The Measurement of Language Knowledge as a Controversial Elaborative Linguistic Framework

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Abstract

This article is an attempt to determine the significance of vocabulary knowledge by describing its components and features on the basis of different existing models in such a way as to explore the language knowledge measurement criteria and find out the extent to which language knowledge is adequately measured. In fact, a plethora of research has been conducted on teaching and learning vocabulary, and testing vocabulary size. Though this linguistic element has been a controversial issue for so long, many scholars in the field of linguistics agreed upon the utility and the crucial role it has in relation to language teaching, learning, and testing. However, the investigation of the vocabulary knowledge takes into consideration three different aspects. The first aspect deals with vocabulary measurement, with the clarification of the differentiation between language knowledge in terms of its inference and language performance in terms of its observation. The second aspect examins the meaning of "word knowledge" by distinguishing between receptive and productive vocabulary knowledge. The third aspect deals with the qualitative aspect of the learners' vocabulary knowledge in terms of understanding by identifying "breadth" and "depth". This article also paves the way for the review of vocabulary size and the counting of family words on the basis of rigorous empirical studies in this field.

1. INTRODUCTION

Nowadays, the learning of vocabulary started to attract practitioners and linguists' attention in the field of teaching and learning, and so in testing, more than ever. According to Meara (1980), this linguistic component was considered as one of the ignored aspects of language learning. There seems to be a long-held belief, outside of the field of specialized vocabulary studies, that words are just words and that learning words is unsystematic. As a result, the issue of vocabulary is neither academically nor pedagogically challenging (Milton, 2009). More recently, a plethora of research and studies have been conducted on teaching and learning vocabulary, and testing vocabulary size. They all agreed upon the utility and the central role this language component has in the field of language teaching, learning, and testing. Language measurement has been the subject of controversy for so long. However, this article is an attempt to shed some light on the language knowledge measurement in the field of

language teaching in such a way as to explore the extent to which language knowledge is measured on the basis of different viewpoints explored in literature. We also devoted some time to decipher the meaning of vocabulary knowledge by describing its components in light of different existing models.

2. LANGUAGE KNOWLEDGE AND VOCABULARY KNOWLEDGE

The deciphering of literature revealed to what extent language knowledge measurement is usually subject to controversy. In this section, we intend to investigate the extent to which language knowledge can be measured and how to bring together different pertinent viewpoints on this issue through the emphasis of the distinction between language knowledge and language performance. The purpose of this section is to define vocabulary knowledge and outline its components. Additionally, it aims at explaining and distinguishing between productive and receptive vocabulary knowledge, as well as clarifying that knowing a word and being able to utilize it properly are two different issues that should be taken into account.

2.1. Is language knowledge measurable?

Milton (2009) pointed out that the fact of "measuring language is not as easy as measuring distance or weight" and that language knowledge is "not a directly accessible quality" to measure (p.14). These statements aptly describe the intricacy of language measurement, which is supported among many researchers who assumed that language knowledge is not observable, yet measurable. Bachman (1990) stated that "language proficiency, however, *cannot be observed directly* [emphasis added]" (p.54). This statement leads us to evoke the psychologist view of the language proficiency, which goes in line with McNamara's (2000) definition about testing that has to do with making inferences. That fact was manifested in test performances that involved the criterion performance, which McNamara (2000) assumed to be "elusive since it *cannot be directly observed* [emphasis added]" (p.24). Along the same vein, Douglas (2010) elaborated on testing language knowledge by stating that "the primary purpose of language tests is to allow us to make inferences about learners' language abilities" (p. 17). He added that "a language test is a procedure for eliciting language performances which we can observe, and from which we can infer the amount and type of language knowledge learners possess, something which we cannot observe directly" (Douglas, 2010, p.17). In fact, Douglas (2010) is attempting to distinguish between language performance and language knowledge, arguing that the former is elicited and is observed while the latter is inferred and is not observed directly. This was largely inspired by Bachman's (1990) claim in which he stated that "we cannot experience grammatical competence, for example, in the same way as we experience eye colour. We infer grammatical ability through observing behaviour that we presume to be influenced by grammatical ability" (p. 54). By taking this claim into account, we can say that there are two different issues, the one we directly observe and another one we don't directly observe. The one we observe represents the "behaviour" generated by an individual or a group of individuals, and the other one that we do not directly observe stands for grammatical ability. Despite this, both types exist, and together they make up what is referred to as a "construct" (Bachman, 1990; McNamara, 2000). In this respect, McNamara (2000) distinguished between a "criterion" and a "test", arguing that the criterion, which he defined as "a series of performances subsequent to the test; the target" is unobservable, whereas the test, which he defined as "a performance or series of performances, simulating/representing or sampled from the criterion" is observable (p. 25). Similarly, Bachman (1990) stated that the first step for the measurement of specific language ability is to explicitly and precisely distinguish the construct under consideration from other related constructs. This implied that it was essential to distinguish the assessment performance that was observable from the ability that was unobservable and about which we seek to draw inferences.

Bachman (1990) claimed that in order to define language proficiency, it was necessary to look at two different approaches, namely the real life approach and the interactional/ability approach. The real-life approach, supported by the American Council on the Teaching of Foreign Languages (ACTFL), did not define language proficiency but instead referred to real-life or the domain of actual language use, which essentially characterized the language users' competence. The features for measuring language proficiency in this approach comprise contextual features and linguistic features such as grammar, vocabulary, and pronunciation. Hence, language proficiency in the interactional/ability approach is defined in terms of all the component abilities, such as those included in the work of Lado (1978), Canale and Swain (1980), Halliday (1993), and Bachman (1990), among others. The operational definition of the construct, as described by Bachman (1990), is the second step to be taken in measurement so as to isolate this construct and render it observable while attempting to "elicit the kind of performance that will indicate the degree to which the given construct is present in the individual" (p. 56).

In short, the majority of the viewpoints, which are stated and explored in regards to language knowledge testing, have concurred that the fact of measuring language knowledge is an undertaking challenge that is hinged on understanding clearly the nature of the language knowledge we want to measure and that language knowledge is inferred rather than explicitly observed, whereas language performance is observable and may therefore be elicited and assigned numbers.
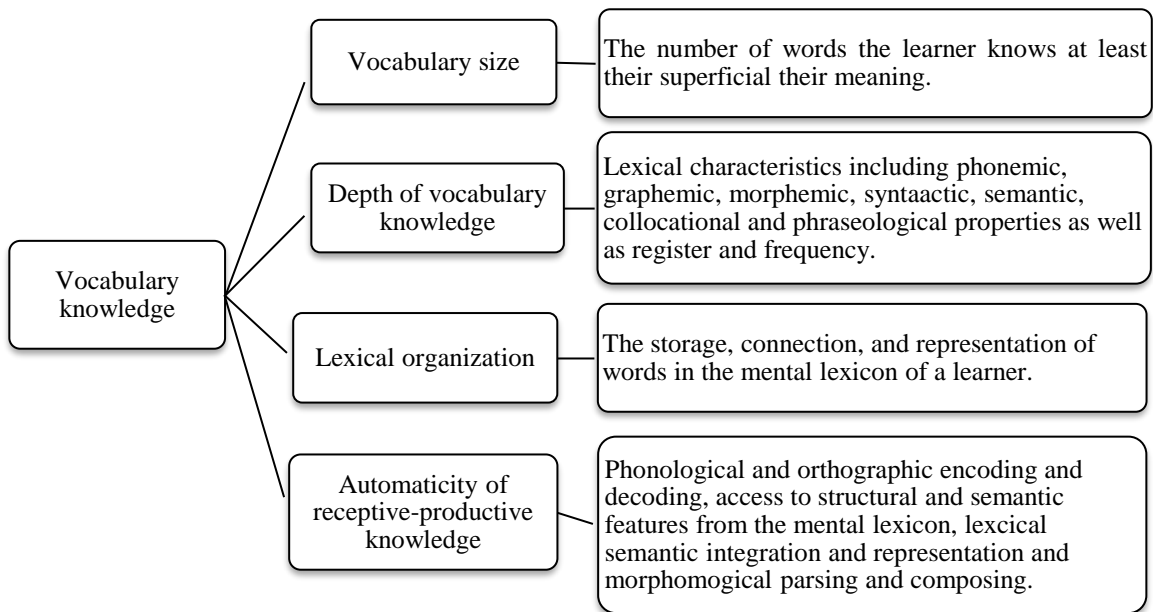
2.2. What exactly is vocabulary knowledge?

The focus of this section is on vocabulary knowledge as our main focal point in this research. In this regard, we can not deny the central importance of vocabulary knowledge in language teaching and learning. Vocabulary building is a requirement for successfully learning a language; otherwise, learning is either minimal or non-existent. Milton (2009) pointed out that the fact of not learning grammar rules will not hinder the learning of English. Hence, having little or no vocabulary will lead to no communication. He also added, "Words are the building blocks of language and without them there is no language" (Milton, 2009, p.10), which contrasts with Cronbach's (1942) claim when he stated that vocabulary knowledge is consisted of word meaning knowledge and the levels of its accessibility. Richards (1976) assumed that the fact of knowing a word involves not only morphological and syntactic features but also word frequency and register properties. However, these views seemed to overlook some crucial aspects including pronunciation, spelling and collocation (Qian, 2002).

Barcroft (2016) suggested three components of vocabulary knowledge that include form, meaning, and mapping. He described form as a physical entity that takes many forms in both spoken and written languages. He also referred to the meaning of a word or the lexical phrase as meaning-related property, which is associated with the word. In this respect, he explained that lexical items involve both connotative and denotative meanings. The former consists of "different types of semantic (meaning-related) association that we make in a given word" while the latter refers to "the direct or literal meaning" (Barcroft, 2016, p.8). Within the meaning component, he described four properties that are shared by words including synonymy, antonymy, homonymy, and polysemy. According to Barcroft (2016), the third component is referred to as "mapping", which denotes how the mental representation of form and the meaning are connected to one another, assuming that this process is "network-oriented and distributed in nature". These three elements work together to create successful vocabulary learning, but they can also be treated separately depending on the objectives of the teacher and the learners (Barcroft, 2016, p. 9).

In terms of the distinction between receptive and productive vocabulary knowledge, it is widely asserted that "passive" and "active" are synonyms for receptive and productive, respectively. Laufer and Goldstein (2004) argued that "word knowledge involves more than just the link between meaning and form" (p. 402). Hence, vocabulary knowledge should

contain four dimensions including vocabulary size, knowledge of word characteristics, lexicon organization, and processes of lexical access (Qian & Schedl, 2004, p. 29). Likewise, Henriksen (1999) suggested a vocabulary knowledge framework that consisted of the "precision of knowledge, depth of knowledge and receptive and productive knowledge" (p.29). Drawing on some earlier models of vocabulary knowledge, such as that of Henriksen (1999), Nation (2001), and Qian (2002) in which they suggested that there are four inherently connected dimensions of vocabulary knowledge including vocabulary size, depth of vocabulary knowledge, lexical organization, and automaticity of receptive-productive knowledge. Accordingly, the following figure illustrates more clearly the components of vocabulary knowledge proposed by Qian (2002).

Figure 2: Summary of Qian's (2002) framework of vocabulary knowledge

Vocabulary knowledge		
	Vocabulary size	The number of words the learner knows at least their superficial their meaning.
	Depth of vocabulary knowledge	Lexical characteristics including phonemic, graphemic, morphemic, syntaactic, semantic, collocational and phraseological properties as well as register and frequency.
	Lexical organization	The storage, connection, and representation of words in the mental lexicon of a learner.
	Automaticity of receptive-productive knowledge	Phonological and orthographic encoding and decoding, access to structural and semantic features from the mental lexicon, lexical semantic integration and representation and morphomogical parsing and composing.

However, these various perspectives, as well as many others, seem to have agreed that vocabulary knowledge consisted of shared characteristics, particularly those of being receptive and productive. Actually, Laufer and Goldstein (2004) noted that the issue is difficult to discern between receptive and productive knowledge, particularly at the level of testing. For example, the fact of translating into L1 could be considered as active knowledge because the test taker supplied the meaning, but it could also be considered as passive knowledge because the test taker showed that they understood the meaning. There was also a disagreement about whether the distinction between passive and active knowledge was binary or instead forms a continuum, which presents another challenge in the sense that if it forms a continuum, it would be unclear how much knowledge is required for passive words to transition to active words (Laufer and Goldstein, 2004). This fact is epitomized in the figure below.

Figure 3: Receptive-productive vocabulary knowledge continuum

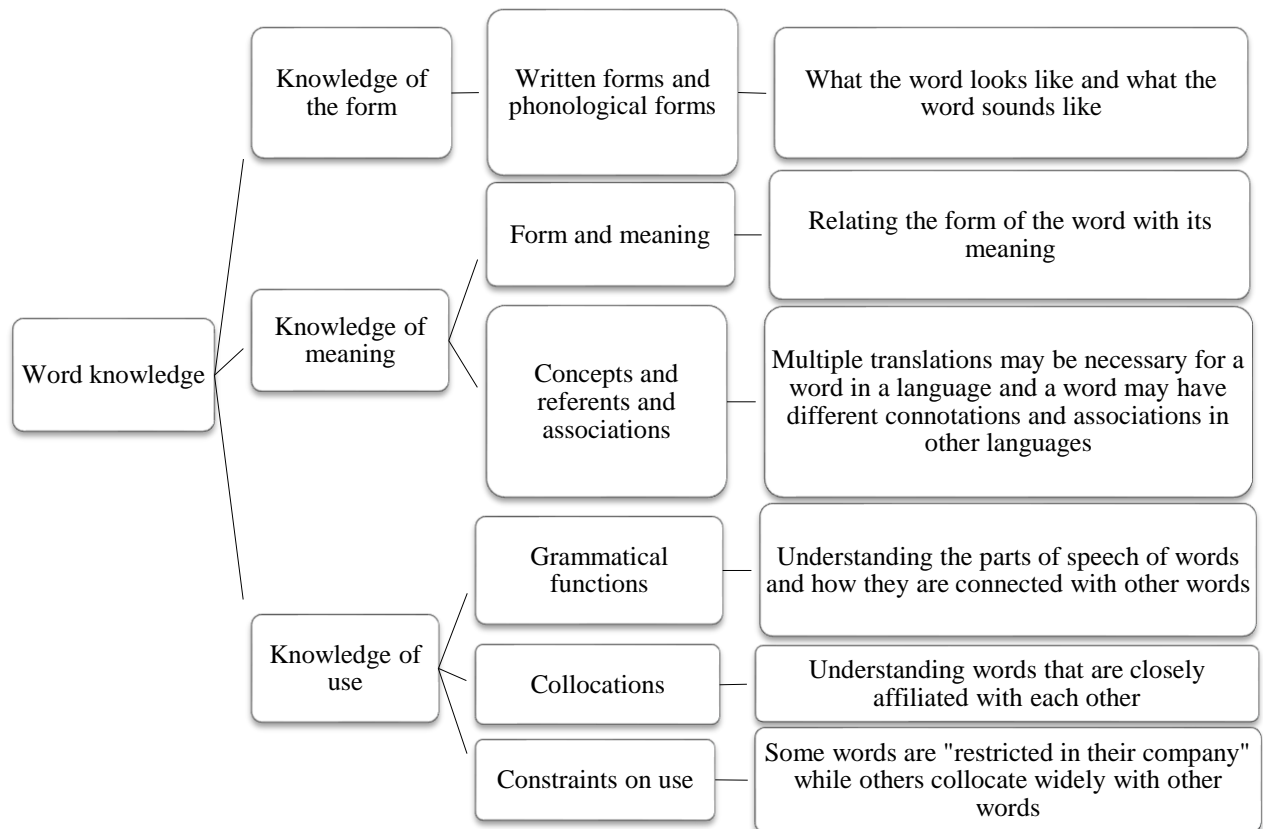receptive   productive
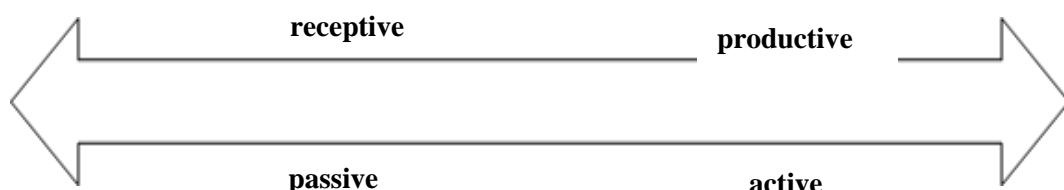
passive   active

As depicted in this figure, it is perfectly apparent that there is no clear-cut distinction between receptive and productive vocabulary knowledge, which makes determining the level of knowledge needed for passive/receptive word knowledge to be transformed into active/productive very challenging.

Similarly, Schmitt (2000) attempted to emphasize the complexity of the nature of vocabulary by stating that "there are different degrees of knowing a word" (p.4), presuming that the fact of understanding and recognizing a word is one thing and being able to use it in different contexts is another thing. In following the same line of reasoning, Laufer and Goldstein (2004) clarified the distinction raised above by claiming that there are four hierarchical levels of understanding of meaning, which can be summed up in two dichotomous distinctions, each of which incorporated passive and active "recall" and passive and active "recognition". In the first distinction, he referred to "the ability to supply the word form" as active knowledge and "the ability to supply the word meaning" as passive knowledge. In the second distinction, he differentiated between those who can "recall" the form or the meaning of a word and those who cannot "recall" but can "recognize" the form or the meaning of a word (p. 406).

Along the same line, Milton (2009) viewed word knowledge receptive or passive knowledge and productive or active knowledge by stating that the former is related to the words that are "recognized when heard or read" while the latter pertained to the "words that can be called to mind and used in speech and writing" (p.13). Likewise, Schmitt (2000) stated that "being able to understand a word is known as receptive knowledge and is normally connected with listening and reading. If we are able to produce a word of our own accord when speaking or writing, then that is considered productive knowledge" (p.4). However, Milton (2009) assumed that dichotomous distinction between receptive or breadth and productive or depth is not suffice to account of the intricacies of word knowledge. In this respect, he asserted that word knowledge is composed of three basic components, which comprise "knowledge of the form", "knowledge of the meaning", and "knowledge of use" (p.14). The first component includes the written form and the phonological form. In other words, what the word looks like and what the word sounds like. It is interesting to notice that Milton (2009) incorporated also the knowledge of affixes in order to add or change the meaning of a particular word. The second component, according to Milton (2009), is made up of three sub-divisions. The first one labelled "form and meaning" and it deals with relating the form of the word with its meaning, as in establishing a connection between a word in a foreign language and its translation in the native language. The remaining sub-divisions reflected concepts, referents, and associations, implying that a word in one language could be translated differently into other languages or might have slightly different meanings and connotations in other languages. On the other hand, the third component, which is "knowledge of use", includes three categories. The first one referred to "grammatical functions" and it involves understanding the parts of speech of words and how they are connected with other words. The second category is "collocations" and it indicates understanding the words that are closely affiliated with each other. The last category involves "constraints on use", which indicates that some words are "restricted in their company" while others collocate widely with other words depending on the meaning the speaker or the writer intends to convey (p.15). The following figure summarises the word knowledge model that Milton (2009) developed.

Figure 3: Summary of Milton's (2009) word knowledge model

Knowledge of the form	Written forms and phonological forms	What the word looks like and what the word sounds like

	Form and meaning	Relating the form of the word with its meaning

Word knowledge → Knowledge of meaning

Concepts and referents and associations	Multiple translations may be necessary for a word in a language and a word may have different connotations and associations in other languages

Knowledge of use

Grammatical functions	Understanding the parts of speech of words and how they are connected with other words
Collocations	Understanding words that are closely affiliated with each other
Constraints on use	Some words are "restricted in their company" while others collocate widely with other words

Milton et al. (2010) distinguished between two types of vocabulary knowledge comprising "orthographic vocabulary", which involves the knowledge of the written forms and "phonological vocabulary", which concerns aural recognition of sounds in a foreign language (p.84). He, therefore, claimed that the former should be a requirement of writing and reading in a foreign language as opposed to the latter being a necessity of speaking and listening. Milton et al. (2010) assumed that the foreign language lexical mental is split into two hemispheres: an orthographic hemisphere, which stores written representations of words, and a phonological hemisphere, where the aural representations are stored. They added that the two hemispheres do not have to match up exactly and that words might exist in one without having an entry for them in the other. On this basis, Coltheart and Rastle (1994) proposed two methods for word recognition: "a direct route", which is focused on visual recognition of a word's orthography, and "a more round-about route", which placed emphasis on applying grapheme-phoneme conversion rules to transform a word's written form into an aural form that can subsequently be decoded (p.84).

Therefore, we can say that vocabulary knowledge is no longer viewed as a solitary, optional component in the field of language learning, teaching, and testing, but rather a multifaceted aspect of language knowledge that addresses not only the depth but also the breadth of language knowledge. Hence, the fact of having a strong vocabulary base without a large vocabulary repertoire does not guarantee good language knowledge and the reverse is also true.

3. INVESTIGATION INTO VOCABULARY UPTAKE

This section examines three crucial points regarding vocabulary uptake. The first one deals with the two major dimensions of vocabulary knowledge, namely depth and breadth, and it seeks to identify both of them in an attempt to distinguish between them in order to highlight their significance to the vocabulary knowledge area. The second point addresses various

perspectives on vocabulary size and aims to shed more light on different studies that have been carried out with respect to vocabulary uptake per contact hour. The third point examines the extent to which words are used as a measurement unit in measuring vocabulary uptake.

3.1. Depth and breadth

The estimation of vocabulary size has been one of the most intricate areas in language testing, more specifically in vocabulary measurement. It is becoming increasingly apparent that the knowledge of vocabulary is not viewed as a single dimension any more, but as multidimensional instead (Qian & Schedl, 2004). Having a large vocabulary is just as important as having a good vocabulary. In fact, the quantity of vocabulary knowledge is not less important than its quality. Laufer et al, (2004) argued that "in the last twenty or so years, there has been a growing realization that total language proficiency consists of much more than just grammatical competence" (p. 203). In this regard, many researchers distinguished between two aspects of vocabulary knowledge, namely breadth and depth (Qian & Schedl, 2004; Milton, 2009). The former referred to the size of vocabulary knowledge, meaning the number of the words a learner knows and the latter referred to the quality of vocabulary knowledge, meaning how well this learner knows these words (Qian & Schedl, 2004). Pronunciation, spelling, meaning, register, frequency, morphological, syntactic, and collocational features were among the various structurally and functionally interrelated components that made up the depth dimension (Qian, 2002). It is further claimed that this dimension also involved "the knowledge of a word's different sense relations to other words in the lexicon" (Haastrup & Henriksen, 2000, as cited in Qian, 2000, p.516). Accordingly, the concept of vocabulary knowledge in terms of breadth and depth, according to Qian & Schedl (2004), is illustrated in the figure bellow.

Figure 4: Vocabulary knowledge: breadth and depth (Qian & Schedl, 2004)

Vocabulary knwoledge	breadth	size	Number or words a learner knows
	depth	quality	how well a learner knows words

According to Milton (2009), the distinction between "breadth" and "depth" implied differentiating between learners who have learned a substantial amount of vocabulary but do not truly understand how to use it, and learners who have learned how the words they know relate to one another or the subtleties of meaning. He argued that the terms "breadth" and "depth" were confusing due to their multiple meanings, in that passive recognition of word forms unrelated to meaning could be a component of vocabulary breadth, even though a learner may not know what it means or may be unable to translate it. Meanwhile, vocabulary breadth could be measured by a test translation in which the test taker is expected to provide a translation equivalent or some other forms of explanation.

Daller et al. (2007) added a new dimension with regard to vocabulary knowledge and described it as a three-dimensional component that comprises breadth, depth and fluency, which is defined as "the ease with which words can be recognised and used" (p. 16). However, Milton (2009) contended that this viewpoint created a "lexical space" that tests usually fail to take into consideration. He clarified that while some learners are highly communicative and gain high fluency, others have trouble accessing the words they know, which causes hesitations and pauses in their communication.

3.2.Perspectives on vocabulary size

The learner's ability to learn new languages successfully is greatly influenced by their vocabulary size. Milton (2008) argued that "an essential part of progress in a foreign language is to grow a vocabulary of several thousand words" (p. 236). He also stated that "you cannot be good in a foreign language without a sizable vocabulary" (Milton, 2009, p.75). However, the estimation of vocabulary size, also known as the breadth of vocabulary knowledge, is an intricate topic in the assessment of vocabulary knowledge. There is a large body of research on the vocabulary size of native English speakers, which has led to vastly disparate estimates of the number of words they know. Many early studies had methodological flaws, such as ambiguity in word definitions and sample techniques skewed toward over presenting high frequency words (Read, 2007). Schmitt (2000) put it, as "the amount of vocabulary the average native speaker acquires is prodigious" (p. 3). Read (2007) pointed out that "vocabulary size measures typically require a relatively large sample of words that represent a defined frequency range, together with a simple response task to indicate whether each word is known or not" (p. 3). Counting the number of words in English and using it as a learning objective, according to Nation (2001), is one approach to determine how many words a learner of English as a second or foreign language needs to know in order to read independently. In this regard, in their studies Nation (2001) and Read (1990) investigated this issue and found that there are 114,000 word families. Accordingly, Nation (2001) opposed this approach on the grounds that assuming that such numbers are too high to constitute reasonable learning objectives and that native speakers do not necessarily know every word in their first language. Another approach of deciding vocabulary-learning goals, according to Nation (2001), is to consider what a native speaker knows and considers that as the goal. In their studies, Nation (2001) and Read (2007) discovered that well-educated native speakers, eliminating proper names and derived forms, know roughly 20000 word families, which was viewed as a lofty objective for a learning program (Nation, 2001, p. 60). Nation and Waring (1997) reported that "the best conservative rule of thumb that we have is that up to a vocabulary size of around 20000 word families, we should expect that [English] native speakers will add roughly 1000 word families a year to their vocabulary size" (p. 3). Schmitt (2000) commented on this fact by stating that "this would be consistent with a 20-year-old university student having 20000 word families" (p.3). According to Nation (2001), a recent research testing vocabulary size with highly educated non-native speakers of English who are pursuing their studies found that their receptive English vocabulary size ranged from 8000 to 9000 (p.60) . The last approach to deciding vocabulary-learning goals, according to Nation (2001), is to work out how much vocabulary is needed to use English for some purposes, such as reading a newspaper or a novel and participating in a conversation. In this respect, studies have estimated that 5000 words are needed (Nation, 2001). These data suggested that developing a native-sized vocabulary for a second language student might be achievable. However, learning every word in English is far-fetched (Schmitt, 2000).

In light of the findings of some related studies, Milton (2008) investigated vocabulary uptake in both incidental and explicit learning of vocabulary in a classroom. Milton and Meara (1998) pointed out that vocabulary uptake from typical classroom learning can be estimated at three to four lexical items each classroom hour, with good students possibly learning more. In the same spirit, Milton (2008) stated that Vassiliu's (1994) research revealed that good learners could learn up to 1000 words in a year and the vast majority of the vocabulary contained in the textbooks that were utilized. Milton (2008) insinuated that vocabulary uptake is influenced by learners' mixed ability. That is to say, learners who are quick on the uptake learn a great deal of words more than the learners who are slow on the uptake. Not very different from the previous figures, Horst et al. (1998) claimed that just two or three words could be picked up while reading a text. However, since reading time and text length might vary, it is unclear how much of the vocabulary can actually be learned. Similarly, Horst et al. (1998) examined

vocabulary learning from a simplified novel containing 21000 words and discovered that, on average, only five new words were learned.

Milton (2009) argued that because of the time spent in class, comparing educational systems and even the progression of students from one year to the next within the same system is frequently challenging. As an illustration for this, he compared the annual growth in vocabulary knowledge among French learners in the UK with that of other learners in other countries, and he figured out that UK students made significantly less progress and achieved a lower final level of achievement compared to EFL learners in Greece. On the basis of this, he claimed that Greek learners received 100 to 125 contact hours annually, while learners in the UK received about half that amount of input for the majority of their learning. Relatedly, in a review of several studies that examined annual rates of vocabulary growth in Europe and Japan, Milton and Meara (1998) claimed that the number of words the learners in these countries might reasonably be anticipated to learn varies from 500 to 600 words per year of formal instruction, in contrast to the corresponding learners in the UK, who learned approximately 200 words. This significant disparity was explained by Milton (2008), who claimed that the learners in the UK spent significantly less time in class than their counterparts in Europe and Japan.

Examining vocabulary uptake per contact hour is one way to get over the difficulties in comparison caused by varying classroom time (Milton, 2009). In this respect, Milton (2009) provided significant figures for anticipated vocabulary uptake per hour pertaining to the Hungarian, Greek, and UK syllabi and school systems. The figures for Hungarian, which concerned annual word uptake per hour, included grades 4–8 and were expected to vary from 0.9 words in grade 4 to 6.3 words in grade 3 (Milton, 2009, p. 87). In Greek, learners' anticipated vocabulary uptake ranged between 5 and 6 words concerning an end target that was associated with the B2 level exam, whereas in the UK, learners' vocabulary uptake related to the B1 level exam is expected to vary between 2.8 and 4.3 words per contact hour (Milton, 2009, p. 87). In fact, according to a vocabulary uptake of roughly 7.5 words per contact hour (including infrequent words outside the X-Lex test range) is required by the University of Cambridge Local Examinations Syndicate (UCLES) for able learners to prepare to take the FCE examination and, as measured by X-Lex, approximately five to six words per contact hour (Milton, 2009, p. 87).

From the same perspective, Milton and Meara (1998) examined studies, including learners in the UK, Germany, and Greece, that calculated vocabulary learning and specified the number of hours of instruction, allowing measurement of vocabulary uptake per hour. The table below displays the findings of these studies as adapted from Milton's (2009) work (p. 88).

Table 1: Summary of vocabulary uptake per contact teaching hour adapted from Milton's (2009)

	Learners	Foreign language	Vocabulary uptake per hour		Source
			Expected	Actual	
Vocabulary uptake per hour	Hungarian	English	09 - 6.3	5.4	Milton (2009)
	Greek	English	5 - 6	4.7	Milton (2009)
	German	English	Not specified	4.4	Milton & Meara (1998, as cited in Milton,2009)
	UK	French	2.8 - 4.3	3.8 – 4.3	Milton (2009)

Milton (2009) argued that learners' vocabulary growth generally seems to be more consistent with the vocabulary uptake figures that were expected, regardless of slight variations and he concluded that "learners, as a very general average, appear to gain about four words per hour from regular classroom contact" (p.89).

In conclusion, vocabulary size plays a crucial role in measuring vocabulary knowledge, and it can be achieved in a number of ways, such as by defining a word and deciding on how to count it. According to prior studies, the rates of vocabulary uptake among students have been found to vary significantly. However, the discrepancy between the figures can be attributed to many potential factors related to either content validity or construct validity issues. Faulty methodologies used to define and count words can also have a great impact on vocabulary size by yielding inflated or deflated figures. Additionally, other factors such as time, exposure, effort, and the like, can influence vocabulary size and knowledge.

3.3. Words as measurement units

Milton (2009) accounted for learning a larger proportion of words in a language in a relatively short time by arguing that these words are not learned as "separate items" (p. 10). This implies that learning word families helps the learners build a large vocabulary repertoire by applying the rules based on the forms of the words they have learned. However, applying the rules to all the forms uniformly runs the risk of overgeneralization, which might lead the learners to make errors. Emphasizing counting word family rather than every inflected or derived form entails considering word family as the unit of measurement, thus, constructing validated vocabulary tests (Milton, 2009).

Milton (2009), in an effort to resolve the issues that were brought up when counting the words, differentiated between many terms used when dealing with vocabulary knowledge and claimed that "tokens" related to "the number of words in a text or corpus" whereas "types" referred to the number of different words" (p.8). He further explained the rationale behind counting different forms of a word as a single unit, attributing it to the regularities of the rules by which words are inflected and derived in languages, such as the formation of plurals in English, with some exceptions that should be learned separately (Milton, 2009). Schmitt (2000) argued that in terms of the correspondence between a meaning and a single word, it is not necessarily identical and that "meanings are represented by multiple words" (p.1). However, the term "word" generated difficulties with the various grammatical and morphological variations of vocabulary (Schmitt, 2000). In this context, it can be difficult to determine whether to count words that have irregular or regular inflections, such as chop, chops chopped, and chopping, as one word or four words. To get around the potential ambiguity of the term "word", Milton (2009) asserted that when words are viewed as a basic form with rule-based variants, vocabulary learning is much easier to understand than when each distinct form of the word is measured independently (p.10). In the same context, Read (2007) made the point that the word family, which consists of a base word and all of its inflected forms as well as derived forms that share the same meaning as the base word is the preferred lexical unit for vocabulary size research. Likewise, Milton (2009) argued that "it makes sense to assume, for most learners that if one form of a word is known, then other, very common derivations and inflections will also be known" (p. 9).

Milton (2009) attempted to clarify the controversy surrounding counting family word and proposed two basic conventions which consisted of "lemmatisation" and the use of "word family as the basis of word counts" (p.11). As cited in Milton (2009), "lemma" is the most accurate unit for counting words (p.12). Lemmatisation involved counting headwords and their frequent inflections, without changing the part of speech. With the assumption that they only grasped the most frequent inflections and derivations, this type of count has been successful in estimating learners' vocabulary levels in foreign languages, especially those at elementary and intermediate levels (Milton, 2009). Counting word family is the other convention that involves a variety of inflections and derivations and bases word counts on word families. Unlike with lemmas, this type of count does not necessitate adhering to the same part of speech. Because all the words that involve different inflections and derivations fall under a single headword, this convention was expected to generate fewer words for vocabulary size than lemmatisation. According to Milton (2009), the disadvantage of this type of counting is that it yields estimates

of vocabulary size that are not similar to those of foreign language learners' knowledge, which frequently measures knowledge using lemmas as the unit of measurement. In the same line of thought, Milton (2009) further explained another convention, which is based on separating out between structural vocabulary such as prepositions and auxiliaries, which usually thought of as being highly frequent and lexical vocabulary, which is regarded less frequent, yet loaded with a lot of meaning. The structural vocabulary is referred to as "level 0", and it is possible to include or exclude these "level 0 words" when making word counts.

In conclusion, it appears that estimates of vocabulary size depend not only on knowing the unit of measurement, but also on choosing the convention that is most appropriate for the situation and the participant with whom learning and measurement take place. Understanding what we exactly want to measure comes first, though, so that we can make the best choice possible.

4. CONCLUSION

Measurement of language knowledge has been a contentious issue that has received extensive research from a variety of angles. This paper has attempted to examine vocabulary knowledge in light of different aspects. The first aspect seeks to investigate the extent to which language knowledge is measurable, highlighting a number of different views on the subject. Most of these views made a distinction between language knowledge and language performance and, therefore, viewed language knowledge as a quality that could be inferred rather than explicitly observed, as opposed to language performance, which could be observed. The second aspect deals with the examination of what is meant by "word knowledge" by elaborating on various frameworks that outline the components of vocabulary knowledge. Through this paper, we tried to clarify the distinction between receptive and productive vocabulary knowledge by exploring two basic types of language knowledge proposed by Milton et al. (2010), comprising "orthographic vocabulary" and "phonological vocabulary." It also clarifies that the foreign language lexical mental is split into two hemispheres, in which these types of knowledge are stored. Furthermore, this paper attempts to highlight the two ways for word recognition that Milton (2009) proposed, including "a direct route", which emphasizes visual orthography recognition, and "a more round-about route", which focuses on the use of grapheme-phoneme conversion rules to convert written words into aural forms that can then be decoded. The third aspect deals with two crucial elements. The first one is concerned with distinguishing between breadth and depth, in such a way as to refer to the quality of the learner's vocabulary knowledge, or the number of terms with which they are familiar. The second element refers to the quality of vocabulary knowledge and to what extent the learner understands those words. Hence, the actual paper also reviews vocabulary size by investigating and presenting figures from different empirical studies pertaining to the measurement of vocabulary size in actual contexts. As an attempt to discuss words as measurement units and differentiate between many terms used to count words such as "token" and "type", we tried to review some approaches regarding the counting of family words such as lemmatisation and the use of word family as a basis of word counts.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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