IMPLEMENTING THE PRINCIPLE OF LANGUAGE ECONOMY IN TRANSLATION OF SCIENTIFIC AND TECHNICAL TEXTS

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Abstract: The purpose of this article is to address the question of whether the principle of language economy is evident in the complete translation of scientific and technical texts. Most available studies examine the issue of language economy in relation to translation activities in relation to simultaneous and, less commonly, consecutive interpreting. Regarding the genre and subject matter of discourse samples studied in other authors' works, they generally did not relate to speech works presenting the results of scientific research. The authors of this article attempted to examine the admissibility of using more compact methods of conveying scientific ideas and concepts in Russian than their English counterparts during the process of complete written translation. For this purpose, a comparative analysis of scientific articles written in English with their Russian-language translations was conducted. The articles were translated by technical specialists with a high level of English proficiency. Our focus was on terminological vocabulary and its Russian equivalents. We also compared specific syntactical methods of conveying content in English and Russian.These results suggest that the concept of linguistic economy is implemented in the practice of translating scientific and technical texts not only from Russian into English but also from English into Russian. In both cases, this phenomenon is due to significant differences in the structure of the two languages.

Keywords: scientific articles, written translation, principle of linguistic economy, terminology, abbreviations, syntactic organization, structural differences between languages.

Introduction

The tendency toward the economical use of language resources in speech without losing the semantic and stylistic integrity of the message being conveyed is observed in both oral and written communication. This tendency is universal, leading linguists to consider it as one of the main factors in language development [1–4].

In linguistic literature, one can encounter various designations for the linguistic manifestations of this phenomenon: compression, brevity, combination, contraction, linguistic economy, speech or situational economy, compression at the level of form, reduction, elimination, and condensation, which do not change its essence. The most frequently used term is "compression," which we will use in what follows, understanding it, following L.O. Zimina, as the rational selection and organization of linguistic means taking into account the communicative task and the communication situation, which allows for a minimum of linguistic means sufficient to convey the maximum content [1, p. 8]. The problem of linguistic economy and its individual aspects have repeatedly been the subject of discussion in the works of both Russian and foreign linguists. This

phenomenon has been discussed at one time by V.A. Bogoroditsky [5], R.A. Budagov [6], A. Martine [7], G. Paul [8], E.D. Polivanov [9], G. Spencer [10], and other language researchers. Less frequently, linguists have focused on the manifestations of compression observed in translation. Today, many authors are addressing issues related to compression in translation, and the next section will present a brief overview of existing works that either directly examine issues of linguistic economy in the context of translation or address them in connection with the discussion of other linguistic issues. Literature Review Despite the current lack of a comprehensive and systematic concept of compression in the field of language and translation [11], the phenomenon itself is considered by linguists to be a regularity and one of the basic technologies inherent primarily to oral translation [3, 12]. Moreover, as E. Yu. Shamlidi notes in her article, compression as a translation technique is primarily used in simultaneous translation [3].

A detailed analysis of the manifestations of compression in simultaneous translation can be found in the works of V. V. Sdobnikov [13] and I. V. Poluyan [14]. According to V. V. Sdobnikov, in simultaneous translation, compression should be considered one of the means of ensuring the very possibility of translation activity [13, p. 125]. The author also distinguishes between compression at the level of meaning and compression at the level of form. Compression at the level of meaning occurs when, during simultaneous interpretation, translators must compress individual segments of the source text to maintain the semantic chain, retaining the most significant information relevant to a specific situation in the target language text while discarding anything unnecessary, redundant, or uninformative. Regarding compression at the level of form, V.V. Sdobnikov identifies three groups of factors that determine it: a) system-related factors, which are associated with the structural differences between the two languages; b) text-related factors, which include elements of redundancy such as repetitions or segments of speech that duplicate the content of previous utterances; and c) situation-related factors.

The latter are elements of textual redundancy that evoke an extralinguistic situation, even though the situation itself may be familiar to the listeners. Based on the above, one might assume that only texts containing a certain amount of redundant information are subject to compression. In other words, the tendency to economize on linguistic resources may be unlikely when translating legal, technical, and economic texts. However, according to V.V. Sdobnikov, every text contains some redundancy; it's just that not all elements of linguistic redundancy are eliminated in principle. In his work, V.V. Sdobnikov examines the manifestations of compression at the linguistic (superficial) level using examples of translation from Russian into English, noting that the English language is more "compact" than Russian. According to the author, the prerequisite for selecting and using the shortest possible forms in translation are the systemic features of the English language and the nature of the structural differences between the two languages. Agreeing with I.V. Poluyan [14], V.V. Sdobnikov notes that the direction of translation (Russian → English or English → Russian) determines the specific manifestations of compression, but speech compression as such can be implemented regardless of the direction of translation [13, p. 136].

It is significant that the downside of compression at the level of form – in particular, when it comes to syntactic structures – is often their semantic complexity. This was noted in R.A. Budagov [6, p. 5] in his work. Based on numerous examples taken from English-language works, N.Yu. Osokina and S.B. Dekterev [15, p. 233] conclude that a number of compact syntactic constructions are "hypersemanticized." Although the object of their research was the language of literary works, a similar tendency is also observed in scientific and technical texts. This is confirmed by numerous

examples cited by B.N. Klimzo in his works [16, 17]. He notes that in many cases, Russian language norms require expressing a thought as fully and explicitly as possible, whereas English allows for a more concise way of conveying a thought or concept, and this circumstance must be taken into account by translators [16, p. 69; 17, p. 11]. This conciseness is based on various types of implications inherent in the English language and which are expressed at different levels of the utterance or text. It is generally recognized that when translating from English into Russian, the translated version is 20–30% larger than the original text. However, in a number of cases, as noted by I.V. Poluyan, the opposite trend is also evident. In his work [14], he cites several examples where a more compact method of conveying content occurs when translating from English into Russian.Compression in these cases is achieved through adverbialization (It is reprehensible → Disgusting), compact nominalization with the simultaneous elimination of the repetition of the word "followed" (Engagement followed engagement, campaign followed campaign → After a series of battles and military campaigns), and the use of a compact Russian verb with a prefix in place of a compound verb-predicate in an English sentence (The coalition has outlived itself → The coalition has outlived itself). Finally, as I.V. Poluyan notes, "the English language is replete with synonymous pairs, which can sometimes be conveyed in just one word" [14, p. 100]. Thus, a review of existing works has shown that the problem of compression in translation is primarily considered in relation to oral, or more precisely, simultaneous, interpreting, and in most cases this occurs when translating from Russian into English. This article attempts to determine whether compression occurs when translating scientific and technical texts from English into Russian without compromising the precise and unambiguous conveyance of their content.

Materials and Methods

The text material analyzed for this problem consisted of English-language articles on various fields of knowledge. The texts included articles on welding technologies, aircraft design and production, chemical engineering, mechanical engineering, construction materials production, oil production, and other fields, borrowed from journals included in international citation databases. The texts of these articles were compared with their Russian translations, which were completed by specialists in the relevant field. These specialists were graduate students and postgraduate candidates who had passed the candidate's exam and possessed a sufficient level of English proficiency for professionally oriented translation. For each article, the translators compiled a terminological glossary reflecting the specifics of its subject matter. In addition, industry-specific scientific and technical dictionaries were used. When comparing the texts of articles with their translations, randomly selected excerpts from the original sources were compared with related fragments of the translated text. This approach allowed us to identify a general trend, regardless of the linguistic material's relevance to a specific subject area or section of the article. When comparing the original articles and their translations, we focused on individual words, phrases, and longer text fragments—sentences and superphrasal units. The study of the linguistic material was conducted within the framework of an analytical and comparative approach, which involved the use of specific methods.

The main methods were observation to identify related linguistic facts in the two languages, and the method of transformational analysis, which allows us to trace the transformations that elements of one language undergo when expressing the original content in the other language. A conversation (survey) method was also used when it was necessary to clarify the acceptability of a particular formulation in the proposed translation.

Results and Discussion

A comparative analysis of the original articles and the related Russian translations confirmed the fact that compression at the linguistic level can occur in the written translation of scientific and technical texts, but its manifestations vary. When translating from English into Russian, the "economy" of linguistic form manifested itself primarily at the lexical level, when either a single word or a phrase consisting of fewer words was used in the translation to convey a terminological phrase consisting of two or more words. Some of these are recorded in dictionaries, for example: oil recovery → oil recovery, printed circuit board , while others are not found in dictionaries, requiring the translator to find an equivalent for such a complex of concepts. Examples of the latter include the phrases "unmanned combat aerial vehicle → attack drone," "polymer crash stone mixture" → polymer crushed stone mixture," and a number of others included in entry-level glossaries. In addition to phrases, cases of linguistic compression have been noted in the translation of phrases related to common vocabulary, such as "long-standing problem" or "root causes."Two points are worth noting. Firstly, cases of more economical denotation of the conceptual content of English terms using Russian were prevalent, while cases of compressed rendering of phrases not included in the terminology systems into Russian were isolated. Secondly, there was a quantitative dispersion of the identified cases of compression when translating terminological vocabulary from English into Russian. In the translated versions of individual articles, examples of linguistic compression in rendering terms were more numerous than in the translations of other articles – the dispersion ranged from 4 to 8% of the total number of words in the sample.Another method of compression in scientific texts is the use of abbreviations, both generally accepted and those dictated by the subject and object of the study. Accordingly, the question arises about the method of transmitting abbreviations: will it be transcribed using Cyrillic, as in the case of DTA (differential thermal analysis), for which the dictionary-recorded equivalent of ДТА (differential thermal analysis) is used in Russian-language texts? Or will the abbreviation be retained in Latin in the translated text, as in the combinations CAD/CAM technology, CAD/CAM system architecture, CAD/CAM production, etc. The latter have long been part of the linguistic vocabulary of engineering specialists, who in oral – and primarily informal – communication use the Russified phonetic equivalent, pronounced as [kad/kam], while in articles written in Russian or translated into Russian, preference is given to the Latin alphabet.

For the sake of objectivity, we note that in Russian, the abbreviation CAD (computer-aided design system) exists, which is recommended to be translated into English as CAD [18]. However, the same author further notes that the term CAD is vague and broad, as it refers not only to design systems but also to software products used for mathematical calculations (the MathCAD package), financial and economic analysis (SAP), and medical diagnostics [18, p. 6]. According to information from another source, the concept denoted by the abbreviation CAD is not a complete equivalent of CAD, since the latter also includes CAM (computer-aided manufacturing) and CAE (computer-aided engineering – engineering calculations, analysis, modeling, and optimization of various processes in a system). Based on this, it can be argued that preserving the original (i.e., in Latin) abbreviation in translation will most accurately convey the concept. Particular attention should be paid to abbreviations whose use in the original text is dictated by the need to denote a certain occasional cognitive complex, often quite extensive, consisting of several words, and repeated multiple times within the article. Such abbreviations often denote a very narrow and/or relatively new concept related to the subject of the study discussed in a given publication. As a rule, such abbreviations are not recorded in dictionaries, and the issue of their rendering is left to the

translators themselves. Finally, there are many abbreviations that are homographs, for example: EOR (enhanced oil recovery) and EOR (east of Rockies). Both meanings are listed in the specialized English-Russian dictionary of oil and gas [19], and only for the former does the dictionary suggest the abbreviation MOH (enhanced oil recovery methods). Such homograph abbreviations can be regarded as the translator's "false friends." These include, in particular, the following abbreviations listed in dictionaries: AC (1. Alternating current; 2. Austin chalk); DC (1. Dead center; 2. Decontamination; 3. Development well—carbon dioxide; 4. Diamond core; 5. Direct current; 6. Drill collar; 7. Dual completion). All meanings of the latter are presented in a specialized industry dictionary [19] and, accordingly, reflect the conceptual apparatus used in oil exploration, oil production, and oil and gas geology. This dictionary also lists a number of other abbreviations denoting several different concepts: BP has seven meanings, KD has two meanings, and WC has four meanings. For some meanings of these abbreviations, the dictionary offers equivalent Cyrillic abbreviations. For example, for the abbreviation DC in its sixth meaning listed above, the dictionary offers the initial abbreviation УБТ, whose phonetic and graphic form does not match its English equivalent. Furthermore, the dictionary lists another abbreviation, NMDC (non-magnetic drill collar), the Russian equivalent of which is a combination of the abbreviation and the full word—не магнитная УБТ. Cases of language compression at the syntactic level caused by redundancy in the expression plan deserve special attention. Below is an excerpt from an article devoted to methods for evaluating models created for metal honeycomb sandwich structures (metallic honeycomb sandwich structures), along with its translated version. In the initial phases of construction, preliminary estimations are frequently created based on scientific methodologies to address structural arrangements known as the sandwich configuration. <…> Given the unique characteristics of the structure's construction and the diverse range of critical applications it can serve, there is a need for a more accurate and systematic model of square honeycomb structures. → In the initial stage of production, preliminary estimations are often made based on methods related to the structural features of sandwich structures. <…>The unique nature of the structure's production and the diversity of its critical applications require the creation of a more accurate model for products with a square honeycomb structure. A count of fully meaningful words in English sentences and their Russian equivalents revealed a ratio of 17 to 13 in the former case and 23 to 18 in the latter. We did not consider prepositions and articles, as they perform grammatical and structural functions in languages. However, it is easy to see that

these predominate in English sentences, meaning that including them in the count would have made the difference in word count even more significant. This is clearly a case of compression, which V.V. Sdobnikov attributes to the influence of system-dependent factors. Furthermore, the translator deemed it unnecessary to include in the translation a number of words that did not affect the accuracy of information conveyed. It is precisely the influence of these factors that can explain the noticeable structural transformations during sentence translation, which, in turn, entailed purely quantitative changes.

Conclusion

The results of our study allow us to draw the following conclusions. Despite the prevailing trend toward increasing the overall text volume when translating from English into Russian, cases of compression at the linguistic level are far from isolated. The most noticeable manifestation of compression in the translation of scientific and technical texts is the use of more compact Russian

terms, as well as abbreviations, including occasional ones not recorded in dictionaries. As for compression at the syntactic level, its manifestations are due to the different structures of the two languages, on the one hand, and a certain redundancy in the plan of linguistic expression, on the other. However, as I.S. Kashenkova rightly notes in her work, the economical presentation of information by eliminating unnecessary words and grammatical structures contributes to linguistic clarity and accuracy [20, p. 366], which are the main indicators of the quality of scientific and technical translation.

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