

Polysemous Verbs *Break*, *Run*, and *Draw* Within Prototype Theory From the Perspective of Saudi Learners of English

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Abstract—This paper attempts to explore the nature of polysemous verbs using a cognitive linguistic framework from the perspective of second-language (L2) users: specifically, English as a foreign language (EFL) students in a Saudi Arabian university context. Drawing on Pulman (1983), this analysis examines multiple senses of the verbs *break*, *run*, and *draw* using prototype theory and seeks to identify any semantic patterns in the priority accorded to the polysemous senses attached to each verb by the learner. A questionnaire with sentences as placeholders embodying different senses of each verb and a 4-point goodness-of-fit scale were prepared. The results of this study show that non-native learners of English (EFL learners) are aware that there is a semantic network of meanings for polysemous verbs, and that these meanings exist on a continuum from more central (about three to four senses for each verb, which could be considered core/generic meanings) to more peripheral (between one to three senses, which could be considered more specific meanings). Correlation analyses between learners' perceptions of a verb's polysemy and vocabulary size and years of learning English were performed, yielding few positive relationships, and those only weakly significant.

Index Terms—polysemy, prototype, cognitive linguistics, semantic networks, EFL learners

I. INTRODUCTION

Basile (2021) writes that polysemy is 'a phenomenon that is central to the description of how languages function' (p. 96). Polysemy is common in a language (e.g., Basile, 2021; Verspoor & Lowie, 2003), and the notion of polysemy has attracted much attention. It is a pivotal issue in linguistics, both theoretically and empirically, and linguists have explored the mental representation of lexical items, lexis access, and the storage of multiple senses in the human mind (Chen & Wang, 2020). Prototype theory is often associated with polysemy. However, most research using this theory has been concerned with nouns, adjectives, and prepositions, whilst prototypicality in polysemous verbs is under-researched (Stamenković & Tasić, 2013). Yet verbs play a central role in language processing (Viberg, 2002; Tanehaus et al., 1993). Gentner (1981, 1982), for instance, found that verbs make more cognitive demands than nouns during language processing, as verbs are harder to retrieve from memory and have greater breadth of meaning than nouns. For example, the 20 most common verbs in English have an average of 12.4 word senses each, and children acquire verbs more slowly than nouns (Gentner, 1982). L2 learners translate the meanings of verbs and try to find equivalents in their own language; this can be an unstable process that results in persistent usage errors with polysemous verbs (Gentner, 1982).

According to Bensoussan and Laufer (1984), even proficient foreign-language learners with a large vocabulary size find it difficult to guess the meanings of polysemous words from the context, and lexical guessing strategies often result in inaccurate guesses for polysemes. Schmitt (1998) asked participants to explain all the meanings they knew for a given word (definitions, examples, diagrams, sentences, and prompts were provided to illustrate polysemous meanings) and found that even advanced learners rarely knew all the senses of polysemous words; the study concludes that learning all the meanings of a word is a slow process. However, both teachers and researchers, such as Toupikioti (2007), Makni (2014), Verspoor and Lowie (2003), and Akamatsu (2010), have drawn on insights from cognitive linguistics to help EFL learners become aware of the mechanisms underlying the meaning extensions of polysemous words and to acquire the various senses of polysemous words as a closely interconnected set. Hence, there is a need for more research on polysemous verbs and perhaps their prototypicality in an EFL context; these are the goals of this study.

II. LITERATURE REVIEW

This section describes the study's theoretical framework and previous related studies.

A. Polysemy

Hurford and Heasley (1983) define a polyseme as 'a word [that] has several very closely related senses' (p. 123).

Mojela (1991, as cited in Mojela, 2007, p. 436) describes polysemy as when ‘one word may have a set of more than one different but related meanings’. According to Taylor (1995), ‘polysemy is the association of two or more related senses with a single linguistic form’ (p. 99). And as Cruse (2006) points out, these related meanings ‘must be felt by native speakers to be related in some way’ (p. 133). As illustrated by Chen and Wang (2020), the English verb *get* spans various related senses. For example, one of its meanings, ‘to obtain’, means to move objects toward the prospective possessor, as in *get it*. It also means ‘to move’, that is, to move objects away from a location or possessor, as in *get out*. Basile (2021) mentions that the more common words in a language are more likely to be polysemous; their meanings vary depending on the context of use. Basile (2021) argues that polysemy is ‘a semiotic necessity’ (p. 97) due to both linguistic economy (a principle preventing every single lexical item from being associated with a single, specific meaning, which might be impossible in a natural language) and the limitations of human memory. Polysemy perfectly meets the functional needs of speakers; effective communication requires only a few thousand words (Basile, 2021).

However, as mentioned in the polysemy literature, it poses ‘a lexicographic challenge’ (Mojela, 2007, p. 436). Mojela (2007) highlights the difficulty of distinguishing polysemes from homonyms, which are ‘roughly two or more words having the same pronunciation and/or spelling, but different in meaning’ (Leech, 1981, p. 228). Homonyms have separate dictionary entries, whilst polysemes are entered in dictionaries as single lexical items with multiple definitions (Mojela, 2007; Saeed, 1997; Taylor, 1995). Researchers (e.g., Mojela, 2007; Saeed, 1997; Taylor, 1995) argue that distinguishing polysemous words from homonyms is both complex and subjective. However, Basile (2021) highlights the positive aspects of linguistic ‘vagueness’, ‘indeterminacy of meanings’, and the emergence of new meanings, as these shifts allow the boundaries of a lexical category to grow and change (p. 97).

B. Polysemy in Cognitive Linguistics

Historically, classical semantics have favoured the single-meaning approach (‘one form, one meaning’) (Nerlich & Clarke, 2003, p. 4). According to this approach, polysemy leads to redundant cognitive representations in the minds of language users (Croft, 1998). However, in the field of cognitive linguistics, which emerged in the 1980s, and specifically the sub-branch of cognitive semantics (Evans, 2007), polysemy is ‘natural’ and ‘ubiquitous’ in language use (Saeed, 1997; Lakoff, 1987). In this view, polysemous words have core or basic meanings, and their peripheral senses extend naturally from these core meanings (Lakoff, 1987; Evans & Green, 2006).

Drawing on Deane (1988) and Cuyckens and Zawada (1997), Basile (2021) argues that words do not accumulate various meanings arbitrarily; rather, the development of polysemy follows certain paths or patterns which are natural to language users’ cognition, and the semantic structures of these words determine speakers’ acquisition and language. Further, the process of interpreting polysemy commences from the speaker’s cognitive context when it involves a communicative language use situation as well as from their encyclopaedic knowledge, and their implicit shared knowledge (Basile, 2021). Hence, if polysemy corresponds to the structures of human cognition, polysemy can provide crucial information about basic mental processes. According to this approach, the meanings of polysemous words are motivated in part by metaphor and metonymy, which are based on speakers’ experiences, and polysemy can be explained using basic conceptual and cultural metaphors (Norrick, 1981). Johnson (1987) also uses the transformation of image schema (a powerful process that helps to capture multiple meanings of a given word) and metaphor and metonymy (the figurative/ peripheral senses of words) to illustrate how polysemous meanings extend from the initial core or prototypical meanings. Later, prototype theory in cognitive semantics was developed to explain polysemy (Taylor, 1995; Evans, 2007; Gries, 2015).

C. Prototype Theory

A number of early experiments on categorization in cognitive psychology were conducted in the United States (e.g., Labov, 1973; Kempton, 1981; Rosch, 1975). Rosch was the pioneer of prototype theory (Taylor, 1995), and her ideas still influence research on prototypicality today (Stamenković & Tasić, 2013). Rosch explored the content and structure of mental representations of semantic categories. She asked university students who were native speakers of English to rate how closely a given sub-category matched a target category (e.g., furniture, clothing, toys) using a 7-point goodness-of-fit scale (1 = the item is a very good example of the category; 7 = the example fits the semantic category very poorly; 4 = the example fits the category moderately well). Her experiments affirmed that natural (e.g., fruit) and nominal (e.g., furniture) semantic categories have no clear-cut boundaries, words have internal structure, and that there are degrees of centrality and periphery within categories. Rosch also proved that ‘degree of membership in a category ... is in fact a psychologically very real notion’ (Taylor, 1995, p. 43).

D. Prototype and Verbs

Relatively few studies have examined prototype and polysemous verbs. However, in one early study similar to those by Rosch, Pulman (1983) asked 20 participants to rate verb prototypicality using a 7-point scale. This study found that, as Rosch found with nouns, aspects of verb meanings can be more or less prototypical and more or less dominant. Pulman investigated the verbs *kill*, *speak*, *look*, *walk*, *deceive*, *rub*, *hold*, and *burn*. He also proposed a verb taxonomy for studying the semantic patterns of these verbs: 0 = unique beginners (e.g., do); 1 = life form (e.g., cause); 2 = generic level (e.g., kill); 3 = specific level (e.g., assassinate). He found that the first two levels were difficult to determine but kept the last two levels in his taxonomy. In his study, Pulman selected six senses (or *category members* or *hyponyms*, as

he calls them) that are associated with the generic meaning of a verb. For example, for *walk*, there are, in order from most to least prototypical, *stride*, *pace*, *saunter*, *march*, *stumble*, and *limp*. Pulman also attempted to measure family resemblances (features that category members do or do not share), but this was more difficult to apply to verbs than to nouns.

Drawing on Pulman's work, Stamenković and Tasić (2013) examined verbs of motion (following Levin, 1993), especially those denoting natural human movement. They asked 45 native speakers of English to take two tests. The first test used direct grading with an inverted 7-point scale; participants were asked to rate the relevance of given verbs to their everyday experiences (1 = the verb is absolutely irrelevant; 7 = the verb is exceptionally relevant). In the second, a free association test, participants were asked to recall as many verbs as possible in three minutes. Later, a corpus-frequency test based on the Corpus of American English (COCA) was conducted, Stamenković and Tasić (2013) then listed 35 verbs of motion in order from central to peripheral. They found that, in general, generic verbs such as *go*, *walk*, *run*, *arrive*, *jump*, and *leave* were at the top of the list, as these verbs are more central and thus more prototypical. More specific verbs, such as *strut*, *stagger*, *wade*, or *wander*, appear lower down on the list, as verbs which are more specific or more difficult to describe or define are less prototypical. They also concluded that the number of semantic features increases as verbs move down the list.

To conclude, despite some inconsistencies in methodology and verb selection and their categories in previous research, cognitive linguistic approaches and prototype theory make it possible to observe polysemy in verbs. Cognitive linguists have also analysed prototypicality in polysemous verbs in languages other than English, including Mandarin Chinese (Chen & Wang, 2020), Swedish (Viberg, 2002), and Spanish (Vicente, 2019). However, little research has been done on polysemous verbs within the prototype approach in an EFL context. Therefore, it might be useful to look at these concepts from the perspective of non-native speakers of English.

This study will look at the verbs *break*, *run*, and *draw* (following Levin, 1993). These verbs belong to three different verb classes: change of state, manner of motion, and image creation, respectively). All three verbs are associated with multiple senses; in this study, each has ten dictionary definitions (not all the senses may be present, however). Based on the literature, the various definitions for each verb are members of a single category (word) and form a continuum, with more typical features on one end and less typical ones on the other.

The present study thus addresses three research questions (RQs):

RQ1: What meanings do EFL learners in a Saudi Arabian University context perceive as more typical for the polysemous verbs *break*, *run*, and *draw*?

RQ2: What meanings do EFL learners in a Saudi Arabian University context perceive as less typical for the polysemous verbs *break*, *run*, and *draw*?

RQ3: Is there a relationship between EFL learners' vocabulary size, years of learning English, and their perceptions of polysemous senses?

III. METHODOLOGY

To answer the research questions, a questionnaire was constructed on an online platform (Google Forms) (see Appendix A). The questionnaire addresses the meanings of three English polysemous verbs (*break*, *run*, and *draw*). These verbs were selected from Levin (1993) and because they all have at least ten interrelated definitions, and are commonly used, they are included in the New General Service List (NGSL) (Browne et al., 2013). For each verb, the questionnaire lists ten example sentences that draw on ten of the verb's possible senses. Senses and example sentences were extracted (and slightly modified) from the following online dictionaries: *Cambridge*, *Merriam-Webster*, *Collins*, and *Macmillan*. I opted to use the top ten meanings for each verb listed in these dictionaries; more than ten might overburden the participants. The senses and example sentences for these verbs are shown in Tables 1, 2, and 3. (The definitions or senses are listed here in the order that they usually appear in the dictionaries, although the dictionaries sometimes list the definitions in slightly different orders.) Participants were asked to rank the sentences with the following prompt: 'Suppose you wanted to use example sentences to explain the meanings of the verbs *draw*, *run*, and *break* to someone who does not understand English very well. How would you rank the following sentences for this purpose: poor, not so good, good, or excellent?'

TABLE 1
SENTENCES AND SENSES OF THE POLYSEMIOUS VERB *BREAK*

Example sentence	Sense
The dish fell to the floor and broke.	To separate into pieces.
Sarah broke her leg.	To damage a bone in the body.
He did not know he was breaking the law.	To fail to obey a rule or fail to keep a promise.
Do not use the cream on broken skin.	To make a hole or to cut.
They tried to break his will.	To destroy someone's confidence.
It was the local newspaper that first broke the story.	To release a piece of news before other sources do.
We usually break for lunch at 12.30 p.m.	To stop for a short time.
Outside workers broke the strike.	To make something end.
We arrived as a storm was breaking.	To change (describing the weather).
His voice broke when he was 13.	To become deeper (a young man's voice).

TABLE 2
SENTENCES AND SENSES OF THE POLYSEMOUS VERB *RUN*

Example sentence	Sense
He can run very fast.	To move quickly using one's legs.
She ran her restaurant for five years.	To organize/be in charge of.
The engine is running more smoothly now.	To operate a computer/engine.
Tears ran down her face.	To flow (describing the movement of a liquid).
How long did the film run for?	To be shown on TV or in the newspaper.
John offered to run me into town.	To take somebody in a car.
You could run the cable behind the desk.	To put something, such as a wire, behind something else.
The buses only run until 11 p.m.	To travel on schedule (e.g., buses/trains).
He laughed and ran his fingers through his hair.	To move/rub something along something else.
John announced his intention to run for president.	To try to be elected.

TABLE 3
SENTENCES AND SENSES OF THE POLYSEMOUS VERB *DRAW*

Example sentence	Sense
She drew a picture of a tree.	To make a picture.
He is an excellent speaker who always draws a crowd.	To attract someone to a place/a person.
The train drew into the station.	To move somewhere slowly.
He took her hand and drew her towards him.	To pull something/someone in a particular direction.
We think she wears those strange clothes to draw attention to herself.	To direct attention towards someone/something.
She drew the curtains.	To close (the curtains).
Our advisors have been drawn from a wide range of experts.	To choose or include someone/something.
He has to draw a conclusion after reading the article.	To reach a conclusion.
She drew inspiration for her stories from her childhood.	To get information from someone or something.
England drew 2–2 against Italy.	To end a game in a tie.

In addition to the questionnaire, participants were asked to complete an online test measuring the size of their vocabulary. *The Vocabulary Size Test* (VST) (Nation & Beglar, 2007; <https://my.vocabularysize.com/>) was used. This test does not give a total score; rather, it indicates the level of a learner's vocabulary based on its size. The VST was developed to reliably, accurately, and comprehensively measure the size of learners' receptive vocabulary, in the first to the fourteenth 1000-word families, that is, how many words a learner knows in English (Nation & Beglar, 2007). The VST has 140 items and takes approximately 40 minutes to complete.

The participants completed the test first and then the survey at home (a link was sent to them via their university's Blackboard Learn). Participants are also students in my classes and were briefly informed about the survey and test during class. They were asked not to check the polysemous meanings of the targeted verbs in dictionaries, and not during the test, to ensure that their responses reflected their general knowledge of English. The data gathered via the questionnaire were then statistically analysed, using IBM SPSS (version 20).

Participants are 52 Saudi female students in the Department of English Language and Translation at Qassim University. They are all non-native speakers of English; all are native speakers of Arabic. These students are in the early stages of the English Language and Translation Programme and have only completed the department entry modules, including courses on language skills and a general linguistics and translation course. They have not been introduced to prototype or polysemy theories, nor were they given any information about the meanings of the target verbs before the experiment. All participants gave informed consent to participate.

There were a total of 52 respondents in the study. Table 4 presents descriptive statistics: the mean age of the students is 21 years, while the youngest student in the study is 19 years old and the oldest is 28. The vocabulary test results were reported in the survey as participants were instructed to enter them, the highest test result is 21,300 while the lowest is 630, with a mean of 7,635. However, most of the students' vocabulary results lie within the range of 4,000 to 10,000, with 37 out of 52 results within that range. Average year of study is four (many students entered their current levels in the programme, rather than their academic year, which means that they are, in general, in their second academic year), and average years of learning English is five.

TABLE 4
DESCRIPTIVE STATISTICS OF RESPONDENTS' DEMOGRAPHY

	Minimum	Maximum	Mean	Standard deviation
Age	19	28	21.25	1.65
Vocabulary size test result	630	21300	7635.19	3671.88
Academic year of study	1	15	4.35	3.21
Years of learning English	1	15	5.34	3.16

To answer RQ1 and RQ2, frequency analysis was used, which looks at the number of times a certain letter, word, or phrase appears in a text or speech, and can be used to identify patterns or establish trends in a data set (Koduru et al., 2020); it can also be used to compare different texts or speech samples to look for similarities and differences between them (Gallagher et al., 2021). To answer RQ3, correlation analysis was performed. Kendall Tau-b correlation coefficient was used to determine the relationship between the variables *vocabulary size test*, *years of learning English*,

and learners' perceptions of the senses of the polysemous verbs 'break', 'run', and 'draw'. Kendall's Tau-b is a non-parametric measure of strength and direction of association existing between two variables measured on at least an ordinal scale (Palikhe & Adhikari, 2020). It is considered a non-parametric alternative to Pearson's product-moment correlation when the data have failed one or more the assumptions of the test (Palikhe & Adhikari, 2020). Kendall's Tau-b correlation coefficient "r" varies over a range of +1 to 0 to -1. The +/- sign signifies the direction of the relationship. In terms of the strength of the relationship, if the correlation value is close to 1, the relationship is strong; if it is close to 0, it is a weak relationship; while if there is no relationship, the coefficient will be approximately equal to zero (Bakar & Rosbi, 2017). This test is appropriate because one of the variables in the correlation is ordinal, while the other variables are continuous; this informs the application of Kendall's Tau-b correlation co-efficient.

IV. RESULTS

RQ1. What meanings do EFL learners in a Saudi Arabian university context perceive as more typical for the polysemous verbs *break*, *run*, and *draw*?

Results of the frequency analyses of the students' perceptions of senses for the polysemous verb 'break', as presented in Table 5, showed that 'to damage a bone in the body' (100%) is a perfect typical sense for 'break', while 'to fail to obey a rule or fail to keep a promise' and 'to separate into pieces' are the next most typical senses for 'break' with 98.1% and 88.5% students' perception, respectively.

TABLE 5
SENSES THAT LEARNERS OF ENGLISH PERCEIVE AS MORE TYPICAL FOR BREAK

Sense	Frequency	Frequency %
To damage a bone in the body.	52	100
To fail to obey a rule or fail to keep a promise.	51	98.1
To separate into pieces.	46	88.5
To stop for a short time.	36	69.3
To destroy someone's confidence.	35	67.3
To release a piece of news before other sources do.	26	50
To change (describing the weather).	21	40.3
To make something end.	19	43.6
To become deeper (a young man's voice).	17	32.7
To make a hole or to cut.	17	32.7

Table 6 shows that 'to move quickly using one's legs' (98%) and 'to organize/be in charge of' (96%) are perceived to be the most typical senses of the verb 'run'. 'To flow (describing the movement of a liquid)' and 'to operate (e.g., a computer/engine)' are the next most typical senses for *run* at 78.8% and 75%, respectively.

TABLE 6
SENSES THAT LEARNERS OF ENGLISH PERCEIVE AS MORE TYPICAL FOR RUN

Sense	Frequency	Frequency %
To move quickly using one's legs.	51	98.1
To organize/be in charge of.	50	96.2
To flow (describing the movement of a liquid).	41	78.8
To operate (e.g., a computer/engine).	39	75.0
To try to be elected.	29	55.8
To travel on schedule (e.g., buses/trains).	29	55.7
To move/rub something along something else.	25	48.1
To be shown on TV or in the newspaper.	33	44.3
To put something, such as a wire, behind something else.	22	42.3
To take somebody in a car.	15	28.8

Regarding the perceptions of the students for the most typical senses for 'draw', as presented in Table 7, 'to make a picture' (96.1%) is the most typical sense, while 'to direct attention towards someone/something' (85%) and 'to get information from someone or something' (79%) are the next most typical senses for it.

TABLE 7
SENSES THAT LEARNERS OF ENGLISH PERCEIVE AS MORE TYPICAL FOR DRAW

Sense	Frequency	Frequency %
To make a picture.	50	96.1
To direct attention towards someone/something.	44	84.6
To get information from someone or something.	41	78.9
To close (the curtains).	37	71.2
To reach a conclusion.	37	71.2
To attract someone to a place/a person.	36	69.2
To pull something/someone in a particular direction.	25	53.8
To end a game in a tie.	30	57.7
To choose or include someone/something.	27	51.9
To move somewhere slowly.	14	26.9

RQ2. What meanings do EFL learners in a Saudi Arabian university context perceive as less typical for the polysemous verbs *break*, *run*, and *draw*?

Table 8 shows that the senses that the participants perceived as less typical for '*break*' are '*to make a hole or to cut*' (65.4%), '*to become deeper (a young man's voice)*' (53.4%), and '*to make something end*' (61.6%).

TABLE 8
SENSES THAT LEARNERS OF ENGLISH PERCEIVED AS LESS TYPICAL FOR *BREAK*

Sense	Frequency	Frequency %
To make a hole or to cut.	34	65.4
To become deeper (a young man's voice).	33	63.4
To make something end.	32	61.6
To change (describing the weather).	31	59.7
To release a piece of news before other sources do.	24	46.1
To stop for a short time.	16	30.8
To destroy someone's confidence.	16	30.8
To separate into pieces.	6	7.6
To damage a bone in the body.	0	0
To fail to obey a rule or fail to keep a promise.	0	0

Table 9 shows that the senses perceived as less typical for '*run*' are '*to take somebody in a car*' (71.2%), while other senses such '*to put something, such as a wire, behind something else*' (57.7%) and '*to be shown on TV or in the newspaper*', (53.9%) are perceived as on average less typical for '*run*'.

TABLE 9
SENSES THAT LEARNERS OF ENGLISH PERCEIVED AS LESS TYPICAL FOR *RUN*

Sense	Frequency	Frequency %
To take somebody in a car.	37	71.2
To put something, such as a wire, behind something else.	30	57.7
To be shown on TV or in the newspaper.	28	53.9
To move/rub something along something else.	26	50
To try to be elected.	21	40.4
To travel on a schedule (e.g., buses/trains).	22	34.6
To operate (e.g., a computer/engine).	11	21.1
To flow (describing the movement of a liquid).	11	21.1
To organize/be in charge of.	1	2
To move quickly using one's legs.	0	0

The frequency analysis of the senses learners perceive to be less typical for '*draw*', shown in Table 10, revealed that '*to move somewhere slowly*' (71.2%) is the least typical sense from the students' perspective.

TABLE 10
SENSES THAT LEARNERS OF ENGLISH PERCEIVED AS LESS TYPICAL FOR *DRAW*

Sense	Frequency	Frequency %
To move somewhere slowly.	37	71.2
To choose or include someone/something.	24	46.2
To pull something/someone in a particular direction.	23	44.2
To end a game in a tie.	22	42.8
To close (the curtains).	15	28.8
To reach a conclusion.	14	26.9
To attract someone to a place/a person.	14	26.9
To get information from someone or something.	10	19.2
To direct attention towards someone/something.	10	19.2
To make a picture.	3	5.7

RQ3. Is there a relationship between EFL learners' vocabulary size, years of learning English, and their perceptions of polysemous senses?

A Kendall Tau-b correlation analysis was performed to determine the association between students' *vocabulary size test result*, *years of learning English*, and *perceptions of senses* for all the verbs. Table 11 shows that there is a positive weak statistically significant relationship between the vocabulary test results and the senses '*to change (describing the weather)*' ($r = 0.33$, $p = 0.000$) and '*to release a piece of news before other sources do*' ($r = 0.32$, $p = 0.000$). This indicates that an increase in vocabulary test results will yield a consequent increase in the perceptions of these senses for '*break*'. While years of learning English is positively and significantly associated with the sense '*to separate into pieces*' ($r = 0.25$, $p = .000$) and '*to fail to obey a rule or fail to keep a promise*' ($r = .38$, $p = .000$), and negatively associated with the sense '*to destroy someone's confidence*', implying that an increase in years of learning English yields less perception of this sense for '*break*' ($r = -0.24$, $p = 0.000$).

TABLE 11
CORRELATION BETWEEN VOCABULARY SIZE, YEARS OF LEARNING ENGLISH, AND SENSES FOR *BREAK*

Sense	Vocabulary Result	Size	Years learning English
To separate into pieces.	-.03		.25*
To stop for a short time.	.03		.13
To change (describing the weather).	.33**		-.05
To fail to obey a rule or fail to keep a promise.	.02		.38**
To make something end.	.05		-.18
To destroy someone's confidence.	.07		-.24*
To damage a bone in the body.	.03		.11
To become deeper (a young man's voice).	.03		-.18
To release a piece of news before other sources do.	.32**		.01
To make a hole or to cut.	.01		-.01

*Significant at $p < .05$, ** Significant at $p < .01$

Regarding 'run', Table 12 shows that there is a positive and statistically significant relationship between the vocabulary test results and the senses 'to move/rub something along something else' ($r = 0.29$, $p = 0.000$), and 'to try to be elected' ($r = 0.27$, $p = 0.000$). This indicates that an increase in vocabulary test results will yield a consequent increase in the perceptions of these senses for the verb 'run'. While years of learning English is significantly but negatively, associated with the sense 'to put something such as a wire behind something else', implying that an increase in years of learning English will yield less perception of this sense for 'run' ($r = -0.26$, $p = 0.000$), while a decrease in years of learning English will yield an increase in the perception of the sense 'to put something such as a wire behind something else' for 'run'.

TABLE 12
CORRELATION BETWEEN VOCABULARY SIZE, YEARS OF LEARNING ENGLISH, AND SENSES FOR *RUN*

Sense	Vocabulary Result	Size	Years learning English
To move quickly using one's legs.	-.14		.19
To organize/be in charge.	-.01		.14
To travel on a schedule.	.16		-.16
To flow (describing the movement of liquid).	.15		-.07
To operate (e.g., a computer/engine).	.15		-.06
To put something such as a wire behind something else.	.15		-.26*
To move/rub something along something else.	.29**		-.06
To be shown on TV or in newspaper.	-.01		.03
To try to be elected.	.27*		.07
To take somebody in a car	.09		-.04

*Significant at $p < .05$, ** Significant at $p < .01$

As for *draw*, Table 13 shows that the vocabulary test results do not have any relationship or association with any of the senses. While years of learning English is positively and significantly associated with the sense 'to end a game in a tie' ($r = 0.31$, $p = .000$) and 'to make a picture' ($r = .26$, $p = .000$), but negatively associated with the sense 'to pull something/someone in a particular direction', implying that an increase in years of learning English will yield less perception of this sense for 'draw' ($r = -0.24$, $p = 0.000$).

TABLE 13
CORRELATION BETWEEN VOCABULARY SIZE, YEARS OF LEARNING ENGLISH, AND SENSES FOR *DRAW*

Sense	Vocabulary Result	Size	Years learning English
To move somewhere slowly.	.09		.01
To end a game in a tie.	-.08		.31**
To close (the curtains).	-.12		-.05
To make a picture.	-.02		.26**
To choose or include someone/something.	-.03		-.17
To attract someone to a place/a person.	-.03		.02
To reach a conclusion.	.06		.07
To pull something/someone in a particular direction.	.10		-.24*
To get information from someone or something.	-.16		.02
To direct attention towards someone/something.	.01		.03

*Significant at $p < .05$, ** Significant at $p < .01$

V. DISCUSSION

In general, these findings seem to be consistent with Stamenković and Tasić's (2013) and Pulman's (1983) studies (despite the fact that they grade verbs in their studies with other additional individual synonym verbs, and do so in isolation without presenting them in sentences: e.g. *kill – murder, assassinate*). Similarly, generic meanings of verbs as

they appear in the sentences in this study, such as (*Sarah broke her leg*), (*He did not know he was breaking the law*), and (*The dish fell to the floor and broke*) for *break*; (*He can run very fast*), (*She ran her restaurant for five years*), (*Tears ran down her face*), and (*The engine is running more smoothly now*) for *run*; and (*She drew a picture of a tree*), (*We think she wears those strange clothes to draw attention to herself*), and (*She drew inspiration for her stories from her childhood*) for *draw*, that were closer to the core/central meanings of the verbs, appeared at the top of the list yielded by the frequency analyses. Based on that, it also seems that non-native learners of English have a grasp of three or four top senses for common verbs such as *break*, *run*, and *draw*, since the number of prototypical meanings ranges from three for *break* and *draw* to four for *run*. By contrast, more specific meanings of the verbs tended to be located further down the list, becoming more peripheral, including (*Do not use the cream on broken skin*), (*His voice broke when he was 13*), and (*Outside workers broke the strike*) for *break*. As for *run*, the peripheral meanings consisted of (*John offered to run me into town*), (*You could run the cable behind the desk*), and (*How long did the film run for?*), and (*The train drew into the station*) for *draw*.

This could also be explained by what researchers such as Vicente (2018) have argued: that when the focus is on polysemous verbs, an ‘underspecification’ model assumes that the meaning of a verb is a core meaning, abstract, and underspecified (whether in a literal or a figurative sense) and can extend to other different (although related) senses in play by becoming more specified, and that verbs behave in a way in which their senses relate to the internal argument. Further, and according to Vicente (2018), metaphor-based polysemy should be taken into consideration here, as metaphors generally build on a more literal sense that might later become conventionalized. Hence, participants in this study seemed to rely on the more underspecified senses within a polysemous verb, perceiving them as more prototypical, whether they are literal, such as ‘*to damage a bone in a body*’ and ‘*to separate into pieces*’ for *break*, ‘*to move quickly using one’s legs*’ for *run*, and ‘*to make a picture*’ for *draw*, or conventionalized, figurative senses such as ‘*to fail to obey a rule/keep a promise*’ for *break*, ‘*to organize/be in charge of*’, ‘*to flow (describing the movement of a fluid)*’, and ‘*to operate a computer/a program*’ for *run*, and ‘*to direct attention towards someone/something*’ and ‘*to get information from something/someone*’ for *draw*. Notably, during language processing, especially when the meaning of a verb is conventionalized, there is no distinction between the literal and the metaphorical – that is, language users do not have to access a literal meaning first to interpret a metaphorical one, as has been pointed out by Vicente (2018). However, Taylor (1995) has also stated that the literal meanings are generally acquired or learned in childhood or at the outset of learning a language before non-literal ones, and the more frequent occurrence of central meanings than peripheral ones in our communicative language use situations might mentally reinforce their meanings, thus making them more prototypical. Therefore, it could be that the EFL learners here identified those literal and more common meanings as more prototypical.

Using an ‘underspecification’ model (Vicente, 2018), the core, underspecified meanings extend to more specified senses. As applied to this study, more specified senses extending from the core meaning seem to go down the list: such senses are ‘*to make a hole or a cut*’, ‘*to become deeper (a young man’s voice)*’, and ‘*to make something end*’ for *break*; ‘*to take somebody in a car*’, ‘*to put something such as a wire behind something else*’, and ‘*to be shown on TV*’ for *run*; and ‘*to move somewhere slowly*’ for *draw*, which then become more peripheral senses for such polysemous verbs from the perspective of EFL learners and from the perspective of prototype theory. This may be due to the non-literality or metaphoric elucidation needed for these senses that learners might not typically use; for example, in (*His voice broke when he was 13*), it is obvious that one’s voice does not break in the manner of a cup, instead meaning that its pitch deepens. Even though people, during polysemy, may need to use their encyclopaedic knowledge of things and experiences (Basile, 2021) that break to help them comprehend how a voice breaks, it seems that some EFL learners in this study might not be aware of what Ungerer and Schmid (1996, p. xii) refer to as the transferability of ‘experience of the concrete world’ that is essential when interpreting non-literal senses, resulting in their considering them to be more specified meanings and then coming to see them as more peripheral senses of polysemous verbs.

Concerning the correlation between the variables vocabulary size, years of learning English, and polysemy, the statistical analyses revealed that, while there were a few significant relationships between polysemous senses and the other two variables, there were no strongly significant relationships. This seems to be supported by Bensoussan and Laufer (1984) and Schmitt (1998), who found that learners did not know all the meanings associated with a polyseme, regardless of their EFL proficiency level, even advanced learners, so it could be argued that some EFL learners in this study assigned a lower rating (as poor or not very good examples) to those meanings associated with verbs less familiar to them, or it may be that they knew the verb but not some of its particular meanings. This study, however, depended solely on vocabulary size test rather than using alongside it a measurement for L2 language proficiency, which may have blunted detecting significant relationships amongst these three variables (that might be present). A further finding in support of Bensoussan and Laufer (1984) and Schmitt (1998) is the fact that, in this study, there were more negative significant relationships between some senses and years of learning English (which could be related to language proficiency), which, despite the greater number of years of learning English, made EFL learners less able to perceive senses such as ‘*to destroy someone’s confidence*’ in *break*, ‘*to put something such as a wire behind something else*’ in *run*, and ‘*to pull something/someone in a particular direction*’ in *draw*, rating them as poor or not very good examples of polysemous verbs. However, this was not always the case, for increasing years of exposure to learning English also made EFL learners more aware of perhaps the more general senses of a verb as well as some figurative senses.

Regarding the relationship between vocabulary size and polysemy, it was found with certain senses within the verbs *break* and *run*, but not *draw*, that students who scored higher on vocabulary size were more aware of senses that tended to be lower down the list from the frequency analyses: for example, although it was weak, there was a positive statistically significant relationship between the senses ‘*to change* (used to describe the weather)’ and ‘*to release a piece of news before other sources do*’ for the verb *break*; and regarding *run*, there was a positive significant relationship between vocabulary size and the senses ‘*to move/rub something along something else*’ and ‘*to try to be elected*’. This may be supported by some vocabulary studies such as that of Koizumi and In’nami (2020), who reported that vocabulary size strongly correlated with polysemy and word associations for Japanese low–intermediate learners of English; so a larger vocabulary size means knowing more polysemy.

VI. CONCLUSION

In general, this study concludes that the prototype theory approved by researchers such as Rosch (1975), Taylor (1995), and Lakoff (1987) seems to be applicable in the case of non-native speakers of English (EFL learners) rating English polysemous verbs, as it seems clear that participants realized that lexis can take different paths through semantic extensions (e.g., Basile, 2021; Evans, 2007), and that polysemous verbs have some central and peripheral meanings through a network of senses (e.g., Pulman, 1983; Taylor, 1995), despite that previous studies rating the prototypicality of verbs were more concerned with native speakers of English. However, some limitations should be kept in mind. More qualitative methods such as exercises in polysemy and free association tests could be employed to determine whether a learner rated a sense as peripheral in terms of meaning because it really is so or simply because they did not know its meaning; this study did not divide participants according to language proficiency levels and depended solely on vocabulary size and years of learning English to give an indication of it. Further research also needs to study polysemy and homonymy as they are quite closely related concepts in the literature.

APPENDIX. PROTOTYPE QUESTIONNAIRE

Scale: (1) poor; (2) not so good; (3) good; (4) excellent.

Verb ‘draw’

We think she wears those strange clothes to draw attention to herself.

The train drew into the station.

England drew 2-2 against Italy.

She drew the curtains.

She drew a picture of a tree.

Our advisers have been drawn from a wide range of experts.

He’s an excellent speaker who always draws a crowd.

He has to draw a conclusion after reading the article.

He took her hand and drew her towards him.

She drew inspiration for her stories from her childhood.

Verb ‘run’

He can run very fast.

She ran her own restaurant for five years.

The buses only run until 11 p.m.

Tears ran down her face.

The engine is running more smoothly now.

You could run the cable behind the desk.

He laughed and ran his fingers through his hair.

How long did the film run for?

Jackson announced his intention to run for president.

John offered to run me into town.

Verb ‘break’

The dish fell to the floor and broke.

We usually break for lunch at 12.30 p.m.

We arrived just as a storm was breaking.

He did not know he was breaking the law.

Outside workers broke the strike.

They tried to break his will.

Sarah broke her leg.

His voice broke when he was 13.

It was the local newspaper that first broke the story.

Do not use the cream on broken skin.

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