Potential Differences in Adult Male Jordanians' Employment of Morphology, Phonology, Syntax and Semantics-Knowledge in Incidental English Lexical Acquisition

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Abstract

This study aims at investigating the potential differences in employing different linguistic knowledge sources by adult male Jordanian English speakers. To this end, a lexical inferring test was used to instigate any previously acquired knowledge in morphology, phonology, syntax and semantics by 16 Jordanians. Data were then analyzed statistically and categorized according to the employed linguistic knowledge sources. Results showed that participants generally tended to use single linguistic knowledge source at a time. They relied more heavily and successfully on their previous knowledge in semantics followed by morphological analysis, whereas reliance on syntax was least used, followed by dependence on phonological relationships which was the most misleading. Differences appeared in terms of the frequency of using each linguistic knowledge source as well as the success of making use of each source. Differences can be ascribed to variance in length of individual's previous English learning experience and time given to formal instruction on applying their knowledge to reading-based lexical learning tasks. The study highlights the importance of knowledge in linguistics as a prerequisite to support cognitive processing, to overcome limited lexical knowledge and to facilitate lexical acquisition. The study has implications for lexical studies and second language acquisition.

Key Words: linguistic knowledge source, linguistic clue, lexical acquisition, cognition.

Introduction

Given the popularity of Second Language Acquisition (SLA) as a research field for the learning of foreign languages, it is appropriate to examine the relationship of English lexical acquisition to other relevant areas of inquiry with the intention to help learners of English as a second language. This study aims at investigating the potential differences in the role of previously learned linguistic knowledge in Jordanians' incidental English lexical acquisition. It explores the primary and secondary linguistic knowledge sources (LKSs) that are used by the adult male Jordanians to process and obtain the meaning of unfamiliar lexical items incidentally. The study also highlights the most misleading LKS used. By incidental lexical acquisition is meant the portion of second language (L2) vocabulary knowledge acquired in the sense that lexical items are acquired as a natural by-product of learners performing everyday linguistics activities and tasks.

The linguistic system of a natural language consists of four essential components: the lexicon, the syntax, the phonology and the semantics (Al-Najjar, 2007:15). The printed lexicon of the standard sociolect of a language comprises complex information about the vocabulary. Therefore, for one to acquire all English lexis is farfetched even to native English speakers, and it is much harder for English as a second language (L2) learners, especially if we take into consideration that "the second edition of the Oxford English Dictionary and Webster's third edition each contains about 500,000 words", exclusive of specialized and scientific terms (Davies, 1999:108).

Acquiring a certain level of lexical knowledge is a requirement for understanding, because of the direct causality-link between lexical knowledge and understanding a reading text (Laufer, 1992). Saying that, every time a reader faces new lexical item, he/she finds it inevitable to attempt to rely on some previously acquired linguistic knowledge (including sentence-level grammatical knowledge, word morphology, punctuation, discourse/text, homonymy, word associations, cognates, morphology, phonology, syntax, and semantic knowledge, etc.) to process information in an attempt to elicit and then acquire the meaning of that new item. Lawson and Hogben (1996:106) argue that good learners do not only use more linguistic knowledge-based strategies, but they also rely more heavily on certain processes than the less competent learners.

Applied Linguistics is an interdisciplinary field that mediates between the theory and the practice of language study, investigating the relationship between language forms and use, and between different kinds of discourse (Kramsch, 2002). Applied linguistics aims to introduce solutions to language related problems, and in this sense it can help L2 learners overcome the challenge of encountering new lexical items whilst reading. Applied linguistics is presupposing linguistics, and one cannot apply what he/she does not possess (Davies, 1999:6). Along Davies' line of thought, major areas of research of applied linguistics such as language acquisition and L2 literacy bring lexical acquisition into the heart of interest of applied linguists, even to researchers who have realized the significance of cognitive processing to acquire new lexical items (c.f., for example, Geeraerts, 1995). Cognitive linguistics sees language, including its lexical items, as embedded in the overall cognitive capacities of man (Geeraerts, 1995:111); in view of this, cognition is the process of knowing which in its completeness includes perception and judgment. Cognition includes all processes of consciousness by which knowledge is accumulated, such as perceiving, recognizing, conceiving and reasoning (Britannica.com).

By the term 'lexical item' the researcher means a unit of vocabulary; all types of words may be referred to as lexical items (Al-Najjar, 2007:95). A lexical item forms the basic element of a language's vocabulary. It is either a single word such as *push*, or a chain of words such as *look forward to*. The lexical item-store of a language is called its lexis. Being in the heart of interest of applied linguists, lexical acquisition has recently been studied more thoroughly than ever, even more than grammar. The great interest in lexical items acquisition is due to a shift toward recognition that learning vocabulary prior to learning grammar and sentences leads to more success, and building lexical capacity is considered a solid foundation for tackling any other aspect of the language, and lexical knowledge is, therefore, considered "the building block of language" (Schmitt, Schmitt and Clapham, 2001:53). Lexical knowledge is one type of knowledge that is correlated to learners' understanding and reading ability (Nassaji, 2004), and it is essential for building linguistic capacity and communicative competence. For this and with the intention to help learners of English as a second language, lexical acquisition area of research has received an upsurge of interest (Paribakht and Wesche, 2009).

Krashen (2004) argues that vocabulary is best learnt through reading. This may justify the use of reading-based tasks in structured second language acquisition. Reading itself helps in lexical acquisition by creating opportunities for processes like inferring word meaning in context (Krashen, 2004). Moreover, lexical knowledge is sometimes looked at as "the single best predictor of English learners' academic achievement [which entails that] effective vocabulary instruction must be a goal of all educators working with English learners" (Wessels, 2011:1), even in the era of digital revolution we live in. Today, learners tend to read e-texts, instead of printed texts, as an electronic variety of written texts they may get access to on the internet, on a computer or on a personal mobile phone.

Saying that, exposure to digital media of reading texts could be either comprehensible or incomprehensible to the second language (L2) reader. Incomprehensibility underlines that unfamiliar lexical items are often a challenge for L2 learners (Segler, Pain and Sorace, 2002). This seems true particularly when realizing that word-formation does not follow one simple form. The vocabulary of the English lexicon could be a composite of simplex words (e.g. great), complex words (e.g. co-operate), compound words (e.g. greenhouse), and complex-compound words (e.g. absent minded) as well as phrase-compounds that are lexicalized syntactic structures (e.g. dog in the manger) (Al-Najjar, 2007:59-60). Nevertheless, certain linguistic clues in the context of the lexical item itself may help make incidental lexical acquisition with the help of previous linguistic knowledge. This use of linguistic clues may compensate for one's limited lexical knowledge.

Literature Review

The following sub-sections display some studies carried out on issues correlated to the area of research of the current study. This would help build up a clear picture of the issue under study.

Deep lexical knowledge

Various texts require varied levels of lexical knowledge, and "the higher the academic level, the greater the [lexical] mastery needed" (Paribakht and Wesche, 1999:196). This mastery is linked to the breadth and depth of lexical knowledge that are inseparably related (Li, 2003). This inseparability is well stressed in Qian and Schedl's (2004) description: lexical knowledge includes four correlated aspects within the process of lexical use and development, namely, vocabulary size, depth of vocabulary knowledge, lexical organization which includes storage and connection of words in the mental lexicon, and automaticity of receptive-productive knowledge.

Broad lexical knowledge is related to the size of vocabulary, i.e. how many words a learner knows their meanings. Cobb (2007) sees that 2,000 most frequent vocabulary items are essential for basic L2 reading because they are likely to cover approximately 80% of the words in a text in general. Nation (2006) contends that much more vocabulary is necessary to read authentic texts, and she argues that 8,000–9,000 word families are required for better comprehension of texts. Saying that, studies (cf., for example, Cobb, 2007; Nations, 2006) reveal that there will always be a need to deal with new lexical items based on what texts you are reading.

Regarding the deep lexical knowledge, L2 learners need to have more than just a superficial understanding of the meaning. The depth dimension should cover such components as pronunciation, spelling, meaning, register, morphology, syntax, collocational properties, and frequency (Qian, 2002). Qian's framework shows that the depth of lexical knowledge is as an important as vocabulary size and it comprises lexical characteristics such as phonemic, morphemic, semantic, collocation, and graphemic properties that play a significant role in reading comprehension.

Nation's (2001:27) model of the distinction between receptive and productive word knowledge includes three main aspects: (1) form, including spoken form (how the word is pronounced), written form (How the word is written and spelled), and word parts (what parts in the word are recognizable), (2) meaning, including form and meaning (what meaning the word form signals), concept and referents (what items the concept can refer to), associations (what other words does this make us think of), and (3) use of the word, including grammatical functions (in what patterns the word occurs), collocations (what words or types of words occur with this one), and constraints of use (where, when, and how often would we expect to meet this word: register, frequency, etc.).
Laufer (1990:148) highlights six linguistic components of lexical knowledge: form (recognizing the spoken and written form, being able to pronounce and spell the word correctly), word structure (recognizing the basic morphemes and word derivations), syntactic pattern in a sentence, meaning, lexical relations with other words (synonymy, antonymy, hyponymy), and common collocations.

According to Nassaji (2004) study, in which he examined the relationship between L2 learners depth of lexical knowledge, learners' lexical inferencing, and their success in deriving word meaning from context, concludes that there is a significant relationship between the depth of lexical knowledge and the type of strategy used and the degree in success achieved. Nassaji's (2004) results indicate that the students with stronger depth of lexical knowledge use certain strategies (morphological analysis, and grammar-based strategy) more frequently than those of weaker depth of lexical knowledge; and depth of lexical knowledge has made a significant contribution to success in making inferences about unfamiliar lexical items.

Linguistic knowledge-based processes leading into incidental lexical acquisition

Fraser (1999) carried out a study on lexical processes and has found that L2 learners tend to use various processes once they encounter unfamiliar words in a reading text. Fraser has found that about 50% of the adopted processes are lexical inferring strategies that were based on previous LKSs. This use of previous knowledge is one of the direct strategies which Oxford (1990:9) describes as being "guessing intelligently" compensatory process, which is "used to make up for limited [lexical] knowledge" (Oxford, 2002:128).

Corder's (cited in Davies, 1999) view of applied linguistics, which depicts "applied linguistics" as presupposing "linguistics", emphasizes that one cannot apply what she/he does not possess (Davies, 1999:6), and this suggests that in order to acquire a lexical item's meaning while reading, L2 readers typically apply their prior linguistic knowledge.. This in turn highlights the role of gaining linguistic knowledge in lexical acquisition. Learning linguistics could become a prerequisite for applying such knowledge in lexical acquisition whilst reading. In this sense, the researcher of the current study assumes that taking advantage of prior linguistic knowledge and applying it to an unfamiliar lexical item in a reading task is one facet of application of linguistics. Saying that, with no prior knowledge in linguistics, efficient employment of viable cognitive processes for incidental lexical acquisition might be questionable. Making "informed" inferences based on prior knowledge in linguistics would involve operations of direct analysis, transformation or synthesis of learning materials (Haastrup, 1991). Such synthesis is based on linguistic clues available in context and it has the potential for leading into incidental lexical acquisition. This study describes learners' task in attempting to achieve lexical acquisition through inferring as a hybrid act that requires achieving two roles: first, acquiring linguistic knowledge (as a prerequisite) and second, being able to employ that knowledge to overcome limited lexical knowledge by inferring the meaning based on processing the clues of already gained linguistic knowledge.

Linguistics knowledge source-clues

For readers to look for linguistic clues to reach a judgment about the meaning of the unfamiliar lexical item, in this sense, their journey of lexical acquisition seems similar to other inference processes carried out by detectives who examine clues in a crime scene. Linguistic clues can be a helpful tool for learners to make informed inferring of the meaning, and at the same time a highlighter of what sources of linguistic knowledge that are used in the lexical acquisition process. Based on the previous accumulated knowledge in linguistics, readers can extract and acquire unfamiliar lexical items (Deschambault, 2012) by referring to linguistic clues and the context in which lexical items appear (Frantzen, 2003). Nevertheless, readers should bear in mind that the outcome of this compensatory process is uncertain and the possibility of failure is there (Rubin cited in Beebe, 1983:46).

According to McKoon and Ratcliff (1992), a clue is a piece of information that is embedded in the construction of a lexical item itself or appears near a lexical item, and offers direct or indirect suggestions about its meaning. Added to that, pieces of evidence/linguistic clues may imply that the more sources of linguistic information you have, the more able you become to activate clues. This might be true in light of Haastrup's (1991) argument that over-reliance on one type (one linguistic knowledge-based type) of clues by readers means that other types of clues are not being activated, which would result in ineffective inferring and thus ineffective lexical acquisition process.

Many researchers have introduced types of knowledge sources and clues that help in incidental lexical acquisition through making informed guesses/ inferring. Nassaji (2003:655), for example, makes a distinction between learners' appeals to knowledge sources and the used strategies. Nassaji defines *knowledge sources* as those "instances when the learner made explicit reference to a particular source of knowledge, such as grammatical, morphological, discourse, world, or L1 knowledge". Moreover, Haastrup (1991) presents three main types of clues:

(1) Interlingual clues: clues related to the reader's use of other languages than the target language, including reflections about the origin from which the target word is derived. In other words, interlingual clues-based inferences are judgments made by learners about the similarity in two or more languages.
(2) Intralingual clues: clues related to the reader's use of the features of the target word such as phonology, orthographic similarity, dealing with morphology (prefixes, suffixes and stems), word class, and collocation. The ability to exploit intralingual clues presupposes that learners already have some knowledge of the target language, in particular.
(3) Contextual clues: clues that involve making use of the text and general knowledge of the world (i.e. that what the participant proposes is not taken exclusively from the text) including beliefs, attitudes, prejudices, factual knowledge, and diagrams, etc.

Haastrup's analysis of 62 pair think-aloud protocols of Danish-speaking learners revealed that *high-proficiency learners make more* successful inferences and show more flexibility in using context clues than low-proficiency learners.

A study by Shen (2008) investigated 120 Thai students' abilities, difficulties, and strategy use in lexical inferring. Data were collected from students' retrospections immediately after a *lexical inference test* as well as a survey on a vocabulary strategy questionnaire. Shen analyzed his self-descriptive data collected from the incorrect answers according to Nassaji's categories, to examine the students' difficulties in the use of knowledge sources. Shen's results showed that most students had difficulty in using world knowledge and morphological knowledge to infer word meaning. Among the high-frequency-used linguistic knowledge-based strategies was 'recognition of cognates'.

Paribakht and Wesche's (1999) study, which underlined the relationship between reading and "incidental" L2 vocabulary acquisition, relied solely on the term *knowledge sources* to describe learners' lexical incidental acquisition (through inferring) strategies, and they condense these knowledge sources under two major headings of clues: *linguistic knowledge sources* which include intralingual and interlingual clues, and *extra-linguistic sources*. Linguistic knowledge sources, in particular, will be utilized in this study. Paribakht and Wesche (1999) conducted a retrospective study of lexical inferring with 10 intermediate-level ESL students in order to find out the knowledge sources and clues they use to understand the meaning of unfamiliar words in a passage.

According to Paribakht and Wesche's (1999) results, students seem to regularly use extra-linguistic and linguistic sources of information. Extra-linguistic information includes the readers' world knowledge, to which McKoon and Ratcliff (1992) refer as global inferences. Paribakht and Wesche's linguistic sources of information refer to different levels of readers' LKSs, including sentence-level grammatical knowledge, word morphology, punctuation, discourse/text, homonymy, word associations, and cognates (see Table 1 below, of Paribakht and Wesche's (1999:2) taxonomy of knowledge source used in lexical inferring).

Table 1: Knowledge sources used in lexical inferring

Extralinguistic sources	Linguistic sources	
	Major	Minor
World knowledge	Sentence-level grammatical knowledge Word morphology Punctuation	Text/ discourse Homonymy Word associations Cognates

Paribakht and Wesche found learners most frequently using grammatical knowledge at the sentence level (35%), followed by morphological analysis of unfamiliar lexical item (15%) and their knowledge of the world (9%). The participants used sentence-level grammatical knowledge in lexical inferring, and sometimes combined that knowledge in grammar with word morphology, punctuation and world knowledge. Individual differences in the knowledge sources were attributed to "the individual's previous L2 learning experience, their L1 and their familiarity with the text topic" (Paribakht and Wesche 1999:214).

Morphology knowledge-based incidental lexical acquisition: Morphological analysis of word structure

In linguistics, morphology is the branch of grammar devoted to the study of the structure or forms of words, primarily through the use of the morpheme construct (Bowen, 1998). Morphology as LKS is essential for building L2 learners lexical capacity, given morphological analysis of word morphology is frequently employed by readers of all levels to infer the meaning of unfamiliar lexical items (Carlisle, 2004; Paribakht and Wesche, 1999).
Morphological analysis here means the process of deriving the meaning of a lexical item by analyzing its meaningful morphemes. Acquiring such a morphological awareness has a facilitative effect on reader's extraction of constituent morphemes by breaking down unfamiliar words to extract inferences. In addition, readers who distinguish word formation (which studies lexical processes such as derivation, compounding, conversion, back formation, clipping, blending, etc.) and inflection of morphologically complex words can also determine the syntactic structure of the sentence, which doubles chances to extract word and phrase meaning.

It is, therefore, a prerequisite for readers to learn about English morphological formation rules and affixation of an element to a base morpheme, in addition to knowing the meaning of affixes. In this respect, there are three aspects of English morphological awareness: the relational aspect (the ability to determine whether a word can be divided into smaller units like the relation between *educate* and *educator*), the syntactic aspect (maneuvering segmented units of a word depending on their syntactic categories, as in the case of adding agentive suffix *-or* to make *terminator*) and the distributional aspect (to have an understanding of distributional constraints of segmented units of a word, as in understanding that creating words like *printable* and *readable* requires adding the suffix *-able* to the verb, not to the noun; and creating words like *illegal, impossible, unbelievable,* and *ineffective* requires adding the prefix(es) *il/im/un/in* to the adjective to obtain its opposite meaning).

It is part of the morphological knowledge of a learner to know that English morphemes are either *free morphemes* (which can function in isolation, as in the free morpheme *sleep*) or *bound morphemes* (which can only function in conjunction with at least one other morpheme, as in the bound morpheme *less*). For example, the word *sleeplessness* is composed of one free morpheme (sleep) and two bound morphemes (-less, -ness).

Free morphemes comprise two kinds: lexical morphemes (nouns, verbs, adjectives, and adverbs) and functional morphemes (e.g. prepositions and pronouns that serve a function rather than convey meaning). Similarly, bound morphemes comprise two kinds: derivational morphemes (which form new words, e.g., care-care*less*) and inflectional morphemes (which signal grammatical relationship, e.g., care- cares/care*d*/car*ing*). It would be instrumental to know the meaning of certain affixes such as those displayed in Table 2 below (Al-Najjar, 2007:100-119):

Table 2: Affixes and meaning

Prefixes		**Suffixes**	
Prefix	**Meaning**	**Suffix**	**Meaning**
be-	affect, provide (e.g. bedevil) cause to, treat as (e.g. befriend)	-able/-ible	fit for (e.g. washable) liable to (e.g. contemptible)
de-	remove (e.g. defrost)	-an/-ian	relating to (e.g. asian)
dis-	deprive of (e.g. discourage)	-ance/-ence	action (e.g. dependence) state (e.g. excellence)
in-	fill with (e.g. inspirit)	-ary	place of the action (e.g. dispensary) relating to (e.g. imaginary)
un-	remove (e.g. unsex, unearth)	-ation	action, process (e.g. flirtation)
a-	without (e.g. asymmetric, apolitical)	-ative	tending to (e.g. imaginative)
arch-	principal (e.g. archenemy)	-ee	recipient of an action (e.g. escapee)
bi-	into two parts (e.g. bisect)	-esque	in the style of (e.g. picturesque)
co-	jointly (e.g. coexist)	-fy	make or form into (e.g. beautify)
counter-	opposing (e.g. counterplot)	-ous/-eous	marked by (e.g. continuous)
intra-	within (e.g. intradermal)	-hood	period (e.g. widowhood)
pro-	supporting (e.g. pro-American)	-ling	young, small (e.g. duckling)

In Carlisle's (2004) study, he examined two school groups' morphological awareness and its relationship to reading comprehension and word reading efficiency in English. The results indicated that the older the group was, the stronger morphological awareness appeared to enhance students' comprehension. Carlisle related the difference between his study groups to that the older the learner is, the greater exposure to complex words in print and more opportunity to decompose morphologically she/he has. Carlisle's study gives us the notion that morphological awareness not only helps comprehension but also develops through experience.

Phonological knowledge-based incidental lexical acquisition

Phonology refers to the study of the sound system of a language. The phonological-lexical relations are expressed by homonymy, homophony and homography. When two or more signifiers have the same phonetic and orthographic form, but have different unrelated meanings, they are called **homonyms**. The knowledge of such lexical ambiguity in homonyms can improve L2 learners' awareness about potential misunderstanding when encountering *bank* (of the river) and *bank* (financial institution), and *pole* (rod/ post) and *pole* (extremity) as in (North Pole).

Homophony literally means 'same sound'. When two or more signifiers have the same phonetic form but have different orthographic forms and meanings, they are called homophones, as in *flour: flower, heal: heel, meat: meet, waive: wave* and *no: know*. Knowledgeable L2 reader would be able to distinguish between homophones like *cell* (prison room) and *sell* (to exchange for money), and *right* (correct) and *rite* (ceremony).

Homography literally means 'same written form'. When two or more signifiers have the same orthographic forms but have different phonetic forms and meaning, they are called homographs, as in *lead* [lid] (to guide on a way) and *lead* [lɛd] (a heavy metal) (Bussmann, 2006). Despite the potential ambiguity in homonyms, for example, they may help in recognizing words. Paribakht and Wesche (1999:209) stated that learners use their knowledge of sound relationships and similarity between the target word and another word in the learners' mental lexicon to infer the meaning of the unknown lexical item. Zibke's (2009) study ended with a conclusion that phonological awareness is widely recognized to help learners read, and metalinguistic awareness that involves processing multiple meanings and identifying ambiguities has to be accepted as a facilitator of reading. Unawareness of facts and differences related to form relationships in homographs, homophones and homonyms would be a stumbling block in the face of L2 lexical learners. The unawareness of all possible meanings opens door to make incorrect lexical knowledge.

Syntactical knowledge-based incidental lexical acquisition

Syntax is a traditional term for the study of the rules governing the combination of words to form sentences (Bowen, 1998).

Al-Najjar (2007:16) adds that the syntax of a language is an account of how words and phrases are arranged to generate well-formed sentences, and the syntax of the Standard English is codified and documented in textbooks and normally acquired in school. With relation to lexical acquisition, syntactic knowledge and awareness of sentence structure, including recognizing syntactic relations between sentence components, contribute to both word meaning-extraction and L2 reading comprehension (Shiotsu and Weir, 2007; Urquhart and Weir, 1998).
Competence in such linguistic knowledge also includes the ability to identify syntactic functions of words, to break down sentences into meaningful chunks and to know verb conjugations, which serves significantly in promoting L2 lexical knowledge and reading comprehension as well (Shiotsu and Weir, 2007). The structure of the sentence can tell us the *part of speech* of the unfamiliar word. Once you know that a word is noun, or adjective, etc., it is often useful to figure out its meaning and continue reading. Consider the following examples:

(1) The dirty old man gave Kate a *salacious* look.
(2) My cook looked at that rusty *gadget* and wondered how it worked.

The italicized word in sentence 1 (*salacious*) is an *adjective*; the context offers words like *dirty man*, which implies that an indecent behaviour was done, and the target word describes a kind of look that a man may give to a woman. All information, before and after the word, helps the reader gather evidence upon which she/he determines the meaning of that adjective. Similarly, *gadget* in sentence 2 is a *noun* that provides you with some purpose, as triggered by the word 'worked'.
Awareness of clues such as *comparison and contrast* clues can also help L2 learners build their lexical knowledge. Comparison clues refer L2 readers to where an unfamiliar word is used in comparison with a familiar word. A comparison clue is where you use the similarity between the familiar and the unfamiliar word to determine the meaning. Connecting words like *similarly, likewise, as, exactly, like, and, as well as, both,* etc. are used to trigger comparison. For example:

(1) No smell is as *tantalizing* as the smell of freshly baked bread.
(2) Miss Johnson is a *prim*, modest woman; likewise, many of her friends are very respectable.

In sentence 1, the adjective 'tantalizing' has been compared to the smell of freshly baked bread, using the word 'as'. This comparison would help infer that 'tantalizing' means 'tempting'. Similarly, 'likewise' in sentence 2, is used to compare *prim* to *respectable*, to give the implication that *prim* means *respectable*. Thus, *prim* has a similar/an acceptable meaning.

A contrast clue is where you use the dissimilarity, the opposite of familiar information, to determine the unfamiliar lexical item's meaning. Conjunction words like *however, but, on the other hand, yet, unlike, instead of, while, and although* join the unfamiliar lexical item/sentence with another lexical item/sentence that is its opposite. Consider the following examples: Rana is neat in appearance while she is *slovenly* in her housekeeping. The signal word in sentence 1, *while* indicates contrast between *neat* and *slovenly*.

Semantic field knowledge-based incidental lexical acquisition

The term semantic field refers to the notion which claims that the vocabulary of a language is "organized into areas/fields within which words interrelate and define each other in various ways. The words denoting colour are often cited as an example of a semantic field: the precise meaning of a colour word can be understood only by placing it in relation to other terms which occur with it in demarcating the colour spectrum" (Crystal, 1988:274). Proceeding from this, for L2 readers to understand and acquire an unfamiliar lexical item, they should place it in relation to other terms (content relationship). Yule (2006:100) mentions that:

When we investigate the meaning of [a lexical item] in a language, we are normally interested in characterizing the conceptual meaning and less concerned with the associative meaning of the words. However, different people might have different associations or connotations attached to a word. […People may be] very interested in using words in such a way that certain associative meanings are evoked.

Based on Yule's argument, awareness of word associations helps L2 learners build their lexical knowledge. Establishing word associations is an indicator of how this awareness may help in drawing inferences, and it highlights the importance of deep semantic knowledge (Laufer, 1990:148). Thanks to such semantic knowledge highlighted by Crystal and Yule, L2 reader will be able to pay attention to synonyms, antonyms, hyponyms, meronyms, collocations, connotations, denotations, figurative language, simile, and metaphor.

Synonymy: Lexical synonymy occurs when two or more signifiers have very closely meanings/signifieds. Synonyms belong to the same lexical category. Thus, there are synonymous nouns (answer, reply), synonymous verbs (buy, purchase), synonymous adjectives (broad, wide), synonymous adverbs (almost, nearly), and synonymous conjunctions (because, since) (Al-Najjar, 2007:67). When reading, the text may pair the unfamiliar word with a *synonym*. For example, in a sentence like 'I was *exhausted* last night; yes, I was shattered', the word 'shattered' as a synonym to the italicised word *'exhausted'* is likely to help the reader deduce the meaning of *'exhausted'*.

Antonymy: When two signifiers of the same lexical category label opposite meanings, they are called antonyms as in fast: slow, fall: ascend, and up: down. An example of how knowledge of *antonyms* facilitates lexical acquisition is displayed in the following sentence: I showed *interest* not indifference. Establishing associations between the word *interest* and its antonym *indifference* helps the reader extract the meaning of the italicized word (interest).

Hyponymy and Meronymy: Hyponymy is a specific term used to designate a member of a class or a larger group. For example, *milk* is a hyponym of the hypernym *dairy*, *oak* is a hyponym of the hypernym *tree*, *cat* is a hyponym of the hypernym *animal*, *apple* is a hyponym of the hypernym *fruit*, and *green* is a hyponym of the hypernym *colour*. Such knowledge helps L2 learners infer the meaning, especially when the class as well as the member of that class is mentioned in the text. Meronymy refers to a part-whole relationship between signifieds, for example, *eyes*, *brows*, *mouth*, *chin* and *jaws* are part of head, and hence, they are meronyms of *head*.

Collocations also help in expecting words that are usually used together with another word mentioned in a text. For example, if a reader reads a word such as *deposit*, she/he would expect words that have meaning related to *checks*, or *money*. Similarly, when reading the verb *sit*, she/he would expect the meaning of the following word to be related to a piece of furniture such as *chair, sofa, couch, settee*, etc.

Connotations and Denotations: Words have *connotations as well denotations,* and words may change meaning when put in different contexts. Semantic knowledge plays a significant role in selecting among competing analyses and discarding illogical analyses. So, the reader needs to look for the appropriate meaning, stored in brain, of a word in any given context. For example, when you come across a word like *deity* in a sentence like 'The King has become more of a *deity*', it does not mean that the king has become an actual God, but merely *an object of inspiration.*

Figurative Language or Idiomatic Language: When the text uses *figurative language* or idiomatic language, L2 reader can deduce meaning by using imagination and reason based on the larger context and looking beyond the words. You do not look for the literal meaning but rather to the implied communicative meaning. In the simile *'Time is like a river'* one may derive such a meaning as 'time follows a definite path'. In *'Mary is as busy as a bee'* the comparison here is suggesting a meaning. In other words, readers' awareness of a remark in such comparison (comparing Mary's business and ongoing movement to that of a bee) help them infer the meaning of what the simile suggests (that is, *Mary is so busy*).

A metaphor is a figure of speech in which a word or phrase is used to make an implicit comparison as in "*All the world's a stage*" (Shakespeare) with no use of words such as *like* and *as*. More examples of metaphor usage in everyday language include using the word 'digest' in *'digest new information'* to mean *process*, *'time is money'* to express in a more persuasive way *how precious time is*, *'time flies'* which does not literally mean flying like a bird but it represents the idea of 'how quickly time passes'. In an expression like *'up to the ears'*, the reader can extract the expression meaning as 'thoroughly involved' if she/he imagines the situation in which things might be to one's ears. Likewise when reading the word *grasp* in 'to grasp a concept', it sends a strong message as if you were clutching a tangible thing in hand, although the concept is intangible, and so forth.

Reviewing the related literature has provided insight of previous studies, used taxonomies and followed methods. Literature has also oriented the researcher to what clues that may instigate a linguistic knowledge. This helped him design his data collection instrument. Realizing that little has been done to study the employment of previously learned LKSs by the Jordanian adults; the present study is an attempt to investigate the potential differences in using them. It is unique in that it focuses on the differences in terms of frequency and effectiveness when used and it is hoped to mediate between lexical studies, applied linguistics, English as a second language (ESL) as well as second language (L2) acquisition.

Research Questions

This study aims at investigating the potential differences in the role of different LKSs in incidental lexical acquisition. It describes the nature of how a previously learned linguistic knowledge underlies the incidental lexical acquisition by L2 readers. It examines the utilized linguistic clues which will in turn highlight the employed LKSs (morphology, phonology, syntax and semantics). It sheds light on the process of *"word-attack"* (to use Oxford's, 1990, term), i.e. how readers may deal with the word itself as well as its co-text. In compliance with this aim, this study has the following focus research questions:

(1) What are the primary sources of linguistic knowledge that are used by adult advanced Jordanian English learners in incidental lexical acquisition?
(2) What are the secondary sources of linguistic knowledge that are used by adult advanced Jordanian English learners in incidental lexical acquisition?
(3) What are the common combinations of LKSs used, if any?
(4) What is the most misleading LKS used by Jordanian English learners?

Methodology

A total of 16 male Jordanians with advanced level of English were chosen as a sample of the study. The sample participants were selected from Jordanian army officers who had excellent English level according to their latest marks on TOEFL and English comprehension level (ECL) test made for them as part of preparing themselves at the Jordanian Armed Forces Institute of Language to travel to Africa to work with the United Nations Peace Keeping Departments (UNPKD) as UN military observers. All of them received formal instruction (yet, with varied length of learning experience) in syntax and sentence level-grammar, phonetics and phonology, semantics, and morphology.

Adult advanced L2 language users were believed to be more able to clearly express themselves than younger learners on how they process their linguistic knowledge, thus rendering more reliable data and findings. The researcher was preparing himself as well to travel to Africa, and that is how he met them at the institute on 31 January, 2016. He introduced the assignment of the list of sentences to them, and explained what was expected from them to provide.

Data collection procedures and instrument

A list of 8 sentences was used in a form of lexical inferring task to instigate any previously acquired deep lexical knowledge by 16 advanced learners of English who are native Arabic speakers. The list of sentences was sent to the participants' mobile phones through a WhatsApp group to which the participants were invited.

For analysis purposes, each participant was also asked to tell the length of years he has spent learning English, to attempt to explore any potential relationship between the length of period and the use of LKSs. Participants were asked to try to extract the meaning of the underlined target lexical items (see Appendix 1 for the list of sentences). Participants were asked to use a piece of paper at the end of tackling every sentence to write down what kinds of clues and previous linguistic knowledge that helped them understand the meaning of the target lexical items. Students could provide a synonym, antonym, translation, or even explanation for each of the underlined lexical item's meaning.

The eight sentences with one word or strings of words being underlined in each sentence were designed by the researcher. The target lexical items (the focus of the inferring task) were meant to meet as much as possible Haastrup's (1991) criteria, which are as follows:

(1) Lexical items should be unfamiliar to all participants.
(2) Lexical items invite the use of various knowledge sources.
(3) A range of lexical item-parts of speech are presented.

Accordingly, the sentences were selected so that the readers would know most of the words except for the target lexical items. Target lexical items included nouns, verbs, adjectives, adverbs, and phrases. Contextualized lexical items covered the various sought LKSs. Sentences included clues to help activate inferring and cognition. This is made in line with Wang's (2011:2) statement that "When a text does not supply clear and enough clues for unknown words, it is very hard for readers […], to figure out the word meaning". See Table 3 for the clues that were intentionally made available in the study's inferring test.

Table 3: Clues in the study's inferring test

Sentence	Target words	Clues
1	uninhabitable	un+inhabitable (morphological analysis) It is an adjective describing the noun *areas* (syntactic knowledge)
2	arch-friends	arch+friends (morphological analysis) It is noun (syntactic knowledge)
3	incised	incise+d (morphological analysis) It is past participle verb (syntactic knowledge) It is collocational with *into* (semantics) It is achieved with a cutting instrument or burin (discourse)
4	brushing off	It is a phrasal verb (syntactic knowledge) It is the opposite meaning of *keen* (semantics) It is in the *but* clause, indicating contradiction (syntactic knowledge)
5	shambles	It is noun functioning as an adjective (syntactic knowledge) It is synonymous with *mess* (semantics) It is homonymous with shambles, slaughterhouse/a place of carnage (sound/phonological relationship)
6	accommodation	It is homonymous with *accommodation*, i.e. housing (sound/morphological relationship) It is noun (syntactic knowledge) It is antonymous with *dispute* (semantics)
7	aural	It is adjective (describing the noun *impairment*-syntactic knowledge) It is homophonous with *oral* (sound/phonological relationship)
8	apolitically	It is adverb (describing the verb *act*-syntactic knowledge) It is a+politically (morphological analysis)

For example, in this study, sentence (1), "Antarctic and arctic poles are uninhabitable areas", included at least two types of clues: the morphemes of the target word (un-, which gives the opposite meaning of the adjective, +inhabitable, which is the base, not the root), and it is an *adjective* describing *Antarctic and Arctic poles* as whether fit areas for living or not. Also, sentence (6) "Finally, the belligerents came into accommodation after five years of dispute." was designed to include the homonym *accommodation* which may mean *housing* in other contexts, and it also includes its antonym, *dispute*. Likewise, the remaining sentences of the inferring test were meant to provide at least two linguistic clues that may activate readers' inferring

Data Categorization

128 inferring tasks were analyzed (8 lexical items per participant). The criterion measure to categorize collected data was the participants' highlighted clues that triggered the meaning. Upon completion the only one meeting with the participants, all responses gathered, either correct or incorrect, were analyzed quantitatively and categorized for each LKS: morphology, phonology, syntax, and semantics. To gain an overview of the made attempts and the used LKS, the sources of knowledge resorted to by participants have been compared in order to shed light on any similarities or differences available between responses of participants, in terms of the employed LKSs.

The answers provided by participants are checked against the related linguistic sources, and are then given the designated category term: morphological analysis, phonological (sound) relationships, syntax, and semantics. For example, Answers that referred to any analysis of the meaningful morphemes of a target lexical item were given the name of morphology-category. Tasks that were tackled by attempting to read aloud the target lexical item to identify any sound similarity with other previously learned words, or identifying a word which was pronounced or spelled the same as a previously learnt word were classified under the phonology-category (of homonymy, homography, homophony, etc.). Situations where participants pointed to any such clues as the relationship between phrases e.g. comparison and contrast, the syntactic functions of words, the word arrangement within the sentence structure, and syntactic category of a word were listed under syntax-category.

Any attempts based on utilizing semantic clues and paying attention to lexical content relationships or word associations such as connotations, collocation, synonyms, antonyms, etc. to help deduce the meaning was categorized under the semantics-category.

Results and Discussion

The purpose of this study is fourfold. First, it explores which LKSs are primarily used (namely among morphology, phonology, syntax and semantics) in the process of knowing the meaning of unfamiliar lexical items by the advanced adult Jordanian English learners. Second, it presents the secondary LKSs used by the advanced adult Jordanian English learners. Third, it searches for any common combinations of LKSs used. Fourth, it highlights the most misleading LKS used by Jordanian English learners in incidental lexical acquisition.

Results

Data showed that the participants had bachelor degrees, except for one who had master degree. All participants mentioned that they received no formal training or instruction on how to employ sources of linguistic knowledge in an attempt to know the meaning of unfamiliar lexical items. All participants studied English for quite long periods. They ranged between 12 and 18 years of studying and learning English.

The participants made 111 attempts of lexical meaning inferences based on their previous LKSs. 17 tasks (out of the 128 study's inferring tasks) could not be inferred at all, and thus left with no meaning provided. This means that 13.28% of the inferring tasks were left blank by the participants, and about 86.72% of the attempts were made by using different LKSs. Cases where participants provided no meaning to the target lexical items emerged probably due to participants' inability to pay attention to the available clues, or their ignorance of some kinds of clues.

The used LKSs and their frequency

Data analysis showed that (as in Table 4 below) the major figures of how frequently participants depended on morphology, phonology, syntax and semantics. The percentages, hereafter, will be based on the 111 made attempts of knowing the lexical items by using LKSs.

Table 4: Participants dependence on morphology, phonology, syntax and semantics

Linguistic knowledge sources	Frequency of using each linguistic knowledge source
Semantics	45.05%
Morphology	23.42%
Phonology	18.92%
Syntax	12.61%

Table 4 shows that using previous semantic knowledge was most frequent among the participants, with a percentage of 45.05%. That was followed by reliance on the morphological analysis of the word, with a percentage of 23.42%, and phonological similarity with a percentage of about 19%. In contrast, previous knowledge in syntax was the least referred to by the participants, with a percentage of 12.16% of the frequency of using LKSs. The Jordanian participants tend to build up the meaning of unfamiliar lexical items by depending on different clues activated in the sentences. See Table 5 below for the frequently used clues in this study.

Table 5: The frequently activated clues by participants

Linguistic knowledge sources	Activated clues
Semantics	Synonyms
	Antonyms
	Collocations
	Connotations
Morphology	Morphological analysis of word structure (i.e. the base and affixes)
Phonology	Homophones
	Homonyms
	Homograph
Syntax	Parts of speech and their function
	Comparison and contrast

The LKSs were identified based on the classification of the identified activated clues. Synonyms, antonyms, collocations and connotations were the most activated clues based on the previously acquired semantic knowledge of the participants and their ability to find word associations in the word co-text. Morphological analysis of the structure of the target lexical item was noticed being used as a second choice by the participants, which implies that not only the co-text but also the word itself should be a subject of study and analysis by the reader. Homophones, homonyms and homographs were also used in an attempt to infer the meaning of unknown lexical items. Comparison and contrast clues as well as recognizing the parts of speech of the target lexical item and its function was also referred to by the participating readers to build up its potential meaning.

Saying that, not every attempt of knowing the lexical item's meaning, through using the LKS, was made successfully. 69.37% of the attempts were successful, and the reached meaning was correct, whereas 30.63% of the attempts led to deduce incorrect meaning. See Table 6 below for successful and unsuccessful employment of LKSs.

Table 6: (Un) Successful employment of LKSs

Linguistic knowledge sources	Frequency of success	Frequency of misleading
Syntax	86%	14%
Semantics	84%	16%
Morphology	73%	27%
Phonology	19%	81%

The 'syntax' category and the 'semantics' category were used most successfully, and led to correct deduction of meaning in 86% and 84%, respectively, of occurrences where syntax and semantics were taken advantage of. Morphological analysis was also used successfully most of the times, but with lower percentage of success (73%) than that was scored when using syntax and semantics. The 'phonology' category was misleading, most of the times, and led to incorrect inferred meaning in 81% of cases where it was used. Examples of the employment of LKSs in successful as well as misleading lexical acquisition are in the following paragraphs.

Regarding the employment of semantic knowledge, it should be highlighted in this place that only 16% of attempts of building up the meaning based on semantic clues were incorrect. This implies that it is worthwhile using by readers. Participants were given serial alphabet from Participant 'A' to Participant 'P'. The researcher remarks are provided in between square brackets []. Consider each of the following examples taken from the participants' reports about employing semantic knowledge:

(1) Having read sentence 5 (Everything in Syria is a mess; the situation turned into **shambles**), participant 'A' reported that "the underlined lexical item means catastrophic, messy or chaotic. The word 'mess' in the same sentence helped me infer the meaning. It gives similar meaning to [synonymous with] the word 'shambles'".
(2) Having read sentence 6 (Finally, the belligerents came into **accommodation** after five years of dispute), Participant 'B' reported that "the underlined word means harmony or agreement. The contradictory of its meaning is given by the word [antonymous with] 'dispute'".
(3) Having read sentence 3 (An image was **incised** into a highly polished metal plate, usually copper, with a cutting instrument, or burin), Participant 'C' reported that "the underlined word means cut. The collocation incised+into implies it is cut and put into a shape to be given a shape of a highly polished metal plate".
(4) Giving unsuccessful meaning after reading sentence 6 and establishing a word association, Participant 'H' reported that "the word 'accommodation' means 'grace' [which is incorrect]. The text indicates that its meaning is the opposite of [antonymous with] 'dispute'".

The successful employment of syntactic knowledge was obvious among Jordanian readers. Yet, about 14% of the syntactic knowledge-employment was unsuccessful. Consider the following examples of successful and unsuccessful use of syntax in lexical acquisition:

(5) After reading sentence 4 (Jamal is very keen on Alice, but she is **brushing** him **off**), Participant 'D' reported that "the underlined word gives contradictory meaning to that of 'keen' because the underlined lexical item is mentioned after a contrast clue (the conjunction word 'but') where the dissimilarity is usually expressed and the opposite of familiar information is given. Therefore, the underlined word may mean 'refusing/ignoring'".
(6) After reading sentence 7 (My cousin has an **aural** impairment), Participant 'J' reported that "the underlined word is an adjective describing a kind of impairment. It could mean hearing, seeing or movement impairment. In general, I think it means a kind of impairment".

(7) After reading sentence 8 (The military are to act **apolitically**), Participant 'P' provided incorrect meaning of the target lexical item. He reported that "the underlined word is an adverb coming after a verb and describing it. It is, therefore, describing how the military are expected to act. Proceeding from this, the word means with discipline".

The successful employment of morphological knowledge in this study was 73% of the total occurrences where morphological analysis was adopted by the participants to deduce meaning. 27% of cases of using morphological analysis were made unsuccessfully. Consider the following examples of how Jordanians use their morphological-analysis knowledge:

(8) Having read sentence 8 (The military are to act **apolitically**), Participant 'E' reported that "based on the prefix 'a' which means 'with no' or 'the opposite' I can tell that the underlined word, 'a+politically', means 'with no political views or with no concern to politics'".

(9) Having read sentence 2 (Who are your **arch-friends**), Participant 'F' reported that "based on analyzing the word structure, arch+friends, 'I think it means 'close or main' friends".

(10) Having read sentence 1 (Antarctic and arctic poles are **uninhabitable** areas), Participant 'K' reported that "the underlined word is composed of un+inhabit+able. 'Inhabit' means 'to live', '-able' is an adjective suffix, and 'un-' gives the opposite meaning of the adjective (inhabitable). Thus, 'uninhabitable' means areas you cannot live in".

(11) Having read sentence 5 (Everything in Syria is a mess; the situation turned into **shambles**), Participant 'L' provided incorrect meaning of the target word. He reported that "based on the root of the word, sham(e), the underlined word means 'not good'". [The participant was misled by the last four letters of the underlined word. Confused by the word shame and the suffix '-able', the participants could not distinguish the target word from the one unbreakable word 'shamble'].

Regarding employing knowledge in phonology, only 19% of its use was successful, whereas 81% of attempts of relying on phonological relationships were unsuccessful. Consider the following examples of how Jordanians rely on phonological and sound relationships to learn the lexical item meaning:

(12) Having read sentence 7 (My cousin has an aural impairment), Participant 'I' was misled and reported that "the underlined word sounds similar to a word I already know its meaning [oral], thus I think it means 'spoken/verbal'".

(13) Having read sentence 8 (The military are to act **apolitically**), Participant 'I' was also misled by the word 'politically' without paying heed to the prefix 'a'. He reported that "the underlined word means 'diplomatically and as related to politics'".

(14) Having read sentence 6 (Finally, the belligerents came into **accommodation** after five years of dispute), Participant 'N' provided incorrect meaning for the underlined lexical item based on his mistaken judgment. He reported that "I know the meaning of the underlined word [misled by its homonym], it means 'lodging/housing'".

Results showed that participants tended to use single LKS when addressing an unfamiliar lexical item. However, there appeared using combinations of linguistics knowledge sources by some participants. Despite its rarity, using combinations proved being a good and most successful choice. All identified combinations were effective and led to correct lexical comprehension. This would emphasize the significance of employing combinations of linguistic sources, especially when overreliance on certain clues might be misleading as in the case of the participants' use of phonological relations.

The single frequent category activated in learners' combinations was semantic knowledge. Using a variety of knowledge sources to deduce word meaning calls attention to Li's (2003) argument that lexical mastery is linked not only to the breadth of lexical knowledge but also to its and inseparable depth. Corresponding to Nassaji's (2004) conclusion, the depth of lexical knowledge of Jordanians' seems to have a significant relationship with the type of used linguistic knowledge and even combinations as well as their successful inferring. Data analysis showed some use of combinations of LKSs. Participants rarely tended to combine more than one LKSs or to take advantage of multiple clues to understand the meaning. Two types of combinations were used. A combination of *semantic clues+ syntactic clues* was used four times. For example, when reading sentence 4, Participant 'D' paid attention to the opposite meaning conveyed by *keen* and *brushing off* as well as the contrast clue, *but*, which is a syntactic clue. Considering the two clues helped the reader reach at the right meaning successfully.

The other used combination was doing the *morphological analysis+ recognizing semantic clues*, which was used once. For example, in sentence 5, Participant 'M' paid attention to the synonymous relationship between the target word *shambles* and its synonym *mess* (which is a correct establishment of lexical relationship), and attempting to relate the first four letters of the target word *shambles* to the word *shame* which implies a negative/ bad meaning. The reader thought that *shambles* is composed of shame+ble+s, which is a wrong analysis for *shambles* is one unit and cannot be broken down into parts. It can be said in this place that if the reader relied only on the mistaken morphological analysis, he would reach a wrong meaning; however, considering multiple clues minimized the risk of understanding the meaning.

Apart from the combinations of LKSs, there appeared five occurrences of using world knowledge, which is extra-LKS, together with LKSs. In response to sentence 5, Participant 'E' relied on a semantic clue+ his background of world knowledge about the conflict in Syria. Like two other participants, Participant 'E' considered the word *mess* as being synonymous with *shambles*, and he related that to his background knowledge of the situation in Syria. His attempt was successful. The combination of morphological analysis+ world knowledge was also used twice, by Participant 'J' and Participant 'M', to know the meaning of *apolitically* in sentence 8. Participant 'J', for example, analyzed *apolitically* into *a+politically* and mentioned that the prefix *a-* give the opposite meaning of the adverb and adjective, in addition to his knowledge of how the military should act. Based on this combination of analysis and relating, the reader mentioned that the meaning of *apolitically* is not politically or diplomatically.
Regardless of the used combinations, it is noticed that using combinations of knowledge sources in this study led to successful processing and thus correct meaning of the target lexical items. In cases where a mistaken morphological analysis, for example, was made relying on another clue helped minimize the risk of misunderstanding the meaning. This is stressed in Paribakht and Wesche's (1999) finding which has highlighted that learners sometimes combine LKSs.

Discussion

Results showed clear answers to the questions of the study. It also provided evidence on Krashen's (2004) stance about lexical items as being best learnt and acquired through reading. The results of the study has highlighted that reading do help in lexical acquisition by creating opportunities for cognition based on context and clues. The following subsections will discuss the major results of the study with relation to previous studies.

Primarily used LKSs

Attempting to know the meaning of the target unfamiliar lexical items of this study, in unassisted reading situation where there are no dictionaries or asking somebody else, the participants found it inevitable to employ their previous knowledge, namely in semantics, word morphology, phonology and syntax, but with varying frequency. This employment was activated by linguistic clues that were present in the reading task. Based on the clues-based process, the participants tried to elicit and then incidentally acquire the meaning of new lexical items.
In line with Lawson and Hogben's (1996:106) argument that good learners do not only employ different LKSs but they also rely more heavily on certain sources, the researcher of this study has found that all Jordanian participants rely on various LKSs, i.e. semantics, word morphology, phonology and syntax (as well as rare use of background world knowledge), and they rely more heavily on knowledge in semantics.

Nevertheless, unlike Paribakht and Wesche (1999) who found that syntax and grammatical knowledge was the main linguistic knowledge used, adult male Jordanians were found to chiefly use their semantic knowledge by recognizing relations and different associations like synonymy, antonymy, etc. to make judgment on the meaning of unfamiliar lexical items. This use of word associations, as contented by Yule (2006), could help L2 learners deduce the meaning. It also re-stresses Laufer's (1990) underlining of the importance of deep semantic knowledge, especially when results show that semantic knowledge is the Jordanians' preferred option to rely on.
Along the lines of Paribakht and Wesche's (1999) finding about using morphological analysis as a second preferred LKS, this study has also found that morphological analysis of the word structure is the participants' second preferred choice. This tendency of interest in analyzing the morphology of the target word stresses Carlisle (2004) and Paribakht and Wesche's (1999) view about morphology as being a LKS that is essential for building L2 learners lexical capacity through processes such as inferring that consequently lead into incidental lexical acquisition.

Relying on the morphological analysis of the lexical item's structure highlights that not only the co-text of the target lexical item but also the word itself should be an area of interest and analysis by the reader. Similar to Nassaji (2004) who found that advanced learners with stronger depth of lexical knowledge use certain strategies (primarily morphological analysis, and grammar-based strategy), Jordanian advanced English learners were found to use certain linguistic sources, including morphological analysis as a second option.

Secondary used LKSs

Using syntactic knowledge was evident in the activation of syntactic clues; yet, this use was the least used by the participants, resulting in introducing the previous knowledge in syntax as secondary employed knowledge source despite its effectiveness and utility in cases where it was used. This seems to be contradictory to the finding of Paribakht and Wesche (1999) who found syntax as well as sentence level grammatical knowledge as main linguistic knowledge used in their study. The participants made use of their knowledge of rules governing the combination of words of sentences, how words and phrases are arranged, and the syntactic relations between sentence components such as those relations triggered by contrast clues. In affinity with Shiotsu and Weir's (2007) finding, this study found that direct analysis of syntactic relations between sentence components contributed to lexical item meaning-extraction. The participants' reports showed that their ability to identify the syntactic functions of parts of speech also served significantly in promoting their lexical knowledge and comprehension. Recognizing the function of certain words was useful in figuring out its meaning.

As regards 'phonology' category, in proportion to Paribakht and Wesche (1999:209) finding, homophones, homonyms and homographs were used by Jordanians in an attempt to infer the meaning of unknown lexical items. Phonology was the second least used source of knowledge, with a percentage of about 19%. Nevertheless, this less frequent use of phonology could be attributed to potential misinterpretation of sound relationships. Despite this potentiality, this study reemphasized Zibke's (2009) contention: phonological awareness, including processing multiple meanings and identifying ambiguities, helps learners learn the meaning of lexical items and facilitate their reading process. Unawareness of multiple meanings and ambiguities leads to incorrect lexical knowledge.

Most misleading LKS used

bout 70% of the attempts were successful and the learned meaning was correct, whereas remaining attempts led to deduce incorrect meaning. It is worth re-highlighting in this place that The 'semantics' category and the 'syntax' category were most helpful, whereas 'phonology' category was the most misleading most of the times. This may justify making efforts to avoid relying on sound relations. It appeared that using combinations of knowledge sources helps avoid misleading decoding and gain effective lexical acquisition.

Based on the previous accumulated knowledge in linguistics, readers can extract and acquire unfamiliar lexical items (Deschambault, 2012) by referring to linguistic clues (Frantzen, 2003). Nevertheless, reliance on one type, such as 'phonology', and leaving other clues inactivated resulted in mistaken and ineffective inferring and lexical acquisition process. In cases where participant 'M', for example, paid attention to the sound relationship between the first syllable of the target word *shambles* and the word *shame* he was not successful, but activating the synonymous relationship clue between the target word *shambles* and its synonym *mess* in the same sentence led to correct establishment of lexical relationship and lexical item's meaning. Identified differences in adult male Jordanians' employment of morphology, phonology, syntax and semantics-knowledge were noted in the frequency as well as the success of making use of each linguistic knowledge. These differences seem to be related to (1) the individual's previous linguistic knowledge and their deep vocabulary input, and (2) the variance in length of individual's previous English learning experience and time given to formal instruction on applying their knowledge to reading-based lexical learning tasks. A strong background in language and linguistics, and the ability to identify the available linguistic clues is evident in contributing to the overall success of incidental lexical acquisition.

Conclusion

The results of the present study point out that adult Jordanians employ LKSs as a way to obtain the meaning of unfamiliar lexical items, but with varying frequency and effectiveness. Adult male Jordanians take advantage of their previous linguistic knowledge that is related to the characteristics of the encountered unfamiliar lexical item itself as well as the co-text of the word to work out meaning. This study reiterates that Jordanian advanced learners of English as a second language are able to acquire lexical items through relying on LKSs.

The researcher finds it worth highlighting in this place that adult male Jordanians use semantics and morphology as major LKSs, and they employ syntax and phonology as minor sources of linguistic knowledge. Regardless of the frequency, most of the time, the participants used their previous linguistic knowledge successfully, which supports the findings of Nassaji (2004) who has concluded that learners with deep lexical knowledge have better access to LKSs; hence, they can construct a more accurate meaning of unfamiliar lexical items. This also stresses the importance of acquiring deep lexical knowledge.

Pedagogically speaking, there is a need to introduce learner-centered materials in reading courses that focus on LKS-based lexical learning and acquisition training. Jordanians also need to be instructed at different levels on the process of analysis of each kind of knowledge clues in reading and listening classes. An extensive exposure to reading texts that introduce complex and new lexical items might be necessary and a plausible option in reading skill-courses.

The study has some limitations though. First, reports of the survey were limited to the length of class periods wherein the survey has taken place. Second, the participants of this study were limited to adult males. Thus, it is not conclusive whether all findings may be generalized to all Jordanians. Third, participants were not given enough time to practice inferring tasks before performing the actual test of the study, and such preparatory practice could have given the students an opportunity to familiarize themselves with the task.

Finally, it would be interesting for further studies to find the relationship between the complexity of unfamiliar lexical items and the use of a certain LKSs by Jordanians. Future investigations may explore the role of LKSs in lexical acquisition in listening context. A similar study applied to school students or even female participants would also help show how successful LKSs can be used. The findings of future studies can be compared to the findings of the current study.

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APPENDIX 1

Lexical Inferring Test

Dear participants,

The purpose of this survey is to collect information about the various linguistic knowledge sources (morphology, phonology, syntax, semantics, etc.) you may refer to when attempting to deduce the meaning of unfamiliar lexical items encountered in an unassisted reading situation. You are kindly requested to respond to the items of this questionnaire. The data you provide will be kept confidential and only used for the purpose of academic research. Thank you!
Awni Shati M. Etaywe

Part one: Please, provide the following personal information
Gender: ❒ Male ❒ Female
Age:
Level of education: ❒ Bachelor ❒ Masters ❒ PhD
Length of the English language learning experience (in years): ❒ 12 ❒ 16 ❒ 18
Have ever received training or a formal instruction on strategies to infer unknown lexical items?
❒ Yes ❒ No

Part two: Read the following sentences and then (1) write the inferred meaning of the underlined lexical items and (2) indicate the clue word(s), part of the word(s), or any information that helped you deduce the meaning of the underlined lexical items

1. Antarctic and arctic poles are **uninhabitable** areas.
Meaning: ……
Clue(s):……
2. Who are your **arch-friends**?
Meaning: ……
Clue(s):……
3. An image was **incised** into a highly polished metal plate, usually copper, with a cutting instrument, or burin.
Meaning:……
Clue(s):……
4. Jamal is very keen on Alice, but she is **brushing** him **off**.
Meaning:……
Clue(s):……
5. Everything in Syria is a mess; the situation turned into **shambles**.
Meaning:……
Clue(s):……
6. Finally, the belligerents came into **accommodation** after five years of dispute.
Meaning:……
Clue(s):……
7. My cousin has an **aural** impairment.
Meaning:……
Clue(s):……
8. The military are to act **apolitically**.
Meaning:……
Clue(s):……

This is an original publication and has not been published elsewhere and has not been submitted elsewhere

BIO DATA

Awni Shati Mohammad Etaywe is a Full Member of the Jordanian Association of Translators and Applied Linguists (JATAL), which is a member of the International Association of Applied Linguistics (AILA). He was born in Jordan, in 1980. He holds a Master Degree of Arts in Applied Linguistics from Jordan University of Science and Technology (with plus grande distinction). In 2002, he was awarded King Abdullah II Award for the top cadet in English Language and Military Science department, Mu'tah University/Military Branch, Jordan. In 2004, he was commissioned from the UK Royal Military Academy Sandhurst where he was introduced to the world of leadership and management, and was awarded the Commandant's War Studies Paper award for the best overseas writing-cadet. He has several diplomas and certificates in management, including: NGO and Volunteer Work Management (with distinction) from the German-Jordanian University; HR Management certificate from DRMI, Navy Postgraduate School, Monterey, California; Project management (from PMI JO); Sustainable Business-Managing the Triple Bottom Line from Alison, Ireland. Mr. Etaywe has served as a head of translation division at Jordan Armed Forces-Center for Studies and Lessons Learned, and as a linguist and liaison officer at the United Nations Stabilization Mission in DRC (MONUSCO), and the United Nations Mission in Eritrea and Ethiopia (UNMEE). He has received a number of medals and awards from the United Nations, Jordan Armed Forces, and the German-Jordanian University. As a linguist, he has been recently recognized by the US Center for Army Lessons Learned (US CALL) for his standard of excellence and professionalism in support of the multinational Exercise Eager Lion. He is the co-author of Lessons Learned Précis (in Arabic), the author of Leadership Précis: Situational and Adaptive Leadership (in Arabic), Fundamental English Grammar Review, Petra Treasury of Essential Idioms and Multi-part Verbs (English-Arabic), and Step by Step into TOEFL-like National Exam. He is the translator of the "US Kauffman Foundation's Fast-Trac New Venture Manual" and the co-translator of the "US Kauffman Foundation's Fast-Trac Tech-Entrepreneur Manual". His fields of interest include Pragmatics, Sociolinguistics, forensic linguistics and Discourse Analysis.