

Publication Date: 30 June 2024

Archs Sci. (2024) Volume 74, Issue 3 Pages 89-95, Paper ID 2024315.
<https://doi.org/10.62227/as/74315>

Syntax of Secondary Academic Texts in Various Fields of Scientific Knowledge: A Comparative Aspect (On the Material of English and Ukrainian Languages)

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Abstract The article focuses on the syntactic structures inherent in secondary academic (in other words, scientific) texts (e.g., review, abstract, thesis, and summary) in English and Ukrainian. The study of the syntax of secondary academic and scientific texts in various fields of scientific knowledge is essential for several reasons, namely for understanding and communication, academic progress, interdisciplinary research, automatic text processing, and professional training. Moreover, the study of the syntax of scientific texts has a practical significance for teaching students and young scholars. The study aims to compare the syntax of secondary academic texts in different fields of knowledge based on the comparative aspect of English and Ukrainian. The research methodology involved corpus-based research, cognitive-linguistic analysis, comparative and qualitative analysis, and experimental research. The authors analyzed the peculiarities of academic writing of secondary scientific texts: reviews, abstracts, summaries, and theses. In addition, the authors have carried out a comparative analysis of the syntactic structures of secondary scientific texts in Ukrainian and English. The article also focuses on the differences in the syntax of secondary academic and scientific texts in the natural sciences, humanities, engineering, and social sciences. The authors have compared the acceptance rate of secondary academic texts for publication in English and Ukrainian to identify challenges related to their writing. Furthermore, the paper provides recommendations for improving the quality of writing secondary academic and scientific texts. The improvement of the syntax in secondary academic texts can significantly increase their clarity and persuasiveness.

Index Terms academic writing, scientific style, academic and scientific texts, secondary scientific and academic text, review, abstract, thesis, summary, syntactic structures

I. Introduction

The syntax of secondary academic and scientific texts is an essential aspect of communication in various fields of scientific knowledge. It serves as a vital tool for conveying ideas, expressing arguments, and structuring information. Although syntactic features may differ from one discipline to another, there are general principles that mark secondary academic texts. Academic texts are the main channels of communication within the scientific community. Understanding the syntactic features of these texts not only helps scientists share knowledge effectively but also makes it easier for students and researchers to enter a new field of knowledge. Correct and structured syntax in scientific texts contributes to the accurate presentation of ideas, concepts, and research results. This is

important for the further development of scientific knowledge, as it helps to avoid ambiguities and errors in interpretation. The analysis of syntax in scientific texts in various fields can reveal common patterns, features, and even differences that can be useful for the development of interdisciplinary research. A better understanding of the syntactic features of scientific texts is necessary to develop and improve automatic text processing methods, express ideas, and work on scientific projects more effectively.

The study focuses on analyzing the syntactic features of secondary academic texts in various fields of scientific knowledge. They include natural sciences, social sciences, humanities, technical disciplines, and many others. We will analyze the specific trends and requirements that stand out in each

of these fields, as well as draw attention to overlaps and common structural elements. Consequently, the study of the syntax of secondary academic and scientific texts in various fields of scientific knowledge is highly relevant. It can make a significant contribution to multiple aspects of research and education. This study aims to analyze the syntactic features of secondary academic texts and to understand how these features reflect the peculiarities of scientific thinking and communication in each particular field. The research findings will help to expand our understanding of how syntax serves as a tool for the effective exchange of scientific information and contributes to the development of scientific discourse in general. Research goals:

- 1) To analyze the existing literature and studies on the syntax of secondary academic and scientific texts.
- 2) To review secondary academic and scientific texts and identify the features of syntactic structures in the context of Ukrainian and English for secondary academic and scientific texts (abstract, review, summary, and thesis).
- 3) To identify the peculiarities of writing secondary academic texts for different fields of knowledge.
- 4) To present a statistical analysis of the acceptance rate of secondary scientific texts for publication in order to identify difficulties in writing such texts and formulate recommendations.

II. Literature Review

Academic writing requires formality in its expression and structure. This includes avoiding informal or casual expressions and adhering to formatting standards (e.g., formatting in a specific citation style and listing references). An academic text should be clear and precise when expressing an idea. The text should be structured and logically connected to avoid ambiguity or vagueness [1]. In academic texts, it is crucial to support the thesis with evidence, citations from credible sources, or research results. This ensures that the text is convincing and credible [2]. Academic writing involves critical thinking and analysis. It is necessary to foster the development of personal arguments, analyze and evaluate existing viewpoints, and provide personal conclusions [3]. All academic texts should follow proper academic standards and requirements, including referencing, citation, and formatting. Each statement should be clearly formulated and supported by relevant evidence or examples. It is essential not only to express a personal opinion but also to substantiate it [4]. The authors investigated the interrelation between metacognitive planning, evaluation and control strategies, and comprehension of scientific texts. Researchers have assessed the comprehension of scientific texts at the level of inference [5].

Scientific research in the field of information retrieval and data analytics focuses on textual classification, which is widely used in both practical work and scientific research. There is a study on long texts, such as academic texts, which mainly focus on abstract extraction [6]. The article discusses academic reading as an essential component of learning for electrical engineering students. It is shown how crucial aca-

demical reading skills are for students learning regarding international standards and requirements. In addition, the authors determine the importance of academic reading in scientific research [7]. Researchers analyzed a bibliographic database to find temporal differences in higher education subjects using text analysis methods [8].

The authors define the place of the scientific essay in the scientific discourse and determine how the text is structured and organized. Particular attention is paid to the consistent development of argumentation and the criterion for answering the task. The most common mistakes made when writing a scientific essay, both structural and logical, are analyzed by Chrdileli & Shulzhenko [9]. The study by Piter et al. [10] focuses on scientific conferences: it is determined that it is essential for scientific articles to be relevant to the field. Scholars from different disciplines regularly hold scientific conferences to exchange information. However, the approval of some papers has been limited due to inappropriate topics [11]. Studying the discourse structure of scientific articles related to the subject area is necessary to provide scholars with more accurate knowledge about research in a particular academic field. The authors present an automatic annotation method that automatically annotates discourse information contained in scientific articles [12].

Shi [13] discusses the practical aspects of the case study, including textbooks and accurate academic sources. The use of formal linguistic ideas to create and manage the diverse meanings of languages is a proper alternative method for processing linguistic information [14]. Wu et al. [15] propose the concept of flexible linguistic preference relations, which uses a more flexible way of forming linguistic expressions.

The article by Davydov & Lozynska [16] discusses linguistic models of assistive multimedia and communication information technologies. Most studies are limited to English and a few other Eastern languages, leaving us susceptible to ambiguity in their interpretation due to the weak grammatical structure of these languages [17]. This study presents a new sentence-level steganography framework for hiding information in syntactic space (HISS-Stega). It provides more embedding potential while maintaining better semantic coherence [?]. Scientific texts strive for impartiality while avoiding emotional coloration and personal assessments. Errors and inaccuracies should be minimized [18]. Although scientific texts may contain complex concepts and terminology, they should be presented in such a way as to be comprehensible to a broad audience within the corresponding field of knowledge. This includes the use of a clear and simple style, definitions of key terms and concepts, as well as illustrations and examples to facilitate understanding [19].

Scientific texts should be meticulously organized systematically and logically. They should feature a clear introduction, body, and conclusion, along with a well-structured sequence of arguments and conclusions [20]. In scientific texts, particular attention is given to citing and referring to previous research, which serves to underpin and validate the author's argument [3]. This practice also fosters a dialogue with prior

studies and lays the groundwork for further research [21]. Scientific texts are typically written in a formal style, eschewing casual phrases and informal expressions. This approach helps to uphold the seriousness and professionalism of the text [22].

Despite the large number of studies devoted to the issue of writing scientific texts and various aspects related to this topic, the syntax of secondary academic and scientific texts in different fields of scientific knowledge (a comparative aspect of the research in English and Ukrainian) has never been the subject of a special study.

Methods The study of the syntax of secondary academic and scientific texts in various fields of scientific knowledge may involve the following methods.

A. Corpus studies

The analysis of large corpora of scientific texts reveals typical syntactic constructions, the frequency of using different syntactic elements, and the comparison of syntax in various fields of knowledge.

B. Cognitive and linguistic analysis

The study of syntactic construction specificity based on the ideas and concepts characteristic of a particular field of scientific knowledge.

C. Comparative analysis

This method involves a comparison of the syntactic features of secondary academic texts in different fields of scientific knowledge in order to identify common trends and differences.

D. Qualitative analysis

This includes an in-depth study of particular texts in order to identify typical syntactic constructions, the peculiarities of their use, as well as their functional role in the transmission of scientific information.

E. Experimental research

This method involves experimental studies to determine the impact of different syntactic techniques on the understanding and perception of scientific information.

III. Results

Academic text writing is a specific style of writing used in educational and scientific contexts to convey information, argue, and prove a point. Its main features include formality, clarity and accuracy, use of evidence, critical thinking, compliance with academic standards, evidence-based argumentation, academic fairness, and impartiality. The scientific writing style is marked by specific features that make texts convincing, accurate, and easily understood within the scientific community. The scientific writing style may differ slightly depending on the specific field of science.

Academic and scientific texts are a form of publication that contains research results, analytical reviews, theoretical concepts, or other vital contributions to the scientific community.

A secondary academic research text is a text that analyzes, interprets, or summarizes the results of research performed by other scholars. It does not contain any original research of its own. Instead, it is based on data obtained from previous research. Secondary texts, i.e., texts compiled from existing texts, include abstract, literature review, thesis statement, and summary. Thus, secondary academic texts play an essential role in the process of scientific exchange of information and knowledge. They help scientists navigate the current state of the research field and generate new ideas for future research.

Let us now examine the concepts used in the study. Syntactic structures organize words and phrases in sentences to convey meaning and the relationship between ideas in a text. They determine how words and phrases are arranged and combined in sentences and paragraphs, ensuring the logical and grammatical coherence of the text.

A review is a critical assessment and analysis of a scientific work performed by other scientists or experts in the relevant field of knowledge. Reviews play an essential role in the scientific community. They help to ensure the quality and reliability of scientific publications and provide a process for critical evaluation and discussion of scientific ideas. Theses of a scientific conference are brief descriptions of the research or projects presented at the conference in oral or written form. They emphasize the contribution of the presented research to the scientific community and its significance in the development of scientific knowledge in the relevant field. An abstract of a research paper is a brief description of the content and main research findings, which is a kind of summary of the paper. The abstract should be short and informative, usually consisting of a few sentences to a paragraph, depending on the format requirements. It should contain the main ideas and results of the study, excluding unnecessary details and supporting information. A summary is a brief statement of the main ideas in a research or academic paper to provide the reader with an overview of the topic, main results, and conclusions of the study. It should have a clear structure, including an introduction, the main body with the main ideas and results of the study, and a conclusion summarizing the main findings and making final statements. Table 1 contains a comparative analysis of syntactic structures in both Ukrainian and English.

Table 2 illustrates the peculiarities of writing secondary scientific texts in English and Ukrainian.

The syntactic structures of reviews may differ depending on their written language. The Ukrainian language has a rich grammatical system and various syntactic structures, which can lead to more diverse and colorful reviews. English usually uses a direct and clear style, which leads to shorter and more precise expressions in reviews. Reviews in English often have a clear structure, subdividing into thesis, argumentation, and conclusions into separate paragraphs.

The syntax of abstracts for articles may differ depending on the language they are written in. Ukrainian abstracts usually begin with a brief description of the research topic, its goals, and relevance. English abstracts usually start with a short

Features of syntactic structures in the Ukrainian	Features of syntactic structures in English
Words order	
A flexible word order - subject, predicate, verb: Subject-Object-Verb	A typical word order in a sentence includes subject, verb, and predicate: Subject-Verb-Object
Use of cases	
A rich system of cases is used to express syntactic relations in a sentence. Words change cases depending on their role in the sentence.	Cases are used less actively, and the order of words and prepositions determines most syntactic relations.
Use of articles	
There are no articles, and nouns can be identified by their context or by using words like "that," "this," "which," etc.	Articles (definite and indefinite) are used to identify nouns.
Verb forms	
Persons and numbers can modify verbs and have different kinds of verbal and tense forms.	Although there are tense forms, verbs are modified by person and number only in the present tense.
Structure of questions	
Changes in tone or adding introductory words are often used to form a question.	Questions are often formed by inverting the subject and verb or using auxiliary verbs.

Table 1: Comparative analysis of syntactic structures of secondary scientific texts in Ukrainian and English

Peculiarities of writing secondary scientific texts in Ukrainian	Peculiarities of writing secondary scientific texts in English
Reviews	
- flexibility of word usage; - syntactic diversity; - detailed description.	- direct and clear style; - structuring of paragraphs; - the use of academic language.
Abstracts to research papers	
Compliance with the structure: - description of the study; - research methodology; - results; - conclusions.	Compliance with the structure: - brief description; - research methods; - results and conclusions; - keywords.
Summaries	
- the flexibility of word usage; - use of cases; - extended descriptions.	- direct and clear style; - structuring of paragraphs; - use of academic language.
Conference theses	
- richness of word usage; - the flexibility of grammatical constructions; - descriptiveness.	- direct and brief style; - academic style; - information structuring.

Table 2: Peculiarities of writing secondary scientific texts in English and Ukrainian

but information-packed description of the study, including its topic, goals, and relevance. Both languages have in common the desire to present information about the article in a brief but information-packed manner, emphasizing the critical aspects of the study and its value to the scientific community.

Syntactic structures of summaries may differ in both Ukrainian and English due to differences in grammar, sentence structure, and stylistic features of these languages. For example, Ukrainian summaries often use detailed descriptions and explanations, which can lead to a more developed and complex syntactic structure. In English, summaries often have a clear structure with an introduction, followed by the body and conclusion, which is also reflected in the syntactic structure. There is a wide use of academic language with technical terms and specialized vocabulary in English summaries, which gives the text a more formal and professional tone.

Syntactic structures of conference theses may differ in both Ukrainian and English. Moreover, the differences may be caused by both linguistic features and standards of the accepted scientific style in the respective language environments. The Ukrainian language allows for more flexibility in using various grammatical constructions, which can lead to

more diverse syntactic structures in theses. As for the syntax, English theses are often structured using headings or bulleted lists, which makes it easier to perceive the information.

The syntax of secondary academic and scientific texts may differ depending on the specific field of scientific knowledge. Figure 1 presents a comparative analysis of the acceptance rate of secondary academic texts in English and Ukrainian to identify their writing challenges and provide recommendations. The minimum value of the acceptance rate for this study is 10, and the minimum value is 0. The acceptance rate means the percentage of articles or papers approved for publication in a particular scientific journal, conference, or periodical compared to the total number of papers submitted for consideration. In total, we analyzed 40 secondary scientific publications for each type of scientific text under consideration per each language. In the humanities, the acceptance rate for Ukrainian-language theses is 7, while English-language theses received an acceptance rate of 6. Abstracts have the same rate - 7, as well as summaries - 6. Ukrainian-language reviews in the humanities have a higher rate of 8, compared to English-language reviews of 7. In particular, such rates may be explained by the syntactic features of academic and scientific

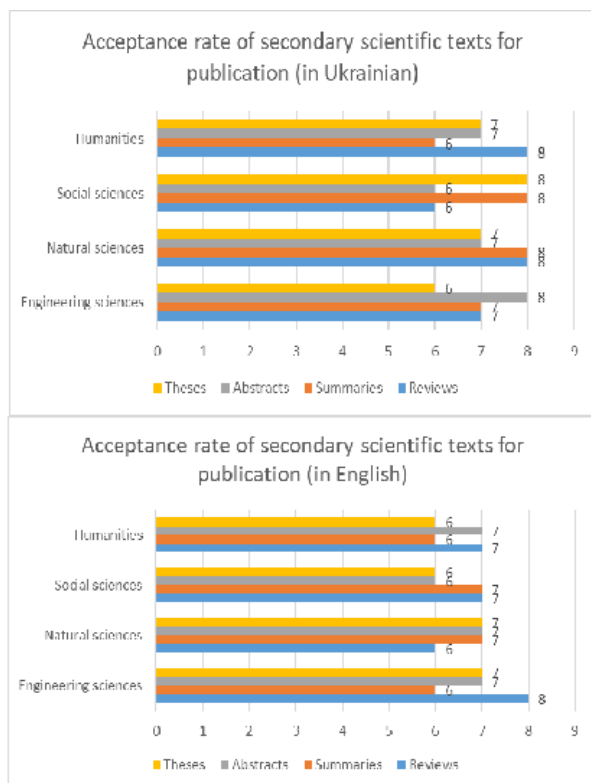


Figure 1: Comparative analysis of the acceptance rate of secondary scientific texts for publishing in English and Ukrainian

texts. In humanities texts, the syntactic structure may be more diverse, with an emphasis on style and emotional coloring. Sentences can be rich and idiomatic, employing various lexical and syntactic devices to convey analytical and interpretive ideas. In addition, humanitarian texts often contain quotations and long reasoning, which can affect the syntactic structure.

Secondary scientific texts in the social sciences have the following rates. Theses in Ukrainian - 8, in English - 6, while abstracts scored 6 points. Summaries in Ukrainian are 8, in English - 7, and reviews in Ukrainian - 7, in English - 6. The syntactic structure may be analytical in social sciences texts (psychology, sociology, or economics). It focuses on describing and analyzing data, conducting research, and drawing conclusions. Sentences can be mid-length, combining both explanatory and argumentative elements. They may also use technical terms and statistical data.

As for the natural sciences, theses and abstracts in both languages scored 7 points each, while summaries in Ukrainian scored 8 points in English and 7 points in Ukrainian. Also, reviews in Ukrainian scored 8 points and 6 points in English. This is partially caused by the fact that texts in the natural sciences often use technical and formal syntax, focusing on accuracy and clarity of presentation. This can include long and complex sentences with many subordinate clauses. The syntactic structure of such texts may be aimed at explaining complex biological processes, including sequences of events,

cause-and-effect links, and detailed descriptions of physiological mechanisms.

Secondary scientific texts in engineering sciences have the following indicators. Theses in Ukrainian - 6, in English - 7. Abstracts in Ukrainian - 8, in English - 7, while summaries in Ukrainian - 7, in English - 6. Reviews in Ukrainian - 8, in English - 7. The syntactic structure in engineering sciences is often focused on a logical sequence of thoughts and mathematical accuracy. Sentences can be short and simple to express mathematical concepts and formulas clearly. However, it can also include complex statements and terms that are unique to the respective field of science.

Our research has led us to crucial recommendations for enhancing the quality of writing secondary scientific texts, which are of significant importance in the context of our study.

- 1) The use of simple and clear sentences is crucial. An author can enhance the text's readability and comprehension by avoiding unnecessary complexity and overloading sentences with many nested constructions. Breaking long sentences into shorter ones, if possible, can significantly improve the understanding of the text.
- 2) Ensuring a logical connection between sentences and paragraphs. Use of communication devices, such as pronouns, repetition of key terms, and lexical connections, to ensure a smooth transition from one thought to another.
- 3) The use of varying sentence lengths to make the text more dynamic and interesting for the reader. Short sentences can be used to emphasize key ideas, while longer sentences can be used for more detailed presentation.
- 4) Varying sentence structure to avoid monotonous text. This may include the use of different types of sentences (simple, compound, compound-subordinate), introductory structures, parallel structures, etc.
- 5) Verifying the harmony between the subject and the predicate, between the noun and the adjective, and between the noun and the verb to avoid grammatical errors.
- 6) The use of the active voice (a subject performs an action) is highly recommended before the passive voice (a subject is the object of an action). This is because the active voice is usually clearer and more concise, leading to a more effective communication of research outcomes.
- 7) Revision of the logical structure. It is necessary to check the sequence of ideas and conclusions to avoid reader confusion.
- 8) Editing and proofreading. After the text is written, it is important to edit it with an emphasis on syntactic errors and shortcomings.

Therefore, the study of the syntax of secondary academic research texts in various fields of scientific knowledge remains relevant and essential to ensure the accuracy, clarity, and effective communication of research outcomes.

IV. Discussion

The syntax of secondary academic and scientific texts in different fields of scientific knowledge can be quite diverse and depends on many factors. This includes the style of publications, audience, traditions, and standards of the scientific community in each particular field. However, it is possible to identify some standard features and trends, such as structure and organization, terminology and style, the use of evidence and citations, methodology and data analysis, as well as the target audience [23]. Regardless of the field, secondary academic texts, such as literature reviews, review articles, and research essays, usually have a structure consisting of an introduction, literature review, methodology, results, discussion, and conclusions.

Each field of scientific knowledge has its own specific terms and terminology that authors should use following the standards of that field. The style may also vary: some disciplines prefer a more formal and technical style, while others may be more literary or philosophical [24]. In academic texts, it is essential to present arguments and conclusions based on evidence and previous research. Therefore, different fields may have different standards for how often to cite and which sources are considered credible [25]. Depending on the field of scientific knowledge, various methods and approaches to data collection, analysis, and interpretation may be used. This can also affect the syntax and structure of the text. For example, it can affect how methods are described and how results are analyzed. It is essential to consider the target audience for the text. For instance, texts intended for specialists in a narrow field may be more technical and informative than texts aimed at a broad audience or scientific newcomers. The adaptability of syntax to these different fields allows authors to effectively communicate their research to their specific audience, empowering them to adjust their writing style accordingly.

Different areas of scientific knowledge have different structures and styles of writing. In such fields as mathematics, physics, and computer science, where clarity and logical argumentation play a key role, the syntax should be concise and clear. Errors or ambiguities in syntax can lead to misunderstanding or misinterpretation of the research results [26]. When it comes to sociology, political science, and economics, syntax plays a vital role in expressing complex concepts and theories. This may include the use of specialized terminology and different writing styles depending on the audience [27]. For literary studies, philosophy, and history, syntax can be more expressive and emotional. In this case, the ability to use syntactic constructions to convey analytical conclusions and interpretation of texts is essential [28]. In interdisciplinary fields, such as bioinformatics or cognitive science, syntax should take into account the specifics of each discipline and ensure clear understanding between specialists from different fields [29]. In the context of an increasingly global scientific environment, syntax is becoming critical to the effective communication of scientific results. Incorrect syntax can lead to misunderstandings, especially in intercultural communication, underscoring the urgency and importance of mastering this

skill.

V. Conclusion

The syntax of secondary academic and scientific texts plays a role in conveying information, accuracy of expression, and persuasion of readers. Different fields of scientific knowledge have their own peculiarities in text organization and choice of language. Each discipline has its own specific terminology that reflects the peculiarities of this field and is used to express concepts and ideas accurately. It is essential to take this aspect into account when analyzing the syntax of scientific texts. Natural and technical texts often have a formalized style of presentation based on strict logic and mathematical precision. This is manifested in the use of structural elements such as formulas, tables, and graphs, as well as in a strict logical sequence of argumentation. In the humanities, the syntax of scientific texts is often more descriptive and emotional. The emphasis in these texts is often on interpretation and analysis rather than formal logic or mathematical calculations. At the same time, texts from the social sciences and humanities have a greater syntactic variety.

Notwithstanding the field of scientific knowledge, an essential aspect of secondary scientific texts is the argumentation and presentation of evidence to support theses put forward. The syntax is subordinated to this goal and is aimed at a logical and consistent presentation of information. Depending on the specifics of the topic and audience, the syntax of scientific texts can be more complex or simple. This may include the use of complex sentences, branched structures, and specific paragraph and section organization. With time, the style and syntax of scientific texts can change due to various factors, such as technological developments, changes in methodologies, and shifts in academic standards. Therefore, it is crucial to take into account current trends and style evolution when analyzing the syntax of scientific texts.

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