

DOI: 10.51728/ZRIPF202501008T

Izvorni naučni rad

Original scientific paper

Primljeno 18.06.2025.

Van. prof. dr. Aida Tarabar
Mašinski fakultet Univerziteta u Zenici
aida.tarabar@unze.ba

Đelaludina Šukalić, MA
Filozofski fakultet Univerziteta u Zenici
djelaludina.sukalic@unze.ba

A RESEARCH INTO RELATIVE CLAUSES IN ENGINEERING TEXTS

Abstract

As relative clauses may pose challenges to non-native speakers of English due to their various forms and functions, the paper investigates the differences and similarities in the use of relative clauses in the engineering texts between English and Bosnian/Croatian/Serbian (B/C/S). The contrastive analysis of texts in the target languages was done on a corpus compiled from two issues of the bilingual journal of mechanical engineering - Mašinstvo. The frequency counts of relative clause were identified and the clauses were classified based on their restrictiveness, relativizers, and, in the English subcorpus, their form. The findings indicate that restrictive clauses dominate both subcorpora, while the choice of relativizers remains similar. However, translation reveals interesting differences such as the use of reduced relative clauses in English to represent various B/C/S expressions. Thus, the research yields pedagogically significant insights for ESP instruction, given the limited contrastive analysis of relative clauses in the field.

Keywords: relative clauses, engineering, contrastive analysis, pedagogical purposes.

INTRODUCTION

Reading, writing and translating engineering texts written in English has become an important part of an engineer's workload in many companies worldwide, including Bosnia and Herzegovina. This also refers to students and professors at engineering universities which try their best to be more visible and recognized within so called Higher Education Area, particularly in their attempts to publish papers in internationally recognized, indexed journals. It is a well-known fact that some of them feel disadvantaged either for not having specialized training in engineering English, or for not being in a situation to study at least a semester in English speaking country.

English for specific purposes (ESP) is a subject that is being taught at only a few faculties in Bosnia and Herzegovina. Some of them are engineering faculties at the University of Zenica which introduced ESP as a subject long time ago, and in that respect made a significant progress to the point that their students attended not only ESP but also CLIL (Content and Language Integrated Learning) classes. CLIL was practiced in some pilot projects at the Faculty of Mechanical Engineering and Faculty of Metallurgy (in the meantime it has changed the name to the Faculty of Engineering and Natural Sciences). The aforementioned praxis in teaching English at these faculties resulted in three students' conferences where students produced papers based on their interests and small scale research. In order to make both types of teaching English for engineering purposes even more successful, the investigation was made into the phenomena of relative clauses which, indeed, pervade engineering texts. Due to many structural and functional differences, relative clauses are often considered one of the most difficult areas of English, for non-native speakers to master, and, for that reason, some of the differences have become the focus of this paper.

THEORETICAL BACKGROUND

Contrastive Analysis

Contrastive analysis in linguistics is a way of contrasting different languages, that results in establishing the various

differences and similarities between those languages. Filipović (1980) defines contrastive analysis more precisely as a systematic contrast of linguistic features of two or more languages and such contrasting results in practical applications in the area of foreign language teaching, for example through the class material preparation. Tomić (1980) also considers that the usual goal of contrastive analysis is “to determine the interference between two or more languages so that the appropriate teaching materials can be made and the appropriate teaching methods can be developed” (p. 49).

Bugarski (1986) confirms that the very beginning of the contrastive analysis was indeed rooted “in a significantly pedagogical context with the motivation of ascertaining the difficulties and errors in the process of learning one of the contrasted languages by the speakers of the other language” (p. 383). However, Bugarski (1986) also defines contrastive analysis as “a larger concept” (p. 384). Therefore, even though the onset of contrastive analysis was tightly connected to its didactic and methodical applications, it subsequently got its application in other fields such as translation and lexicography (Tomić, 1986, p. 18) as well as the typological and general linguistic language studies (Bugarski, 1986, p. 383).

There are three main periods in the general historical development of contrastive studies: traditional, classical, and modern (Đorđević, 1987, p. 13). While the traditional period started by emphasizing the importance of language contrasting and the recognition of similarities and differences between different languages, it was in the classical period that contrastive studies were accepted as a serious scientific discipline whose results were used in the foreign language teaching, translation studies and other areas of applied linguistics (Đorđević, 1987). After that, the modern period of contrastive studies began and it was characterized by modern approaches and international projects (Đorđević, 1987, p. 18). In line with the aforementioned periods in general development of contrastive research, Filipović (1980, p. 25) describes two examples of complementary contrastive projects: The Yugoslav Serbo-Croatian - English Contrastive Project (YSCEC) and Zagreb English Serbo-Croatian Contrastive Project (ZESCCP). As Filipović (1980, p. 27) emphasizes, the projects’

resulting contrastive grammar is a comprehensive instructional grammar and not theoretical contrastive grammar nor pedagogically applied contrastive grammar.

Linguistic contrast itself can be defined, within contrastive analysis, in terms of the resulting similarities and differences between different languages. Mihailović (1980, p. 11) defines it as equivalence and non-equivalence between the two languages in terms of their matching and nonmatching linguistic units or mutual relations between the same linguistic units. Mihailović (1980, p. 11) also stresses that contrast depends primarily upon two things and those are: nature and type of linguistic means, and the analytical descriptive model that the investigator uses for contrasting. Thus, for example, a distributed language model allows contrasting on five different levels: phonetic, phonological, morphological, grammatical and semantic (Mihailović, 1980, pp. 11-12). Similar understanding of the term contrast and its analysis on different levels within contrastive linguistics was supported by Bugarski (1986, pp. 384-385).

Moreover, from the methodological standpoint, there are different methods and techniques as well as principles of contrastive research studies, and they are usually tied to the three areas of contrastive research: contrastive analysis, translation theory, and error analysis. It is important to mention that error analysis is treated under the umbrella of contrastive analysis by some linguists while others treat it separately (Klajn, 1986, p. 53).

In the context of contrastive analysis, various methodological approaches can be considered. Thus, Mihailović (1983) offers a potential classification system that results in six approaches: global, partial, systematic, sectional, two directional and one directional. As Mihailović (1983) explains it, under a global approach, comparison of every concept or element of one language with the elements and concepts of the other language is done with a goal of determining the differences and similarities between the mentioned languages. This global approach, along with the systematic and two directional one, falls under the wider contrastive research compared to the partial, sectional, and one directional approaches which are considered to be more narrow contrastive research examples. Partial approach, as the name itself suggests, is limited to only some linguistic parts and levels (Mihailović, 1983, p. 2) but not all

linguistic elements. Systematic approach focuses on the linguistic elements that obligatorily belong to a certain corresponding level or a subsystem, whereas sectional approach explores elements from different levels or subsystems and the choice itself depends on various extra linguistic or intralinguistic information (Mihailović, 1983, p. 2). In a one directional contrastive approach, the focus is on a practical language and the process of determining differences or similarities in comparison to another language, while in the two directional contrastive approach, both languages complement each other (Mihailović, 1983, p. 2).

Apart from the aforementioned methodological approaches, there are also various techniques of contrastive analysis. Mihailović (1983) makes a distinction between four techniques of contrastive analysis. The first proposed technique, the technique of individual assessment, is a subjective method based upon the graders' knowledge unlike the second technique of group test which is based upon completely or predominantly matching respondents' results (Mihailović, 1983, p. 3). The third technique, the technique of using the translational equivalence, is also objective but the choice of the number of translations, as well as the translational and linguistic examples of the same type, influences the reliability of the results. In contrast, the final, fourth technique is more reliable and this is the technique of corpus use as it makes it possible to combine systematic and sectional approaches to contrastive analysis (Mihailović, 1983). Riđanović (1980, p. 16) also mentions subjectivity as a potential problem and, as a solution, suggests contrasting everything that is even remotely similar between the mother tongue and the foreign language which results in the contrastive grammar of the two contrasted languages and makes such analysis a theoretical contrastive analysis. The results of such analysis can find their practical application in many situations, ranging from making teaching materials to solving sociolinguistic and psycholinguistic problems related to languages in contrast (Riđanović, 1980, p. 16). To exemplify, Čulić (1986, p. 327) considers that the results of contrastive analysis can be used within the translation method in foreign language teaching, particularly of English for Specific Purposes (ESP). While Imamović (2017) acknowledges the importance of contrastive analysis in language teaching and translation studies, she also emphasizes that "not all

contrastive studies are pedagogically motivated" (p. 15), shifting the focus toward theoretical contrastive analysis. Within the framework of theoretical contrastive analysis, Riđanović (1980, pp. 16-17) mentions three approaches: comparing the description of a language A on the basis of a specific linguistic model with the description of a language B within the same model, using elements from different models, and using a representative corpus of a model A and its translational equivalent in a language B. It is the third approach of corpus use that is identified as the most suitable one by Riđanović (1980).

Relative Clauses

Relative clauses are one of the types of subordinate clauses. They are called and treated as relative as they contain a covert or overt anaphoric element within their structure and the element's interpretation is influenced by its antecedent, to which, in turn, the relative clauses relate through their form, i.e. they grammatically depend on the said antecedent (Huddleston & Pullum, 2012; Kordić, 1995). Huddleston and Pullum (2012) mention twofold classification, that is, classification in terms of formal types and relational types. The formal types are determined based on the absence or presence of the relative words (such as *who*, *which*, *that*, etc.). Thus, based on the formal types there are *wh relatives* and *non wh relatives* (*that relatives* and *bare relatives*) (Huddleston & Pullum, 2012, p. 1034).

The relational types of relative clauses are determined on the basis of their function and relation to the constructions within which they can be found. The main two types are: integrated (also known as restrictive) and supplementary (also known as non-restrictive) relative clauses. Huddleston and Pullum (2012, p. 1033) also mention cleft and fused relative clauses. They define cleft relative clause as "the clause that occurs after the foregrounded element in an it-cleft construction" (Huddleston & Pullum, 2012, p. 1035) and the fused relative constructions as *wh* types that do not allow "the separation of a relative clause from its antecedent" (Huddleston & Pullum, 2012, pp. 1035-1036). Integrated, restrictive, defining clauses are used without commas as opposed to the supplementary, non-restrictive, non-defining clauses which

“generally serve as ‘parenthetical comments’ or ‘afterthoughts’” (Radford, 2009, p. 226). The choice of relative pronouns is influenced by the antecedent so it is possible to use *that* and *who* for people, and *which* and *that* for things. However, in non-restrictive sentences only *who* and *which* can be used. Depending on whether we are dealing with the subject or object of the clause, it is possible to use *who* (subject) or *whom* (object) for human antecedents.

Nonetheless, it is important to mention reduced relative clauses as well. According to Quirk and Greenbaum (1973, p. 252) post modifying clauses or phrases (post modifying participle clauses, post modifying adjective phrases, post modifying prepositional phrases) can frequently be considered as reduced relative clauses. In this sense, focusing on the post modifying participle clauses, there are two types of such relative clauses: *ing relative* and *ed relative*. For the -ing relative clauses, their function is that of a post nominal modifier and both restrictive and non-restrictive finite relative clauses can be reduced using -ing non-finite relative clauses. Ed-relative clauses are reduced forms of restrictive or non-restrictive relative clauses whose relative pronoun functions as a subject and their meaning is essentially passive.

As the research is contrasting relative clauses in two languages, it has to be noted that most of classification is valid in both languages (Kordić, 1995; Browne & Alt, 2004). To exemplify, the distinction between restrictive and non-restrictive (appositive) clauses in B/C/S is also recognized (Kordić, 1995, pp. 25-26; Jahić et al., 2000, p. 440), and Browne and Alt (2004) confirm that the choice of relative pronouns, that is, relativizers, in B/C/S is also influenced by the antecedent. Kordić (1995, pp. 53-54) lists the pronominal relativizers as adjectival pronouns *koji*, *čije*, *kakav*, *koliki*, and nominal pronouns *ko* and *šta*, and claims that antecedents typically appear with either one or the other while Jahić et al. (2002, pp. 441-442) simply list all six of the aforementioned pronouns, along with *što* and *da*, as possible relativizers of relative attributive clauses. Of course, in B/C/S pronouns also have different forms depending on the case (for example, nominative or accusative) and gender (*koji* vs. *koja*) or number. Along with *koji*, another type of relativizer often used to

introduce relative clauses in B/C/S is *što* (Riđanović, 2012, p. 459; 461). In the case of an interrogative, demonstrative or indefinite pronoun as the antecedent's head "the relativizer *tko* (who) or declinable *što* (what) is used depending on the human/non-human distinction (Kordić, 1995, p. 58). Of course, relative pronouns can also have "adverbials of place, time, and manner as antecedents" ((Kordić, 1995, p. 59), and then relativizers include *gdje*, *kuda*, *kamo*, *odakle*, 'where', *kada* 'when', *kako* 'how', and so on (Jahić et al., 2000, p. 443). If the antecedents are used to express quality or quantity, it is possible to use pronouns *kakav* and *kolik(i)* to express quality (type) and quantity (size, number), respectively (Kordić, 1995, p. 59; Jahić et al., 2000, p. 442). These seem to be quite frequent as Browne (1986) states that "a Serbo-Croat speciality is relative clauses on quality- and quantity- expression antecedents" (p. 68). For possessive forms relativizer *čiji* 'whose' is used. Kordić (1997) claims that relative clauses are "relatively frequent in the modern S/C [Serbian/Croatian] since they have expanded as attributes at the expense of the participles performing that function" (p. 57) also citing Maček (1970, p. 124) who claims that relative clauses are more frequent in S/C compared to English.

Moreover, some previous research studies have already indicated certain similarities and differences between B/C/S and English in terms of relative clauses. Browne (1986, p. 92) states that in English several relative clauses (RCs) can share a single antecedent and while the same is possible in B/C/S, it is done so predominantly through the use of an appropriate conjunction. Browne (1986) also states that comparative structures are more easily included in relative clauses in S/C compared to E, and that, in B/C/S, relative clauses often make it possible for the speaker to move to the beginning of a sentence an element that would otherwise occur later. Janković (2019), for example, has mentioned that for English -ing relative clauses "no counterparts can be constructed in Serbian using either the present participle or any other nonfinite verb form" (p. 275). Riđanović (2007, p. 317) also states that, in the English language, relative clauses appear in two forms, full and reduced, but the reduced forms do not have such equivalents in B/C/S.

In terms of the use of relative clauses within the register of technical English, there are some previous studies that offer

interesting results. Cho and Lee (2016) analysed relative clauses in several science and engineering journals and the results showed that the frequency of use was between 11% and 26% within the four investigated journals and restrictive relative clauses were always more common compared to the non-restrictive ones, sometimes more than double. Cho and Lee (2016) discovered that the distribution of relative clauses in terms of types was always in favour of OS type (object nouns, subject relative clauses), followed by OO (object nouns, object relative clauses), SS (subject nouns, subject relative clauses) and SO (subject nouns, object relative clauses). In restrictive relative clauses, that was predominantly used followed by which and finally zero relative pronoun. As brevity and conciseness is important for technical English (Master, 2002), it is expected that reduced relative clauses will often be used. Master (2002) analysed relative clauses within technical journals belonging to different disciplines and he discovered that not only were restrictive relative clauses more common (confirmed by Cho & Lee, 2016) but also that just about half of the relative clauses were indeed reduced relative clauses.

Because relative clauses have been recognized as “one of the most difficult areas of English for non-native speakers of the language to master, due to differences between English and their mother tongue, and the complex grammatical attributes” (Cho & Lee, 2016, p. 62), the aim of this paper was to analyse the subcorpora with respect to the employed types of relative clauses and their frequency counts. Investigating similarities and differences between the subcorpora in terms of the aforementioned results was another important aim. The primary goal was to determine how relative clauses are employed by the non-native, B/C/S writers, but also what sort of differences exist between the two analysed subcorpora. Such results shed light not only on the features of relative clauses when used in the engineering texts by non-natives, but also provide a useful resource for the teaching purposes, especially within ESP.

METHODOLOGY

For the purpose of this research paper the contrastive analysis of relative clauses in the engineering texts in English and B/C/S

was done on the corpus compiled from the two issues of a journal focusing on mechanical engineering. The two analysed issues were taken from The Bilingual Journal of Mechanical Engineering - Mašinstvo. More precisely, the latest two issues available online, at the time of writing this article, were used to create the corpus (Volume 17(2-1) from 2020, and Volume 18(1-2) from 2021). It is important to mention that only papers published in both languages were taken into consideration, as the two chosen issues also contained a total of three papers published only in English. This resulted in the final corpus containing two subcorpora: English and B/C/S.

The corpus was then analysed by determining the normalized frequency of relative clauses per hundred sentences following the typical methodological approach for frequency counts of relative clauses (Cho & Kim, 2009; Cho & Lee, 2016), as well as their various types. The analysis was carried out on the English and B/C/S texts, respectively. First, the total number of examples of relative clauses in English and B/C/S subcorpora was determined along with the subcorpora sentence lengths. Next, normalized frequency counts were calculated for both of the languages and all the examples were first analysed according to the restrictiveness criteria. Finally, the extracted relative clauses were classified according to the relativizers used (e.g. *what*, *who*, *that*, *koji*, *što*, etc.) for both of the languages and the form of the clauses for the English subcorpus (e.g. reduced -ed and -ing types). Translation equivalents for the relative clauses without the direct relative clause translations were noted as well.

RESULTS AND ANALYSIS

The analysis results showcase the contrasted frequencies of relative clauses in English and B/C/S along with the results pertaining to the types of relative clauses that were employed.

Table 1. Frequency of all relative clauses.

All relative clauses	English subcorpus	Frequency per 100 sentences	B/C/S subcorpus	Frequency per 100 sentences
	148	25.47%	132	25.09%

Overall, as can be seen from Table 1 above, both languages show relatively similar frequency counts. However, B/C/S subcorpus does show, to a slight extent, lower normalized frequency. Taking into consideration the fact that there are five examples of relative clauses in B/C/S that have no relative clause translation equivalents in English, that makes the difference between the two corpora, in terms of frequency of relative clauses, even more prominent. On the other hand, there are twenty-one examples of relative clauses in English that had no B/C/S counterparts in the relative clause form. These examples are translated by using adjectival, nominal, and prepositional clauses in B/C/S.

Table 2. Frequency distribution of restrictive and non-restrictive relative clauses.

Restrictiveness	English subcorpus		B/C/S subcorpus	
	Count	Frequency	Count	Frequency
Non-restrictive relative clauses	18	12.16%	18	13.63%
Restrictive relative clauses	130	87.83%	114	86.36%

In terms of restrictiveness, as Table 2 shows, only 12.16% (ENG) and 13.63% (B/C/S) of the analysed relative clauses are non-restrictive which means that restrictive clauses are predominantly used in both subcorpora. This confirms the results of earlier studies indicating the high frequency of use of restrictive relative clauses in technical texts.

Table 3. Frequency of the employed types of relative clauses.

Type of relative clauses	ENGLISH	Type of relative clauses	B/C/S
Relativizer - That	26.35%	Relativizer - koji, koje, etc.	73.48%
Relativizers - Which, who, what, why	30.40%	Relativizer - što	10.60%
Preposition + which	6.75%	prep + kojih, itd.	5.30%
Relativizer - where	2.70%	Relativizer - gdje	3.03%
Relativizer - whose	2.02%	Relativizer - čije, čija	2.27%
Relativizer - when	0.67%	Relativizer - kada	0.76%
Reduced -ed	22.30%	Relativizer - kakav	0.76%
Reduced -ing	3.38%		

Reduced phrases - ADJ, etc.	5.40%		
--------------------------------	-------	--	--

Table 3 indicates the frequency of various types of relative clauses in the two analysed subcorpora. As can be seen, apart from the various *wh* relativizers, that relativizer seems to be the most frequently employed with the frequency of 26.35% in the English subcorpora. Reduced -ed clauses are quite common along with the relative clauses using relativizers *which*, *who*, etc., with 22.30% and 30.40% respectively.

Almost all relative clauses in English had corresponding translation equivalents in B/C/S in the form of relative clauses with overt relativizers. The most frequently used relativizers in B/C/S were *koji* (and corresponding forms, *koja*, *koje*, *koju*, etc.) and *što*, as Table 3 shows. Once again, both languages show a lot of similarities in terms of frequency counts but the differences can easily be seen with qualitative analysis in terms of translation equivalents. For example, reduced clauses show considerable frequency counts in English. This makes these clauses potentially problematic for the translation as their direct counterparts do not exist in B/C/S and students have to use other translational equivalents.

Below are some of the analysed examples from the Journal of Mechanical Engineering *Mašinstvo* that exemplify various aforementioned types of relative clauses:

a) Examples of various restrictive and non-restrictive full relative clauses containing numerous relativizers such as:

relativizer that - Naučno-istraživački rad je djelatnost odnosno svojevrsan proces *koji* ima svoj rezultat. Scientific research work is an activity or a kind of process *that* has its result.

relativizer who - *koji* - *for a human antecedent* - U mnoštvu ponuda nije lahko zadovoljiti (i zadržati) kupca *koji* očekuje bolje usluge, bolje proizvode, niže cijene, fleksibilnost, dostupnost.

In a multitude of offerings, it is not easy to satisfy (and retain) a customer *who* expects better services, better products, lower prices, flexibility, availability.

relativizer *which* - Zatim se popunjava trebovanje, *koje* vrši poslovođa Službe za održavanje. Then the requirement is filled in, *which* is done by the manager of the Maintenance Service.

b) examples of relative clauses where relativizer *which* is preceded by various prepositions:

- U ovom slučaju odabran je plan eksperimenta sa 13 ponavljanja *od kojih* su 5 u centralnoj tački. In this case, an experimental design with 13 replicates, *of which* 5 are in the central point, has been chosen.

c) Example containing relativizer *where*

- Dat je pregled ispitivanja, *gdje* je navedeno kako se ispitivanje vrši i objašnjeno je kako da se tumače dobijeni rezultati. An overview of tests is given *where* it is stated how tests are performed and it is explained how to interpret the obtained results.

d) Example containing relativizer *whose* - *čije*

- Shodno članu 22. stav 2. spomenute Uredbe za parametre, *čije* su izmjerene vrijednosti veće od propisanih, isti ne smije odstupati za više od 50% a za suspendovane materije za 100%, te se konstatuje da izmjerena vrijednost cijanida koja je prekoračila dozvoljenu vrijednost zadovoljava navedeni uslov. Pursuant to Article 22, Paragraph 2 of the Regulation mentioned, for parameters *whose* measured values are higher than prescribed, it may not deviate by more than 50% and for suspended meters by 100%, and it is concluded that the measured value of cyanide exceeding the permitted value satisfies the specified condition.

e) Examples showing reduced -ed clauses translated with full relative clauses in B/C/S as well as other phrases such as ADJP:

- To je komercijalni softver *koji služi* za planiranje eksperimenta i optimizaciju rezultata, te statističku obradu i vizualni prikaz. It is commercial software *used for* experiment planning and optimization of results, as well as statistical processing and visual display.

f) Examples showing reduced -ing clauses translated with full relative clauses in B/C/S:

- Potrošači ocjenjuju proizvod prema njegovim osobinama, cijeni, pouzdanosti, izgledu, prema imidžu *koji prati proizvod*... Consumers evaluate the product according to its characteristics,

cost, reliability, appearance, according to the image *accompanying the product...*

g) Examples showcasing a possibility of stacking several relative clauses and a conjunction *a* being used in B/C/S in such sentences - *that* and *which* - *koji*

- Prikupljanje i mogućnost da se prevedu ulazni parametri *koji* dolaze od kupca, *a koji* vrlo često nisu tehnički mjerljivi, u tehnički mjerljive podatke od ključnog je značaja za uspješno provođenje kompletnog QFD procesa. The collection and the ability to translate the input parameters *that* come from the customer, *which* are often not technically measurable, into technically measurable data is of crucial importance for the successful implementation of the complete QFD process.

h) Example showing a different relativizer *što* being used and the resulting translation error - *what* - *što*

- Zadnji red predstavlja odstupanje od modela koje je veće od 0,1 *što* znači da odstupanje nije signifikantno, pa je prema tome model adekvatan za primjenu. The last row represents a deviation from the model that is greater than 0,1 *what* means that the deviation is not significant and therefore the model is adequate for application.

These and other analysed examples and the determined frequencies indicate that, in the engineering texts of the analysed corpus, there is a significant frequency of relative clauses of various types. The frequency and complexity of relative clauses make them potentially challenging for the non-native writers and translators. For example, various combinations of relative clauses within a single, complex sentence are possible - complete and reduced, or integrated and supplementary. Furthermore, even though there is a relatively similar frequency of use of particular relativizers, the examples show that the translation equivalents between the two languages do not always coincide. Examples include different relativizers being used in the translated sentences, or different types of clauses being employed. Additional problems arise from the aforementioned examples of relative clauses existing in one of the two subcorpora and not having relative clause translation equivalents in the counterpart subcorpus.

CONCLUSION

The results show that the main discovered features pertaining to the relative clauses in the engineering texts by non-native writers, such as the predominant use of defining, restrictive clauses or the types of relativizers used, remain considerably similar in both the source language and the target language. On the other hand, the analysed examples reveal that the translation process from B/C/S to English results in many differences between the use of relative clauses in the two subcorpora that the raw frequency counts do not highlight. Such differences include the use of reduced relative clauses in English to translate various B/C/S phrases, such as the adjectival or prepositional ones.

Therefore, the undertaken contrastive analysis of relative clauses in the engineering texts indicates that there are various differences between the two languages that can potentially make writing engineering texts in English, or translating such texts to English, more difficult for the non-native writers. Consequently, the results of this research can potentially result in practical applications in terms of language teaching in the area of ESP, in particular, technical English. To exemplify, the relatively high frequency of reduced -ed clauses, various noted form patterns (preposition + which), common mistakes (što - what*), and other differences, can all be used in the ESP teaching process to directly target potentially problematic features of relative clauses for the non-native writers. In turn, this reveals a need for further analysis of written texts in English by B/C/S speakers and its comparison with the existing equivalent texts in English by native English speakers. Such twofold analysis can have very important and pedagogically meaningful results especially with regard to the relative clauses that recently have not been frequently investigated from the contrastive standpoint.

BIBLIOGRAPHY

- Browne, W. (1986). *Relative Clauses in Serbo-Croatian in Comparison with English*. The Yugoslav Serbo-Croatian-English Contrastive Project, New Studies 4. Zagreb: Institute of Linguistics.

- Browne, W., & Alt, Th. (2004). *A Handbook of Bosnian, Serbian, and Croatian*. SEELRC.
- Bugarski, R. (1986). Terminologija kontrastivne lingvistike. *Zbornik radova III Simpozijum Konstrastivna jezička istraživanja*. Novi Sad, 6. i 7. decembar 1985.
- Cho, D.W., & Kim, J. (2009). A corpus-based study on the frequency and usage of participial clauses in two science journals. *English Teaching*, 64(4), 25-42.
- Cho, D. W., & Lee, K. (2016). English relative clauses in science and engineering journal papers: A comparative corpus-based study for pedagogical purposes. *Ampersand*, 3, 61–70.
- Čulić, Z. (1986). Primjena kontrastivnih istraživanja u nastavi jezika. *Zbornik radova III Simpozijum Konstrastivna jezička istraživanja*. Novi Sad, 6. i 7. decembar 1985.
- Đorđević, R. (1987). *Uvod u kontrastiranje jezika*. Beograd, Zavod za udžbenike i nastavna sredstva.
- Filipović, R. (1980). Kontrastivna gramatika: Gramatika jednog ili dvaju jezika? *Zbornik radova Simpozijum Konstrastivna jezička istraživanja*. Novi Sad, 7. i 8. decembar 1979.
- Huddleston, R. D., & Pullum, G. K. (2012). *A student's introduction to English grammar*. Cambridge University Press.
- Imamović, A. (2017). *Grammatical Categories in English and Bosnian*. OFF-SET. Tuzla.
- Jahić, D., Halilović, S., & Palić, I. (2000). *Gramatika bosanskoga jezika*. Dom štampe.
- Janković, Lj. (2019). Theoretical Analysis of the Differences in the Use of English and Serbian Nonfinite Relative Clauses. *PhilologiaMediana*, 11, 267–281.
- Klajn, I. (1986). Analiza grešaka i greške analize. *Zbornik radova III Simpozijum Konstrastivna jezička istraživanja*. Novi Sad, 6. i 7. decembar 1985.
- Kordić, S. (1995). *Relativna rečenica*. Hrvatsko filološko društvo, Zagreb.
- Kordić, S. (1997). *Serbo-Croatian*. München: Lincom Europa.
- Maček, D. (1970). Relative pronouns in English and Serbo-Croatian. *YSCECP, Reports 3*, R. Filipović (Ed.), Zagreb, 105-128.

- Master, P. (2002). Relative clause reduction in technical research articles. In E. Hinkel & S. Fotos (Eds.). *New perspectives on grammar teaching second and foreign language classrooms* (pp. 201-231). Mahwah, NJ: Lawrence Erlbaum Associates.
- Mašinstvo*. (2020). 3-4 (17).
- Mašinstvo*. (2021). 1-2 (18).
- Mihailović, Lj. (1980). Lingvistički pojam kontrasta. *Zbornik radova Simpozijum Kontrastivna jezička istraživanja*. Novi Sad, 7. i 8. decembar 1979.
- Mihailović, Lj. (1983). Jezik i govor u kontrastivnoj analizi. *Zbornik radova Simpozijum Kontrastivna jezička istraživanja*. Novi Sad, 10. i 11. decembar 1982.
- Quirk, R., & Greenbaum, S. (1973). *A university grammar of English*. Longman.
- Radford, A. (2009). *Analyzing English Sentences: A Minimalist Approach*. Cambridge University Press; Cambridge.
- Riđanović, M. (1980). Skice za teorijsku kontrastivnu analizu. *Zbornik radova Simpozijum Kontrastivna jezička istraživanja*. Novi Sad, 7. i 8. decembar 1979.
- Riđanović, M. (2007). *Praktična engleska gramatika*. Sarajevo: Šahinpašić.
- Riđanović, M. (2012). *Bosnian for foreigners: with a comprehensive grammar*. Rabic.
- Tomić, O. M. (1980). O nekim tipološkim refleksima kontrastivne analize. *Zbornik radova Simpozijum Kontrastivna jezička istraživanja*. Novi Sad, 7. i 8. decembar 1979.
- Tomić, O. M. (1986). Kontrastivna lingvistika i metodologija nastave stranih jezika. *Zbornik radova III Simpozijum Kontrastivna jezička istraživanja*. Novi Sad, 6. i 7. decembar 1985.

ISTRAŽIVANJE O RELATIVNIM REČENICAMA U INŽINJERSKIM TEKSTOVIMA

Van. prof. dr. Aida Tarabar
Đelaludina Šukalić, MA

Sažetak

Budući da zavisne relativne rečenice mogu stvarati poteškoće za govornike engleskog kao stranog jezika, zbog svojih različitih oblika i funkcija, ovaj rad istražuje razlike i sličnosti u upotrebi relativnih rečenica u inženjerskim tekstovima na engleskom i bosanskom/hrvatskom/srpskom (B/H/S) jeziku. Kontrastivna analiza tekstova na ciljnim jezicima urađena je na korpusu sastavljenom iz dva broja dvojezičnog časopisa – Mašinstvo. Utvrđena je učestalost upotrebe relativnih rečenica, a rečenice su klasificirane prema restriktivnosti, relativizatorima, te, u engleskom potkorpusu, prema njihovom obliku. Rezultati pokazuju da restriktivne rečenice prevladavaju u oba potkorpusa, dok je izbor relativizatora uglavnom sličan. Ipak, prijevod otkriva zanimljive razlike, poput upotrebe reduciranih relativnih rečenica u engleskom jeziku za izražavanje različitih konstrukcija iz B/H/S jezika. Istraživanje stoga pruža pedagoški značajne uvide za ESP podučavanje, s obzirom na ograničenost kontrastivne analize relativnih rečenica u ovom polju.

Ključne riječi: relativne rečenice, inženjerstvo, kontrastivna analiza, pedagoške svrhe.