Collocational Competence among Polish Students of Croatian as a Foreign Language

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Abstract: Collocations in the Croatian language have been described in detail (Blagus Bartolec 2014). However, research on collocational competence in Croatian as a first or foreign language is still sparse. Previously, only the factors that influence the collocational competence of Croatian native speakers (NSs) were investigated, showing that NSs have the best knowledge of collocations with high frequency and associative strength (Ordulj and Cvikić 2017). The most extensive research on collocational acquisition in Croatian as a foreign language (CFL) in heterogeneous groups was done by Ordulj (2017). This research showed that participants with lower proficiency had very poor collocational competence, while participants with higher proficiency showed an equal knowledge of noun collocations in the nominative case and in oblique cases. This paper aims to deepen previous findings and to examine productive knowledge of noun collocations based on their frequency, associative strength, morphological features, and the proficiency level of Polish students of Croatian. Collocations used in this research were collected from essays written by students of Croatian at B1 and B2 CEFR (2005) proficiency levels. The hrWaC corpus was used to count the frequency of collocations, and the associative strength of collocational constituents was assessed by native speakers of Croatian. The respondent sample comprised 27 students of Croatian in Krakow, Poland, who were divided into two proficiency level groups: lower (2nd and 3rd year of studies) and higher (4th and 5th year of studies). The influence of morphological features on collocational knowledge was tested with two fill-in-the-blank tasks containing collocations in the nominative and oblique cases. The analysis of productive tasks showed that morphological features do not influence collocational knowledge at the lower or higher proficiency level. In both cases participants produced the best results in tasks with collocations of high frequency.

1. Introduction

Collocational competence, as part of lexical competence, is one of the most important and challenging aims in Second Language Acquisition (SLA). It was Hill (1999) who introduced the notion of collocational competence into SLA in the late 1990s, thus shifting the focus from teaching individual lexical items to

developing collocational competence. Many applied linguists argue that collocations remain a neglected area of lexical competence development (El-Dakhs 2015; Martyńska 2004; Koya 2003; Gitsaki 1999), and unsurprisingly, the most extensive research has been done on collocations in English as a Second Language (ESL). In vocabulary acquisition, emphasis has mainly been placed on acquiring individual lexical units, although it is estimated that about 70% of everything we hear, say, read, or write falls into the category of collocations (Hill 2000: 53). The importance of collocations in SLA has been deservedly recognized by applied linguists (Nation 2001; Hill 2000; Gitsaki 1999; Lewis 1997). For instance, Nation (2001: 517) claims that "language knowledge is collocational knowledge" and that "all fluent and appropriate language requires collocational knowledge". Consequently, it goes without saying that collocational usage in a foreign language contributes to fluency and more natural communication (Shin 2007; Borić 2004). Collocations also narrow the meaning of individual lexical units, which enhances comprehension and production in a foreign language (Schmitt 2004). Additionally, the use of structurally and semantically different types of collocations contributes to a more interesting style in oral and written production. As was just mentioned, collocations are often considered a neglected part of vocabulary acquisition. On the one hand, students are likely to learn and use individual lexical units without paying attention to the environment in which they naturally co-occur, thus contributing to insufficient development of reading skills. On the other hand, teachers of foreign languages often emphasize grammar, especially in morphologically rich languages, which is not beneficial for students' development of lexical and collocational competence. Another issue in collocational research is the lack of a clear and unambiguous definition of a collocation and the resulting inconsistencies in terminology, as well as different approaches to the phenomenon, which makes collocations difficult to understand even for teachers.

    This study was motivated by the general lack of research on the collocational competence of non-native speakers of Croatian. Since research on collocational competence in CFL is still rather sparse (Ordulj 2016, 2017; Burić and Lasić 2012; Petrović 2007), this study aims to shed light on the productive knowledge of Croatian noun collocations among Polish students of CFL, considering their collocational frequency, associative strength, and morphological features. In a broader context, this research also provides insight into the acquisition of collocations in cases where students' first language is morphologically complex and typologically similar to the target language. The results and instruments used in this study could be useful in designing teaching materials and research instruments with different collocational types and for developing new approaches to teaching CFL, specifically for developing collocational competence in heterogeneous and homogeneous groups of CFL learners.

In the following sections, the notion of collocations in relation to other lexical combinations (idioms and free lexical combinations) in Croatian is presented, followed by a review of relevant literature. In the second part of the paper, the research questions, hypotheses, instruments, and methodology of the present study are described in detail, followed by the interpretation of the findings on collocation knowledge among Polish students of CFL.

2. Background

2.1. Theoretical Background

Previous studies on collocations in ESL demonstrated a pluralism of definitions and approaches to this lexical phenomenon. The same can be said for Croatian linguistics, which has shown a growing interest in collocations in recent years. The majority of studies are concerned with the lexicographic presentation of collocations, most likely due to the fact that Croatian still lacks a collocational dictionary. Generally speaking, research on collocations in Croatian can be divided into several strands that deal with collocational structure (Petrović 2007, 2008b), theoretical issues (Stojić 2012; Ivir 1992–93), contrastive and semantic approaches to collocations (Borić 1998), lexicographic processing of collocations (Turk 2010; Borić 2002; Pritchard 1998; Petrović 2008a; Duplančić Rogošić 2007), and collocations in language for specific purposes (Štefić, Mravak-Stipetić, and Borić 2010; Miščin 2012). Since there is still no clear and unambiguous definition of collocations, both the Croatian and the foreign literature list the features as formal criteria for identifying collocations. Features such as restrictions on the combination of constituents and greater probability or predictability of co-occurrence and recurrence (Borić 1998, 2002; Pritchard 1998; Benson 1985) cannot be considered the only criteria for differentiating collocations from other lexical units, because these features are inherent in all lexical and grammatical word combinations in a communicative context. Furthermore, Croatian linguists often ignore the semantic (analyses of semantic relations between collocational constituents) and formal features (such as parts of speech, morphological, syntactic, and word formation features) that are most relevant for defining collocations in Croatian. All the above points call for observing collocations in relation to other lexical combinations, especially idioms and free lexical combinations, which seem to represent the largest stumbling block for linguists in defining collocations without vagueness.

In Croatian linguistics, idioms are seen as expressions of secondary nomination, which indicate personal and emotive attitudes and opinions (Turk 2000), and do not arise in spoken language (i.e., by spontaneous word arrangement) but are rather incorporated in discourse as fixed expressions. The nature of collocations is seen as rather arbitrary, although collocational constituents

occur together in a fixed order. On the other hand, free lexical combinations are defined as sequences of words that are characterized by many possibilities of combining and exchanging elements, and therefore, have a lower possibility of co-occurrence (Petrović 2007; Borić 2002; Pritchard 1998). In this research, however, collocations are differentiated from free lexical combinations by taking into account the semantic criterion and freedom of combination. Those lexical items whose elements can be combined with other units without limits are considered free lexical combinations. Collocations are lexical combinations that arise from the syntagmatization process, where assimilation or change in meaning of individual elements creates new collocational meaning.

The most comprehensive definition of collocations in Croatian linguistics, which is also accepted in this paper, was given by Blagus Bartolec (2014: 80), who argues that a collocation is a "special lexical combination at the syntagmatic level based on semantic connectedness of individual lexical units, which specifies their meanings". She further emphasizes the communicative function of collocations, since they are very frequent among native and non-native speakers, which differentiates them from other types of lexical combinations. When it comes to the semantic features of collocations in Croatian, it should be mentioned that they do not have the status of lexical units, given that they arise from the process of syntagmatization. According to Blagus Bartolec (2014: 85), a crucial characteristic of collocations is the semantic potential of their constituents. In other words, constituents in the collocational relationship come with their own independent meanings, and through interaction they create collocational meanings that point to extralinguistic reality according to the communicative needs of the speaker. This functional approach to collocations is also accepted in this paper. However, since collocations in the context of CFL are sparsely studied, this research focuses only on collocations having nouns as bases and adjectives as their collocators.

2.2. Collocational Competence in Foreign Language

One of the major foci of studies on collocational competence in ESL is to examine receptive and productive knowledge of collocations. For instance, Begagić (2014) used three fill-in-the-blank productive tests and appropriateness-of-judgment receptive tests to investigate knowledge of verb-noun, adjective-noun, and verb-adverb collocations among 40 students majoring in English Language and Literature in Zenica, Bosnia and Herzegovina, who are native speakers of Bosnian, Croatian, and Serbian. Begagić (2014) found that students have generally inadequate collocational knowledge, with receptive knowledge outranking productive, and that the most problematic collocation types were verb-adverb and adjective-noun. According to Begagić (2014), students' lack of awareness of the importance of collocations (since they are generally focused on learning grammar rules), as well as negative transfer from their first lan-

guage could be the possible factors causing such results. Poor collocational knowledge of Polish-speaking intermediate English learners was shown by Martyńska (2004). In her study, participants demonstrated satisfactory knowledge of individual lexical units, but they knew only 55% of all collocational types, excelling in verb-noun and adjective-noun collocations.

In a study conducted on Spanish-speaking university students of English, Jaén (2007) confirmed students' better receptive knowledge of adjective-noun collocation types. According to Jaén, one of the most important aspects of testing collocational competence is the selection of testing items. She argues for using corpora as a source, relying on frequency of collocational constituents. In her opinion, corpora are the most reliable sources for the selection of items because they contain "authentic and representative samples of the language" (Jaén 2007: 135). Regarding other criteria for testing, it is important that collocations are used in different "text types and contexts, [and that] they are semantically transparent and restricted in their commutability" (Jaén 2007: 136). The importance of corpora as the most reliable and useful sources for selecting collocations and counting their frequency was confirmed by Siyanova-Chanturia and Spina (2015: 551). However, apart from the usage of corpora, they argued that teachers' intuition may represent a very important factor in estimating collocational frequency. Their stance was corroborated in a comparative study of intuitive judgments of adjective-noun collocation frequency among native speakers and learners of Italian (Siyanova-Chanturia and Spina 2015). In general, their results revealed that L2 learners of advanced proficiency in Italian were equally successful in estimating collocations of high and low frequency as native speakers. These findings suggest that both native speakers and L2 learners are successful in estimating lexical items at the "far ends of the frequency continuum" (Siyanova-Chanturia and Spina 2015: 552). This follows usage-based theories, according to which acquisition of lexical items is determined by frequency of (co-)occurrence in language input (Ellis 2012). Using items of high frequency creates stronger mental representations, so the most problematic items remain those in the middle of the frequency continuum because "they are less salient and less striking than highly frequent or infrequent items" (Siyanova-Chanturia and Spina 2015: 552).

Although large native corpora can be representative sources of collocations, there still remains the question of how reliable frequencies collected by large native corpora can be in the collocational acquisition of L2 learners. It should be taken into account that non-native speakers are mostly exposed to classroom language instructions and that their usage of linguistic structures and patterns differs significantly from that of native speakers, who are immersed in a natural language environment. Due to their limited exposure to language, and especially to collocations, it often occurs that infrequent expressions for NSs are much more frequently used by NNSs and vice versa. For that reason, non-native speakers often underuse or overuse some collocations

that they are familiar with, regardless of frequency in native corpora or in a natural language environment. To address this question and other factors influencing productive knowledge of English collocations sampled from the COCA, including frequency, mutual information (MI) and amount of language study and instruction, González Fernández and Schmitt (2015) tested Spanish speakers of EFL using a productive form recall format. The following findings emerged:

Firstly, corpus frequency has a moderate influence on collocational knowledge, but higher than MI, although it must be noted that "frequency based on general English native speaker corpora may not be the best way of sequencing collocations in instruction, as it may not reflect actual learner exposure very well." (González Fernández and Schmitt 2015: 114)

Secondly, consistent reading, watching English TV/films and using social networking sites are very useful activities for developing collocational competence in EFL.

Thirdly, the amount of language study and instruction moderately influences collocational knowledge.

The importance of choosing which collocations to teach was also pointed out by Hill (2000). Taking into consideration the criterion of collocational strength, Hill (2000: 63–64) differentiates strong, weak, and medium-strength collocations. Strong collocations encompass those collocational constituents that can be replaced with only a limited number of lexical items (e.g., *rancid butter*). Weak collocations are characterized by a somewhat weaker predictability and for that reason sometimes they can easily be confused with free lexical combinations (e.g., *white wine*). The most important collocations, according to Hill (2000: 63–64), are medium-strength collocations, because they are in the middle of the collocation spectrum and because learners usually know individual lexical items but not the collocations made of these frequent words.

Taking into consideration the criterion of restrictedness, Nesselhauf (2003) analyzed verb-noun collocations in essays written by German learners of English. The results showed that learners struggled most with lexical combinations with a medium degree of restrictedness, where the verb takes a wider range of nouns (e.g., *exert influence*, *control*, *pressure*, *authority*, *power*, *attraction* …), which means that these combinations are "more creatively combined by learners" (Nesselhauf 2003: 233). The best-learned combinations were those with a high level of restrictedness (e.g., *pay attention*), because they are "more often acquired and produced as wholes" (Nesselhauf 2003: 233).

It is believed that the development of general vocabulary increases productive and receptive collocational knowledge. This has been confirmed in research on English (Koya 2003; Gitsaki 1999) and Italian as L2 (Bonci 2002). Furthermore, collocational usage can be a clear indicator for differentiation of lower and higher proficiency levels of non-native speakers. Students at

higher ESL proficiency levels use more complex types of collocational structures than students at lower proficiency levels, who mostly rely on frequent collocations consisting of nouns, adjectives, and verbs (Gitsaki 1999). This could be due to exposure to collocations, differences in the first language, the structural and semantic complexity of collocational types but also due to educational context, that is, the exposure to different collocational types in the learning process (Begagić 2104; Gitsaki 1999). Previous research has shown that receptive knowledge of collocations comes before productive, but collocational competence in ESL is generally rather insufficiently developed and neglected (Begagić 2014; Jaén 2007; Martyńska 2004). Additionally, it is evident that choosing examples of collocations appropriate for research based on certain criteria (e.g., frequency, collocational strength, restrictedness) is crucial. When it comes to the most appropriate source of collocations, Jaén (2007) argues for corpora, whereas Siyanova-Chanturia and Spina (2015) emphasize teachers'/native speakers' intuition.

2.3. Collocational Competence in Croatian as a Foreign Language

Research on collocational competence in Croatian as a foreign language (CFL) is still sporadic. The few studies that investigate the phenomenon focus on different types of exercises for developing collocational competence (Petrović 2007), or on different types of collocations in textbooks for CFL beginners (Burić and Lasić 2012), noting that the most frequent collocations in CFL are adjective-noun collocations. A recent detailed study on factors influencing productive knowledge of adjective-noun collocations in CFL was done by Ordulj (2017). It considered the frequency of collocations, their associative strength (strong and weak collocations), morphological features (collocations in the nominative case and morphologically marked collocations in oblique cases), as well proficiency (B1 and B2 CEFR levels). It should be emphasized that the sample structure, comprised of 70 students of B1, B1+, B2, and B2+ proficiency levels, was very heterogeneous regarding gender, language (pre) knowledge, and first language. Based on her results, Ordulj (2017) formulates the following general conclusions:

Firstly, participants at B1 proficiency level show better production of frequent collocations in the nominative than in oblique cases. More precisely, they show very weak knowledge of morphologically marked collocations in oblique cases, regardless of their frequency and associative strength. Therefore, the most important factors influencing the use of collocations among B1 proficiency participants are morphological features and frequency.

Secondly, participants at B2 proficiency level show equal knowledge of noun collocations in the nominative and oblique cases, which means that morphological features do not significantly affect their collocational knowledge. Participants had the best results in tasks with strong collocations of higher

frequency, which corroborates frequency and associative strength as the most important factors for better collocational knowledge among B2 proficiency participants. This is in line with a study of the collocational competence of native speakers of Croatian done by Ordulj and Cvikić (2017).

Thirdly, response-accuracy analysis of tasks with collocations in a wider context for B1 and B2 CFL proficiency levels shows that context does not have a significant influence on collocational usage. Participants at the B2 proficiency level performed better with strong collocations of higher frequency and weak collocations of lower frequency, but surprisingly both B1 and B2 CFL learners knew weak collocations of low frequency better than weak collocations of higher frequency.

For the purpose of this research, it should be mentioned that Polish and Croatian are typologically similar languages, with resemblances reflected on all linguistic levels. Both of these Slavic languages have grammatical person, number, gender, case, aspect, and so on. Despite the similarities between the two languages, Polish-speaking learners of CFL still have difficulties at all levels of language proficiency, as reported by Aleksovski 2014, Kordić and Vidović Bolt 2013, and Podboj 2013. For instance, there are difficulties in acquiring Croatian noun and adjective agreement, since many nouns in Polish have similar or even the same form as their Croatian counterparts, very often with the same meaning but different grammatical gender (Aleksovski 2014). Furthermore, problems relating to meaning and usage of words in typologically related languages are frequent, since their contents are usually only partially the same, and many cases of false friends additionally complicate the issue (see Sokolić and Vidović Bolt 2012 for a more detailed review).

3. Research Problems and Hypotheses

In this study, productive knowledge of Croatian adjective-noun collocations among high and low proficiency level Polish students of CFL is investigated, considering word frequency, associative strength, and morphological features. There are several reasons why the acquisition of collocations in CFL is examined considering the aforementioned factors. Firstly, as can be seen from previously mentioned studies (Siyanova-Chanturia and Spina 2015; Ellis 2012; Jaén 2007; Nation 2001), frequency is one of the most important factors in selecting collocations for research, since it directly affects the usage of lexical units. As Ellis (2002: 144) points out: "Frequency is a key determinant of acquisition because "rules" of language, at all levels of analysis (from phonology, through syntax, to discourse), are structural regularities that emerge from learners' lifetime analysis of the distributional characteristics of the language input". Secondly, collocational strength is a key factor in choosing examples for classroom practice and evaluation, as was noted by Hill (2000). Since previous research on collocational competence of native speakers (Ordulj and

Cvikić 2017) and a heterogeneous group of non-native learners of Croatian (Ordulj 2017) had confirmed that the use of noun collocations is under the influence of frequency and associative strength, it is reasonable to assume that these factors will influence the performance of Polish CFL learners as well. Learning collocations is based on the associative learning of sequences because "objects once experienced together tend to become associated in the imagination" (James 1950: 363) and chunking is the mechanism that supports language reception and production. As Pawley and Syder (1983: 192) point out, "In the store of familiar collocations there are expressions for a wide range of familiar concepts and speech acts, and the speaker is able to retrieve these as wholes or as automatic chains from long-term memory". On the other hand, acquisition of lexical items in CFL is affected by morphological diversity, that is, noun and adjective declension, phonetic assimilation, and morphological homonyms and homographs (Cvikić and Bošnjak 2004). Since previous research has already confirmed that morphological features influence the acquisition of collocations at B1 CFL proficiency level (Ordulj 2017) and that Polish CFL learners can have difficulties in acquiring Croatian noun and adjective agreement (Aleksovski 2014; Kordić and Vidović Bolt 2013), it can be assumed that morphology could be one of the factors influencing the use of noun collocations among Polish CFL learners.

Basing this research on results previously presented by Ordulj (2017) with non-native speakers of CFL and taking into account the aforementioned factors, the main goal of this study was to examine knowledge of noun collocations among Polish CFL learners of higher and lower proficiency levels based on collocational frequency, associative strength, and morphological features.

The following research questions and hypotheses will be addressed:

Q1: Do morphological features influence productive knowledge of noun collocations among participants of lower and higher CFL proficiency levels?

H1a: At the lower proficiency level, morphological features will affect productive knowledge of noun collocations. Participants will perform better on tasks with morphologically unmarked collocations in the nominative case compared to morphologically marked collocations in oblique cases.

H1b: At the higher proficiency level, morphological features will not affect productive knowledge of noun collocations. Participants will perform equally well on tasks with collocations in the nominative and oblique cases.

Q2:   Do frequency and associative strength influence productive knowledge of noun collocations among participants of lower and higher CFL proficiency levels?

H2:   Participants with higher CFL proficiency level will have more correct answers than participants with lower CFL proficiency level. Furthermore, at the lower proficiency level, frequency of collocations will be crucial, causing lower proficiency participants to have more answers that are correct in tasks with high rather than low frequency, whereas the associative strength will not make a significant difference. On the other hand, at the higher proficiency level, frequency and associative strength will affect collocational knowledge, with participants with higher proficiency excelling in tasks with collocations of high frequency and strong associative strength, compared to collocations of high frequency and weak associative strength, and low frequency and strong/weak associative strength.

Q3:   Do frequency and associative strength influence knowledge of noun collocations in the wider context taking into account CFL proficiency levels?

H3:   Participants with higher proficiency will have more correct answers than participants of lower proficiency. The frequency and associative strength of collocational constituents will have an effect on productive knowledge of collocations at both proficiency levels. Participants will perform better on tasks with collocations of high frequency and strong associative strength, compared to all other types of collocations. Still, answer accuracy will be higher for collocations of lower frequency and weak associative strength compared to collocations of higher frequency and weak associative strength.

4. Methodology

4.1. Participants

Participants in this study were university students of Croatian in Krakow, Poland. The sample consisted of 27 learners (10 male and 17 female participants) with an average age of 23 years (SD = 1.68). Their years of study were distributed as follows: five students were in the second year (A2 level), nine students were in the third year (B1 level), five students were in the fourth year (B2 level), and eight students were in the fifth year (C1 level) of their studies. It should be emphasized that their first language is Polish, which means that the

sample was homogeneous in that aspect. Since the sample was rather small, for the purposes of testing the hypotheses it was divided into two proficiency level groups: lower (2nd and 3rd year) and higher (4th and 5th year).

4.2. Materials: Criteria for Collecting and Selecting Collocations in the Present Study

As already mentioned, adjective-noun collocations chosen as testing items were selected according to the following criteria: semantic and formal features, frequency, and associative strength. The reasons for selecting collocations according to these criteria are described in section 3. Semantic and formal features for defining collocations in Croatian according to Blagus Bartolec (2014) are described in section 2.1. The division into base (noun) and collocator (adjective) allowed for a further corpus analysis of selected collocations.

Collocations were collected from 300 essays on different topics written by learners of CFL at B1 and B2 proficiency levels. Studying collocations and collocational competence in Croatian is still rather difficult because there is no collocational dictionary for either native or nonnative speakers and because other sources of collocations are limited. The first Learner Corpus of Croatian as a Second and Foreign Language—CROLTEC (Mikelić Preradović, Berać and Boras 2015), the only source of collocations for NNSs, has been available only since November 2017. So collocations can only be verified in corpora for Croatian as L1, which contain information about their frequency. For that reason collected collocations were verified in the *Veliki rječnik hrvatskoga jezika* (Anić 2003) and the hrWaC corpus (Ljubešić and Erjavec 2011), which is currently the largest Croatian language corpus, comprising 1.9 billion tokens. A total of 228 collocations were collected, of diverse frequency and associative strength and representing a range of grammatically and semantically possible collocations. Of these, 30 adjective-noun collocations were randomly chosen for the study. In this research, collocations in the hrWaC corpus were searched using CQL (Corpus Query Language) queries. Collocations were searched using the attribute 'word', so a CQL query for the collocation *osnovna škola* 'elementary school' looks like this:

[word="osnovn.*" & tag="A.*"] [word="škol.*" & tag="N.*"]

This query shows that the attribute value consists of "osnovna" and "škola" and that additional markers are used in order to make the query more precise. The equals sign (=) is used to add value to the attribute. The mark "tag" refers to a specific part of speech that is searched. Since this research focuses on adjective-noun collocations, A refers to adjectives and N refers to nouns. The wildcard (.*) represents different forms of search words, that is, encompasses adjectives' grammatical gender, number, and case, and nouns'

type, gender, number, and case. Finally, in order to point to two attribute values that are searched, the ampersand symbol (&) is used.[1]

Using computational linguistic tools in the hrWaC corpus, the frequency of collected adjective-noun collocations was calculated. It should be mentioned that CQL queries for each collocation did not contain case endings that would indicate the frequency of a specific case form; therefore wildcard (.*) was used to include all case forms of each collocation. Research has shown that some case forms appear more often than others in CFL; that is, a large percentage of nouns and adjectives does not appear equally in all cases (Cvikić and Jelaska 2003). For example, in traditional Croatian grammars, dative is listed in third and accusative in fourth place. However, relevant CFL research shows (Cvikić and Jelaska 2003; Cvikić and Jelaska 2007) that in terms of frequency accusative is one of the most important cases, whereas dative is significantly rare. So the order of teaching cases in CFL should be adapted accordingly. Because of that, frequency of collocations was determined regardless of the case form, rather than limiting it to specific case forms. The highest frequency in a row was considered as most relevant. For example, the most frequent form of the collocation *osnovna škola* was its genitive form *osnovne škole* with 32,168 occurrences. The frequency range of the 30 target collocations was set as follows: higher frequency (HF) from 1,222 to 43,106 occurrences and lower frequency (LF) from 15 to 953 occurrences in the hrWac corpus (Appendix 1).

Collocational strength was determined by using the associative connectedness assessment method, where participants assess the range of connection between the association and the collocational constituents (Maki 2007; Barrett and Fossum 2001). Finally, the associative strength of collocational constituents was assessed by 188 native speakers of Croatian, who estimated the strength of association between collocational constituents on a scale from 1 to 5. After this assessment, descriptive data (M, SD) that represent the average associative strength were calculated for each collocation. The average mean value (M) for the 30 target collocations was 3.56, so collocations were divided into two groups: all collocations with mean value (M) above 3.56 were collocations with strong associative strength (SAS), whereas the rest of the collocations with mean value (M) under 3.56 were labeled as collocations with weak associative strength (WAS). The associative strength range of the 30 target collocations was: strong associative strength with mean value (M) from 4 to 3.61 and weak associative strength with mean value (M) from 2.61 to 3.5 (Appendix 1).

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[1] More detailed instructions on the use and purpose of CQL queries can be seen on the web page of Sketch Engine at https://www.sketchengine.co.uk/corpus-querying/ (Accessed Zagreb, 17 March 2017).

4.3. Tasks

The test consisted of three fill-in-the-blank tasks. In every task, a collocational base was given (a noun) and participants were asked to demonstrate their productive knowledge of the collocator (adjective). Before testing, two native speakers of Croatian who are also experts in CFL teaching were asked to review all three fill-in-the-blank tasks.

The first two of the three tasks were designed to examine the influence of morphological features. There were 40 isolated sentences without a wider context. In the first task, collocations were in the unmarked and independent nominative case, which means that the noun, as well as the adjective, was in the nominative case (example 1).

(1) Najnovije je istraživanje potvrdilo da su skup automobil, dizajnerski sat i vikendica najvažniji **statusni** simboli koji se koriste za javno pokazivanje moći i ugleda.

Recent research has confirmed that an expensive car, a designer watch, and a summer house are the most important **status** symbols used to publicly demonstrate power and reputation.

In the second task the same collocations from the task with collocations in the nominative case were given in oblique (or dependent) cases, which means that if the noun was in the instrumental case, so was the adjective (example 2). In other words, in the Croatian language adjectives agree with the noun they modify in case (nominative is the independent case and genitive, dative, accusative, locative, and instrumental case are oblique cases), gender (masculine, feminine, neuter), and grammatical number (singular or plural). Since this is one of the first studies of collocations in CFL, no exceptions to grammatical agreement between nouns and adjectives were included.

(2) Najnovije je istraživanje potvrdilo da su skup automobil, dizajnerski sat i vikendica među najvažnijim **statusnim** simbolima koji se koriste za javno pokazivanje moći i ugleda.

Recent research has confirmed that an expensive car, a designer watch, and a summer house are considered as the most important **status** symbols used to publicly demonstrate power and reputation.

The distribution of collocations from the tasks with collocations in the nominative case and oblique cases is given in Table 1 on the following page.

In the third part of the test, in order to examine the influence of wider context, frequency, and associative strength, participants were given a fill-in-the-blank task in which collocations were put into a more informative, wider

Table 1. Distribution of adjective-noun collocations according
to frequency and associative strength in the tasks with
collocations in the nominative case and oblique cases

**Fill-in-the-blank tasks
(nominative and oblique cases)**

HIGHER FREQUENCY + STRONG ASSOCIATIVE STRENGTH	LOWER FREQUENCY + STRONG ASSOCIATIVE STRENGTH
1. ljudska prava 'human rights'	1. sinkronizirano plivanje 'synchronized swimming'
2. društvena mreža 'social network'	2. samohrani roditelj 'single parent'
3. kulturna baština 'cultural heritage'	3. organska hrana 'organic food'
4. kreditna kartica 'credit card'	4. masovna proizvodnja 'mass production'
5. farmaceutska industrija 'pharmaceucital industry'	5. akcijski film 'action movie'
HIGHER FREQUENCY + WEAK ASSOCIATIVE STRENGTH	LOWER FREQUENCY + WEAK ASSOCIATIVE STRENGTH
1. službeni jezik 'official language'	1. statusni simbol 'status symbol'
2. zdravstvena zaštita 'medical insurance'	2. umjetničko klizanje 'figure skating'
3. sportske novine 'sport newspapers'	3. ručna torba 'hand bag'
4. nevladina organizacija 'non-governmental organization'	4. virtualni prijatelj 'virtual friend'
5. osobni podatak 'personal data'	5. stereotipna uloga 'stereotypical role'

context. For that reason, a topic about food and dietary habits among Croatians was chosen to compile a short text with adjective-noun collocations. All 20 collocations (base + collocator) in the wider context were in oblique cases. The task with collocations in the wider context includes 10 of the same collocators as do the tasks with collocations in the nominative case and oblique

cases (*ljudska prava, društvena mreža, farmaceutska industrija, samohrani roditelj, organska hrana, masovna proizvodnja, zdravstvena zaštita, nevladina organizacija, statusni simbol, virtualni prijatelj*). The other 10 collocations were new and included only in the task with collocations in the wider context (*prehrambene navike, plava riba, životni standard, smrtonosna bolest, ruralno područje, bijelo brašno, klimatski uvjeti, turistički centar, kupovna moć i kućni budžet*) (see Table 2).

Table 2. Distribution of adjective-noun collocations according to frequency and associative strength in the task with collocations in the wider context

Fill-in-the-blank tasks with wider context

HIGHER FREQUENCY + STRONG ASSOCIATIVE STRENGTH	LOWER FREQUENCY + STRONG ASSOCIATIVE STRENGTH
1. ljudska prava 'human rights'	1. plava riba 'pelagic fish'
2. društvena mreža 'social network'	2. samohrani roditelj 'single parent'
3. prehrambene navike 'dietary habits'	3. organska hrana 'organic food'
4. životni standard 'standard of living'	4. masovna proizvodnja 'mass production'
5. farmaceutska industrija 'pharmaceutical industry'	5. smrtonosna bolest 'deadly disease'

HIGHER FREQUENCY + WEAK ASSOCIATIVE STRENGTH	LOWER FREQUENCY + WEAK ASSOCIATIVE STRENGTH
1. ruralno područje 'rural area'	1. statusni simbol 'status symbol'
2. zdravstvena zaštita 'medical insurance'	2. bijelo brašno 'white flour'
3. klimatski uvjeti 'climate conditions'	3. turistički centar 'tourist center'
4. nevladina organizacija 'non-governmental organization'	4. virtualni prijatelj 'virtual friend'
5. kupovna moć 'purchasing power'	5. kućni budžet 'household budget'

4.4. Procedure

The study was conducted in February 2016 in Krakow, Poland. In order to investigate the influence of morphological features, the tasks with collocations in the nominative case and oblique cases had the same adjective-noun collocations, and for that reason the participants were divided into two groups. The first group was asked to complete the tasks with collocations in the nominative and the task with collocations in a wider context, and the second group was asked to complete the tasks with collocations in the oblique cases and also the task with collocations in a wider context. Each task was presented separately and the order of tasks, as well as of collocations in the tasks was varied. Participation in this research was voluntary. The participants used a password and were not asked to reveal their personal identity or to provide contact information to the researchers. The coding of the collected data was done by the authors. Only adjective-noun collocations from Table 1 and Table 2 were accepted as correct answers, while all other possible answers were grouped into different types of answers. Namely, incorrect answers were grouped into three categories (lexical, grammatical, and overlapping answers), which were then divided into different types or deviations (e.g., wrong case of the adjective, wrong part of speech, approximation …), but the qualitative analyses of these answers is not the focus of this study. Since the emphasis of the study is on factors (morphological features, frequency, and associative strength) that influence collocational usage among Polish speakers of CFL, only the quantitative results are presented below.

5. Results

5.1. Answer Accuracy Analysis of Tasks with Collocations in the Nominative Case and Oblique Cases for Lower and Higher CFL Proficiency Level

In order to examine the influence of morphological features on productive knowledge of noun collocations in the nominative and oblique cases, descriptive data on the answer accuracy proportions were calculated for lower and higher proficiency participants (Table 3 on the following page). Due to rather small samples, the table shows medians (Mdn) and semi-interquartile ranges (Q).

Two nonparametric Mann-Whitney U tests, which are used for examining differences between independent groups, were performed in order to examine the differences in answer accuracy in productive tasks with isolated sentences with morphologically unmarked collocations in the nominative case and morphologically marked collocations in oblique cases for higher

Table 3. Descriptive data on answer accuracy
proportions in productive tasks with isolated sentences
with morphologically unmarked collocations in the
nominative case and collocations in oblique cases among
participants of lower and higher CFL proficiency level

			Median	Semi-interquartile ranges
Lower CFL proficiency	Nominative	(N = 8)	.25	.08
	Oblique cases	(N = 6)	.18	.08
Higher CFL proficiency	Nominative	(N = 6)	.45	.10
	Oblique cases	(N = 7)	.50	.005

and lower proficiency participants. The Mann-Whitney U test confirmed that there is no difference in answer accuracy between participants who solved the productive tasks with isolated sentences with morphologically unmarked collocations in the nominative case and those who solved the tasks with morphologically marked collocations in oblique cases, neither among lower proficiency participants ($z = .71$, $p = .477$) nor among higher proficiency participants ($z = -.50$, $p = .617$).

Since it was confirmed that answer accuracy among participants considering their proficiency level (lower, higher) is equal for tasks with collocations in the nominative case and oblique cases, in the following step of the analysis the data were grouped exclusively based on participants' CFL proficiency (lower level N = 14, higher level N = 13). The answer-accuracy proportions were calculated for each participant for four types of collocations in tasks with collocations in the nominative and oblique cases, considering their frequency and associative strength, as follows:

(i)   collocations of higher frequency and strong associative strength

(ii)   collocations of higher frequency and weak associative strength

(iii)   collocations of lower frequency and strong associative strength

(iv)   collocations of lower frequency and weak associative strength.

In order to examine the influence of frequency and associative strength on productive knowledge of noun collocations, a 2 × 2 × 2 ANOVA with collocational frequency (lower, higher) and associative strength (strong, weak) as within-participant factors and with CFL proficiency level (lower, higher) as

a between-participants factor was performed. The obtained results are presented in Table 4 below.

Table 4. Results of the 2 × 2 × 2 ANOVA with collocational frequency (lower, higher) and associative strength (strong, weak) as within-participant factors and with CFL proficiency level (lower, higher) as a between-participants factor for answer accuracy

Source of variation	df	F	MSE	p
CFL proficiency level	1.25	39.414	.056	.001
Frequency	1.25	106.703	.031	.0001
Associative strength	1.25	3.345	.026	.079
CFL proficiency level * frequency	1.25	9.786	.031	.004
CFL proficiency level * Associative strength	1.25	.820	.026	.374
Frequency * Associative strength	1.25	1.836	.018	.188
CFL proficiency level * Frequency * Associative strength	1.25	3.630	.018	.068

The main effects of CFL proficiency levels and frequency on answer accuracy were found. Furthermore, the two-way interaction of CFL proficiency level and collocational frequency on answer accuracy was found to be significant. Duncan's post hoc test showed that among higher CFL proficiency participants the answer accuracy for collocations of higher frequency is higher (M = .72; SE = .07) than for collocations of lower frequency (M = .26; SE = .03; p < .001). Among lower CFL proficiency participants, answer accuracy is on average significantly lower (p < .01) than among higher CFL proficiency participants. However, a pattern in the results was noticed: answer accuracy was higher for collocations of higher frequency (M = .32; SE = .07) than for collocations of lower frequency (M = .07; SE = .03; p < .001). These results are presented in Figure 1 on the following page.

5.2. Answer Accuracy Analysis of Tasks with Collocations in a Wider Context for Lower and Higher CFL Proficiency Level

In the next stage of the analysis, answer accuracy in the productive task with collocations in a wider context among participants of lower (N = 14) and higher (N = 13) CFL proficiency level was examined.

In order to investigate answer accuracy in the productive task with collocations in a wider context, a 2 × 2 × 2 ANOVA with collocational frequency
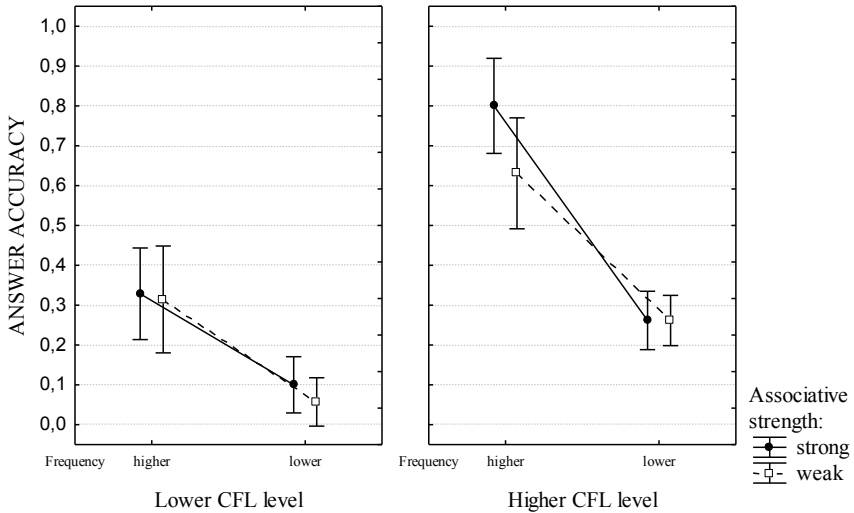
Figure 1. Answer accuracy in productive tasks with isolated sentences considering frequency (higher, lower) and associative strength (weak, strong) of collocational constituent among participants of lower and higher CFL proficiency.

(lower, higher) and associative strength (strong, weak) as within-participant factors and with CFL proficiency level (lower, higher) as a between-participants factor was performed. The results are shown in Table 5.

Table 5. Results of the 2 × 2 × 2 ANOVA with collocational frequency (lower, higher) and associative strength (strong, weak) as within-participant factors and with CFL proficiency level (lower, higher) as a between-participants factor for answer accuracy.

Source of variation	df	F	MSE	p
CFL proficiency level	1.25	23.404	.055	.001
Frequency	1.25	39.419	.035	.001
Associative strength	1.25	20.478	.017	.001
CFL proficiency level * Frequency	1.25	1.328	.035	.260
CFL proficiency level * Associative strength	1.25	.001	.017	.983
Frequency * Associative strength	1.25	106.607	.024	.0001
CFL proficiency level * Frequency * Associative strength	1.25	3.035	.024	.094

The main effect of CFL frequency level on answer accuracy was found. Answer accuracy was on average higher among higher CFL proficiency participants (*M* = .40; *SE* = .03) than among lower CFL proficiency participants (*M* = .18; *SE* = .03; *p* < .001). Furthermore, the effects of frequency and associative strength as well as the two-way interaction of frequency and associative strength on answer accuracy were found to be significant. Duncan's post hoc test confirmed that answer accuracy was the highest for collocations of higher frequency and strong associative strength (*M* = .61; *SE* = .05) compared to all other types of collocations (collocations of higher frequency and weak associative strength (*M* = .19; *SE* = .03; *p* < .001), collocations of lower frequency and strong associative strength, (*M* = .07; *SE* = .02; *p* < .001), collocations of lower frequency and weak associative strength (*M* = .27; *SE* = .03; *p* < .001). It can be noted that answer accuracy was unexpectedly higher for collocations of lower frequency and weak associative strength, compared to collocations of higher frequency and weak associative strength (p < .05), and lower frequency and strong associative strength (p < .001). These results are presented in Figure 2.
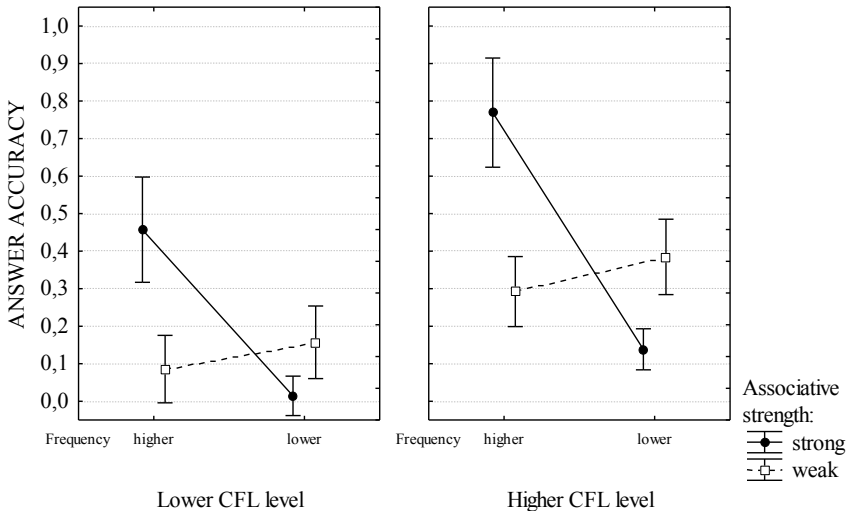

Figure 2. Answer accuracy in productive tasks with collocations in a wider context considering their frequency (higher, lower) and associative strength of collocational constituents (weak, strong) among respondents of lower and higher CFL proficiency level.

5.3. Discussion

In this study, productive knowledge of Croatian adjective-noun collocations among Polish students of Croatian was investigated, considering word frequency, associative strength, morphological features, and CFL proficiency level.

In order to investigate the influence of morphological features on productive knowledge of noun collocations among participants of lower and higher CFL proficiency, calculations of the differences in answer accuracy proportions were made. Hypothesis H1a, predicting that participants of lower CFL proficiency level would have better results in tasks with collocations in the nominative case, was not confirmed, while hypothesis H1b, for higher CFL proficiency, was confirmed. In other words, this analysis showed that participants at both proficiency levels know collocations in the nominative and oblique cases equally well. Even though Polish students of CFL can have difficulties with noun-adjective agreement (Aleksovski 2014; Kordić and Vidović Bolt 2013), it can be concluded that morphological features of lexical units do not affect collocational usage and that Polish CFL students had adequately acquired basic Croatian noun and adjectival declensions for adjective-noun collocations used in this research. The results mentioned for Polish students with higher CFL proficiency level further confirm prior research on collocations in heterogeneous groups, which suggested that the knowledge of collocations in the nominative and oblique cases is equal only at B2 proficiency level (Ordulj 2017). This is also in line with a study on collocational competence of native speakers of Croatian done by Ordulj and Cvikić (2017). On the other hand, morphological features seem to be a crucial factor in collocational usage among heterogeneous CFL learner groups of lower proficiency (Ordulj 2017), which stands in contrast to findings about Polish CFL students of lower proficiency level.

Apart from morphological features, in this research on productive collocational knowledge it was important to examine the influence of the frequency and associative strength of collocations on the usage of noun collocations among Polish CFL students of lower and higher proficiency levels. The analysis showed that hypothesis H2 is partially confirmed. Namely, higher-proficiency participants on average demonstrated higher answer accuracy compared to lower proficiency participants, but it can be observed that only frequency affected collocational usage in both groups. In fact, a pattern can be observed: There is higher answer accuracy for collocations of higher frequency, compared to collocations of lower frequency. These findings confirm that frequency of lexical co-occurrence in the linguistic input plays an important role in collocational acquisition among Polish CFL students for productive knowledge on both higher and lower proficiency levels. Since high-frequency collocations create stronger mental representations in the mental lexicon of

non-native speakers than low-frequency collocations do, these findings are in line with prior research (Siyanova-Chanturia and Spina 2015), including on the role of frequency in language acquisition (Ellis 2002, 2012; Jaén 2007; Nation 2001). Associative strength (i.e., the predictability of collocational constituents) did not appear to be significant in this study, even though it was found to be an important factor in collocational usage of B2 CFL learners with different first languages (Ordulj 2017).

Finally, one goal of this research was to investigate the influence of frequency and associative strength on productive knowledge of noun collocations in a wider context among lower and higher proficiency respondents. Hypothesis H3 is confirmed. In other words, higher proficiency participants demonstrate higher accuracy than lower proficiency participants. When it comes to answer types, regardless of the proficiency level, answer accuracy was highest for collocations of high frequency and strong associative strength, which are more frequent in non-native usage and are furthermore characterized by stronger predictability of collocational constituents which can be produced as wholes or sequences associated in the mental lexicon of the speaker (Nesselhauf 2003; Pawley and Syder 1983; James 1950). However, the analysis unexpectedly showed that Polish students of CFL have better knowledge of collocations with lower frequency and weak associative strength than of collocations of higher frequency and weak associative strength, which was also confirmed for heterogeneous learner groups (Ordulj 2017). As Blagus Bartolec (2014) points out, collocations are lexical units with a highly emphasized communicative function, and development of collocational competence is influenced by various factors. It is reasonable to assume, following González Fernández and Schmitt (2015: 114), that "L2 learners might better know those collocations which are likely to be encountered in daily situations, and therefore to have a more useful communicative function, compared to collocations whose function is more restricted to specific contexts". So a possible cause of the domination of collocations with lower frequency and weak associative strength among Polish learners of CFL could be exposure, that is, repeated usage of these collocations in everyday life through the personal interests of the participants (social networks, traveling, food, etc.) or the influence of L1. Since corpus frequency relates to acquisition of collocations only moderately, as was indicated by González Fernández and Schmitt (2015), it would be worth investigating and comparing corpus frequency as indicated by hrWaC with intuitive frequency assessment by NSs and NNSs of Croatian, which could deepen the insights of this research. However, in order to get more precise answers, further research on the influence of context and frequency on collocational usage in CFL is needed.

Since the main goal of the present study was to investigate factors influencing the productive knowledge of adjective-noun collocations among Polish

CFL students, a qualitative analysis of collocational errors will not be presented in this paper.

6. Conclusion

Based on the analysis conducted, the following conclusions can be drawn about factors influencing productive collocational knowledge among Polish students of CFL.

Firstly, participants at both proficiency levels demonstrate that morphological features of lexical units do not influence production of collocations in CFL.

Secondly, frequency is a factor that influences production of collocations at both CFL proficiency levels, whereas associative strength does not appear to be significant.

Thirdly, production of collocations in a wider context among participants at both CFL proficiency levels is influenced by both frequency and associative strength, whereas the influence of context falls for further research.

In general, it can be concluded that the acquisition of adjective-noun collocations among Polish students of CFL is satisfactory. However, answers to research problems and hypotheses examined in this study were not unambiguous, marking it as just a beginning of research on collocational competence among Polish students of CFL. It should be mentioned that there are some limitations to this research method that should be taken into account. First of all, it was conducted on a rather small number of participants; therefore the results should not be generalized. Furthermore, in order to get better insight into the overall acquisition of collocations in CFL, additional research with different collocational types is required, which would encompass both heterogeneous and homogeneous CFL learner groups.

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Appendix 1. List of Target Collocations With Frequency and Associative Strength Information

Collocation	M	SD	Frequency
ljudsko pravo	4	1.05	43.106
zdravstvena zaštita	3.5	1.14	16.895
osobni podatak	3.48	1.15	16.619
kulturna baština	4.39	0.81	14.524
društvena mreža	4.24	0.95	11.696
nevladina organizacija	3.14	1.27	4.521
kreditna kartica	4.57	0.72	4.258
prehrambena navika	3.67	1.12	3.048
životni standard	3.93	1.04	2.769
ruralno područje	3.46	1.11	2.078
službeni jezik	3.32	1.16	1.887
sportske novine	3.47	1.08	1.455
farmaceutska industrija	3.98	1.02	1.446
kupovna moć	3.07	1.23	1.341
klimatski uvjet	3.13	1.17	1.222
statusni simbol	2.69	1.27	953
akcijski film	3.82	1.03	940
kućni budžet	3.39	1.2	836
samohrani roditelj	4.15	0.96	806
masovna proizvodnja	3.9	0.98	664
smrtonosna bolest	4.06	0.99	501
bijelo brašno	3.44	1.31	486
organska hrana	3.61	1.17	446
ručna torba	3.04	1.22	426
plava riba	3.68	1.37	423
umjetničko klizanje	3.47	1.24	364
turistički centar	3.26	1.15	333
sinkronizirano plivanje	3.76	1.23	249
virtualni prijatelj	2.86	1.24	183
stereotipna uloga	2.61	1.14	15