaking groups rejected these sentences and incorrectly rated intransitive sentences without the reflexive clitic as grammatical. In contrast, the Turkish-speaking learners, as well as the control group, were more accurate than the English groups because they rated these sentences positively on the scale.

In the Turkish study, there were 18 Turkish native speakers, 24 Spanish speakers, 18 native speakers of English and 9 Japanese speakers. As mentioned before, Turkish has two morphological patterns of transitivity alternations: causative and anticausative patterns. In the causative pattern, there is an overt causative suffix –*Dir* which marks the transitive variant of the verb; and anticausative pattern in which the intransitive variant must be marked with the passive morpheme –*ll*. Montrul hypothesized that Spanish and English learners would behave similarly with respect to the acquisition of causative morphology but the Spanish learners would be more accurate than English learners with respect to the anticausative pattern. Table (14)

shows the results of the alternating verbs in the Turkish study (taken and adapted from Montrul, 1997: 319):

Table 14. Mean scores on the causative and anticausative pattern:

Language/proficiency	*Transitive alternating causative	Transitive with *dir*	Intransitive alternating causative	*Intransitive with *–ll*
Natives (N=18)	-2.93	2.88	2.67	-2.83
L1 English (N=18) Intermediate	-1.20	2.26	1.66	-.31
Spanish (N=14) Intermediate	-1.13	2.28	1.69	.83
L1 Spanish (N=10) High-intermediate	-2.44	2.73	1.8	-.44

The results showed that the Spanish learners and English learners behaved alike with respect to the causative pattern: they both were accurate. Furthermore, whilst the L2 learners had a tendency to accept the grammatical form of the intransitive variants, they also accepted the ungrammatical form with *–ll* to some extent. According to Montrul, since the English and Spanish learners of Turkish were extremely accurate in the L2 Turkish study, this supports the hypothesis that acquiring overt morphology is much easier than acquiring zero morphology.

Another study that looked at how L1 morphology as well as UG had an effect on the acquisition of the causative/inchoative alternation of change of state and psych verbs was Montrul's (2001) study. Montrul tested the acquisition of these two classes of causative verbs in English, Spanish and Turkish by speakers of L1 English, Spanish, Turkish and Japanese. As mentioned earlier, both psych verbs and state verbs participate in the causative inchoative alternation crosslinguistically but the

alternation is realized differently in these languages. Montrul points out that while English has zero morphology and Spanish has anticausative, Turkish and Japanese have both causative and anticausative morphology. She proposed that "overt/non-overt morphophonological shape of affixes carry over from the L1 as well, and that learners are also prone to add or omit morphology if this is dictated by their L1. The basic idea is if the formal features of a given morpheme are expressed overtly in the L1 but non-overtly in the L2, L2 learners will have difficulty with zero-morphemes and will try to find a surrogate L2-specific phonological from on which to map formal features of such a lexical item; if a morpheme has no phonological form in the L1 but it does in the L2, L2 learners are likely to assume that such morpheme does not have an overt from in the L2 either, at least, initially. This pattern of morphological acquisition is expected with change of state and psych verbs" (Montrul, 2001: 159-160).

Finally, in addition to showing the effects of the L1 in the type of morphological errors observed, it cannot be denied that the argument structure of the two verb classes plays a role in their acquisition as well. Thus, in cases where the L1 of the learners and the target languages match in terms of morphology, still more difficulty is expected with transitive psych verbs than with transitive agentive verbs in the three languages, due to the misalignment problem of arguments to syntactic positions with psych verbs. As discussed earlier, these errors can be explained if L2 learners – like L1 learners – have full access to and make errors that are consistent with the operation of a thematic hierarchy and UTAH (Montrul, 2001: 160).

As for the English study, 18 adult native speakers of Turkish (low-intermediate), 29 Spanish speakers (12 high-intermediate and 17 intermediate) and a control group of 19 English native speakers took part in this experiment. The results of a picture judgment task showed that the Spanish group were inaccurate with the inchoative form as they rejected the zero-derived intransitive forms and accepted the periphrastic *get* forms. This led Montrul to conclude that the Spanish group have transferred the anticausative pattern onto English. As for the Turkish speakers, the results showed that they have not transferred the causative pattern but have partially transferred the anticausative pattern. However, an individual item analysis revealed that "...the Turkish speakers do not treat individual verbs differently" (Montrul, 2001: 167). As for the psych verbs, the results were in line with her hypotheses in that the Turkish learners rejected zero-derived transitive forms and accepted zero-derived intransitive forms; this is a clear transfer from L1. The Spanish learners, however, were accurate with both causative and anticausative patterns.

In the Spanish study, the results of the state verbs revealed that there was a significant difference between the Turkish-speaking and English-speaking learners as the Turkish learners were more accurate than the two English groups. This difference was predicted as Turkish is similar to Spanish in that it has anticausative morphology whereas English has only zero morphology. With psych verbs, however, learners had less problems with the inchoative form and again this difference was expected as psych verbs do not alternate in transitivity in English.

In the Turkish study, the findings confirmed Montrul's predictions with regard to L1 influence because English learners had difficulty learning overt morphology in

Turkish. They more were inaccurate than the Spanish and Japanese learners in accepting overt morphology on the inchoative form of state verbs.

This led Montrul to conclude that errors with argument structure alternations could be related to the way the alternations are morphologically realized in the L1 of the learners and errors could also be related to the "...atypical alignment of thematic roles to syntactic positions" (Montrul, 2001: 186-187). According to Montrul, these findings are in line with the predictions of the Full Access/Full Transfer Hypothesis (Schwartz & Sprouse, 1996). In this study, we further test Montrul's claim about L1 morphological transfer onto the L2 to see the effect of L1 morphosyntactic properties in L2 learners' interlanguage.

As for studies on causative psych verbs, White, Brown, Bruhn de Garavito, Chen, Hirakawa and Montrul (1999) investigated the acquisition argument structure of psych verbs such as fear (Experiencer-V-Theme) and frighten (Theme-V-E) in interlanguage syntax. As discussed above, the realization of the argument structure of psych verbs constitutes a potential learnability problem because the mapping of thematic roles to syntactic positions is not clear from the input learners receive; experiencer might surface in subject position as (76b) or in object position as (76a).

(76) a. Dogs frighten children.

b. Children fear dogs

White et al. hypothesized that if learners had problems with psych verbs at all, they would resort to UTAH and thematic hierarchy in order to determine how to map thematic roles to syntactic positions. In other words, the linking of the arguments of psych verbs to syntactic positions in interlanguage grammars is not based on arbitrary

mappings. “Instead, given a psych verb with experiencer and theme arguments, learners may resort to a default mapping strategy, whereby the theme is projected to object position and remains there, even when it should have raised to subject position at S-structure. Errors, then, are predicted to be unidirectional: experiencer-object verbs may incorrectly surface with experiencer in subject position, as in (77a), but experiencer subject verbs should not occur with the theme in subject position as in (77b)” (White, 2003: 225-226):

(77) a. *The students frighten exams.

b. *Exams fear John.

White et al. conducted a number of experiments to investigate these hypotheses. The results showed that (Japanese) learners had considerable difficulties with experiencer-object- psych verbs. Furthermore, Japanese-speaking learners of English performance on experiencer object verbs was significantly worse than French-speaking learners of English, even though they were at the same level of proficiency. White (2003) attributed this difference to L1 effect as Japanese is different from English and French in that Japanese “has an explicit and productive causative morpheme, which is required in the case of experiencer-object psych verbs”. Once again, it appears that differences between the L1 and L2 in the morphology signalling argument-structure alternations may be problematic for L2 learners. As with unaccusatives, errors with experiencer object psych verbs indicate that learners fail to raise the theme to subject position. According to White (2003: 228) “such errors are nevertheless indicative of an interlanguage system that recognizes the mapping of themes to VP-internal direct-object position”. As we saw in the previous section, “errors with unaccusatives similarly suggest that verbs whose

argument structure includes only a theme are recognized as such and are distinguished from verbs which include an agent argument". As with psych verbs, L2 learners do observe the distinction between unaccusative and unergative verbs in terms of the difference in argument representation. It has been shown that "where errors occur, these support the claim that the learner correctly represents the argument structure of unaccusatives as taking an internal Theme argument. The study by White et al. (1999) suggests that same is true of psych verbs: problems that occur are consistent with an appropriate argument structure for psych verbs but difficulties in determining where the theme argument should surface" (White, 2003: 234). As we have seen, "...in the case of psych verbs...presence of overt causative morphology in L1 Japanese and absence of such morphology in L2 English may have contributed to the problem L2 learners had in working out the mapping of English experiencer-object verbs, since French speakers had no such difficulties and French, like English, lacks overt morphology associated with psych verbs" (White, 2003: 234).

5.4 SUMMARY

To summarize, a number of studies have shown that L2 learners make overpassivization errors regardless of their L1 backgrounds. These studies show that L2 learners tend to make overpassivization errors with unaccusative verbs but not unergative verbs although these two classes have the same surface form. Therefore, a number of researchers argue that these results indicate that L2 learners are aware of the fact that the arguments of these two types of verbs are represented differently (e.g. Hirakawa, 1999). Since L2 learners of different L1 backgrounds were observed to make a distinction between unaccusative and unergative verbs, this has often been taken as evidence supporting the claim that L2 learners have access to UG. That is, if

learners' interlanguage grammar is not constrained by universal principles, these learners should not make a distinction between unaccusative and unergative verbs. The question that arises now is whether the L2 learners in this study would be able to observe this distinction. We have also presented studies which investigated transitivity alternations and effects of argument-changing morphology (e.g., Montrul, 2001; Kondo, 2005). The findings of these studies suggest that the presence of overt morphology in the L1 which signals argument structure properties and absence of such morphology in the L2 might cause difficulty to L2 learners. Finally, studies of object-experiencer psych verbs have shown that these verbs present challenges to learners because of a misalignment of thematic roles to syntactic positions. That is, errors suggest that L2 learners fail to raise the theme to subject position. Furthermore, the study by White et al. (1999) suggests that learners appear not to be aware of the fact that these verbs have zero-causative morphology in English. In Chapter 6, these issues will be examined in the context of the acquisition of four types of verbs in L2 English by speakers of Libyan Arabic

CHAPTER 6
TESTING THE ACQUISITION OF ENGLISH ARGUMENT-STRUCTURE-CHANGING MORPHOLOGY BY L1 SPEAKERS OF LIBYAN ARABIC

6.0 INTRODUCTION

This chapter reports an investigation into the acquisition of argument-structure-changing morphology in L2 English by L1 speakers of Libyan Arabic. The purpose of the study was to see whether Arabic learners of English know which verbs alternate in transitivity and which do not; whether L2 argument structure is affected by L1 morphological patterns and whether UG plays a role in the acquisition of argument structure alternations. (These questions will be made more precise in the presentation of the general hypotheses of the study).

In the light of the discussion of verb classes in English and Arabic in chapter 5, this chapter is divided as follows. Section 6.1, presents a summary of the characteristics of the four verb classes in Arabic and English to be investigated. In section 6.1.1, we lay out the research questions and general hypotheses underlying the study. Section 6.2 presents the main task for eliciting information relating to the hypotheses: a grammaticality judgment task, together with the description of a preliminary 'verb translation task' whose purpose was to make sure that participants were familiar with the vocabulary used in the judgment task. Section 6.3 presents the results of the two experiments.

6.1 SUMMARY OF THE MORPHOSYNTATIC CHARACTERISTICS OF THE FOUR CLASSES OF VERBS IN ARABIC AND ENGLISH

In this section, we summarize the morphological and syntactic properties of the four types of verbs investigated in this study (see tables 15, 16, 17 & 18):

Table 15. Morphological marking of change of state verbs in English and Libyan Arabic

Verb tokens	*close, burn, break, freeze*	
	Transitive	**Intransitive**
English	Ø	Ø
Libyan Arabic	Ø	anticausative
Verb tokens	*sink, melt*	
	Transitive	**Intransitive**
English	Ø	Ø
Libyan Arabic	causative	Ø

Table 16. Morphological marking of psych verbs in English and Libyan Arabic

Verb tokens	*surprise, annoy, frighten, amuse, embarras, disgust*	
	Transitive	**Intransitive**
English	Ø	no counterpart
Libyan Arabic	Ø	anticausative

Table 17.Morphological marking of unaccusative verbs in English and Libyan Arabic

Verb tokens	*disappear, emerge, escape, arrive, vanish*	
	Transitive	**Intransitive**
English	no counterpart	Ø
Libyan Arabic	causative morphology	Ø
Verb token	*die*	
	Transitive	**Intransitive**
English	suppletive counterpart (*kill*)	Ø
Libyan Arabic	Suppletive counterpart	Ø

Table 18. Morphological marking of unergative verbs in English and Libyan Arabic

Verb tokens	*resign, laugh, cry, dance*	
	Transitive	**Intransitive**
English	no counterpart	Ø
Libyan Arabic	causative morphology	Ø
Verb token	*cough, yawn*	
	Transitive	**Intransitive**
English	no counterpart	Ø
Libyan Arabic	no counterpart	Ø

6.1.1 RESEARCH QUESTIONS AND HYPOTHESES

The experiment was designed to test Arabic speakers' acquisition of argument-structure-changing morphology. Following the discussion of L1 and L2 research on transitivity alternations and the potential influence of L1 argument-changing morphology on L2 development, three hypotheses were formulated:

Hypothesis 1:

> L1 speakers of Libyan Arabic learning English will prefer morphologically marked forms where the equivalent verb in their L1 is morphologically marked as the result of transfer from the L1.

Specifically, learners are expected to be accurate with the zero-morphology of transitive verb constructions (e.g., *the thief broke the window*), but will be inaccurate with the zero-morphology of their intransitive counterparts (e.g., *the window broke*), and will prefer sentences with overt morphology (e.g., *the window was broken*) as a surrogate form for the prefixes (*in*) or (*t*a) in Libyan Arabic *in-kṣar* 'broke' and *ta-jammid* 'froze'. Furthermore, since some physical change of state verbs in Libyan

Arabic have causative morphology, learners could assume that those verbs that in Libyan Arabic belong to the causative pattern (*melt, sink*) and those that belong to the anticausative pattern (*freeze, close, break, burn*) follow different morphological patterns in English as well. That is, these learners may assume that *melt* and *sink* are possible with zero morphology in the intransitive form, but that other verbs (*freeze, close, break, burn*) are not. As for the native speakers, they are expected to opt for zero morphology in all three constructions.

Since English unaccusative verbs (e.g., *arrive*) have some Arabic counterparts that alternate with overt morphology (e.g. a-*ss*a*ww*a*g wa*ṣṣ*il* a-*rr*a*jil*, '*the driver arrived the man'), Arabic learners of English are expected to overgeneralize the alternation to English, accepting forms like **the driver arrived the man* which are ungrammatical in English. As for the intransitive form (e.g., *the man arrived*), given that unaccusative verbs in Libyan Arabic are similar to English, it is predicted that Arabic learners will have less difficulty with the intransitive structure than the transitive and passive structures.

Similarly, with unergative verbs, it is predicted that since some of these verbs, unlike English, can be used in the transitive constructions, Arabic learners will overgeneralize this alternation to English. That is, sentences such as a-*rr*a*jil ḍaħħik '* a*l-wilid* (*the man laughed the boy) might be rated acceptable by Arabic learners. Moreover, since only some unergative verbs (*dance, laugh, resign, cry*) can alternate in transitivity, Arabic learners will assume that only these verbs are possible in transitive sentences, and not others (*cough, yawn).* As for the intransitive form (e.g., *the boy laughed*), given that unergative verbs in Libyan Arabic are similar to English, Arabic learners are not expected to have any difficulty with this form.

Hypothesis 2a:

> Arabic-speaking learners of English will have more problems with transitive psych verbs (*the lion frightened the hunter*) due to the misalignment of arguments to syntactic positions with psych verbs, than with transitive agentive verbs (e.g., *the thief broke the window*). This is the result of the influence of universal mapping principles like UTAH.

As for the anticausative forms (e.g. *The hunter was frightened*), following Montrul (2001) it is predicted that Arabic learners will have less difficulty with the morphology of this construction (which matches the Arabic anticausative pattern) than with the morphology of intransitive change of state verbs, if they are aware of the fact that these verbs are different from change of state verbs in their morphological expression. This leads to hypothesis 2(b):

Hypothesis 2(b):

> Arabic speaking learners of English will have fewer problems with the morphology of intransitive English psych verbs than with the morphology of English intransitive change of state verbs as the result of transfer from the L1.

Previous studies by Hirakawa (1999) and Kondo (2005) have shown that L2 learners make overpassivization errors with unaccusative verbs (e.g., **the man was died*) but not with unergative verbs (e.g. **the boy was laughed*). The findings of these studies suggest that L2 learners of English show sensitivity to the distinction between unaccusative and unergative verbs, supporting the claim that the arguments of these

two classes of verbs are represented differently. Therefore, if L2 learners in this study make passivization errors with unaccusatives but not with unergative verbs, one can argue that L2 learners represent the argument structure of unaccusative verbs, and not unergatives, as having an internal theme argument. This leads to hypothesis 3:

Hypothesis 3:

Arabic-speaking learners of English will show sensitivity to the universal distinction between unaccusative and unergative verbs by over-passivizing unaccusatives.

6.2 THE STUDY

6.2.1 MATERIALS

A grammaticality judgement task was used to elicit information about how Libyan Arabic speakers acquire the mapping of Lexical Conceptual Structure and Predicate Argument Structure to morphosyntactic structure in English. However, to ensure that participants knew the meaning of the vocabulary items used, a preliminary verb translation task, testing a total of 24 verbs, was conducted.

The verb translation task

Following Montrul (1997: 162), it was assumed that "... if a person does not know the basic meaning of a verb then he or she might not now know its syntactic behaviour". The task included all the verbs that were used in the grammaticality judgement task. Table 19 presents some of the verbs that were included in the task (for a full list of the relevant verbs, see appendix D.). The English verbs were

presented in a random order and in the infinitive form and they were all translated into Arabic. We used the imperfect tense form (non-past) for the Arabic verbs. As table 19 shows, participants were given an English verb together with three Arabic verbs, and they were required to choose the correct translation of each verb out of three suggested meanings and underline it. It should be noted that all the Arabic verbs were in Modern Standard Arabic (not Libyan) as there is no written form of the dialect. It is also important to note that the task was a screening test, not part of the experiment.

Table 19. Some of the verbs that were included in the translation task

English	**Arabic verb (1)**	**Arabic verb (2)**	**Arabic verb (3)**
Amuse	**يسلي 'amuse'**	**يحزن 'sadden'**	**يأمل 'hope'**
Sink	يبحر **'sail'**	يغطس **'sink'**	يغرق **'drown'**
Embarrass	يحرج **'embarrass'**	**يغضب 'anger'**	يفرح **'gladden'**
Emerge	**يختفي 'disappear'**	**يذوب 'melt'**	**يظهر للعيان 'emerge'**

Grammaticality Judgment task:

In order to test the hypotheses, a grammaticality judgement task was designed. Recall that Montrul used an acceptability judgment task with pictures. In this study, a grammaticality judgement task was administered to a total of 39 Arabic native speakers of English of different proficiency levels. The purpose of the task was to see i) whether Arabic learners of English know which verbs alternate in transitivity and which do not; ii) whether L1 morphology has an effect on their choice of verb forms

in certain structures ; and iii) whether UG plays a role in the acquisition of argument-structure-changing morphology. It should be noted that since this task is not a production task, it is not possible to test whether participants prefer transitive or passive to intransitive forms but it is possible to test how accurate the participants are at judging the three constructions.

6.2.2 PARTICIPANTS:

39 undergraduate college students participated in the study. They were all native speakers of Libyan Arabic and they were students in the department of English at Almirqib University. There were 19 first-year students: 8 males and 11 females; and 20 fourth-year students: 8 males, 12 females. The mean age of the first group was 19.6; and the mean age of the 4th year students was 21.3. They had regular classes 5 days a week. Initially, participants were selected on the basis of their university course results and their teachers' evaluation report. Furthermore, students, as in the first test, had to pass an entry test in order to be enrolled in the department of English. We had a copy of this test and made sure to choose only the subjects who scored 75-85% from first-year students and 85-100% from fourth-year students. Since this task was administered 8 months after the compounding tasks, a different group of participants were selected for this study.

Of the 39 Arabic-speaking learners, 3 participants reported that they spoke foreign languages other than English (Italian).The learners had started learning English, on average, around the age of 12 in a classroom setting but none of them reported having lived in an English-speaking country prior to the test. Most of these

learners reported taking extra English lessons in private language institutes, on top of their full-time regular English instruction offered at the university.

Furthermore, 10 undergraduate native speakers of English took part in the study as a control group: 4 females and 6 males (mean age 20.7). They were all students at the University of Leeds with little or no training in Linguistics. All participants had no idea about the ultimate purpose of the study. The Arabic participants were not paid but they were offered feedback on their performance. As for the native speakers, they were given a sum of money. Finally, and as mentioned earlier, all participants in this study are the same ones who took part in the second experiment reported in chapter 4.

6.2.3 PROCEDURE

Participants were divided into two groups (first year and fourth year) and both groups were tested on different days. The test took place in a quiet room to ensure that nothing would distract the participants' attention. Firstly, they were asked to fill in a short questionnaire with personal information and language background. After that, the experimental procedure was explained to them in writing. The test instructions were given in English to the native and non-native speakers. In the task, participants were asked to read some sentences and to rate them in terms of their grammaticality by putting a tick in the box below the sentence, as the examples in (1) show. There were four types of verbs: change of state verbs (6), Psych verbs (6), unaccusatives (6) and unergatives (6) as shown in (2) below. Each verb was used in three different structures (transitive (1a), intransitive (1b) and passive (1c)). Thus, there were 72

sentences presented in a random order (see Appendix D). Furthermore, each sentence had three rating categories:

Perfect- if the sentence sounds correct.
Possible- if participants cannot decide whether it is correct or incorrect.
Impossible- if the sentence sounds incorrect.

This rating scale was chosen to force participants to make a clear decision about each test item, while allowing them to provide a nuanced judgment where they felt the sentence was not entirely ungrammatical. An illustration of test items is given in (1):

(1) a) The thief broke the window.

Perfect	Possible	Impossible

b) The window broke

Perfect	Possible	Impossible

c) The window was broken.

Perfect	Possible	Impossible

(2) Verbs used in the study

a. Change of state: *close, freeze, break, burn, sink, melt*

b. Psych verbs: *surprise, disgust, annoy, frighten, amuse, embarrass*

c. Unaccusative: *disappear, emerge, die, escape, arrive, vanish*

d. Unergative: *resign, cough, laugh, yawn, cry, dance*

As the examples in (1) show, while the transitive sentences contained an agent (or the causer of the event), neither the intransitive and nor the passive structures included an agent argument. Since the inchoative form in English has zero morphology, passive forms were used as the overt morphology to test L1 morphology influence.[7] However, it is important to note that the *be* forms were used and not the verb *get* as in Montrul's study because we also wanted to test whether Arabic learners make overpassivization errors with unaccusative and unergative verbs as reported in previous studies (e.g., Zobl, 1989; Balcom, 1997; Ju, 2000; Hirakawa, 1999; 2001). Of the 72 sentences, 42 were grammatical and 30 ungrammatical. No filler sentences were used in this study because the task contained four types of verbs and 6 verbs per verb class. Thus, it was deemed unlikely that the participants would guess what the purpose of the study was. In addition, it was judged that the task would be too long if more sentences were included. Participants took 40 minutes to complete the two tasks: the grammaticality judgement task and the verb translation task together with the information sheet. The native speakers completed the grammaticality judgement task only. Furthermore, participants were shown some examples before the beginning of the grammaticality judgment task to make them familiar with the task. Finally, it should be noted that only participants that were accurate on the verb translation task were retained for analysis. Only 36 participants met this criterion.

[7] It should be noted that we did not include the periphrastic causative with the verb *make* in the transitive constructions as the majority of transitive forms are similar to English in that they are not marked morphologically. Furthermore, since this task included 4 classes of verbs used in 72 sentences, including the periphrastic form would have made the task too long.

6.2.4 RESULTS

This section reports results obtained from the vocabulary translation task and the grammaticality judgement task.

The vocabulary translation task

Tables 20 and 21 summarize the results of the verb translation task. The results were calculated as follows: if learners chose the correct translation of the verb given, they were assigned one point and zero was given to the wrong answers.

Table 20. The number of subjects who correctly selected the appropriate translation of change of state and psych verbs

Change of state verbs	1st year N=19	4th year N= 20	Psych verb	1st year N= 19	4th year N=20
break	19	20	disgust	18	20
close	19	20	annoy	18	20
burn	19	20	amuse	19	20
freeze	19	20	embarrass	18	20
melt	18	18	frighten	19	20
sink	18	18	surprise	19	20

Table 21. The number of subjects who correctly selected the appropriate translation of unaccusative and unergative verbs

Unaccusative	1st year N=19	4th year N= 20	unergative	1st year N= 19	4th year N=20
vanish	18	20	resign	18	19
emerge	18	18	cough	18	20
escape	19	19	laugh	19	20
arrive	19	20	yawn	18	18
die	19	20	cry	19	20
disappear	19	20	dance	19	20

As the tables show, most learners were able to select the appropriate translation in this task. However, three learners (one from the first year group and 2 from the fourth year group) had difficulty identifying the correct translation of certain verbs within particular classes of verbs. These learners were excluded from participating in the grammaticality judgement task.

The grammaticality Judgment Task

In this section, the group results of the grammaticality judgement task are discussed. The first step was to conduct a reliability analysis to determine the reliability of all items. Cronbach's alpha analyses were computed to investigate the items' reliability. The results showed the Cronbach's alpha to be (.808) or above as shown in table 22. Thus, we can safely conclude that the test items produced reliable responses.

Table 22. The results of the reliability analysis

Items	Cronbach's alpha
Change of state verbs	.846
Unergative	.808
unaccusative	.862
Psych verbs	.865

In the analysis of the grammaticality judgement task, learners' answers were scored as follows:

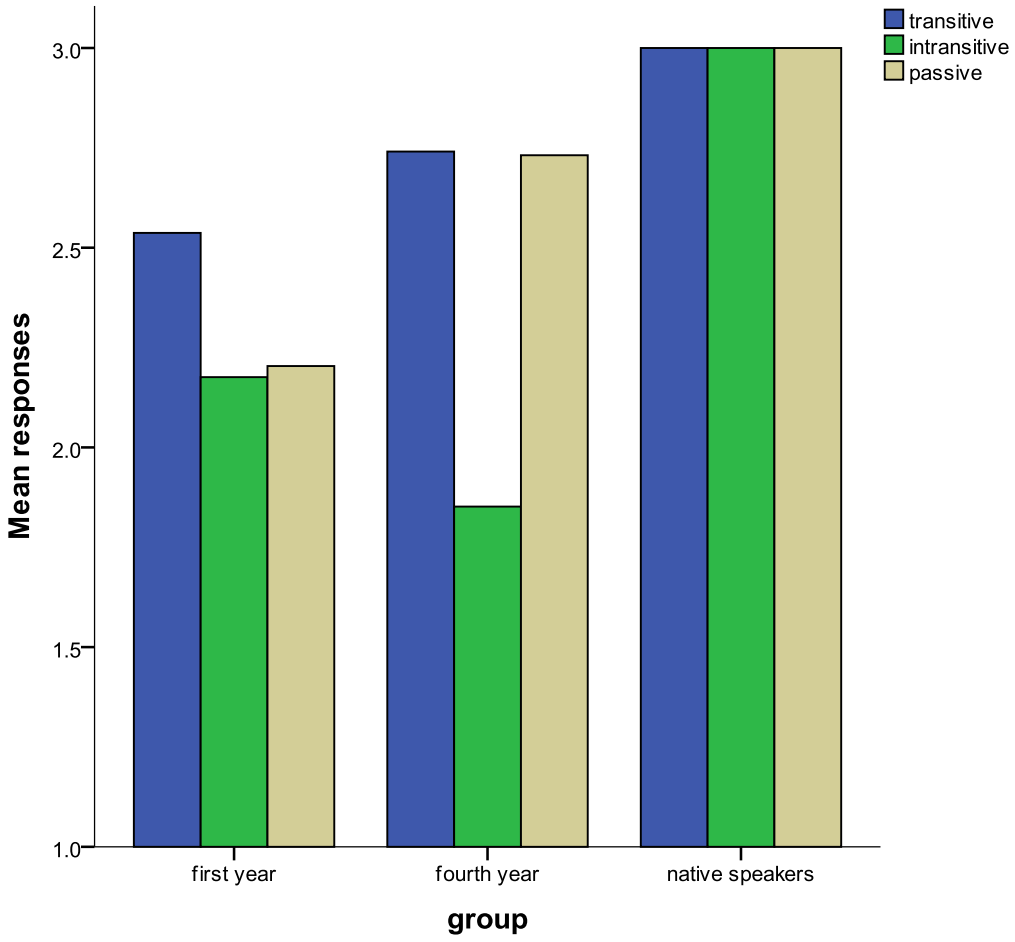
Impossible = 0 Possible = 1 Perfect = 2

As mentioned above, out of 39 participants, three participants were eliminated and as a result only 36 participants were included for the analysis. In the next section, we present data from the native and non-native participants.

Change of State verbs

Recall that hypothesis 1 proposed that, as the result of L1 transfer, Libyan Arabic speakers learning English would prefer morphologically marked forms where the equivalent verb in their L1 is morphologically marked. In the case of change of state verbs the prediction is that they would favour passive forms over intransitive forms. Figure 8 presents the responses of the 3 groups.

Fig. 8. Mean responses on transitive, inchoative and passive forms of change of state verbs



As hypothesized, the control group correctly accepted the three forms 100% of the time. In contrast, the non-native speakers were less accurate especially with the intransitive form. As predicted, results of transitive sentences such as *the thief broke the window* were overall very accurate in comparison to the other two constructions. Moreover, results of the intransitive sentences were the least accurate among the three constructions. A Kruskal-Wallis test, for more than two independent samples, was carried out to compare the three groups (1st year, 4th year and native speaker controls) on every condition (all the results are presented in Table 1 Appendix E). As table 1 shows, they were all strongly significant, due to the difference between the Arabic-speaking group and the native speakers.

With transitive sentences, a Mann-Whitney test (for two independent samples) was conducted to compare 1st years with 4th years, then 4th years with native speakers (Since the 4th years are either better than or no different from the 1st years, if all differences are significant, they will also be for the 1st years) . The results showed that the difference between 1st years and 4th years is significant at 5% level ($U = 225.500$, $N_1 = 18$, $N_2 = 18$, $p = .041$); and the difference between 4th years and native speakers was also significant ($U = 145.000$, $N_1 = 18$, $N_2 = 10$, $p = .003$). Thus, the results revealed that there was a difference between the Arabic speaking groups on the transitive sentences largely because of the performance of the first year students who were less accurate than the fourth year group.

As for the intransitive variant (e.g., *the window broke*), the results of Mann-Whitney test, for two independent samples revealed that there was a significant difference between the two learner groups ($U = 83.500$, $N_1 = 18$, $N_2 = 18$, $p = .012$); and there were also significant differences between the 4th years and native speakers ($U = 180.000$, $N_1 = 18$, $N_2 = 10$, $p < .001$). Surprisingly, the first year students were more accurate than the fourth year students on this structure.

With passive sentences (e.g., *the window was broken*), significant differences were found between the two Arabic-speaking groups on Mann-Whitney U-tests for two independent samples ($U = 255.500$, $N_1 = 18$, $N_2 = 18$, $p = .003$). This difference was due to the performance of the first year students who had a tendency to rate passive sentences as ungrammatical. There were also significant differences between the 4th years and native speakers ($U = 140.000$, $N_1 = 18$, $N_2 = 10$, $p = .005$).

To summarize, results relating to change of state verbs revealed that there were significant differences between the native speakers and the Arabic-speaking group: the native speakers were very accurate at the three structures, accepting the correct forms100% of the time. In contrast, the L2 learners were less accurate. Results of transitive sentences such as *the thief broke the window* were, as predicted, very accurate in comparison to the other two constructions. Moreover, intransitive sentences like *the window broke* were, as hypothesized, the least accurate among the three constructions. This suggests that L2 learners in general know that these verbs alternate in transitivity but they are more accurate at accepting transitive sentences than passive and intransitive. Contrary to our predictions, the above graph shows that there was no difference in the rate of acceptability between the inchoative form and the passive form in the first year group. As for the fourth year group, it is clear that they had a tendency to rate passive constructions as acceptable more often than the intransitive forms. In short, data from the non-native speakers show that fourth year students were more accurate than first year students on transitive and passive constructions. The results, however, cannot explain why 4th years were less accurate than 1st years on the intransitive constructions which have overt morphology in Arabic.

Finally, since the results of the intransitive form indicate that the first year group, unlike the fourth year group, did not distinguish passive from intransitive sentences (see figure 8 above), an individual item analysis was performed to see whether individual verbs might have had an effect on Arabic learners' responses. Recall that since some change of state verbs in Libyan Arabic have causative morphology, we hypothesized that learners could assume that those verbs that in Libyan Arabic have causative morphology (*melt, sink*) and those that belong to the

anticausative pattern (*freeze, close, break, burn*) follow different morphological patterns in English as well. Figures 9 and 10 present the results of individual verbs for both groups.

As figure 9 shows, the first year students were accurate with change of state verbs in the transitive constructions. Similarly, the fourth year group did not have any difficulty with the transitive construction as shown in figure 10. They, however, were more accurate than the first year students with this construction. There appears to be more variation between verbs in the passive and intransitive constructions. For example, the verb *break* in the intransitive construction appears to be rated lower than the other verbs by the first year group. The fourth year group, on other hand, rated intransitive verbs lower than the first year group, especially with verbs *break* and *burn*. Furthermore, it seems that both groups, especially fourth year students, rated the verbs that have causative morphology in Arabic (*sink, melt*) as slightly more grammatical than the other verbs in the intransitive sentences. With the passive constructions, the verb *sink* was rated as less grammatical than the other verbs by both groups of learners.

Fig. 9. First year students' mean responses on individual change of state verbs in the three structures

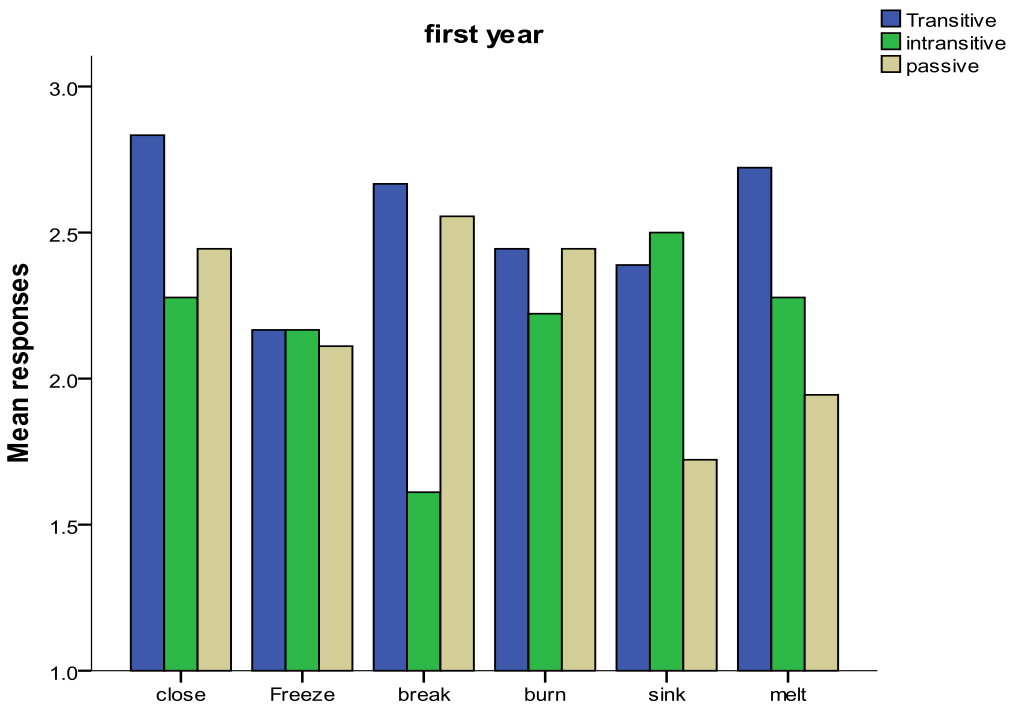
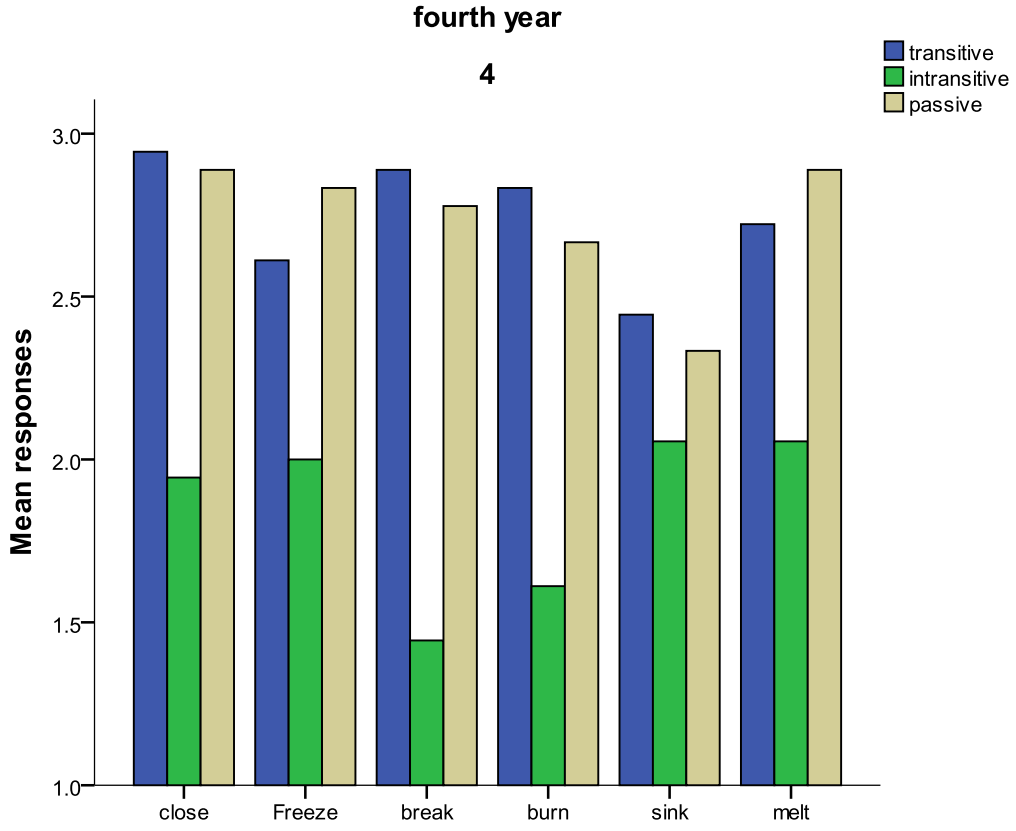


Fig. 10. Fourth year students' mean responses on individual change of state verbs in the three structures



In short, the results of change of state verbs are partially in line with our first hypothesis as the L2 learners seem to have difficulty with the intransitive constructions more than the other two structures. However, it is not clear why the first year students were more accurate than fourth year students with the intransitive structures.

Psych verbs

Since the intransitive variants of psych verbs in English must be marked with overt morphology (e.g., *the hunter was frightened*) which matches the Arabic anticausative pattern, we predicted that Arabic learners would have less difficulty

with the morphology of intransitive psych verbs than with the morphology of intransitive change of state verbs (hypothesis 2(b)). With the transitive construction (e.g., the *lion frightened the hunter*), we predicted that these might be problematic for the Arabic learners as they, unlike change of state verbs, exhibit a misalignment problem (hypothesis 2(a)).

The results revealed that the native speakers were very accurate at the three structures, accepting the correct forms and rejecting the incorrect intransitive forms (e.g., **the hunter frightened*) 100% of the time. In contrast, the non-native speakers were less accurate than the native speakers at the three structures. However, it should be noted that the Arabic learners had more difficulty with the intransitive constructions than the other two structures. A Kruskal-Wallis test, for more than two independent samples, was used to compare the three groups on every condition. The results were all strongly significant: this difference resulted entirely from the difference between the Arabic and the native speaker controls (all the results are reported in Table 1 Appendix E).

With transitive structures (e.g., *the lion frightened the hunter*) a Mann-Whitney test (for two independent samples) was carried out to compare 1st years with 4th years, then 4th years with native speakers. The results revealed that the difference between 1st years and 4th years was not significant ($U = 188.500$, $N_1 = 18$, $N_2 = 18$, $p = .391$); but the difference between 4th years and native speakers was significant ($U = 170.000$, $N_1 = 18$, $N_2 = 10$, $p < .001$).

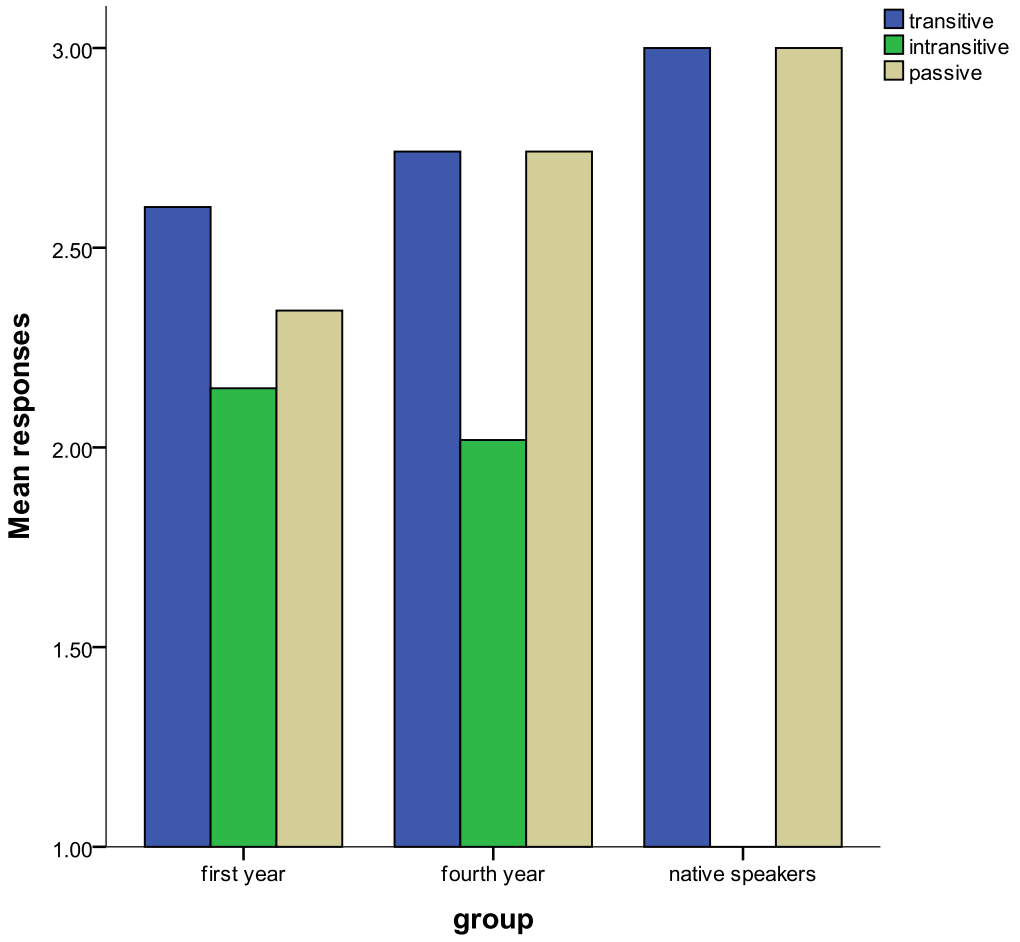
As for the results of intransitive sentences which are ungrammatical in both English and Arabic (e.g., **the hunter frightened*), no significant differences were found between the two Arabic-speaking groups on Mann-Whitney U-tests for two independent samples ($U = 130.000$, $N_1 = 18$, $N_2 = 18$, $p = .308$): 4th years were

slightly more accurate than 1st years at rejecting this structure. However, the differences between 4th years and native speakers were significant (U = .000, N_1 = 18, N_2 = 10, p < .001). Thus, contrary to the native speakers and to our predictions, both groups, especially first year, rated these sentences as grammatical.

With passive constructions (e.g., *the hunter was frightened*), the results of Mann-Whitney U-tests for two independent samples showed that there were no significant differences between the two Arabic-speaking groups (U = 210.000, N_1 = 18, N_2 = 18, p = .121), but there were significant differences between 4th years and native speakers ((U = 155.000, N_1 = 18, N_2 = 10, p =.001). The differences between the L2 learners was largely due to the performance of the fourth year students who rated these sentences more acceptable than the first year students.

In short, Fig. 11 shows that the fourth year students were more accurate than 1st years on all conditions, especially on the passive construction, but the differences between the two groups were not significant. Overall, the results suggest that learners, as with change of state verbs, are more accurate with transitive and passive than with the intransitive versions.

Fig. 11. Mean responses on transitive, intransitive and passive forms of psych verbs



Finally, we looked at individual verbs to see whether certain verbs caused difficulties to learners. As figure 12 shows, the first year group results on individual verbs did not vary but it seems that they were more accurate with the verb *amuse* in the intransitive constructions than the other verbs. The fourth year students, however, behaved differently. As figure 13 shows, there was no great deal of variation in the performance of the fourth year students with respect to how they treated individual verbs.

Fig. 12. First year students' mean responses on individual psych verbs in the three structures

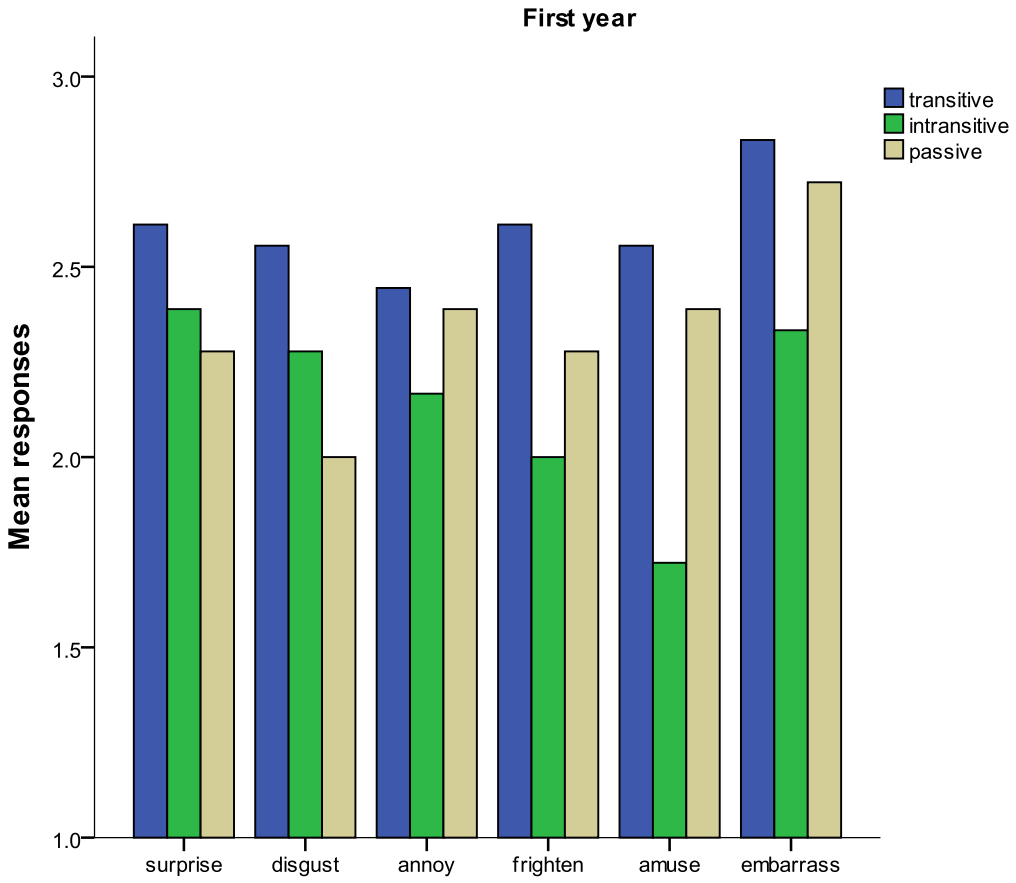
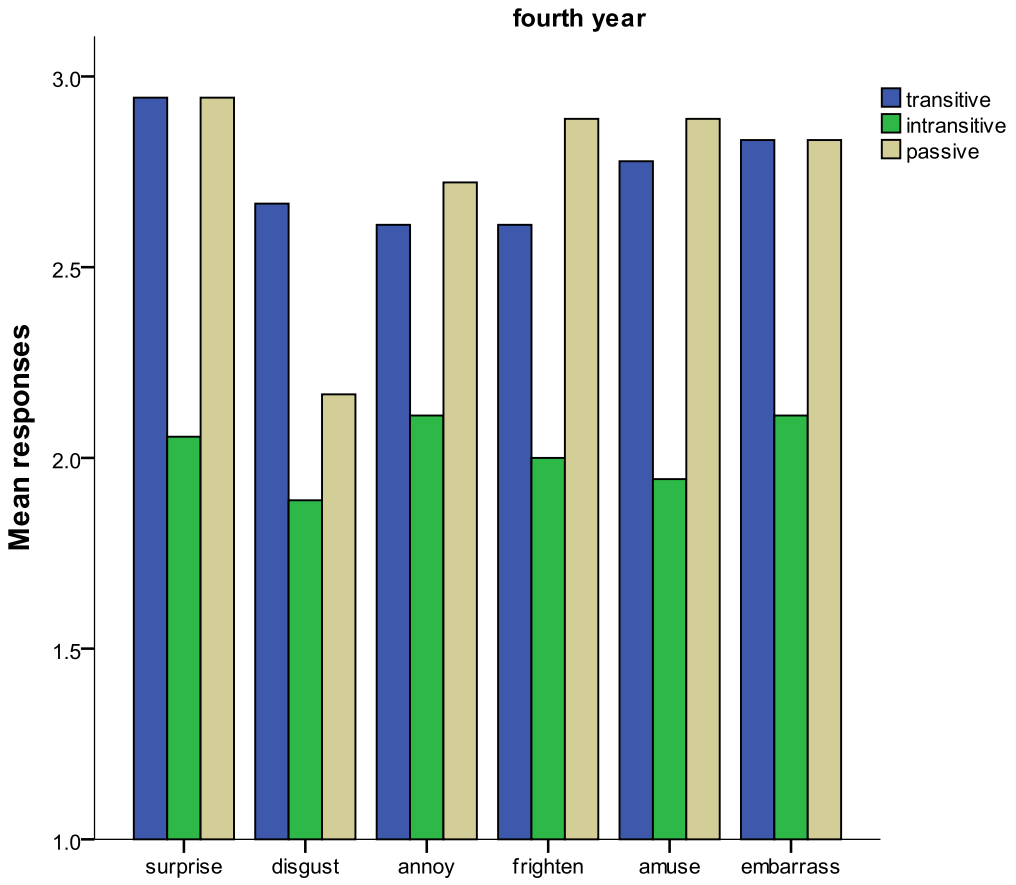


Fig. 13. Fourth year students' mean responses on individual psych verbs in the three structures



Unaccusative/unergative verbs

With unaccusative verbs, recall that while unaccusatives cannot be used in transitive constructions in English (e.g., **the driver arrived the man*), these structures are, in most cases, grammatical in Libyan Arabic. Therefore, we hypothesized that Arabic learners would overgeneralize the transitive alternation to English, accepting forms like * *the driver arrived the man* which are ungrammatical in English. As for the intransitive form, given that unaccusative verbs in Arabic are similar to English; Arabic learners would not have any difficulty with this form.

As hypothesized, the control group were very accurate at the three structures, accepting the intransitive form and rejecting the transitive and passive sentences 100% of the time. In contrast, the non-native speakers were less accurate, especially with the transitive form. A Kruskal-Wallis test, for more than two independent samples, was carried out to compare the three groups on every condition. The results were all strongly significant, due to the difference between the Arabic-speaking group and the native speakers (all the results are reported in Table 1 Appendix E).

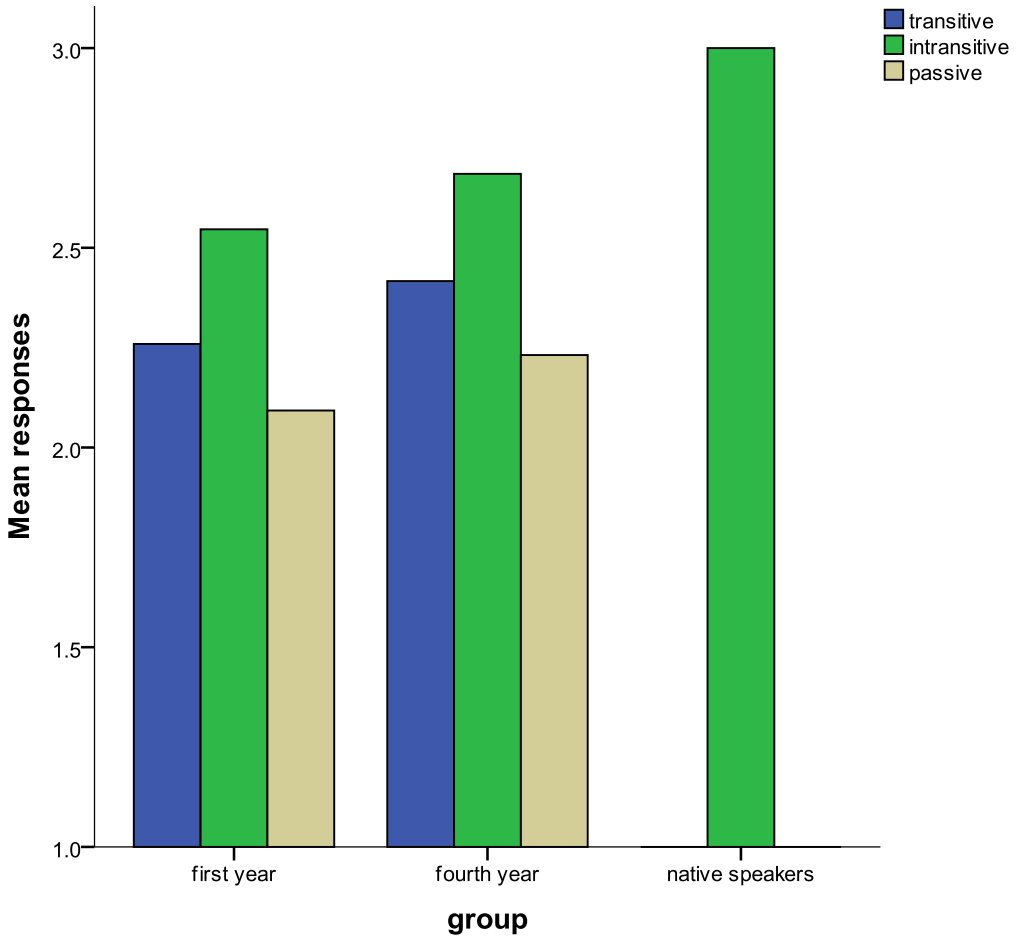
As predicted, results of transitive sentences showed that the L2 learners rated these sentences as grammatical. Moreover, the transitive sentences were the least accurate among the three constructions. A Mann-Whitney test (for two independent samples) was used to compare 1st years with 4th years, then 4th years with native speakers. The results revealed that the difference between 1st years and 4th years was not significant ($U = 189.500$, $N_1 = 18$, $N_2 = 18$, $p = .380$); but the difference between 4th years and native speakers was significant ($U = .000$, $N_1 = 18$, $N_2 = 10$, $p < .001$). This suggests that the Arabic-speaking participants are not aware of the fact that unaccusative verbs cannot alternate in transitivity in English.

As for the results of intransitive sentences (e.g., *the man arrived*), no significant differences were found between the two Arabic-speaking groups on Mann-Whitney U-tests for two independent samples ($U = 193.000$, $N_1 = 18$, $N_2 = 18$, $p = .316$). However, the differences between 4th years and native speakers were significant ($U = 150.000$, $N_1 = 18$, $N_2 = 10$, $p = .001$).

With passive sentences which are ungrammatical in both Arabic and English (e.g., **the man was arrived*), a Mann-Whitney test (for two independent samples) was carried out to compare 1st years with 4th years, then 4th years with native speakers. The results revealed that there were no significant differences between the two Arabic-speaking groups ($U = 182.000$, $N_1 = 18$, $N_2 = 18$, $p = .525$). However, there were significant differences between the 4th years and native speakers ($U = .000$, $N_1 = 18$, $N_2 = 10$, $p < .001$).

To summarize, Fig. 14 shows that both groups were more accurate with the intransitive than transitive and passive sentences. Furthermore, while there was no significant difference between the two groups of L2 learners on the three structures, there were significant differences between the control group and the non-native speakers. As hypothesized and similar to the findings of previous studies, the L2 learners did rate passive sentences with unaccusative verbs as acceptable.

Fig. 14. Mean responses on transitive, intransitive and passive forms of unaccusative verbs



Thus, it is clear that proficiency did not have an effect on the learners' performance: the two groups did not differ significantly in terms of the acceptance and rejection of the three structures. Surprisingly, however, the first year students were slightly more accurate than the fourth year students on the passive and transitive constructions.

Finally, we looked at individual verbs to see whether learners treated these verbs differently (recall that all these verbs, apart from the verb *die*, can have non-

suppletive transitive counterparts in Libyan Arabic). As figures 15 & 16 show, there seems to be no variation between verbs in the three constructions.

Fig. 15. First year students' mean responses on individual unaccusative verbs in the three structures

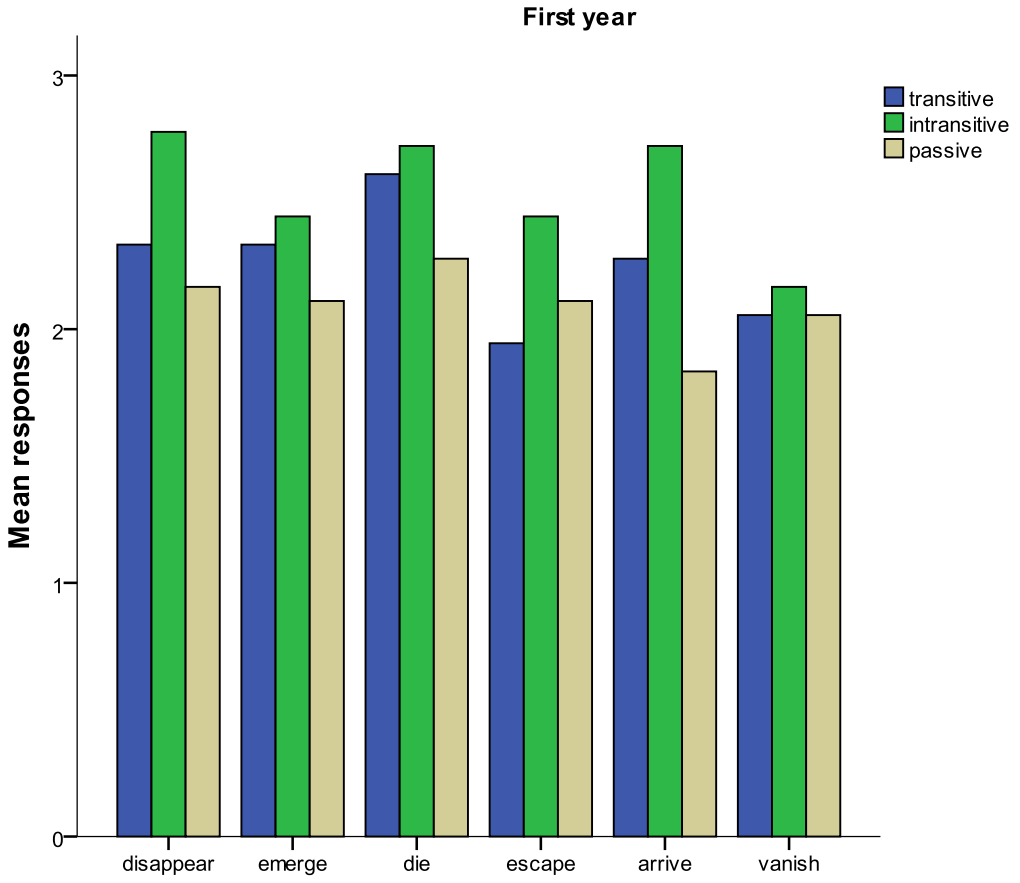
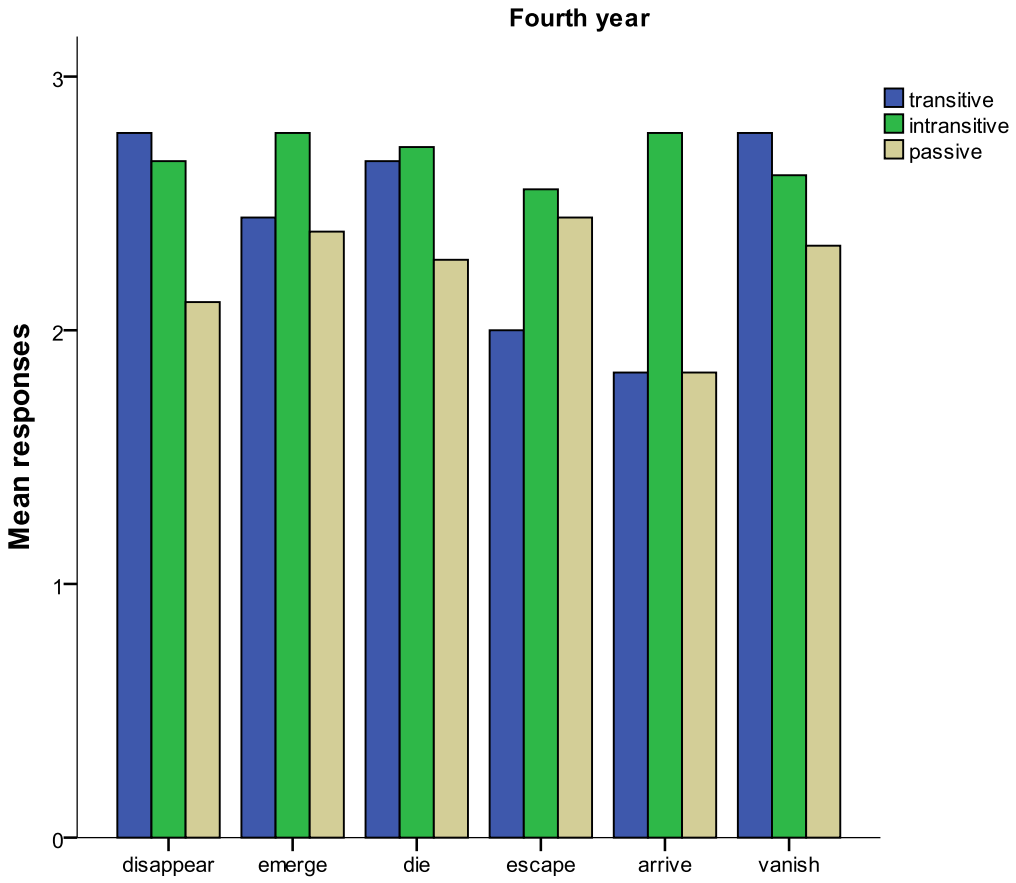


Fig. 16. Fourth year students' mean responses on individual unaccusative verbs in the three structures



With unergative verbs (e.g., *laugh*), we predicted that since some of these verbs can be used in transitive constructions, Arabic learners might overgeneralize this alternation to English, accepting sentences like **the man laughed the boy*. Furthermore, since only some unergative verbs (*dance, laugh, resign, cry)* may alternate in transitivity, Arabic learners might assume that sentences with these verbs might be possible in transitive constructions but not other verbs (*cough, yawn)*. With the intransitive form, given that these structures in Arabic are similar to English, Arabic learners are not expected have any difficulty with this form.

As hypothesized, the native speakers were very accurate with the three structures, accepting the intransitive form and rejecting the transitive and passive forms 100% of the time. The non-native speakers, however, behaved differently. With transitive structures which are ungrammatical in English (**the man laughed the* boy), a Mann-Whitney test (for two independent samples) was used to compare 1st years with 4th years, then 4th years with native speakers. The results revealed that the difference between 1st years and 4th years was significant ($U = 89.500$, $N_1 = 18$, $N_2 = 18$, $p = .021$); and the difference between 4th years and native speakers was also significant ($U = .000$, $N_1 = 18$, $N_2 = 10$, $p < .001$). The significant differences between the L2 learners were due to the performance of the first year students who had a tendency to rate these sentences as grammatical.

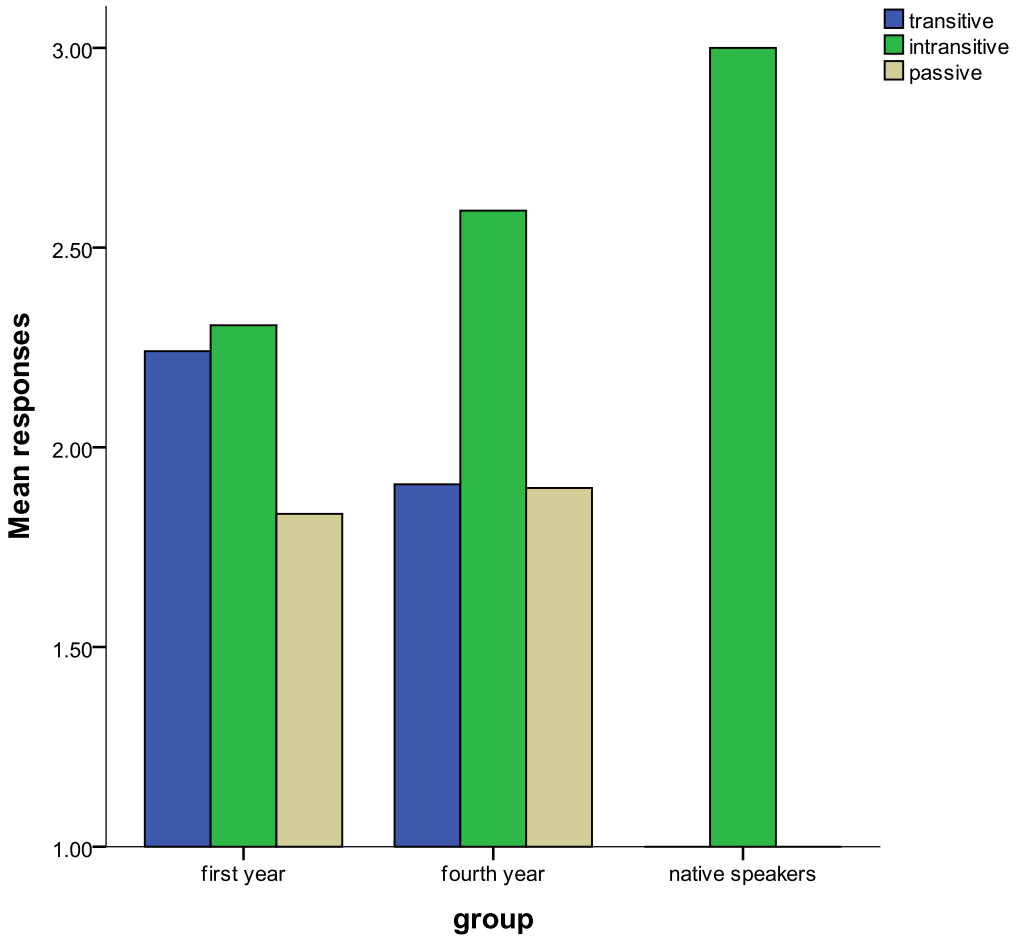
As for the results of the intransitive sentences (e.g., *the boy laughed*), no significant differences were found between the two Arabic-speaking groups on Mann-Whitney U-tests for two independent samples ($U = 130.$, $N_1 = 18$, $N_2 = 18$, $p = .219.000$, $p = .068$). However, the difference between 4th years and native speakers was significant ($U = 170\ .000$, $N_1 = 18$, $N_2 = 10$, $p < .001$).

With passive sentences which are ungrammatical in both languages (e.g., **the boy was laughed*), the differences between the two Arabic-speaking groups were not significant (Mann-Whitney U-tests for two independent samples, $U = 219.000$, $N_1 = 18$, $N_2 = 18$, $p = .811$). However, there were significant differences between the 4th years and native speakers ($U = 5.000$, $N_1 = 18$, $N_2 = 10$, $p < .001$).

Thus, the findings seem to be in line with our hypothesis as both groups accepted unergative verbs in the transitive construction. With intransitive sentences, the results revealed that the difference was not significant. Fig. 17 shows that both

groups were, as hypothesized, more accurate with intransitive than transitive and passive constructions. As for the passive sentences, the results showed that the difference between the two learner groups was not significant. Contrary to our predictions (hypothesis 3) and to previous findings (e.g., Kondo, 2005), both groups did make some overpassivization errors with unergative verbs.

Fig. 17. Mean responses on transitive, intransitive and passive forms of unergative verbs



Finally, we looked at individual verbs to see whether there was an individual item effect on Arabic learners' responses. Recall that since some unergative verbs in Libyan Arabic might be used in transitive constructions, we hypothesized that learners could assume that only those verbs that can alternate in transitivity (*dance,*

laugh, *resign*, *cry*) might be used in transitive sentences. Figures 18 & 19 present the results of individual verbs for both groups. As the figures show, the first year students had more problems with transitive sentences than the passive sentences; and interestingly, the first year and fourth year students were more accurate with the verb *laugh* in transitive sentences than the other verbs. However, this was not the case with the verb *yawn*. Similarly, both groups were less accurate with the verb *dance* in the grammatical intransitive form than the other verbs. This suggests that Arabic morphology did not have much effect on the learners' performance on individual verbs.

Fig. 18. First year students' mean responses on individual unergative verbs in the three structures

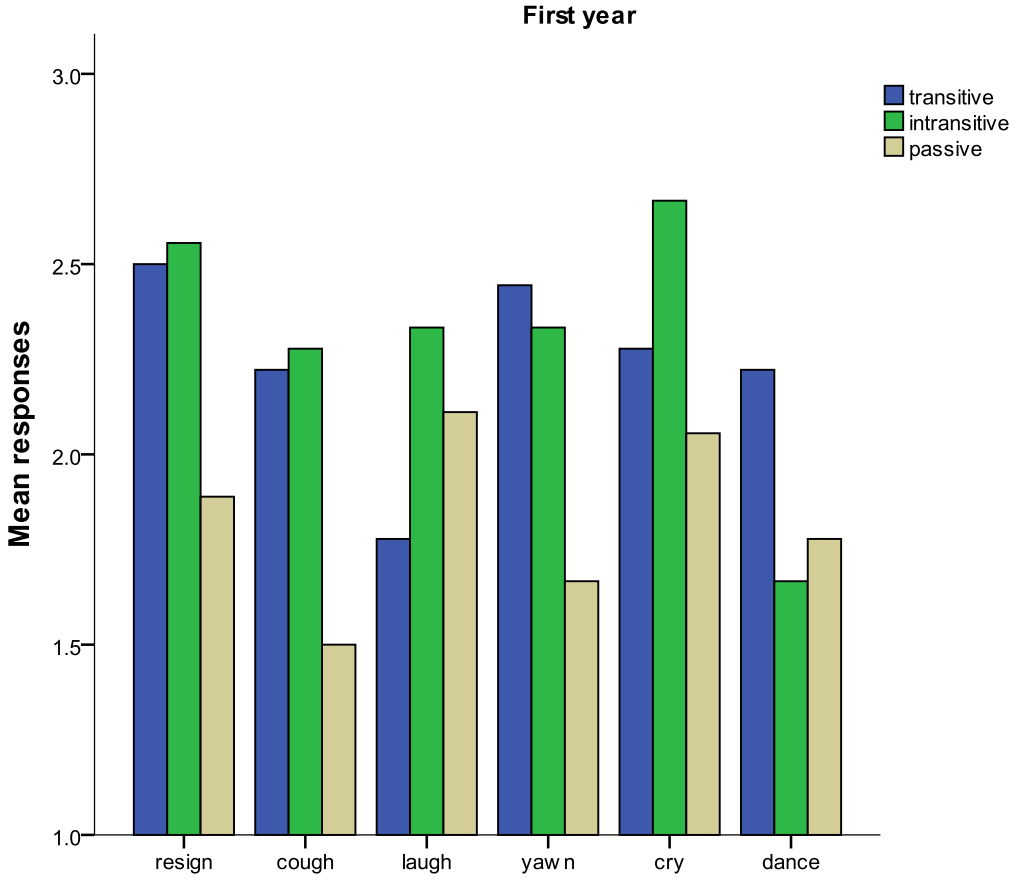
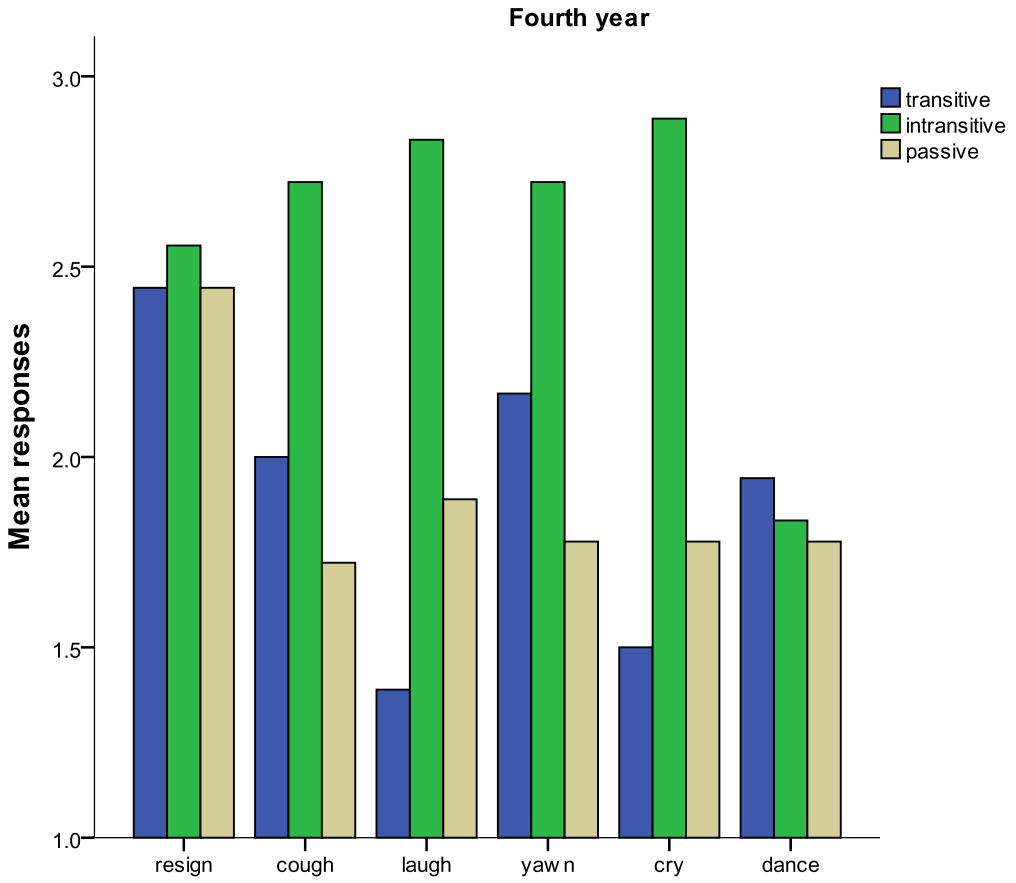


Fig. 19. Fourth year students' mean responses on individual unergative verbs in the three structures



6.3 SUMMARY OF FINDINGS IN CHAPTER 6

The first hypothesis tested in this study was that speakers of Libyan Arabic would transfer the morphological marking associated with argument structure realization in their L1 into their L2 English grammars. Even in cases where English requires no morphological reflex of argument structure properties, Libyan Arabic speakers would prefer verb constructions where a verb is morphologically marked (for example, preferring a passive over a bare verb in the case of change of state intransitives (*was broken* versus *broke*) and unaccusatives (**was arrived* versus *arrived*)). Results from the grammaticality judgement task show that in the case of

change of state verbs, both groups of participants (the 1st years and the 4th years) were less accurate in judging the approrpiateness of bare intransitives than transitives, and the first year group were less accurate in their judgement of passives than in their judgement of active transitives (figure 8). In the case of unaccusative verbs (figure 15), both groups rated passive constructions grammatical, in contrast to the native speakers. These findings are consistent with the L2 speakers being uncertain about the marking of intransitive forms of verbs, even allowing morphological marking where it is ungrammatical in English (on unaccusative verbs).

Hypothesis 2(b) aimed to determine how pervasive the transfer of L1 moprhological properties is in L2 development. It proposes that speakers of Libyan Arabic will be more accurate on the form of intransitive English psych verbs (which are ungrammatical as bare verb forms - **The hunter frightened* – and require passive morphology: *The hunter was frightened*) than they are on intransitive change of state verbs. The reason is that such verbs are marked with anticausative morphology in Libyan Arabic. Therefore L2 learners should expect intransitive forms to be morphologically marked in English. However, as figure 11 shows, the L2 participants responded in a similar way on both psych verbs and change of state verbs. Both groups were less accurate in their judgements of bare intransitives than transitives. And the first year group accepted passive forms of psych verbs less than the 4th years. This suggests a more general uncertainty about the form of intransitives in L2 English than a direct mapping of morphological patterns from Libyan Arabic to English would suggest.

Hypothesis 2(a) considers the potential role of UG in determining the L2 participants' knowledge of transitive psych verbs. The proposed universal alignment of thematic roles with syntactic positions predicts that in the unmarked case the

linking of Experiencer arguments to subject position will be preferred over the linking of Theme arguments to subject position, when both are present. English verbs like *fear* match the expeced alignment (*The hunter*$_{[Experiencer]}$ *fears the lion*$_{[Theme]}$). However, verbs like *frighten, amuse, annoy* are marked because the Theme appears in subject position: *The lion frightened the hunter*. If learners are initially guided by universal linking preferences, they will judge transitive constructions like *The lion frightened the hunter* less grammatical than transitive constructions involving change of state verbs (*The thief broke the window*). There was no evidence in this study that participants were making such a distinction. The performance on transitive change of state verbs (figure 8) and transitive psych verbs (figure 11) was broadly similar.

Pursuing evidence for the potential role of UG in guiding L2 learner development, hypothesis 3 proposed that the L2 participants in the study would be sensitive to the proposed universal distinction between unaccusative and unergative intransitive verbs. In particular, they would be more likely to passivize unaccusatives (to reflect the fact that subjects are assumed to have moved from a position in a verb's complement to subject position) than unergatives. Figures 15 and 18 do indeed show a stronger tendency by both groups to overpassivize unaccusatives more than unergatives.

Overall, there is evidence that the morphological properties of the L1 may influence L2 speakers in the treatment of argument structure realization in the target language. For the speakers in the present study the influence had the effect of making them generally unsure of the marking of intransitive forms across verb types. There is also evidence that there may be influence from UG, but it only showed up in the treatment of unaccusatives versus unergatives, not in the linking of thematic roles to syntactic constructions.

In the next chapter results from the study of the morphologiocal marking of argument structure realization and noun compounding are compared, and implications drawn about the role of the L1 and the role of UG in the development of L2 knowledge of these pre-syntactic properties.

CHAPTER 7
DISCUSSION

7.0 INTRODUCTION

In chapter 2.5 it was noted that many of the general hypotheses about second language acquisition (Full Transfer/Full Access, Minimal Trees, No Access (to UG) and Partial Access (to UG)) have primarily used evidence from the acquisition of morpho-syntax to support their claims. It is important to establish whether their proposals also hold for pre-syntactic properties. This thesis has reported a study of the knowledge of English synthetic and root compounding (a lexical phenomenon) and argument structure realization (a semantics-syntax interface phenomenon) by L1 speakers of Libyan Arabic. The study assumed the general framework of the principles and parameters model of linguistic knowledge and tested the extent to which transfer from the L1, access to hypothesized properties of UG, and common patterns of developmental restructuring of grammatical knowledge could be identified.

Three experiments were conducted, two on the formation of compounding, and one on knowledge of argument-structure-changing morphology in English. In this chapter, first the results of the two experiments on noun compounding are discussed, followed by a discussion of the results relating to argument structure realization.

7.1 THE ACQUISITION OF ENGLISH COMPOUNDING BY L1 SPEAKERS OF LIBYAN ARABIC

The first experiment found little evidence that Libyan-Arabic-speaking learners of English transfer the VO order of Arabic compounds into English synthetic compounds, producing the English OV order consistently both with synthetic (*mouse catcher*). It was noted, however, that this may be becuase the participants tested were already moderately proficient in English. It is possible that L1 influence will be found at lower proficiency levels, but this would need additional testing in future work.

If the OV structure of their synthetic compounds is the result of having acquired the positive value of the noun incorporation parameter (Keyser & Roeper, 1992), the participants in the study should obey the UG principle of level-ordering, which excludes the possibility of the plural marking of incorporated regular plural nouns. According to level ordering, synthetic compound noun formation applies before the inflectional process of plural marking applies. At the same time, irregular plurals may appear in synthetic compounds because they are assumed to be stored as whole forms in the lexicon, and may be selected for noun incorporation.

Clahsen (1995) claimed to have found that L2 learners of German obeyed level ordering. The native speakers in the present study also responded in a way that is consistent with level ordering, because they disfavored regular plurals inside compounds while allowing some irregular plurals. The L2 learners in the present study, however, clearly prefer plural non-head nouns to singulars (e.g. preferring *shoes polisher* over *shoe polisher*). More than 60% of their responses contained regular non-head plural nouns. This suggests that the Libyan Arabic speakers have acquired synthetic noun compounding without obeying the concomitant UG principle

of level ordering, which would suggest that they do not have access to UG in this domain.

However, there is another possibility. This is that although the L2 learners have established the OV order of synthetic compounds, they have not done so through noun incorporation. Rather, they are using a looser merger operation that simply conjoins two Ns, and is implemented after inflectional morphology has applied. This would allow them freely to produce forms like *shoes polisher* or *shoe polisher*. Such a rule would predict little difference between the choice of regular and irregular non-head plurals. However, it is interesting to note that the L2 participants produced more irregular plurals than regular plurals. This difference may suggest that they are sensitive to the different frequencies of regular plurals (hardly any) and irregular plurals (some) in the input they encounter, although they do not use such frequencies directly to determine their own use of plurals. If they did they would use far fewer regular plural non-head nouns. A sensitivity to the frequency of forms in input might also account for why the L2 learners allowed more regular plurals in root compounds compared to synthetic compounds.

The results are, then, potentially consistent with the proposal that Libyan Arabic speakers have not (yet) reset the noun incorporation parameter from its negative value in Arabic to its positive value in English. They are using the conjunction of Ns operation to model compounds encountered in English without having identified that the surface forms result from noun incorporation. Thus, this is not evidence against access to UG, but evidence that parameter resetting has not yet occurred. And it may be that parameter resetting only occurs at more advanced levels of proficiency than tested in the present study.

It appears that proficiency in the present study did not have any bearing on the L2 learners' performance: whilst the first year students included more plurals inside compounds than the fourth year students, especially in the second test, the results cannot explain why L2 learners even at the highest level of proficiency still allow more plurals inside compounds than singulars. It should be noted, however, that since the L2 learners who participated in this study were not fundamentally different in terms of proficiency, we cannot rule out completely the possibility of a proficiency effect. Recall that previous studies reported conflicting results. For example, Murphy (1997) found that the inclusion of regular plurals inside compounds decreased with proficiency, whereas Murphy (2000) indicated that her findings suggest that proficiency did not affect how often the L2 learners allowed regular plurals inside compounds. Therefore, one could still argue that proficiency might be an important factor in disallowing regular plurals within compounds for L2 learners.

Another interesting issue that has been raised in this study is the influence of variations in methodology. As mentioned earlier, most of the previous studies have used an elicited production task (e.g., Gordon, 1985; Clahsen, 1995; Lardiere, 1995), an acceptability judgment task (e.g., Haskell et al., 2003; Senghas, Kim & Pinker, 2005) or eye-movement tasks (Cunnings & Clahsen, 2007; Silva et al., 2013). Since previous research has shown that the use of a variety of different methodologies may be responsible for different or unpredictable empirical findings (See Birdsong, 1989; Murphy, 1997; Murphy, 2000: 184), it might be useful to use two different methodologies in one study to see the extent to which the findings are consistent. Recall that our second task was different from the first one in that participants in the first task were presented with plural non-heads (e.g., *rats* in "what could you call someone who eats rats?") and therefore this could have influenced their responses. In

the second task, a forced-choice gap-filling task was used where participants had to choose the correct form of the compound out of three possible expressions. Given the fact that the participants in both studies did not differ from each other in generating compound nouns, and that these results did not differ from previous studies which employed different output modalities, the validity and reliability of the findings appear to increase.

Furthermore, the data from both studies do not seem to lend support to the Full Transfer Full Access Hypothesis as there was little evidence of the Libyan-Arabic-speaking participants having transferred the VO order of Arabic compounds into English. Although the 1st year university groups in the study accepted more such cases than the 4th year groups, the difference was not significant. However, it is clear that none of these participants are beginners so transfer effects, which are expected at the initial state, may not be evident in the results. Further investigation with less proficient learners would be necessary to test this.

Finally, it should be noted that input alone is not sufficient to explain the dissociation between regular and irregular plurals in compounds because compounds in English do not typically have either irregular or regular plurals internally. Therefore the constraint against regular plurals inside compounds is difficult to infer from the input learners receive. And in fact there are a number of exceptional cases of compound nouns in which the non-head is regularly inflected. Thus, if L2 learners do hear some regular plurals in non-head positions in compounds and if they hear other nouns that have singular non-heads, this would make the possibility of learning on the basis of the input they receive even harder. That is, it seems that the restriction on plurals (especially regular plurals) inside compounds is underdetermined by the L2

input. If this is the case, explicit correction or explicit grammatical instruction in classrooms might be helpful.

7.2 TRANSITIVITY ALTERNATIONS AND EFFECTS OF ARGUMENT-CHANGING MORPHOLOGY

The purpose of experiment 3 was to investigate the acquisition of argument structure and its morphosyntactic instantiation in English by Libyan Arabic speakers. Following Montrul (1997, 2000, 2001), we hypothesized that errors with argument structure changing morphology would be constrained by the way the abstract features associated with causative or anticausative morphology were phonologically spelled out in Arabic. That is, if features were spelled out with overt morphology in the L1 but with zero morphology in the L2, L2 learners "...would tend to find surrogate morphophonological forms specific to the L2 to express those features" (Montrul, 2001: 180-181).

Furthermore, previous studies have hypothesized that properties of UG guide the development of L2 grammars. In the case of argument structure realization, two properties that are potentially relevant are the alignment of thematic roles with syntactic positions, and the distinction between unaccusative and unergative verbs. If UG is available to the L2 learners in the present study, it was predicted that this would show up in their knowledge of psych verb role alignment and in the extent to which they overpassivized unaccusative/unergative verbs.

No direct link between the form that argument-structure-changing morphology takes in Libyan Arabic and the knowledge of morphological realization

in English was found. Although participants were variable in their treatment of the morphological properties of intransitive change of state verbs, as expected, they were not accurate on intransitive psych verbs with zero morphology, which would be expected on the basis of Arabic. This suggests that the participants were generally variable in their treatment of intransitives, regardless of the type of intranstive and its argument structure realization properties in Arabic. It appears that differences between *some* verbs in Arabic and English in their morphology cause learners to have indeterminate representations for the realization of English intransitive verbs generally.

There was little evidence that UG was guiding the grammatical development of learners in the case of English psych verbs. The participants showed no sensitivity to UG-determined alignment preferences between thematic roles and syntactic positions: both groups responded similarly in their treatment of change of state and psych verbs. However, in the case of the unaccusative/unergative distinction it was found that participants were more likely to passivize unaccusatives than unergatives, suggesting that they are distinguishing the two classes of verbs.

Thus, we argue that the data from a grammaticality judgement task lend partial support to the Full Transfer Full Access Hypothesis. There is evidence that properties of the L1 may influence L2 speakers in the treatment of argument structure realization in the target language. For the speakers in the present study the influence had the effect of making them use an L1-based interlanguage to determine verb alternation: participants, especially 1st years, accepted the transitive form of unaccusative and unergative verbs which are ungrammatical in English (recall that 4th years' performance was better than the 1st years especially in the case of unergative verbs). Furthermore, it is clear from the results that there is a degree of

overgeneralization among speakers in response to the marking of intransitive forms across verb types. Arguably, overgeneralization does not necessarily mean an absence of L1 transfer. These findings are consistent with the L2 speakers being unsure about the marking of intransitive forms of verbs, even allowing morphological marking where it is ungrammatical in English (on unaccusative and unergative verbs). Finally, the results also suggest that there is evidence that there may be influence from UG, but this was clear in the treatment of unaccusatives versus unergatives, not in the linking of thematic roles to syntactic constructions.

Taking the evidence together with that from noun compounding, it can be said that there is some evidence of L1 influence in the development of pre-syntactic processes in the L2 learners studied, and there is no evidence that positively contradicts the hypothesis that L2 learners have access to UG in developing knowledge of L2s, although there is little direct evidence in the results obtained for the involvement of UG.

7.3 FUTURE RESEARCH

In future research it would be useful to test Libyan Arabic speakers who are both less proficient and more proficient in English than the participants in the present study. At the outset of the research reported here it was predicted that there would be clear differences in the response patterns of the 1st year and 4th year groups in the tests, as the result of a difference in proficiency. It turned out, however, that performances were closer than expected, although there were areas were the two groups diverged (e.g. in response to passive forms of change of state and psych

intransitives). It would be interesting to find out whether less proficient speakers initially produce synthetic compound nouns where the word order matches Arabic (VO), and at what point in development they switch to the English OV order. By the same token, it would useful to know whether Libyan Arabic speakers with more advanced proficiency in L2 English cease to allow regular plurals inside synthetic noun compounds, consistent with them acquiring the English value of the noun incorporation parameter, or whether absence of noun incorporation persists into the steady state.

In future work it would also be important to compare the acquisition of English by Libyan Arabic speakers with speakers of L1s where the properties of compound nouns are more similar to English (e.g. Chinese), to determine more clsoely the effects of the L1.

Finally, future work will need to use additional tasks which encourage participants to display their productive knowledge of noun compounding and argument structure realization, perhaps through the use of novel (invented) nouns and verbs. This will allow a closer examination of their knowledge of the syntactic processes involved.

APPENDICES

APPENDIX A: *PARTICIPANT PERSONAL INFORMATION FORM*

Name	
Age	
sex	
Native language	
Country of origin	
Glasses/contacts	
Other language spoken	
Age started learning English	
Time in English speaking country	
Opppotunity to leaning English outside University	
Daily communication in English	

APPENDIX B: *ITEMS USED IN THE ELICITED PRODUCTION TASK*

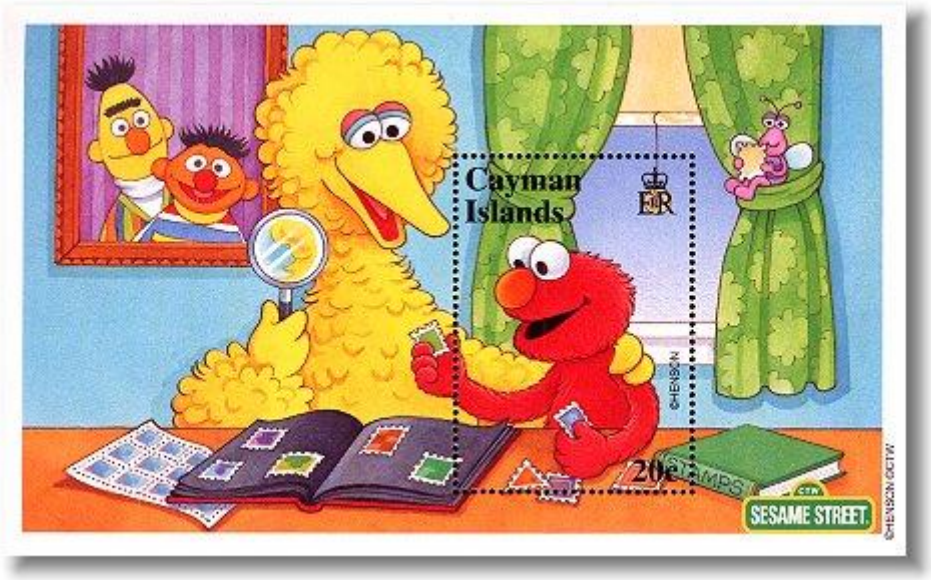
What could you call someone who tells stories?

Answer: ……

What could you call someone who washes cars?

Answer: ……

What could you call someone who collects stamps?



Answer: ……

What could you call someone who makes Jeans?

Answer: …….

What could you call something that catches mice?

Answer: …….

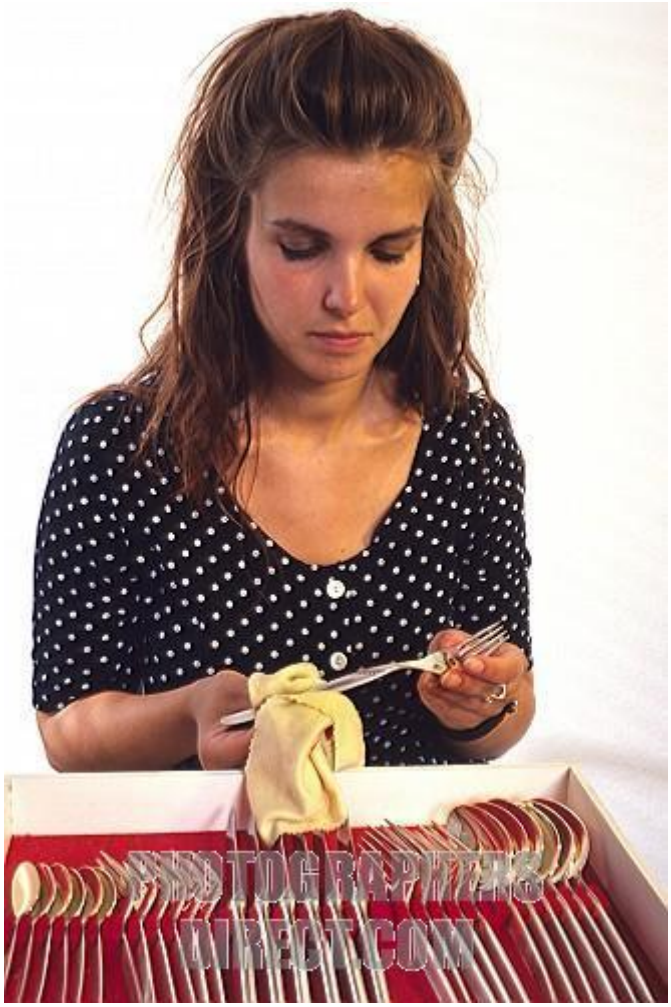
What could you call someone who hates lice?

Answer: …….

What could you call someone who polishes shoes?

Answer: ……..

What could you call someone who sells cutlery?



Answer: ……..

What could you call someone who loves children?

Answer: ……

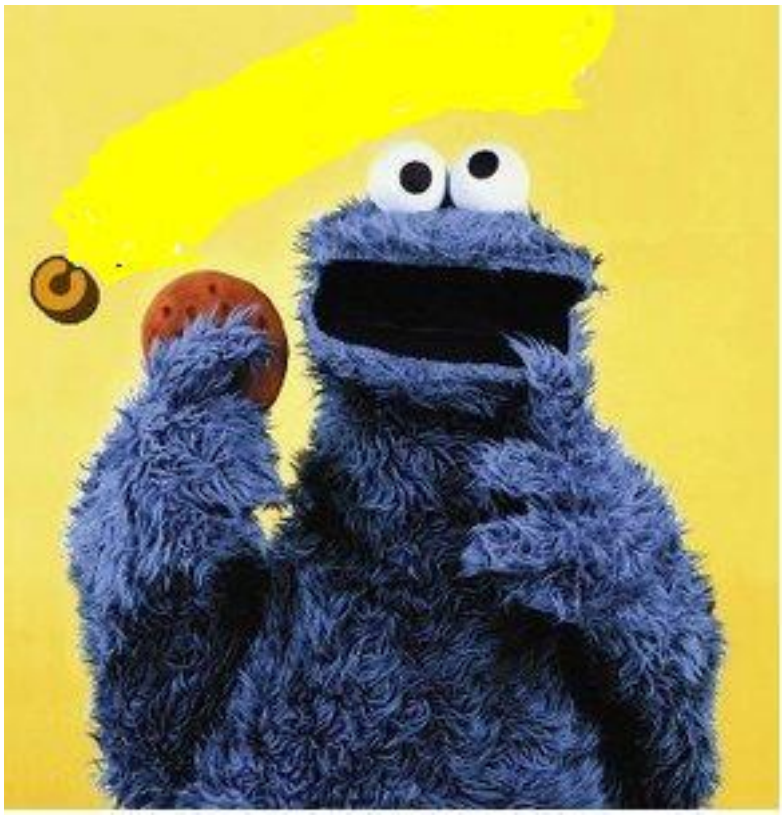
What could you call something that opens cans?

Answer: …….

What could you call someone who chases geese?

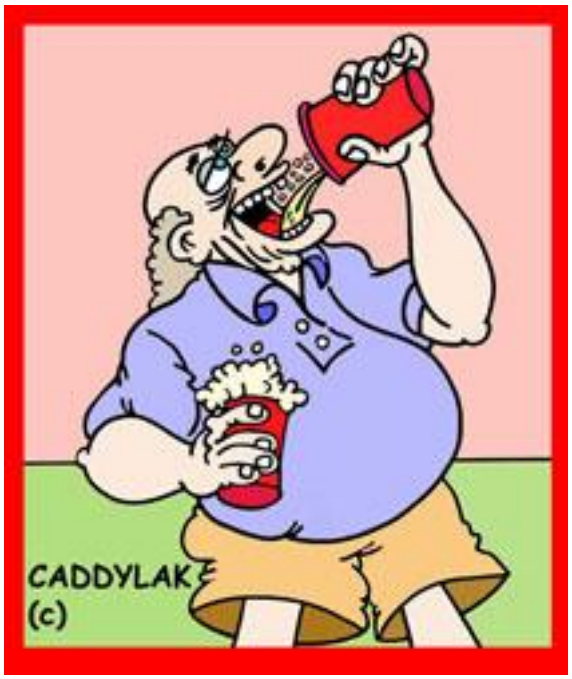
Answer: ……

What could you call someone who loves chocolate?



Answer: ……..

What could you call someone who drinks beer?



Answer: ……..

What could you call someone who loves salad?

Answer: ……

What could you call a cupboard in which you put plates?

Answer: ……..

What could you call a box in which you put jewellery?

Answer: ……..

What could you call a cupboard in which you put shoes?

Answer: ……..

What could you call a cupboard in which you put keys?

Answer: ……..

What could you call a box in which you put munitions?

Answer:

What could call a box in which you put pens?

Answer: …….

What could you call a box in which you put toys?

Answer:.....

What could you call someone who kills mice?

Answer:.....

What could you call someone who handles dogs?

Answer: .....

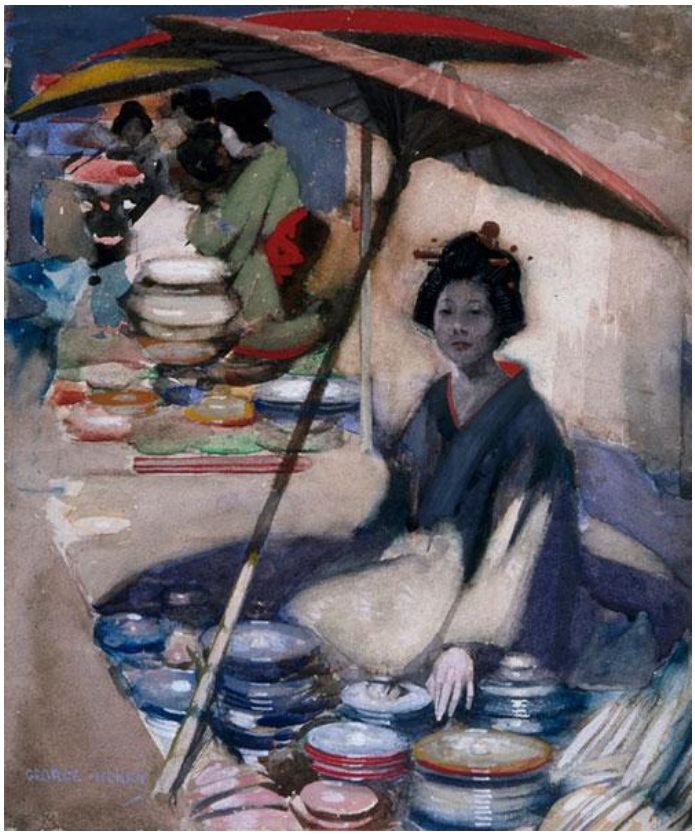
What could you call a box in which you put goods?

Answer: .....

What could you call a box in which you put letters?

Answer .....

What could you call someone who collects pottery?



Answer: .....

What could you call a box in which you put post?

Answer .....

What could you call someone who shoots geese?

Answer……..

APPENDIX C: *SENTENCES INCLUDED IN THE FORCED-CHOICE GAP-FILLING TASK*

(1) a. John likes washing cars.

b. I call him ……(washer cars- car washer-cars washer).

(2) a. This cupboard is used to put plates in.

b. I call it the..... (plate cupboard- plates cupboard- cupboard plates).

(3) a. Chris always shoots geese on Fridays.

b. I call him the..... (shooter geese- geese shooter-goose shooter).

(4) Arguments arose as soon as the three.....(Mother-in-laws, mothers-in-law, mothers-in-laws) arrived.

(5) a. That tailor makes good jeans.

b. I call him the..... (jeans maker- maker jeans- jean maker).

(6) a. Olivia likes collecting stamps.

b. I call her the..... (stamps collector- stamp collector- collector stamps).

(7) a. This cupboard is used to put shoes in.

b. I call it the..... (shoe cupboard- shoes cupboard- cupboard shoes).

(8) a. This tool is used for catching mice.

b. It is called the..... (mouse catcher - mice catcher- catcher mice).

(9) a. This box is used to put cheese in.

b. I call it the..... (cheeses box- box cheeses- cheese box).

(10) a. Jack likes handling dogs.

b. I call him the..... (handler dogs- dogs handler- dog handler).

(11) a. This cupboard is used to put keys in.

b. I call it the..... (keys cupboard - key cupboard- cupboard keys).

(12) a. George hates lice because they make him scratch his head all day.

b. I call him the..... (lice hater- hater lice -louse hater).

(13) a. This box is used to put jewellery in.

b. I call it the..... (box jewellery- jewelleries box- jewellery box).

(14) During her visit to the city, the queen was accompanied by two of her..... (ladies-in-waiting, ladies-in-waitings, lady-in-waitings).

(15) a. My grandma likes telling stories.

b. I call her the..... (teller story- story teller- stories teller).

(16) a. this box is used to put pens in.

b. I call it the..... (pens box- pen box- box pens).

(17) a. My cat likes killing mice.

b. I call her the..... (mouse killer- mice killer-killer mice).

(18) a. Caity loves salad so much.

b. I call her the..... (lover salad – salads lover- salad lover).

(19) The president chose five..... (editor-in-chiefs, editors-in-chief, editors-in-chiefs) to represent the country in the press conference.

(20) a. My friend's dad polishes shoes.

b. I call him the..... (shoes polisher- polisher shoes- shoe polisher).

(21) a. This box is used to put letters in.

b. I call it the..... (letter box- box letters- letters box).

(22) a. Julia's Mum loves children so much.

b. I call her the..... (children lover- child lover- lover children).

(23) a. This box is used to put goods in.

b. I call it the ..... (box goods- goods box- good box).

(24) a. Jody sells cutlery in the market.

b. I call her the..... (cutlery seller- seller cutlery- cutleries seller).

(25) a. This tool is used to open cans.

b. It is called the..... (cans opener - can opener- opener cans).

(26) a. This box is used to put post in.

b. I call it the..... (post box- box post- posts box).

(27) a. My grandfather likes collecting pottery.

b. I call him the..... (potteries collector- collector pottery- pottery collector).

(28) a. This box is used to put toys in.

b. I call it the..... (box toys- toys box- toy box).

(29) a. That boy always chases geese.

b. I call him the .....(goose chaser-chaser geese- geese chaser).

(30) a. Her child loves chocolate so much.

b. I call him the..... (chocolates lover- lover chocolate- chocolate lover).

(31) a. That man always drinks beer in the evening.

b. I call him the..... (beers drinker- drinker beer - beer drinker).

(32) That man buys three bunches of (lilies of the valley, lily of the valleys, lilies of the valleys) for his wife every day.

APPENDIX D: *SENTENCES INCLUDED IN THE GRAMMATICALITY JUDGEMENT TASK*

1) The viewer was disgusted.

Perfect	Possible	Impossible

2) The thief broke the door.

Perfect	Possible	Impossible

3) The guard escaped the prisoner.

Perfect	Possible	Impossible

4) The old lady laughed.

Perfect	Possible	Impossible

5) The new employee was resigned.

Perfect	Possible	Impossible

6) Caity frightened.

Perfect	Possible	Impossible

7) The prisoner escaped.

Perfect	Possible	Impossible

8) Mary was arrived at school.

Perfect	Possible	Impossible

9) The door broke by itself.

Perfect	Possible	Impossible

10) Susan laughed the old lady.

Perfect	Possible	Impossible

11) The water was frozen.

Perfect	Possible	Impossible

12) The magician disappeared the rabbit.

Perfect	Possible	Impossible

13) The dog frightened Caity.

Perfect	Possible	Impossible

14) The teacher was surprised.

Perfect	Possible	Impossible

15) The crowed danced.

Perfect	Possible	Impossible

16) Nicolas closed the window.

Perfect	Possible	Impossible

17) The child was coughed.

Perfect	Possible	Impossible

18) The rabbit disappeared.

Perfect	Possible	Impossible

19) The editor amused.

Perfect	Possible	Impossible

20) The jewellery box was emerged.

Perfect	Possible	Impossible

21) The window closed by itself.

Perfect	Possible	Impossible

22) The music danced the crowed.

Perfect	Possible	Impossible

23) The butter was melted.

Perfect	Possible	Impossible

24) The thief died the old man.

Perfect	Possible	Impossible

25) The article amused the editor.

Perfect	Possible	Impossible

26) His mother was embarrassed.

Perfect	Possible	Impossible

27) The boy cried.

Perfect	Possible	Impossible

28) The man burned the house.

Perfect	Possible	Impossible

29) The student was yawned.

Perfect	Possible	Impossible

30) The passenger annoyed.

Perfect	Possible	Impossible

31) The old man died.

Perfect	Possible	Impossible

32) The coin was vanished.

Perfect	Possible	Impossible

33) The house burnt.

Perfect	Possible	Impossible

34) The dentist cried the boy.

Perfect	Possible	Impossible

35) The ship was sunk.

Perfect	Possible	Impossible

36) The coin fell into the mud and vanished.

Perfect	Possible	Impossible

37) The train delay annoyed the passenger.

Perfect	Possible	Impossible

38) The passenger was annoyed.

Perfect	Possible	Impossible

39) The student yawned.

Perfect	Possible	Impossible

40) The storm sank the ship.

Perfect	Possible	Impossible

41) His mother embarrassed.

Perfect	Possible	Impossible

42) The boy was cried.

Perfect	Possible	Impossible

43) The man vanished the coin.

Perfect	Possible	Impossible

44) The old man was died in an accident.

Perfect	Possible	Impossible

45) The ship sank by itself.

Perfect	Possible	Impossible

46) The boring lecture yawned the student.

Perfect	Possible	Impossible

47) The man stole the jewellery box that emerged from the sea.

Perfect	Possible	Impossible

48) The house was burnt.

Perfect	Possible	Impossible

49) The child's behaviour embarrassed his mother.

Perfect	Possible	Impossible

50) The child coughed.

Perfect	Possible	Impossible

51) The editor was amused by the article.

Perfect	Possible	Impossible

52) My grandmother melted the butter.

Perfect	Possible	Impossible

53) The teacher surprised.

Perfect	Possible	Impossible

54) The crowed was danced.

Perfect	Possible	Impossible

55) Mary arrived at school.

Perfect	Possible	Impossible

56) The butter melted by itself.

Perfect	Possible	Impossible

57) The rabbit was disappeared.

Perfect	Possible	Impossible

58) The smoke coughed the child.

Perfect	Possible	Impossible

59) Peter arrived Mary at school.

Perfect	Possible	Impossible

60) The window was closed.

Perfect	Possible	Impossible

61) Mary's absence surprised the teacher.

Perfect	Possible	Impossible

62) The new employee resigned.

Perfect	Possible	Impossible

63) The low temperature froze the water.

Perfect	Possible	Impossible

64) The viewer disgusted.

Perfect	Possible	Impossible

65) Caity was frightened

Perfect	Possible	Impossible

66) The man emerged the jewellery box.

Perfect	Possible	Impossible

67) The water froze.

Perfect	Possible	Impossible

68) The old lady was laughed.

Perfect	Possible	Impossible

69) The manager resigned the new employee.

Perfect	Possible	Impossible

70) The prisoner was escaped.

Perfect	Possible	Impossible

71) The violence on TV disgusted the viewer.

Perfect	Possible	Impossible

72) The door was broken.

Perfect	Possible	Impossible

APPENDIX E: *RESULTS OF THE GRAMMATICALITY JUDGEMENT TASK*

Table 1. Kruskal-Wallis results (for more than two independent samples) comparing all three groups:

	Chi^2	df	P value
Change of state verbs			
Transitive	19.028	2	$p < .001$
Intransitive	27.320	2	$p < .001$
Passive	21.119	2	$p < .001$
Psych verbs			
Transitive	16.250	2	$p < .001$
Intransitive	22.719	2	$p < .001$
Passive	13.741	2	$p = .001$
Unaccusatives			
Transitive	23.880	2	$p < .001$
Intransitive	13.099	2	$p = .001$
Passive	21.357	2	$p < .001$
Unergatives			
Transitive	26.669	2	$p < .001$
Intransitive	20.971	2	$p < .001$
Passive	17.888	2	$p < .001$

Table 2. Mann-Whitney results (for two independent samples) comparing 1st years with 4th years

	U	N_1 = 18, N_2 = 18	P value
Change of state verbs			
Transitive	225.500		p = .041 (significant at 5% level)
Intransitive	83.500		p = .012 (significant)
Passive	255.500		p = .003 (significant)
Psych verbs			
Transitive	188.500		p = .391
Intransitive	130.000		p = .308
Passive	210.000		p = .121
Unaccusatives			
Transitive	189.500		p = .380
Intransitive	193.000		p = .316
Passive	182.000		p = .525
Unergatives			
Transitive	89.500		p = .021 (significant)
Intransitive	219.000		p = .068
Passive	169.500		p = .811

Table 3. Mann-Whitney results (for two independent samples) comparing 4th years with native speakers

	U	$N_1 = 18, N_2 = 10$	P value
Change of state verbs			
Transitive	145.000		p = .003
Intransitive	180.000		p < .001
Passive	140.000		p = .005
Psych verbs			
Transitive	170.000		p < .001
Intransitive	.000		p < .001
Passive	155.000		p = .001
Unaccusatives			
Transitive	.000		p < .001
Intransitive	150.000		p = .001
Passive	.000		p < .001
Unergatives			
Transitive	.000		p < .001
Intransitive	170.000		p < .001
Passive	5.000		p < .001

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