

A COMPARATIVE STUDY OF DISCOURSE MARKERS IN THE TRANSLATION OF BULGARIAN MEDICAL RESEARCH ARTICLES

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The paper looks into a major discourse element in medical research articles (MRA) – discourse markers (DM). They serve as an important element in achieving translation equivalence. A corpus analysis of DM is performed including original Bulgarian MRA, their translations into English and original English MRA serving as *tertium comparationis*. The greatest diversity of DM has been found in the Introduction section in all corpora. Both sections – Methods and Results – are much poorer in DM in all corpora. Our findings in the Discussion sections show that English MRA use more DM in logical cause-and-effect conclusions, while the Bulgarian ones rely mostly on DM when they compare their research outcomes with prior results. Translated texts' DM in that section follow articles in the Bulgarian language corpus (BLC), however, we found some diversity in the translation variants.

Key words: medical research articles, discourse markers, translation equivalence

1. Introduction

1.1. Research articles – form and function

The research article (RA) is the academic genre heavyweight, whose structure serves as the mainframe of all other genre forms. Swales (1990) first focuses on the ideational characteristics of the RA – he introduces the notion of rhetorical *move*. A rhetorical move indicates “a change in information flow” (Swales 1990: 140-141), while the main function of RA is to convince the reader of the significance of the presentation of the scientific product through publication.

In its turn, the medical research article (MRA) has been evolving since the 18th century, having occupied a substantial part of the first research paper *Philosophical Transactions of the Royal Society* (Marta

2015). It has taken a fully-fledged form in the middle and late 20th century, adopting the IMRD structure – constituted by Introduction, Methods, Results and Discussion sections respectively. The main role of IMRD structure is to facilitate a paper's ultimate goal – persuading the reader in the veracity of the presented hypothesis and its proof. Thus, each of the above mentioned sections is employed to a different end, according to its rhetorical function. The Introduction presents the aim of the study, the main hypothesis, and it upholds the significance of the research. The Methods main goal is to convince the reader that the applied approach(es) are trustworthy and can be replicated. The Results section presents the findings of the research, while the Discussion interprets the latter while juxtaposing them against the backdrop of prior research.

1.2. Discourse markers in research articles

Particularly important for the development of the RA (and MRA as its subgenre form) genre strategies are discourse markers (DM), which are the intersection points in a text, performing rhetorical functions, marking the boundaries of the moves in a MRA, signifying a change in the information flow, signaling alterations in an author's stance. In linguistic terms, DM may be represented by various word classes: prepositions and adverbs such as *on, at, however, moreover, thus, largely* / *въпреки (vapreki – however), досега (dosega – so far)*; conjunctions *and, but*; but also multiword expressions such as *so far, in addition to, associated with, in relation* / *по отношение на (po otnoshenie na – in relation to), по този начин (po tozi nachin – in this way)*, etc. Discourse markers enter into many roles and are designated by linguists in various ways: *sentence connectives* (Halliday and Hasan 1976), *semantic conjuncts* (Quirk et al. 1985), *discourse operators* (Redeker 1990, 1991), *pragmatic particles* (Östman 1995), *discourse markers* (Biber et al. 1998); *discourse particles* (Schourup 1985, Fischer 2000); *pragmatic markers* (Schiffrin 1987, 2006; Fraser 1998, 1990), *linkers* (Foley & Hall 2003), etc. The fact that DM serve so many purposes, while their functions at the same time are not clearly delineated creates disagreements and discrepancies in the analyses of many linguists both analysts of DM and further afield. Despite those disagreements, however, there is unanimity regarding the DM's basic function – they are simultaneously endowed with hedge functions and participate in reinforcing the text cohesion. One working hypothesis that may facilitate researchers was proposed by Biber, according to whom DM are: “inserts which tend to occur at the beginning of a turn or utterance and to combine two roles: (a) to signal a transition in the evolving progress of

the conversation, and (b) to signal an interactive relationship between speaker, hearer, and message,” (Biber et al. 1998: 1086).

The advantage of this definition is that it integrates the text with the interpersonal metafunction (Halliday & Matthiessen 2004) as a starting point in identifying DM. In other words, as Davis (2015: 195) points out, through DM authors signal the connection between the two parts of the text and also the relationship between them. In view of the various textual functions they perform, Blakemore (1992: 138-141) expounds the following functions:

- DM allow the retrieval of contextual information
- DM can reinforce an existing assumption by providing better evidence
- DM may signal a proposal that contradicts the assumption made
- DM can specify the role of a particular speech in the discourse

Fraser (2009a: 8) defines four types of DM – contrastive, elaborative, inferential, temporal, to which Davis (2015: 195) adds a fifth type – meta-discourse:

- contrastive – *alternatively, although, contrary to expectations, conversely, unlike, on the other hand/ за разлика от (za razlika ot – unlike), въпреки (vpreki – although/despite), от друга страна (ot druga strana – on the other hand), обратно на това (obratno na tova – contrary to)*
- elaborative – *above all, also, correspondingly, equally, for example / in a similar way, largely, in relation to, compared to / по такъв начин (po takav nachin – in this way), до голяма степен (do golyama stepen – to a great extent), по отношение на (po otnoshenie na – in relation to), в сравнение с (v sravnenie s – in comparison to), според (spored/ according to)*
- inferential – *so, after all, as a conclusion, as a consequence, as a result of, consequently, for this / that reason /, thus, according to/ в заключение (v zaklyuchenie – in conclusion), в резултат на (v rezultat na – as a result of), следователно (sledovatelno – therefore), така (taka – so), по този начин (po tozi nachin – in this way)*
- temporal – *then, after, as soon as, before, eventually, finally, first / най-напред (nay-napred – first), преди (predi – before, prior to), най-накрая (nay-nakraya – finally), след (sled – after, then), в хода на (v hoda na – in the course of)*
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- meta-discourse – *as mentioned, as previously stated, as previously discussed / както бе упоменато (kakto be upomenato – as mentioned before), зореспоменатото (gorespomenatoto – the abovementioned)*

Davis (2015:195) comes with a simple yet exhaustive definition of DM, which we will adopt: “Discourse markers are words or phrases that signal two features in a stretch of text. The first is that the author is signalling a connection between two segments of text, and the second is that the author is sending a message to the audience regarding the importance of the relationship between the two segments.” This definition is very much in the spirit of systemic-functional linguistics as it covers both the textual and the interpersonal metafunctions which are relevant in the case of DM.

1.3. Discourse markers in translation

Translating DM is a tall order since the very properties that prototypical members of the functional class of DM share are non-propositionality, context-dependence, multi-functionality and a primarily non-referential function.

Being a functional rather than a lexical category, DM can't be translated on the basis of their core meaning. They must be perceived in view of their discourse function, so what should be translated is their pragmatic value, rather than their lexical meaning. This excludes any literal translation, thus striving for formal equivalence is ruled out. Any such attempt will invariably turn out to be an inoperative strategy, since research has shown that it is impossible to find one-to-one correspondences between DM in two different languages (Lewis 2006).

In their inventory, translators have a variety of options depending on the extent to which they want to (or are able to) convey the subtleties of the ST and the linguistic means by which they choose to do so. Equivalent effect is equally impossible to achieve, because of the various social, stylistic, interpersonal, discourse and other effects that are simultaneously conveyed by a particular use of a DM. What is left to achieve is a well-balanced compromise, which in most cases is the staple of any translation.

2. Methods

2.1. Building the corpora

The corpora in the current research have been built so as to suit the purposes of translation analysis. The study employs the methodology of both corpus-driven and corpus-based approaches (McEnery, Xiao, Tono 2006), aiming at the most detailed analysis of the selected language material. On the other hand, because of our desire for verification, we adhered to free access sources or those that could be obtained through institutional subscription. Desiring the highest possible representation, the study is based on a broad-spectrum corpus of Bulgarian articles from almost every field of medicine, where the representative journal published full translations into English. The English-language articles are from foreign journals with high impact factors, published in countries such as the USA, Canada, the UK, the Netherlands, and others. All English-language journals are from the Elsevier and Scopus systems and are peer-reviewed. All the excerpted articles were published between 2012 and 2019.

We have built three corpora: one in Bulgarian language, dubbed Bulgarian language corpus (BLC), a second, called Translated article corpus (TAC), consisting of the full translations of the articles from BLC, while the third corpus is comprised of original English language articles (English language corpus – ELC) from foreign journals. As far as size is concerned, we have excerpted 50 articles to build BLC and the respective TAC, while ELC comprises 34 articles. In terms of word count, the BLC consists of 95586 words, TAC – 100827 words and ELC – 105641 words. Our guiding principle with regard to size was word count, which is very close if we consider the two primary corpora – BLC and ELC. For the sake of the analysis we have abstained from building very large corpora. Nevertheless, the total count of words in all corpora is 302054 words, which is a formidable number and accounts for excellent representativeness by this criterion.

All excerpted articles were initially scanned into PDF files and then into word processing files for ease. For data processing, we used WordSmith, version 6.0 (Scott 2012), freely available, employing all three of its features: Concordance, KeyWord and WordList, which allow the monitoring of word contexts and repetitive lexical and syntactic constructions. To this end, the three corpora were merged into three respective files, and the sections *Introduction*, *Methods*, *Results* and *Discussion* were further separated and combined into separate files for more efficient processing.

2.2. Identification of Moves

The following Moves have been identified in the current research.

Rhetorical Moves in BLC and ELC	
BLC	ELC
<p>Introduction Move 1: Introduction of general topic Move 2: Transition to specific topic Move 3: Identifying research niche Move 4: Aim of research</p> <p>Methods Move 5: Description of sample Move 6: Description of experiment Move 7: Data processing</p> <p>Results Move 8: Presenting main results of research Move 9: Presenting specific results</p> <p>Discussion Move 10: Short description of results Move 11: Comparison with prior research Move 12: Detailed description of results and data analysis Move 13: Statement of study importance Move 14: Conclusion</p>	<p>Introduction Move 1: Introduction of general topic Move 2: Transition to specific topic Move 3: Identifying research niche Move 4: Aim of research</p> <p>Methods Move 5: Type and design of clinical trial Move 6: Description of sample Move 7: Description of experiments Move 8: Description of data collection procedure</p> <p>Results Move 9: Description of main results of study Move 10: Description of specific results</p> <p>Discussion Move 11: Short assessment of results in view of the set aims in the Introduction section Move 12: Analysis and assessment of specific results Move 13: Comparison with previous studies Move 14: Limitations of study Move 15: Conclusion</p>

Table 1. Identified Moves in BLC and ELC articles

As can be seen from Table 1, the original articles in either language share many common structural features, although there are some notable differences as well.

2.3. Analysis of translation strategies

In terms of translation equivalence, we have performed both quantitative and qualitative analyses. We have identified and juxtaposed the

frequency of appearance of DM in TAC as opposed to the other two corpora and also distinguished any divergences of TAC DM from DM in BLC ones.

3. Results and discussion

The largest variety of DM was found in the Introduction sections, while the scarcest in the Methods sections in all corpora. Table 2, below presents a breakdown of the most frequently used DM in all corpora.

Discourse markers			
	BLC	ELC	TAC
Introduction	въпреки (vapreki), според (spored), за съжаление (za sazhalenie), по този начин (po tozi nachin), досега (dosega), до голяма степен (do golyama stepen), от друга страна (ot druga strana), според (spored), заедно (със) (zaedno (sas)), независимо че (nezavisimo che), нещо повече (neshto poveche), поради (poradi)	therefore, however, in addition, in general, in relation to, both... and, to (some) extent, due to, despite, prior to	therefore, however, despite, due to, in relation to, to (some) extent, both and, as a result of, moreover, compared with
Methods	в резултат на (v rezultat na), в хода на (v hoda na), по отношение на (po otnoshenie na), за целта (za tselta)	first, second, third, a number of, during, after, then	first, second(ly), a number of, in contrast
Results	в сравнение със (v sravnenie sas), по отношение на (po otnoshenie na)	compared with, furthermore, therefore, moreover, however	compared with, in terms of,

Discussion	в сравнение със (v sravnenie sas), по отношение на (po otnoshenie na), за разлика от (za razlika ot), в тази връзка (v тази vrazka)	compared with, due to, associated with, in addition to, in contrast, moreover, therefore, as a result of, consequently, for this/that reason	in addition to, in contrast, moreover, therefore, compared with, according to, furthermore
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Table 2: *Most frequently used discourse markers in all corpora*

The heterogeneity of Moves and Steps in the Introduction section of MRA is also a prerequisite for the diversity of DM that are used. For example, in *Move 1: Introduction of general topic*, the BLC articles are dominated by elaborative DM, since this Move outlines many parallel facts.

Despite the variety of forms, the frequency of DM used in the Introduction section of BLC articles is much lower than that in the ELC. Bulgarian authors strongly prefer other means of cohesion (nominalization, synonymy, etc.) over the use of DM. In contrast, in ELC, the use of DM in building text cohesion is widespread, especially in *Move 1: Introduction of general topic* and *Move 2: Transition to specific topic*.

With respect to the DM typology, the above-mentioned markers that are used in the Introduction section are:

- elaborative – *accordingly, both... and, to a large extent, together with / по този начин (po този nachin), до голяма степен (do golyama stepen), заедно с (zaedno s)*
- contrastive – *on the other hand, despite / despite, however, contrary to, despite/ въпреки (vapreki), от друга страна (ot druga strana), независимо че (nezavisimo che)*
- inferential – *according to / so, as a result of, consequently, for this / that reason, in relation to, therefore/ затова (zatova), споед (spored), в резултат на (v rezultat na)*
- temporal – *so far, prior to/ до този момент (do този moment), досега (dosega)*

The use of DM in TAC generally follows the BLC pattern not only with regard to number, but also type and position of the markers. As a

whole, DM in ELC often occupy initial position, which in most circumstances is not the case in BLC. To some extent that fact is premeditated by the differences in the grammar systems and especially in the word order of the languages in question. For instance, *however* has 52 tokens in the Introduction section in ELC articles out of 151 in total, while there are 32 tokens of the same DM in TAC with only 8 instances of the word used in the Introduction section and 4 instances of the word in initial position in the sentence. If we look into the equivalent word in Bulgarian, we will see that *however* in TAC is simply a translation of *obache* (which has 30 tokens in BLC as a whole.) The same is valid for the oppositions *therefore* – *zatova*, *according to* – *spored*, *for this reason* – *poradi тази причина*, *in the course of* etc.

In the Methods section of the BLC articles, a very small number of DM were identified: *в хода на* (*v hoda na*) – temporal, *в резултат на* (*v rezultat na*) – inferential, *по отношение на* (*po otnoshenie na*) – elaborative, *за целта* (*za tselta*) – elaborative, *най-напред* (*nay-napred*), *първо* (*parvo*), *второ* (*vtoro*), *трето* (*treto*) – temporal. The ELC ones with the highest frequency are the temporal markers of discourse – *during*, *after*, *before*, *then* and those marking sequences – *first*, *second*, *third*, particularly high in *Move 7: Description of experiments*. This section is the poorest in DM in all corpora, with TAC tokens closely following their Bulgarian equivalents. Like the previous section, here the English DM are much more numerous in relative terms, of course.

The Results section of BLC articles does not abound in DM either, with two phrases standing out among all others – *в сравнение с*, *по отношение на*, with the highest frequency in *Move 9* in both corpora. The first is used in medial position in the sentence, while the second occurs most often at the beginning. Their TAC equivalents are also the most frequently used DM – *compared with*, *in terms of*.

In ELC, the use of elaborative and inferential DM is very characteristic of the commentary Steps: *Move 9: Step 3*, *Move 10: Step 2*, etc.

- elaborative – *compared with*, *furthermore*, *moreover*, *in addition*
- inferential – *therefore*
- contrastive – *however*

Like the Introduction, in the Discussion section, the diversity of DM is relatively large. In BLC, the basic DM are elaborative and contrasting:

- elaborative – *по отношение на* (*po otnoshenie na* – *in regard to*), *в тази връзка* (*v тази връзка* – *in this regard*)
- contrastive – *в сравнение със* (*v sravnenie sas* – *in comparison to*), *за разлика от* (*za razlika ot* – *unlike*)

- inferential – *поради (poradi – on account of), в резултат на (v rezultat na – as a result of)*

In ELC, the most commonly used DM are also elaborative and contrasting, but also the inferential ones.

- elaborative – *compared with, in addition to, associated with, moreover*
- contrastive – *however, in contrast to*
- inferential – *due to, as a result of, consequently, for this / that reason*

What we can infer from these findings is that ELC articles make use of more DM when it comes to logical cause-and-effect conclusions, mainly in Move 11, Move 12 and Move 13, while BLC articles mostly rely on DM when they compare their research outcomes with prior results – Move 11. In terms of DM typology, TAC does not make a distinction in Discussion either but there is some diversity in translation units – i.e. *poradi* is translated as *due to*, but also as *therefore*, and *because*.

Metadiscourse markers were not detected in BLC and the number of differential markers was also negligible. Perhaps only the phrase *In conclusion*, at the beginning of the sentence of the Conclusion part, which is formulaic in its ideational nature and is, of course, of high frequency.

4. Conclusion

In addition, studies at the interface of DM research, academic genre forms and translation studies can provide new insights into all respective subjects. While finding translation equivalents is a reliable way of mapping individual DM' functional spectra and can also serve as a heuristic for “establishing semantic-pragmatic fields” (Degand 2009: 174), such research can be useful for analysing translation strategies as well.

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