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# POLYSEMY-RELATED PROBLEMS IN ESP STUDENTS – A CASE STUDY

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*Abstract.* Detected as a problem in foreign language learning, polysemy has been a subject of many various studies and from many various aspects. The problem of polysemy is particularly important in English for Specific Purposes, or in our case English for Police Purposes, since it very often gets unnoticed by learners. Having learnt one meaning in a General English course, learners are usually unaware that the same word can have a new meaning in technical texts. The aim of the case study is to examine to what extent the students can recognize the senses of polysemous words in different contexts and if the level the particular meaning is associated with (according to the CEFR) influences the percentage of correct/incorrect answers. We used a questionnaire and a self-designed vocabulary test to collect the data both about the participants and their practical knowledge of polysemy. The study was conducted with a group of I-year students of Forensic Engineering at the University of Criminal Investigation and Police Studies. The results obtained should help improve the course of English for Police Purposes.

### *Introduction*

Anyone learning a foreign language is well aware of the fact that learning new words is important and that it can present quite a challenge. As soon as we learn a meaning of a word, we come across that same word in another context and realize that the meaning we know does not fit, or that it simply does not make sense in that context. The new meaning of the already “familiar” word can be looked up in a dictionary, where we find a number of meanings for one item, whereas the meanings can be either similar or quite different. This could be the description of the first encounter with polysemy. Polysemy has been recognized as a significant problem in vocabulary learning, regardless of whether we are learning General English (GE) or English for Specific Purposes (ESP). It seems to be evasive category, since the words may have one or two meanings in General English, and other or several other meanings in various disciplines which are not classified as General English. The case study presented in this paper attempts to identify to what extent the students learning English for Police Purposes can differentiate between different meanings of polysemous words given to them in different contexts, in other words, if they can find the appropriate meaning of a given polysemous word in a given contexts, and if the meaning of a polysemous word associated with a particular level according to the CEFR influences the percentage of correct/incorrect answers.

### *Previous Research on Polysemy*

In order to illustrate previous research on polysemy, we shall first present what it means, what the problems with research of polysemy are and why it is important for English for Specific Purposes, or in our case English for Police Purposes.

*Polysemy – general characteristics.* The word polysemy comes from Greek words *poly*, which means “many”, and *sema*, which means “a sign” (The American Heritage Dictionary of the English Language, 2000). It actually refers to

the capacity of a sign or a word to have multiple related meanings, or multiple meanings which overlap to some degree.

It has been discussed by philosophers (as early as Aristotle, for instance), in psycholinguistics, computational and theoretical linguistics, pragmatics, psychology, philosophy of language and cognitive linguistics (Vicente & Falcum, 2017). Liao and Chang (2012) say that polysemy in second language teaching and learning is rarely researched, although language teachers and applied linguists acknowledge the importance of polysemy and understand the influence polysemous words can exert on second language reading.

*Polysemy and homonymy – similarities and differences.* Almost half a century ago, Lyons (1968, p. 405) said that “the ‘ideal’ language would be one in which each form had only one meaning, and each meaning was associated with only one form”. In practice, we know that such an ideal language does not exist, and that due to changes in the world around us the vocabulary in languages changes faster than ever, most often by the process that the existing words are given new extended meanings. Thus, we come to the situation that one form can have several related or unrelated meanings. In theory, when one form has several related meanings, we are talking about polysemy (for instance, *article, blank, code*, etc.), and when one form has several unrelated meanings, we are talking about homonymy (for instance, *arm, bank, bar, bill*, etc.). Polysemy and homonymy based on the criteria of relatedness of meanings is difficult to establish, so Laufer (1997, p. 152) suggests that homonymy and polysemy should be regarded as one problem in language learning. That the two concepts are very often discussed in literature together is also supported by Cruise (2000), who classifies them both into the category of linguistic ambiguity. It is, however, distinct from homonymy, which refers to the words that have the same spelling or pronunciation (homophony), but have different and unrelated meanings. Klepousniotou et al. also notice (2008, p. 1534), that some authors have found differences between polysemy and homonymy (Frazier & Rayner, 1990, as cited in Klepousniotou et al., 2008), and others have found similarities (Klein & Murphy, 2001, as cited in Klepousniotou et al., 2008), and that polysemy is far more frequent in language than is homonymy, as almost any word can become polysemous and have its core meaning extended<sup>3</sup> (Copestake & Briscoe, 1995; Jackendoff, 2002; Murphy, 2002; Pustejovsky, 1995, as cited in Klepousniotou et al., 2008, p. 1534).

Even though the need exists, it is sometimes difficult to discern between the two concepts. This is why the two most often mentioned criteria to differentiate

<sup>3</sup> Dash (2010) says that the study of polysemy of a language has often been associated with the study of homonymy because distinction between the two has not often been very clear. However, he underlines that there is a need to draw a clear line of distinction between the two, because these forms differ from each other not only in their nature, but also in function and implication.

between polysemy and homonymy are etymology or the history of the word and if the meanings are related (Lyons, 1995). Therefore, it is often necessary to refer to the history of some word to see if the two meanings are historically related. In dictionaries, it is common to find polysemes under the same headword, while homonyms are entered as separate headwords, very often with different numbers (for instance, *bat*<sup>1</sup> or *bat*<sup>2</sup>). Palmer (1981, p. 102) also confirms that the decisions on how to enter a word into a dictionary, either as a polyseme or a homonym, are made based on etymology. If it is established that the identical forms are of different origin, then they are treated as homonyms, and are entered as separate headwords.<sup>4</sup> If the different forms are of the same origin, even if they have different meaning, they are treated as polysemy and are entered into the dictionary under one headword.<sup>5</sup> Mohan Raj et al. (2021, p. 141), however, warn that words become lost in etymology, and what once was a useful distinction of meaning may no longer be so. In this brief discussion, it can be seen that the first problem is related to the definition and classification of polysemy.

*Vocabulary learning and polysemy – possible problems.* Many researchers have noticed the problems of vocabulary learning, and in particular the problems related to polysemy in vocabulary learning. Laufer (1997, p. 152), for instance, argues that empirical evidence is available to illustrate learners' difficulties with homonymy and polysemy. Bensoussan and Laufer (1984) found that the largest number of errors in comprehension of words was induced by words with multiple meanings, and they found that learners who were familiar

<sup>4</sup> *mole*<sup>1</sup> – 1. A small permanent spot on the skin; a birthmark 2. A stain or spot, as in garment; *mole*<sup>2</sup> – A small, insectivorous mammal (family *Talpidae*) with velvety fur, minute eyes, and very broad forefeet adapted for digging and forming extensive excavations; *mole*<sup>3</sup> – A jetty or breakwater, partially enclosing an anchorage or harbour; *mole*<sup>4</sup> – A morbid mass formed in the womb by the degeneration of the partly developed ovum, and giving rise to false pregnancy: also spelled *mola*; *mole*<sup>5</sup> – See MOL – *Chem.* The gram-molecule (Webster Comprehensive Dictionary, Vol. 2, 1977, p. 820).

<sup>5</sup> *range, n.* 1. The area over which anything moves, operates, or is distributed. 2. *U.S.* An extensive tract of land over which cattle, sheep, etc., roam and graze. 3. *U.S.* Pasturage; grazing ground. 4. *Bot. & Zool.* The geographical area throughout which a specific plant or animal exists. 5. The extent or scope of something: the whole *range* of politics. 6. The extent to which any power can be made effective: *range* of vision [...]. 7. The extent of variation of anything: the temperature *range*. 8. The extent of possible variation in pitch: said of musical instruments or the voice. 9. A line, row, or series, as of mountains. 10. *U.S.* A row of townships, each six miles square, numbered east or west from a base meridian. 11. *Rare* Rank; order. 12. The horizontal distance between a gun and its target. 13. The horizontal distance covered by a projectile. 14. A place for shooting at a mark: a rifle *range*. 15. In archery, the number of ends shot at each given distance [...]. 16. A large cooking stove for conducting several cooking operations at one time. 17. *Stat.* The inclusive difference between the extreme values in any series of variable data [...] (Webster Comprehensive Dictionary, Vol. 2, 1977, p. 1044).

with one of the meanings of a polyseme/homonym did not abandon this meaning even though it did not make any sense in context. Thornbury (2002, p. 28) noticed that words with multiple meanings can be troublesome for learners, because having learned one meaning of the word, they may be reluctant to accept a second, totally different, meaning. He also described the polysemous nature of English vocabulary as a challenge to dictionary compilers, but also a complete headache for learners (Thornbury, 2002, p. 9).

In further illustration of variety of research of polysemy, we would mention Elston-Güttler and Williams's (2008) study which investigated the influence of the first language (L1) lexicalization patterns on the processing of the second language (L2) words in sentential contexts by advanced German learners of English, and they found out that the first language polysemy affected the second language meaning interpretation. Among the most recent research of polysemy, we would single out Ozturk's study (2018, p. 83), who investigated the acquisition of noun polysemy in English by EFL learners, in particular the differences among three types of senses (core vs. metonymical vs. metaphorical). She noticed that multiple meanings are even more widespread among high frequency vocabulary which is generally seen as more important to learn in a foreign language. Ozturk (2018, p. 83) mentions that her 2016 research has shown that 95% of the words from the most frequent 3,000 words of English had more than one meaning and it went up to 100% among the most frequent 1,000 words. Multiple meanings might also become a major challenge in reading authentic text (Ozturk, 2018, p. 84).

*Polysemy and learning ESP – possible problems.* The problems related to polysemy are even more pronounced in case of learning English for Specific Purposes (ESP), or in our case English for Police Purposes (EPP). Researching the problems that the learners of English language face, it has become clear that difficulties of ESP learners go beyond technical vocabulary. Technical vocabulary is an integral part of subject learning (Bravo & Cervetti, 2009; Woodward-Kron, 2008). Ha & Hyland (2017, p. 2) say that technical vocabulary is important in EAP classes (we would add here in ESP classes also), as it helps learners develop their subject knowledge and they further specify that a word with only one entry in a general/specialised dictionary or with the same entry in a general and a specialised dictionary is regarded as monosemous. In fact, it seems that learners acquire technical vocabulary more easily, particularly if they are familiar with the particular field in their mother tongue. The greatest problem is the vocabulary or words which have one meaning in General English and extended or new meanings in ESP. This is the category of words defined by some authors as sub-technical (Cowan, 1974; Baker, 1988, p. 91), or semi-technical (Trimble, 1985, p. 130; Farrell, 1990), or non-technical (Chung & Nation, 2003), in other words what we call polysemous words in this paper. They are often unnoticed

by both learners and teachers, as the former assume they have already learned their meaning, and the latter assume that learners would ask for additional explanation in case they have noticed that something is odd in the relevant sentence or text. Understanding may also be impeded by limited vocabulary knowledge particularly in authentic/technical texts. The additional problem is that EFL/ESP learners, although they may be aware of polyvalence in their own language, are often unaware of polysemy in the new language they are learning. In his doctoral thesis, Parent (2009) says that he is sometimes struck by the fact that learners are well aware of polysemy and homonymy in their first language but generally fail to find candidacy for it during problematic junctures in their second language. To be sure, they know it exists, and many low proficiency learners can even name a few L2 homonyms, but the ability to suspect lexical polyvalence, as Laufer (1997) has claimed, is often surprisingly unavailable.

In the previous research on homonymy and polysemy in English for Police Purposes, Mićović (2012, p. 45) discussed the findings related to new meanings a word gets over time. Namely, it is logical to expect that the older meaning of a word would be better known than the new one. This is what we have, for instance with *bug*, where the meaning related to English for Police Purposes (a concealed microphone) originated later in time (1949) (Etymonline, n.d.). However, there were other quite the opposite examples, where the oldest meaning was less known, while the extended meaning which came later in time is better known today. Such an example is *magazine*, which today is most known probably in its meaning of “a journal”. The oldest meaning of this word dates back to 1580s, meaning “a warehouse, place for storing goods, especially military ammunition”, and today it is almost obsolete. The meaning of “periodical journal containing miscellaneous writings” dates from the publication of the first one, *Gentleman’s Magazine*, in 1731, while the meanings of “cartridge chamber in a repeating rifle” and that of “a case in which a supply of cartridges is carried” respectively date back in late 19<sup>th</sup> century (Etymonline, n.d.).

There is also a study of Xia (2020), who analysed the polysemy in English for Science and Technology (EST) translation. The author analysed the internal and external causes of polysemy in EST translation from the perspective of translation practice, noticing that with the continuous development of science and technology one word appears often in different disciplines (for instance, *cell* or *reaction*). Nevertheless, people think that the meaning of one word remains the same, and in EST translation the context can also affect the accuracy of meaning and the consistency of the translation. Finally, Vardidze (2020) investigated the effectiveness of teaching polysemous nouns through his own innovative method that he called Similarity-Based Approach (SBA) and compared it to the translation-based vocabulary instruction method (TBM).

## *Material and Methods*

Prompted by findings of the authors mentioned earlier in the paper, in particular those by Parent (2009), Mićović (2012; 2020), and Xia (2020), we have decided to conduct this quantitative case study, with the aim of examining how our students deal with polysemy.

For this purpose, we have formulated the following research questions:

1. To what extent do our students recognize the meaning of polysemous words in different contexts?
2. Does the level the particular meaning/sense is associated with (according to the CEFR) influence the percentage of correct/incorrect answers?

The data were collected using a questionnaire and a vocabulary test. The questionnaire was used to establish how long the students had been learning English language and which secondary school they completed, while the vocabulary test was used to check the knowledge of core and additional meanings of selected polysemic words. The data were processed by counting and given as percentages in Table 2 below.

*Sample.* The research was conducted at the University of Criminal Investigation and Police Studies in Belgrade with 35 students of the first year of undergraduate studies of Forensic Engineering, who attended the course English Language I. The students volunteered to participate in the research. The data were collected at the beginning of two academic years respectively, in October 2018 and October 2019.

The students in Serbia are supposed to have a B2 level<sup>6</sup> of English language proficiency when they finish secondary school. This level is estimated based on the number of years of learning English as a Foreign Language in elementary and high schools in Serbia, which ranges from 10 to 12 years depending on whether they started to learn English as a Foreign Language in the first or in the third grade of elementary school. Various high schools select various course books, but they all finish the fourth grade of high school with a B2 level course book. This is also confirmed by Danilović and Grujić (2014, p. 205) as well as by Danilović-Jeremić (2015, p. 92), who confirm in their study that “the students had spent between eight and ten years learning English in elementary school and high school. Their level of proficiency in English was estimated as B2 (according to

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<sup>6</sup> It is very difficult to estimate the vocabulary size of our sample without testing, and the data found at different sources also vary as to how many words should be known for every level. According to Thornbury (2002, p. 21), students aiming to pass the Cambridge First Certificate Examination (FCE) should probably aim to understand at least 5,000 words. The Vocabulary size at different Common European Framework Levels (CEFR) is as follows: A1 < 1,500 words; A2 – 1,500–2,500; B1 – 2,500–3,250; B2 – 3,250–3,750; C1 – 3,750–4,500; C2 – 4,500–5,000 (Milton, 2011, p. 224).



the Common European Framework of Reference)”. However, speaking from the experience, the actual level of knowledge in most cases is lower, and regardless of the fact that the number of years of learning English as a foreign language is rather similar the students still differ a lot in terms of their knowledge. This claim would need to be investigated further, but in the previous research by Mićović (2020) on influence of vocabulary size on reading comprehension of ESP texts, the author established that the sample of research differed quite a lot, as the number of years they had been learning EFL ranged between 8 and 12, while the number of words they had learned ranged between 2,000 and 10,100 based on the Vocabulary Size Test by Nation (Nation & Beglar, 2007).

In the case of our sample, all the respondents learned English during their education prior to enrolment, and the number of years ranged from four (only two students) to thirteen. However, the majority of students were in the category of those who learned English for 12 years (26 or 74.29%) (Table 1).

Table 1. Structure of the sample

Type of secondary school	Number of students	Number of years of learning English
Grammar school	2	13
Grammar school	18	12
Vocational school (Medical, Chemical, Music)	8	12
Grammar school	1	10
Vocational school (Medical, Chemical, Music)	2	9
Vocational school (Medical, Chemical, Music)	2	8
Vocational school (Medical, Chemical, Music)	2	4

*Research instruments.* Two instruments were used to collect the data for this study, a questionnaire and a self-designed vocabulary test. The questionnaire consisted of two open-ended questions and it was used to get the basic details on the respondents. The first question was “How long have you been learning English?” and the second one was “What type of secondary school have you completed before enrolling at the University? (grammar school or vocational secondary school)”.

The vocabulary test we used can be classified as diagnostic (Schmitt, 2000, p. 164), in terms that it was used to “diagnose” the knowledge of core and non-core meanings of words in our respondents. The purpose of this “diagnosis” was to get new insight in the overall knowledge of our students and the results were expected to help improve the English for Police Purposes course in the future.

The words selected to be tested are rather common, which with the exception of lexeme *bug* are included in the General Service List (GSL) published by Michael West (1953), which originally included about 2,000 important vocabulary words,

as well as in the New General Service List (NGSL), which was developed sixty years later by Dr Charles Browne, Dr Brent Culligan, and Joseph Phillips and it now contains 2,284 words. These words are thought to be of greatest ‘general’ use to learners of English (Browne, 2013). As said earlier, Ozturk (2018, p. 83) confirmed that 95% of the words from the most frequent 3,000 words of English had more than one meaning. The words we have selected also appear in the English for Police Purposes lessons that would be taught during the course.

Some items are given in two different meanings, some in three or four. The meanings were illustrated in a sentence, starting from the meaning which is supposed to be acquired earlier and then followed by the meanings which are supposed to be acquired later. Here is an example of one of the items on the test: the word *solution* is defined in Cambridge Dictionary (Cambridge Dictionary, n.d.) primarily as “the answer to a problem” and secondarily as “a liquid into which a solid has been mixed and has dissolved”. Thus, when *solution* means “the answer to a problem”, Cambridge Dictionary associates it to a B1 level of English and it represents the first sense of the word which users of English will think of, but, when *solution* means “a liquid”, the dictionary signals the fact that *solution* is a specialized term from chemistry which is likely to be acquired later. Consequently, *solution* is a polyseme as it stands for these two various meanings which are meant to be learnt at different levels of English and for different purpose (Valcea, 2019).

The test used in this case study included 10 items given in 24 sentences illustrating both their core and non-core meanings. The respondents were asked to give a precise translation only of the term given in italic. The items that were chosen included the words that the students were supposed to have come across during the previous education and therefore were familiar with, and at the same time the words that were used in the texts the students would be taught during the semester. Here is the example of one item in the test:

*search*

1. After a long *search*, they eventually found the missing papers.  
– Nakon duge \_\_\_ konačno su pronašli dokumenta koja nedostaju.
2. The police carried out a thorough *search* of the suspect, but they – failed to find any drugs.  
– Policija je izvršila detaljan \_\_\_ osumnjičenog, ali nije uspela da nađe drogu.

The examples and the explanations we use in the text and a related table were taken from online edition of Cambridge Dictionary (Cambridge Dictionary, n.d.), except in case of the noun *hair*, the explanation of which is taken from Wiktionary. The words selected to be tested in this case study are the following nouns: *state, solution, servant, office, home, power, hair, plant, bug* and *search*.

## Results and Discussion

The results of the test are given in Table 2, which also contains the explanation what meaning was used in a sentence, and what level of Common European Framework of Reference (CEFR) for languages the meaning is associated with. For some meanings, the level was not specified in the dictionary. Our discussion was supported by the information about the selected items from the online edition of Cambridge Dictionary (Cambridge Dictionary n.d.) as well as from Online Etymology Dictionary (Etymonline, n.d.).

Table 2. Items and their meanings used in the test

Item	CEFR level	Correct (%)	Incorrect (%)
<i>state</i> , a condition or way of being that exists at a particular time	B2	94.28%	5.72%
<i>state</i> , a country or its government	C1	77.14%	22.86%
<i>solution</i> , the answer to a problem	B1	100%	0 %
<i>solution</i> , a liquid in which other substances have been mixed and dissolved	chemistry	11.43%	88.57%
<i>servant</i> , a person who is employed in another person's house, doing jobs such as cooking and cleaning, especially in the past	B2	45.71%	54.29%
<i>servant</i> , a person who works for the government	B2	48.57%	51.43%
<i>office</i> , a room or part of a building in which people work, especially sitting at tables with computers, phones, etc., usually as a part of a business or other organization which people work, especially sitting at tables with computers, phones, etc., usually as a part of a business or other organization	A2	94.28%	5.72%
<i>office</i> , a place where you can go to ask advice from or receive treatment from a doctor or dentist	A2	62.86%	37.14%
HOME, the house, apartment, etc. where you live, especially with your family	A1	100%	0 %
<i>home</i> , connected with or done in your own country	Not available	91.43%	8.57%
<i>power</i> , the amount of political control a person or group has in a country	C1	68.57%	31.43%
<i>power</i> , strength	C1	71.43%	28.57
<i>power</i> , authority	C1	2.86%	97.14%
<i>hair</i> , [U], the collection or mass of such growths growing from the skin of humans and animals, and forming a covering for a part of the head or for any part or the whole body	A1	100%	0%
<i>hair</i> , [C], a pigmented filament of keratin which grows from a follicle on the skin of humans and other mammals	A1	80%	20%

<i>plant</i> , a living thing that grows in earth, in water, or on other plants, usually has a stem, leaves, roots, and flowers, and produces seeds	A1	77.14%	22.86%
<i>plant</i> , a factory in which a particular product is made or power is produced	Business English	25.71%	74.29%
<i>plant</i> , something illegal or stolen that has been put secretly in a person's clothing or among the things that belong to them to make them seem guilty of a crime	Not available	11.43%	88.57%
<i>bug</i> , a very small insect	B1	91.43%	8.57%
<i>bug</i> , an illness that is usually not serious and is caused by bacteria or a virus	B2	82.86%	17.14%
<i>bug</i> , a mistake or problem in a computer program	B2, IT	68.57%	31.43%
<i>bug</i> , a very small device fixed on to a phone or hidden in a room, that allows you to listen to what people are saying without them knowing	Not available <sup>7</sup>	65.71%	34.29%
<i>search</i> , an attempt to find someone or something	B1	88.57%	11.43%
<i>search</i> , a careful examination of a place or a person in order to find something or someone	B1	68.57%	31.43%

If the results are interpreted with reference to the CEFR level the meaning is associated with, it can be seen that the words selected to be tested range from level A1 to level C1, that some meanings are associated not with the level but with the particular profession, such as chemistry or business, while for some meanings such information is unavailable. The correct answers for A1 meanings range from 100 % to 77.14%, for A2 from 94.28% to 62.86%, for B1 from 100% to 68.57%, for B2 from 94.28% to 45.57 and for C1 from 77.14% to 2.86%. As it can be seen, the percentage of correct answers tends to decline from level A1 to level C1. However, when the meaning tested is related to a certain profession, such as chemistry or business, the percentage of correct answers drops significantly to 11.43% and 25.71% respectively.

The results also suggest that in majority examples the first meaning did not present a problem for the students. In all cases, except in case of *servant*, the correct results ranged from 68.57 to 100%. In case of both meanings of *servant*, the answers were divided almost equally, but still slightly in favour of incorrect answers (54.29% and 51.43%), or we can say that less than a half of respondents provided correct answers in both cases (45.71% and 48.57% respectively). However, it seems that those who knew the first meaning also knew the second one. The explanation might be that the second meaning is rather close to the first one (“a person who is employed to do work for another person” (Cambridge Dictionary, n.d.)), so it was not difficult to provide a correct answer.

<sup>7</sup> Although Cambridge Dictionary which we used for reference does not associate this meaning to any particular profession, we can say that this meaning can be associated to police vocabulary.

When other meanings are observed, the situation is quite different. The results suggest that these meanings did present a problem to a varying degree. The greatest percentage of incorrect answers were given in case of *power* in the senses of “authority” (97.14%), for *solution* when its meaning is associated with chemistry (88.57%) and *plant* when its meaning is associated with Business English (74.29%). As far as the senses related to chemistry and Business English are concerned, these findings are consistent with the studies by Cassels & Johnstone (1985) and Johnstone (1991), who argue that in a content area like science, where distinctions between every day and scientific meanings of words may be particularly salient the students consistently experience difficulties in recognizing the correct scientific usage of words that have distinct every day and scientific meanings (e.g., *random*). White (2016) argues that the language of science gives meaning to words in context which differs from their everyday (English) meanings. If familiar words obtain unfamiliar meanings due to the changed context, learners fail to understand the accepted meaning of these words. The everyday context that learners use to conceptualise concepts is mostly inadequate to reach the conceptual understanding shared by the scientific community.

If we refer to etymology in order to find the possible explanation for the above results, in case of lexeme *state*, the students seemed to be more familiar with its first and older meaning (according to the dictionary of etymology (Etymonline, n.d.)) than with the second meaning, but the difference in correct answers is not significant. In case of *solution*, students also seemed to be more familiar (100%) with the first meaning which is older and dates back from the 14<sup>th</sup> century (Etymonline, n.d.) than with the newer and more specific meaning, associated with chemistry. This result was a little bit surprising, taking into account that the majority of respondents had chemistry as a part of their high school curriculum (as they completed either a grammar school where the natural sciences were predominant or some of vocational high schools, such as medical high school or high school for dental technicians). From this point of view, it could be expected that they were familiar with the “chemical” meaning of the lexeme *solution*, but it turned out that the majority of the answers were incorrect (88.57%).

Lexeme *home* seems not to present problem to the students, yielding the high percentage of correct answers in both senses (100% and 91.43%).

In case of lexemes *office* and *bug*, the percentage of correct answers depended on the meaning in that results differed for almost one third. Although there is not a significant difference in two meanings of *office* in English, what makes it difficult is that there are two different translations into Serbian, the first one being more general (*kancelarija*), and this one did not present a problem for the students as 94.28% provided correct answers, while the second one required another word (*ordinacija*), and yielded less correct answers (62.86%).

Similar results are obtained for lexeme *bug*, the percentage of correct answers decreasing (as noticed before) with the level the particular meaning is associated with (B1 to B2 to IT to police profession), a significant drop being recorded for the fourth meaning which is considered related to police profession (from 91.43% to 65.71%).

Very interesting results come for lexeme *hair*. Here we actually have an example of count/non-count polysemy (Huddleston & Pullum, 2002, p. 336). As Huddleston and Pullum (2002, p. 336) notice, “in some cases, the existence of paired count and non-count senses is entirely predictable, so that it is not necessary for a dictionary to list both: one can be inferred from the other”. This is exactly the case with the Cambridge Dictionary, which offers the description of the uncountable meaning only: “the mass of thin thread-like structures on the head of a person, or any of these structures that grow out of the skin of a person or animal”. This is why we had to look for the meaning of *hair* as a countable noun in another dictionary. Both meanings are given in the above table. The grammatical similarity with Serbian language is rather high. Although Serbian does not classify nouns as countable or uncountable, it does have a category of mass nouns, and in English this category is actually the same category as the category of uncountable nouns – it is defined as a noun without a plural form or a noun that cannot be counted (also known as non-countable or non-count noun). There are several translations of this noun available in Serbian, which depends on whether it is a common or mass noun. As a common noun, the meaning will correspond to the meaning of a countable noun in English, and it can be translated as *dlaka* (more general, and may refer to all types of hair on the human body, as well as the hairs coming from various animals) or *vlak* (more specific, referring only to those hairs on the human scalp). As a mass noun, the meaning will correspond to the meaning of an uncountable noun in English, and it can be translated as *kosa* in case of humans, or *dlaka* in case of animals (where it is synonymous with *krzno*, or *fur* in English). And here is where the problem is detected. The first meaning of *hair* as uncountable noun is the meaning for which 100% students provided the correct translation. However, when it comes to the second meaning of *hair* as a countable noun, 80% students provided the correct answers and 20% provided the incorrect answers. They used the same translation as in the first sentence (*kosa*), which is wrong since in this context humans and animals cannot be treated in the same manner.

The case with lexeme *power* seems to be somewhat different. It is given in three different meanings and each of these meanings has a different translation into Serbian. However, the hardest seems to be the third meaning. If we compare the three examples, the correct answers for the first and the second meaning of *power* are similar (68.57% and 71.43% respectively). In other words, the majority of respondents are familiar with these two meanings. As for the third meaning, which we would associate with English for Police Purposes, only one respondent

provided a correct answer while all the others used one of the previous two meanings, or provided incorrect answers (97.14%). As for the CEFR level, all three meanings are associated with C1 level (Cambridge Dictionary, n.d.), so the explanation for high percentage of incorrect answers for the third meaning cannot be there. It is the same with etymology, since the meaning of power as “legal power or authority; authorization”, is given as the extension of the original meaning of “ability; ability to act or do; strength, vigor, might”. A possible explanation that can support such high percentage of incorrect answers is that the respondents are not familiar with the appropriate translation in Serbian – *ovlašćenje* – since in Serbian it is most often used in legal discourse, they still may not be familiar with. In most cases the incorrect answers were *moć* or *snaga*. Another possible explanation might be that the more information about the context were required, which is consistent with the findings of Alnamer’s (2017) study, who stated that it could be inferred that when more information about a context is provided, the context becomes more understandable, and the meaning of a polysemous word more accessible. According to Alnamer (2017, p. 119) this result also supports Kim and Choe’s (2015, as cited in Alnamer, 2017, p. 119) suggestion that differences in second-language learners’ knowledge can be measured not only by how many individual meanings they have memorised, but also by their ability to use contextual clues.

As for the lexeme *plant*, the first meaning seemed not to present a problem as the two extended meanings. According to the dictionary of etymology (Etymonline, n.d.), the first meaning of “any small vegetable life, vegetation generally” is recorded by 1550s. Most extended meanings, such as the second meaning given in the test, are from the verb, on the notion of “something planted”, such as “construction for an industrial process,” from 1789, at first with reference to the machinery, tools, apparatus, etc., later also the building; also slang meaning “a spy” (1812). The third meaning is not explained, but it is most probably derived also from the verb *plant*, meaning “to put something in a particular place”. This meaning was also a problem to our respondents, as there were only four correct answers (11.43%) and 31 incorrect answers (88.57%). Perhaps, in this example the problem is that there is not a direct translation into Serbian, i. e. in this meaning noun *plant* does not have an exact match in Serbian but has to be translated with some form of the verb *plant* (for instance, one possibility is *podmetnuto*). Therefore, the errors or incorrect answers in this case may be explained by the lack of the corresponding term in Serbian.

The last item on the test, the lexeme *search*, was given in two slightly different meanings, but the second one yielded more incorrect answers. Although the first sentence illustrated quite a general meaning, and the second one was more police-related, in both cases the respondents seemed to be more familiar with the term *search* used in the context of information science (e.g., Google search), and they were inclined to translate it incorrectly as *pretraga*, *pretraživanje*.

According to the dictionary of etymology, and this came as a surprise, the second meaning is rather old. Namely, search as “a right to investigate illegal activity” is from early 15<sup>th</sup> century (Etymonline, n.d.). Both meanings are associated with B1 level according to the CEFR (Cambridge Dictionary, n.d.). There were more correct answers in the first example of *search* than in the second, but it was obvious that the incorrect answers the respondents provided were either *pretraga* or *pretraživanje*.

The results of the present case study suggest great similarity to the findings of a few previous studies. According to Bensoussan and Laufer (1984), polysemous words elicited the largest number of errors in the comprehension of words by EFL learners, and their performance was worse on guessing the meanings of these words than on guessing the meanings of other words. Laufer (1997), as said earlier, stated that EFL learners are reluctant to abandon the primary meaning even when it makes no sense in a context. The study revealed that the students faced difficulties in using the suitable equivalent in translating polysemous words. As Hulstijn and Laufer (2001) notice, even the advanced learners rarely knew all the meanings of a polysemous word. The results of the present case study are also similar to the results of Alnamer’s (2017) study, which shows that the learners had no problems guessing the primary meaning of the English polysemous words, but they faced difficulty guessing the extended meanings of polysemous words in unusual contexts.

As it can be seen from the above, the results obtained in this case study do concur with the findings of the previous research by Bensoussan and Laufer (1984), Laufer (1997), Alnamer (2017), White (2016), as well as Cassels & Johnstone (1985) and Johnstone (1991).

## *Conclusion*

The present case study investigated the knowledge of core and non-core/extended meanings of the words used in both General English and English for Specific Purposes, in our case English for Police Purposes, in a group of students of Forensic Engineering.

It can be seen from the results that our respondents vary in their knowledge of polysemy, however, the first conclusion we make, which is also the answer to our first research question, is that the answers produced by our respondents regarding core and non-core (extended) meanings of polysemous words differ but they are very similar to the results of the previous studies (Bensoussan & Laufer, 1984; Laufer, 1997; Alnamer, 2017; White, 2016; Cassels & Johnstone, 1985; Johnstone, 1991). This is confirmed by their better results or higher percentage of correct answers related to core meanings (except in the case of noun *servant*). Our findings also support a part of the findings of previous research



by Ozturk (2018) (even though there are significant differences in her study and the present one), who investigated the acquisition of noun polysemy in English by EFL learners, focusing specifically on differences among three types of senses (core vs. metonymical vs. metaphorical). The results of her study indicated that core senses were known better than the corresponding extended senses and metonymical senses better than metaphorical senses.

We can also point out that two meanings seem to present a real problem for our respondents—*power* and *plant*, the former probably due to insufficient knowledge of legal vocabulary in Serbian and the latter due to the lack of direct translation into Serbian.

As for our second research question, the CEFT level the particular meaning of a polysemous word is associated with influences the percentage of correct answers in that the number of correct answers declines as the particular meaning is associated with a higher CEFR level. What has also been noticed is that whereas there is a moderate decline as we climb up the CEFR levels, there is quite a drop in correct answers when some meaning of a word is related with a certain profession (such as chemistry or business).

As for the future research, we must underline that this study was carried out at the beginning of the course English Language I as “a diagnosis of the students” knowledge of polysemy. It would certainly be interesting to repeat the testing at the end of the course English Language II (which follows the course English Language I, and both courses are held during the I year) to see if there are improvements in knowledge of polysemy after two courses, i.e., two semesters of learning and explicit teaching of English for Police Purposes.

Possible future solutions to the problem of polysemy in EPP learning could include the additional vocabulary exercises, which will deal with polysemic words or semi-technical words (if we refer to another classification mentioned earlier). It is clear that the current evidence does support the idea that the everyday meanings of scientific terms are a potential source of interference in meaning-making in scientific discourse (Osborne, 2002). Given that many words in science have both a specialized scientific meaning and a more common everyday meaning (e.g., *property*, *model*, *energy*, *force*, *charge*), Cerveti et al. (2015) say that it may be useful to target such words for additional instruction, perhaps highlighting differences between every day and scientific meanings. Therefore, the exercises should focus both on core and non-core meanings related with and significant for police profession specifically. Valcea (2019) argues that the senses of polysemous words can be easily taught by starting from the primary sense (which belongs to General English in most cases) and extending the meaning based on the features of GE word. She does not recommend gradual teaching of senses as it hinders a total grasp of the senses of a word. She finds polysemy a great way of working with vocabulary in an efficient way based on some connecting elements common to all/ some senses

of a word. Another way to improve the knowledge of both core and non-core meanings would be to include more reading of authentic technical texts, in which according to Ozturk (2018), multiple meanings might also become a major challenge. Technical texts are the best solution for any ESP course, and they can be used to test comprehension focusing not only on technical but on semi-technical words as well.

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### Проблеми са полисемијом код студената који уче енглески језик струке – студија случаја

#### Резиме

Усвајање вокабулара приликом учења страног језика већ деценијама је у жижи интересовања многих истраживања. У оквиру тих истраживања, полисемија је препозната као посебни проблем у усвајању вокабулара. Дефинисана као појава када један облик речи има више повезаних значења, полисемија за- даје главобољу и онима који уче општи енглески језик, али можда још више онима који уче енглески језик за неку одређену струку, где је овај проблем идентификован као проблем који превазилази учење стручног вокабулара. Наиме, ускостручни вокабулар углавном не представља проблем. Најчешће су то речи које имају одређено, специфично значење, које је онима који уче енглески језик за неку одређену струку лакше за усвајање уколико добро познају терминологију дате струке на матерњем језику. Проблем полисемије идентификован је као већи проблем, јер овакве речи могу да имају једно или два значења у општем енглеском језику, а друга или више других значења у различитим областима које не бисмо дефинисали увек као општи језик. Оно што још отежава ситуацију са савладавањем полисемије јесте чињеница да су они који уче страни језик, чак и у ситуацији када су свесни постојања полисемије у матерњем језику, склони да занемаре њено постојање у страном/ енглеском језику који уче, те да се, сходно томе, упорно држе оног значења речи које им је познато, одбијајући да усвоје неко друго (Parent, 2009).

У овом раду представићемо резултате студије случаја која је спроведена на Криминалистичко-полицијском универзитету у Београду са студентима прве године форензичког инжењерства. У првом делу рада дефинисан је укратко појам полисемије, а затим је дат и кратак преглед неких од истраживања, док је у другом делу рада представљено наше истраживање. Циљ истраживања био је да се утврди у којој мери студенти препознају различита значења полисемичних речи у различитим контекстима и да ли ниво према Заједничком европском референтном оквиру за језике са којим је одређено

значање повезано утиче на проценат тачних/нетачних одговора. У сврху прикупљања података, у истраживању су коришћена два инструмента. Први је био упитник којим су прикупљени основни подаци (дужина учења језика и врста завршене средње школе), а други је био тест сачињен за ово истраживање који се састојао од различитих значења истих речи датих у одговарајућим реченицама. Добијени резултати указују да студенти препознају и основна и пренесена значења речи, али у променљивом односу, што је потврђено вишим процентом тачних одговора када су у питању основна значења речи. Када је реч о томе да ли ниво са којим је одређено значење полисемичне речи повезано утиче на тачност одговора, можемо да констатујемо да проценат тачних одговора опада како расте ниво коме одређено значење речи припада (А1 до Ц1 према Заједничком европском референтном оквиру за језике), при чему је приметно да проценат тачних одговора више опада у случајевима када је нека реч повезана за одређеном струком (као на пример, хемија или пословни језик), него што је то случај са нивоом са којим се повезује одређено значење.

На основу резултата истраживања могуће је унапредити курс енглеског језика за полицијску струку и то тако што ће се увести већи број вежбања вокабулара који ће обухватити како основна тако и проширена значења речи, јер претходна истраживања указују (на пример, Valcea, 2019) да је боље истовремено учити сва значења него их давати појединачно. Поред тога, још један начин да се побољша знање различитих значења речи јесте сигурно и читање аутентичних стручних текстова, што је увек добар избор за сваки курс језика струке, на основу кога се касније може проверавати знање како основних тако и проширених значења речи.

*Кључне речи:* познавање вокабулара; полисемија; енглески језик за полицијску струку; основно значење; проширено значење.

