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## GRAMMATICAL MEANS OF A RESEARCH PAPER ABSTRACT IN THE ENGLISH AND UKRAINIAN LANGUAGES: CONTRASTIVE ANALYSIS AND TRANSLATION DIFFICULTIES

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The paper examines verb tense and verb forms characteristic of an English research paper abstract and investigates their usage peculiarities. Contrastive approach to abstracts analysis in English and Ukrainian aims at listing grammatical discrepancies and similarities between the languages to help authors and translators find adequate translation tools.

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

У статті досліджено видочасові форми дієслова й віддієслівних конструкцій, притаманних англійській науковій анотації, та особливості їх уживання. Констрастивним шляхом вивчено спільні й відмінні риси англійських та українських анотацій з метою полегшення праці укладачів і перекладачів у доборі адекватних способів перекладу граматичних конструкцій.

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

### **Мясоед Г. И., Самойленко С. А. ГРАММАТИЧЕСКИЕ СРЕДСТВА АННОТАЦИИ НАУЧНОЙ СТАТЬИ НА АНГЛИЙСКОМ И УКРАИНСКОМ ЯЗЫКАХ: СРАВНИТЕЛЬНЫЙ АНАЛИЗ И ТРУДНОСТИ ПЕРЕВОДА**

Статья рассматривает видовременные формы глагола и грамматические отглагольные конструкции, характерные англоязычной аннотации научной статьи, а также особенности их употребления. В результате контрастивного анализа англоязычных и украиноязычных аннотаций выявлены сходства и различия в грамматике с тем, чтобы облегчить поиск авторами и переводчиками адекватных средств перевода.

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

**Literature review.** Presenting a successful research paper abstract allows scientists to find new readers and colleagues worldwide. However, they sometimes face difficulties while trying to get their abstracts accepted by Abstract reference volumes as they fail to meet the requirements set to this genre of academic writing. To avoid the problem both authors and translators into English as a global language of science need to know linguistic 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 grammatical structures characteristic of an abstract. From the grammatical standpoint the use of tenses in a research paper abstract is really important. Journals provide authors with recommendations which can include ones on grammatical means usage. For example, 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...”) [8<http://www.scitext.com/index.php>]. 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 [4, p. 4].

The language an author writes in defines other grammatical means as well. While English is basically an analytical language with grammatical links expressed by grammatical morphs, and Ukrainian is an inflecting language with grammatical links expressed by related grammatical morphemes – flexions [3, p. 23]. English grammar is characterized with stable structure and fixed grammatical constructions. Shapovalova & Tityareva (2012) argue, though, that both English and Ukrainian scientific languages use impersonal and passive constructions, unlike the personal sentences where 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: [6, c. 44]. 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 [7, p. 129–130].

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 [5], **e.g.**: There was a lack of evidence of a satellite orbiting – Не було достатньо доказів відносно того, що супутник вийде на орбіту.

**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 who states 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 [2, 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

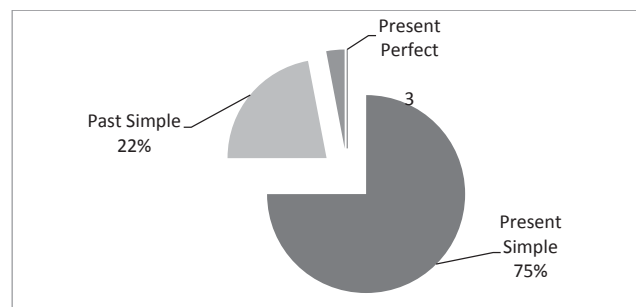
translation difficulties and construct sentences according to the norms and stylistic requirements of the target language [2, c. 63].

**Research objectives.** This paper aims to investigate grammatical means typical of the research paper abstract, namely verb tenses and verb forms frequency usage. It also seeks to find correspondences and discrepancies between the grammatical means of the English and Ukrainian languages as a tentative research into translation means to help non-native English scientific writers from Ukraine 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 (hereinafter referred to as [9]) 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. Qualitative and quantitative research methods are used. Frequency analysis was applied to investigate grammatical means usage in the abstracts. Verb tense forms were approached quantitatively. Instances of correspondence and discrepancy between the grammatical means of the English and Ukrainian languages were compared with the help of contrastive analysis. Statistical methods were used to verify the quantitative data.

### Results and discussion.

Grammatical means of abstract writing were analyzed using the quantitative method. Figure 1 summarizes the results of the verb tense forms usage analysis we conducted.



**Fig.1. Distribution of English verb tenses in authentic research paper abstracts**

The research data clearly demonstrate that the generalization strategy is mainly used on the grammatical level when choosing verb tense forms. This includes Present Simple, Present Perfect and Past Simple. As shown by the data,

abstracts are characterized by the wide use of Present Simple, which accounts for 75 %. This is because abstracts usually state any fact. For example: The magneto is a system that generates an electric current without the use of an electrical power source. Past Simple is used to describe the study, e.g., We studied how different lasers are used to correct different kinds of vision defects.

In our analysis Past Simple is used in 22 % of sentences which is three times as small as Present Simple. The frequency of other tenses is much less.

Present Perfect accounts for 3 % to denote completed action, 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.

Future Indefinite was found only once to forecast the outcome and can be considered insignificant in abstracts, e.g., Our vision is that in the near future model repositories for model fragments that can be flexibly combined will be established and propose basic concepts that can support the development of MAS in this context.

The other category of the analysis was verb forms and grammatical constructions characteristic of an authentic English research paper abstract. The results of their analysis are provided in Figure 2.

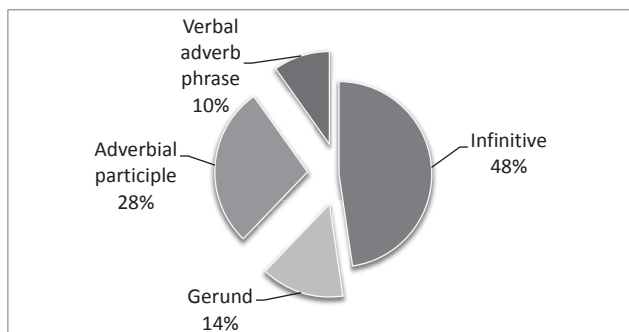


Fig. 2. Distribution of grammatical constructions in authentic research paper abstracts

As can be seen from Fig. 2, infinitives are used most frequently and account for 48 %, while participles and gerunds are used in 28 % and 14 % of the analyzed sentences correspondently. Verb adverb phrase is used in abstracts as often as in 10 % of cases. Contrastive method offers opportunities to find similarities and differences between the two languages, which we will demonstrate in the usage of infinitive, gerund, participle and adverbial participle phrase in the research appear abstracts.

One of the relevant grammar issues is usage of the infinitives and Gerunds. Their usage mainly

depends on the function and construction in the sentence, e.g., The purpose of our project is to study magneto ignition systems. Granular computing includes methods from various areas with the aim of supporting human in better understanding of analyzed problems and generated results. After we had analyzed the abstracts, we found that both in physics and computer science the number of infinitives is almost the same and accounts for 40%. The Gerunds are used rarely. The infinitives and Gerunds are also widely used, e.g., Researchers analysed meteorite fragments that fell on a frozen lake in Canada.

We compared infinitive verb forms in the English and Ukrainian languages in search for discrepancies and equivalents, e.g.: These intriguing devices allow the human eye to see in almost complete darkness – Ці захоплюючі пристрої дають змогу людському оку бачити майже в повній темряві. In the English sentence ‘to see’ denotes an action simultaneous to the action expressed by predicate, and this infinitive has its Ukrainian equivalent ‘бачити’ with suffix -ти. English infinitive, unlike the Ukrainian, is characterised by the following features: (a) it can be used as attribute to express modality and equals a subclause with its predicate expressing future action, e.g., In this paper we propose a middleware, to be deployed on top of physical sensors and sensor networks, capable of abstracting sensors from the inappropriate interfaces, and offering them to third party applications in an as-a-Service fashion for prompt and universal use – У цій статті ми пропонуємо міжплатформне програмне забезпечення, яке повинно бути розгорнено поверх фізичних датчиків і сенсорних мереж, здатних розглядати абстрактно датчики від власних інтерфейсів, пропонуючи їх програмам сторонніх розробників у якості адаптованої послуги для швидкого і універсального використання. English passive infinitive ‘to be deployed’ is a translation equivalent of Ukrainian active infinitive ‘розгорнути’; (b) it can be used as nominative/predicative part of a compound nominal predicate after auxiliary verb ‘be’ yet, infinitive never follows auxiliary verb ‘бути’ (be) in Ukrainian, e.g., Its task is to identify groups consisting of similar data objects according to defined similarity criterion – Її завдання полягає в тому, щоб визначити групи, що складаються з подібних об’єктів даних відповідно до визначеного критерію подібності. We also found that in abstracts the infinitive is usually used as subject or predicate, e.g.: The aim of



this experiment is to raise the efficiency of production – Мета цього експерименту – підвищити якість продукції. Satellites' purpose is to provide in-flight phone communications on airplanes – Мета супутників – надати телефонний зв'язок на борту літаків під час польоту [67]. The objective of Wi-Fi is to transmit data from one network device to another by radio – Мета технологій бездротового доступу – передавати дані від одного пристрою до іншого за допомогою радіохвиль [68].

Gerund does not have an equivalent in Ukrainian, and combines properties of both a verb and a noun to denote process unlike the infinitive [1, p.103]. a sample gerund usage in an abstract is, **e.g.**, Granular computing includes methods from various areas with the aim of supporting human in better understanding of analyzed problems and generated results – Гранульовані обчислення включають у себе методи з різних галузей із метою допомогти людині краще зрозуміти проаналізовані проблеми і зроблені висновки. In this sentence gerunds 'supporting' and 'understanding' are expressed in Ukrainian by infinitives. Ukrainian verbal noun is closer to the English gerund; nonetheless, it fails to express process, but means a subject, **e.g.**, Such statements would innovate upon many aspects of service operations, from discovery to composition, deployment and monitoring – Такі заяви стали б нововведеннями в багатьох аспектах функціонування послуг, від відкриття до формування, розгортання та моніторингу. The study shows that abstract nouns as opportunity (of), idea (of), habit (of), hope (of) are used in gerundial constructions [5], **e.g.**: Studying the properties of electrons gave the possibility of constructing a very powerful microscope – Вивчення властивостей електронів надало можливість (яку?) розробити потужний мікроскоп. The use of holography gave the scientist and engineer the opportunity of using interferometric analysis – Використання голографії дало змогу вченим та інженерам робити інтерферометричний аналіз.

The analysis also demonstrated the difference between the English gerund and the English verbal noun, as the latter are used with articles, demonstrative and impersonal pronouns, **e.g.**, We did research on the subject of radiocarbon dating for the purpose of gaining a better understanding of how the method is performed, what role radioactive decay plays in the process, and both the positive and negative aspects it includes – Ми зробили дослідження на тему датування

по радіоактивному вуглецю з метою краще зрозуміти те, як виконується цей метод, яку роль радіоактивний розпад відіграє в цьому процесі і які позитивні та негативні аспекти він включає. So, an English verbal noun 'understanding' is used with the indefinite article and is expressed by Ukrainian infinitive, moreover, gerunds has a tense for, which additionally can be expressed by collocating with prepositions 'on'/'upon' or 'after'. **E.g.**: After explaining the basics of nuclear reactors, the basics of fission, the energy produced, and the wastes produced, one should feel slightly abreast of the subject – Засвоївши основи ядерних реакторів, основи поділу виробленої енергії, відходів виробництва, кожен напевно зрозуміє основи предмета. One more differentiating feature is that both tense forms of the gerund have passive forms, **e.g.**, These connectors restrict how and where data can flow between loosely-coupled components taking into account the data being exchanged – Ці з'єднувальні блоки обмежують, як і де дані можуть передаватися між вільно зв'язаними компонентами з урахуванням даних, якими виконується обмін. In Ukrainian, on the contrary, instead of gerund the infinitive is used. As for the Participle which combines characteristics of adjective and adverb, it either equals Ukrainian 'дієприкметник' (verbal adverb/adverbial participle) when denotes an attribute, or 'дієприслівник' (adverb) when has the meaning of an adverbial modifier [1, p. 99]. We compared these results with our study and found that active and passive Participle I (can have both of these meanings and is expressed either by Ukrainian present tense verbal adverb, or verbal attributive clause, or adverb, **e.g.**, We show soundness and completeness of the abstraction mechanism for well-defined constraints, and validate our approach by evaluating the performance of a prototype implementation with different test cases, with and without abstraction – Ми показуємо коректність і повноту механізму абстрагування для чітко визначених обмежень і підтверджуємо правильність нашого підходу, оцінюючи ефективність реалізації прототипу за допомогою різних тестів, з абстрагуванням і без.

Participle II has only attributive meaning and usually corresponds to Ukrainian passive verbal adverb, **e.g.**, The aim of the presented process quality characteristic for safety is that risks related to achievement of safety goals in software development can be evaluated with process assessment – Метою представленої характеристики процесу, характерної для безпеки, є те, що



ризиків, пов'язаних з досягненням цілей безпеки в розробці програмного забезпечення, можуть бути оцінені оцінкою процесу.

Verbal adverb phrase usually serves as a means of logical clarification or focusing, e.g., Based on a new concept of process quality characteristics, process quality attributes for safety are tentatively defined – Основані на новій концепції якісних характеристик процесу, атрибути якості процесу в цілях безпеки визначаються попередньо.

**Conclusions.** 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 researchers interested in writing English abstracts and translators working in the field of science.

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