

GRAMMATICAL PECULIARITIES OF AN AUTHENTIC ENGLISH RESEARCH PAPER ABSTRACT

Investigated in this article are the grammatical means of English research paper abstract and provided is a thorough analysis of phrase and sentence structures, verb tense forms and constructions. Comparison of grammatical means of English and Ukrainian abstracts aims at finding appropriate translation tools for non-native authors and translators.

Key words: *research paper abstract, grammatical means, physics, computer science, translation difficulties.*

Literature review

As technological progress enables researchers to communicate their research findings across the nations, they experience the need to present their works to the international academic community. Presenting a successful research paper abstract allows scientists to find new readers and colleagues worldwide, but they sometimes face difficulties while trying to get their abstracts accepted by Abstract reference volumes. To meet the requirements set to this genre of academic writing both authors and translators need to know lexical and grammatical means that are used in English abstracts and to develop skills of their usage. The research of the literature on this topic allows to list the lexical units and grammatical structures characteristic of an abstract. Thus, according to [3, c.5], the research subject can be introduced with synonymous verbs study, investigate, analyse, determine, examine, consider [7, p. 5], e.g.: The scientific article abstract is analysed. As an abstract is a text of scientific style, it uses clichés to better perceive the information, e.g.: The text deals with / The article is devoted to an important problem of... [6, c. 106].

The study conducted by Mikhelson & Uspenskaya (1995) demonstrates that different lexical and grammatical means are used for a range of aims as highlighting particular information, summing the abstract up and recommending practical applications of the research findings [7]. It is now evident that the previous research examined lexical means of scientific writing more thoroughly than grammatical ones, but grammatical means of research paper abstract did not get enough attention of scholars. Comparative analysis of English and Ukrainian shows that the former uses more varied range nouns as subjects which results in syntactic differences when authors or translators translate these abstract into English, as Ukrainian adverbial modifiers transform into subjects, e.g.: *The paper describes (discusses) new methods.* – *В цій статті описуються нові методи.* *A system which makes use of the electric method of detecting is described.* – *Описується система, в якій використовується електричний спосіб детектування* [7, p. 85]. T. Yahontova (2002) stresses the tendency to use impersonal active constructions and meta-text in a research paper abstract, e.g.: *This paper shows / investigates...* or passive voice, e.g., *The data were analyzed...*, but to avoid the first person and negative sentences [10, p. 129-130].

From the grammatical standpoint the use of tenses in a research paper abstract is really important. Authors use the following recommendations [11]: to use the present tense to denote "unchanging truths", the past tense for actions undertaken by a researcher and referring back "for what is being done in the paper, the future tense is appropriate to invite the reader to follow the author, e.g. "in Section 7 we shall see that...", but omit *shall* when referring immediately ahead, e.g. "we now show that...", and finally "use the present tense if the writer is thinking of how the paper *is* set out (, e.g. "in Section 7 it is shown that..."). In the research on the tenses in scientific writing, Mikhelson & Uspenskaya (1995) found that Present Simple and Present Perfect used to denote complete action is a distinguishing feature of a research paper abstract. However, when an empirical part of the research is described, Past Simple is used [7, p. 4]. Shapovalova & Tityareva (2012) argue, though, that both English and Ukrainian scientific languages use impersonal and passive constructions, unlike the personal sentences where the subject is denoted by either a pronoun or noun 'the author / authors.' The constructions *The present paper concentrates on analyzing...*; *The paper examines the problem...* are typical: [9, p. 44]. The relevant issue of grammar is English gerundial and infinitive construction usage, as in the Ukrainian language there are no corresponding constructions, which is a barrier to proper translation and construction of a sentence [8], e.g.: *There was a lack of evidence of a satellite orbiting* – *Не було достатньо доказів відносно того, що супутник вийде на орбіту* [12].

The research [2] says that necessary grammar skills to write an abstract include the ability to use complete verb forms instead of contractions to meet the requirements set to academic style, conditional sentences, modal verbs, participles and adverbial constructions, the Passive Voice, and sequence of tenses [2, p. 10]. V. Karaban (2001) states that the English scientific language broadly employs passive structures with normal word order where predicate follows the subject, while in Ukrainian the word order in this sentence type is usually inverse and it has predicates expressed by passive present and passive past [5]. The research says that necessary grammar skills to write an abstract include the ability to use complete verb forms instead of contractions to meet the requirements set to academic style, conditional sentences, modal verbs, participles and adverbial constructions, the Passive Voice,

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Gap in the previous research

There is little research devoted to the study of grammatical peculiarities of the research paper abstract, yet, even that is insufficient for the proper study of translation means of the abstract from Ukrainian into English. To render the information of an abstract correctly into English, non-native language writers have to learn the language difficulties to avoid mistranslation and, thus, misunderstanding of the research results, which is inappropriate in scientific writing. We agree with V. Karaban (2003) who argues that knowledge of grammar is more important for translation than that of terminology, as the latter can be easily translated with the help of a bilingual dictionary, while unfamiliarity with translation equivalence may well be a time-consuming problem [6, p. 11]. That is why both authors and translators need knowledge of grammatical constructions and grammatical means of expression appropriate for research paper abstract. As we stated in the previous section, English and Ukrainian are of different language types; different language structures, ranges of grammatical categories, forms and constructions are the first and the major group of translation difficulties of the scientific text. Thus Ukrainian has no correspondence to article, gerund, subject and object infinitive constructions, while English does not have Ukrainian ‘дієприслівник’ verbal adverb (adverbial participle), noun and adjective cases, etc. Word order also differs as Ukrainian can use free word-order in a sentence, with subject group often following the predicate phrase, which requires an author / a translator skills to restructure the whole sentence, rearrange the sentence parts to make normal word order characteristic of English grammar and English scientific style. This makes it necessary for translators and authors to analyse grammatical structure of sentences in the other language, fix translation difficulties and construct sentences according to the norms and stylistic requirements of the target language [6, c. 63].

Research objectives

This paper aims to investigate grammatical means typical of the research paper abstract, namely phrase structures, sentence structure and grammatical means of sentence parts expression, verb tense and verb forms frequency usage. It also seeks to compare the grammatical means of English and Ukrainian abstracts to help Ukrainian scientific writers and translators who assist the scholars to find appropriate ways for translation.

Materials and Methods

We base our study on the analysis of 16 authentic English research paper abstracts on physics physics (45 sentences) and computer science (60 sentences), published by Middle Tennessee State University and Springer Science + Business Media – the international publishing company, which specializes in academic journals and scientific books [12]. Qualitative and quantitative research methods are used. The phrase structures of the research paper abstract sentences were studied by means of immediate constituent analysis. Frequency analysis was applied to investigate sentence structure and grammatical means usage in the abstracts. Component analysis was chosen to examine means of sentence parts expression. Verb tense forms were approach quantitatively. Instances of correspondence and discrepancy between the grammatical means of the English and Ukrainian languages were compared with the help of comparative analysis. Statistical methods were used to verify the quantitative data.

Results and discussion

The research data clarify the preferable **sentence structure** to use in the abstract of the research paper which needs to be presented in English. It was found that among the total 105 sentences, hereinafter referred to as [12], there were 44 simple sentences, 40 complex sentences, and 21 compound sentences in the research paper abstracts, which make up 42%, 38% and 20% correspondently. Though simple sentences are numerous in the abstracts, the findings clearly demonstrate the complex sentences outnumber the simple ones in the research paper abstracts in physics and computer science. We also found that complex sentences are twice as frequent as compound ones with the ratio of 2:1, which proves cause and effect relationships in the research that the authors aim to express. Table 1 reveals how often authors use certain grammatical means in their abstracts in English.

As can be seen in Table 1, English abstracts are characterized by: infinitives – the most frequent verb form, which is used in 48% of the analyzed sentences; gerund – 14%; Participle – 28%, and verbal adverb phrase is found in 10% of the abstract sentences. Considering tense forms, 75% of the studied sentences had Present Simple, while Past Simple comprises only 22% and the smallest share belongs to Present Perfect with only 3% frequency.

Table 1

Frequency analysis of research paper abstract grammatical means usage

Physics (45 sentences)		Computer science (60 sentences)		Total number	Total %
Category	Number	Category	Number		
Infinitive	23	Infinitive	25	48	48

Gerund	4	Gerund	11	14	14
Adverbial participle	8	Adverbial participle	20	28	28
Verbal adverb phrase	2	Verbal adverb phrase	8	10	10
Present Simple	23	Present Simple	52	75	75
Past Simple	20	Past Simple	2	22	22
Present Perfect	2	Present Perfect	1	3	3

The *immediate constituent analysis* allows for studying the **phrase structures** we now demonstrate, e.g., *Our group decided to study the various ways that the temperature of stars can be determined, specifically by using Wien's Law and spectroscopy*. This sentence is complex, with the main 'our group decided to study the various ways', where the subject is 'group' and the predicate is 'decided'; and an object clause 'The temperature of stars can be determined, specifically by using Wien's Law and spectroscopy', with 'temperature' as subject and 'can be determined' as predicate. The main clause is divided into elements: /((Our) group| [decided (to study)] the (various) ways|. In the noun groups 'our group' and 'various ways' the grammatical kernel is a noun and the marginal element is an attribute expressed by a possessive pronoun and an adjective. In the verb group 'decided' the grammatical kernel is a verb, and the marginal element is an adverb. The subordinate clause can be divided into components /the temperature of (stars)|can (be determined)| specifically |by using (Wien's Law and spectroscopy). In the noun group 'the temperature of stars' the grammatical kernel is a noun, and the marginal element is an object, while in the verb group a verb is the grammatical kernel and an infinitive is a marginal element. The adverbial group is presented by an adverb grammatical kernel 'specifically'. The participial phrase 'by using Wien's Law and spectroscopy' has adverbial participle as a grammatical kernel and objects as marginal elements. E.g.: *Our group focused on the evolution of a star; however, it must be noted that this diagram has helped astronomers in many other ways*. This sentence is complex, compound and consists of the clauses: 'our group focused on the evolution of a star' with 'group' as a subject and 'focused' as a predicate; and 'however, it must be noted' having 'it' as subject and 'must be noted' as its predicate, which also has an object clause 'that this diagram has helped astronomers in many other ways', where a subject is 'diagram' and a predicate is 'has helped'. The main clause is divided into the following elements: /((Our) group| [focused on the (evolution of a star)]. In the noun group 'our group' the grammatical kernel is a noun, and the marginal element is an adjective, while in the verb group 'focused on the evolution of a star' a verb is the grammatical kernel and direct and indirect objects are marginal elements. The clause is divided into components /it |must (be noted)| with pronoun 'it' as a grammatical kernel in the noun group, and verb in the verb group where the marginal element is an infinitive. The subclause is divided into the components /((this) diagram| has helped (astronomers in many other ways)| where the noun group 'this diagram' has a noun as its grammatical kernel, and an adjective as a marginal element. In the verb group 'has helped astronomers in many other ways' a verb is the grammatical kernel and an object and an adverb are marginal elements. Having analyzed the grammatical characteristics of authentic English research paper abstracts we found that in the phrases composing the abstract sentences there is a grammatical kernel and a marginal element: in the noun group the former is a noun and a pronoun, and the latter is an adjective and an object; in the verb group the grammatical kernel is usually a verb and marginal elements can be an adverb, an object or an infinitive; the adverbial group has an adverb as a grammatical kernel; the participial phrase has adverbial participle as a grammatical kernel and an object as a marginal element.

Considering abstract translation difficulties we conducted *component analysis* to distinguish **the means of sentence parts expression**. In this part of our research we compare the findings with the results obtained by A. Vasiliev [1]. He states that as English does not have flexions, an author / translator needs to understand the sentence structure and possible deviations to avoid when translating this sentence [3, p. 15]. Normal word order is typical of an English sentence: Subject-Predicate-Subordinate parts of sentence. The subject should precede the predicate and can be expressed by a noun, a gerund, an infinitive or an infinitive construction [1, p. 270]. Our research data are consistent with the previous research only in two categories – subjects in abstracts are often expressed by nouns and pronouns. We found that in the research paper abstracts the subject is most often expressed by nouns and pronouns, e.g., *The purpose of our project was to use some of the techniques learned in class and apply those techniques to astronomy, commonly called astrophysics*. The subject is the 3rd person singular noun 'purpose'. *Already in the model driven design of service-oriented architectures one can identify concepts that are common in the design of such systems and what agent-based systems concerns*. The subject is pronoun 'one' in the plural form. Nevertheless, there were no subjects expressed by gerunds or infinitives in the analyzed sentences which we explain by the fact A. Vasiliev did not focus on this genre of scientific writing. We also examined the predicates in the abstracts and the obtained data demonstrate that both branches of science employ simple and compound predicates. An example of a simple predicate expressed by the personal verb form in the Past Simple is, e.g.: *Through this project, our group investigated three different modes of energy storage: batteries, fuel cells, and capacitors*. A simple predicate expressed by a collocation can be illustrated as follows: *We also decided to study the HR-diagram because it makes use of the temperature of stars by plotting luminosity versus temperature*. Compound nominal predicate consisting of an auxiliary verb 'to be' in its personal form of the Present Simple and an adjective can be found in the following sentence: e.g.: *As a group, we found that understanding how the temperature of a star is found is fairly straightforward after studying modern physics in class this semester*. Sentence *'Such statements would innovate upon many aspects of service operations, from discovery to composition, deployment and*

monitoring demonstrates a compound verbal predicate usage, with predicate composed of *modal verb+infinitive* to denote probability.

As subordinate parts of an English sentence are object, attribute and adverb, we analyzed these parts and specified the results compared to the previous research [1, p. 277]. Thus, direct object in abstracts is most often expressed by nouns, e.g., *The objective lens collects photons and focuses them on the image tube*. Numerals as objects are rare, e.g., *Night vision devices are one of the most fascinating technologies in use today*. Our research results did not find any subordinate sentence parts expressed by pronouns, infinitives or gerunds as well as no example of indirect object. However, indirect prepositional object is often used and expressed by nouns, pronouns or gerunds with prepositions, but most often it is a Noun+Preposition object, e.g., *For software this approach is not necessarily valid*. We found that attribute in abstracts is most often expressed by adjectives, e.g., *After a rather slow start and some assistance from outside sources we gathered the necessary information to complete the project*. The infinitive frequently performs the adverb function, e.g., *Our group wishes to conclude with our opinion that the overwhelming dangers caused by nuclear reactors are not worth the energy they produce*. To sum up, component analysis allowed us to distinguish the means of sentence parts expression which make the following groups: subject-noun / pronoun; predicate-past tense verb; direct / indirect object-noun; attribute-adjective; adverb-infinitive.

We also compared the word order in English and Ukrainian abstracts. The obtained results are consistent with the previous study [5, p.15] and concluded that a Ukrainian writer / translator should restructure the sentences while translating the abstract from Ukrainian into English building normal word order, e.g., *Human subject research, with increasing frequency, is conducted outside of the United States*. – *Все частіше проводяться дослідження людського організму поза межами США. The following bacterial Life-Forms are proposed to study in research laboratories*. – *Пропонуються наступні форми бактерій для дослідження у лабораторіях*. *The bio-fuel experiment is carried out on the International Space Station*. – *На МКС проводиться експеримент з біопаливом*.

Conclusion

Frequency analysis of certain linguistic means makes it possible to see clearly which grammatical structures should be used in the research paper abstract. The information on analysis of grammatical peculiarities of an abstract of an authentic English research paper may be useful for the researchers interested in writing English abstracts and for the translators working in the field of science.

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Illustrative resources

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М'ясоїд Г. І.

ГРАМАТИЧНІ ОСОБЛИВОСТІ АНОТАЦІЇ АВТЕНТИЧНОЇ АНГЛОМОВНОЇ НАУКОВОЇ СТАТТІ

У статті досліджено граматичні засоби англomовної наукової анотації і здійснено аналіз структури фраз і речень, вищо-часових форм дієслова. Порівняння граматичних засобів англomовних та українomовних анотацій спрямоване на пошук оптимальних шляхів їх перекладу.

Ключові слова: анотація наукової статті, граматичні засоби, фізика, інформатика, перекладацькі труднощі.

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ГРАММАТИЧЕСКИЕ ОСОБЕННОСТИ АННОТАЦИИ ОРИГИНАЛЬНОЙ АНГЛОЯЗЫЧНОЙ НАУЧНОЙ СТАТЬИ

В статье рассматриваются грамматические средства англоязычной аннотации научной статьи и предлагается анализ структур фраз и предложений, видовременных форм глагола, характерных для этого жанра. Сравнение грамматических средств англоязычных и украиноязычных аннотаций имеет целью облегчить поиск адекватных средств их перевода.

Ключевые слова: аннотация научной статьи, грамматические средства, физика, информатика, трудности перевода.

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