
**RHETORICAL STRUCTURE OF RESEARCH MEDICAL ARTICLE ABSTRACTS –
BULGARIAN-ENGLISH CONTRASTIVE STUDY**

Ivaylo Dagnev

Medical College at Medical University - Plovdiv, Bulgaria, ivodagnev@abv.bg

Mariya Saykova

Medical College at Medical University - Plovdiv, Bulgaria, mariya_saykova@abv.bg

Maya Yaneva

Medical College at Medical University - Plovdiv, Bulgaria, mayavyaneva@gmail.com

Abstract: From the perspective of the readership of a research medical article "the abstract is the first textual part with which the reader faces the title". Therefore, its communicative function is enormous, as it serves largely as a reference to the information value of the article. According to Hyland, the abstract is a "critical point" which, in a transcendent sense, tilts the scales in favor of reading or rejecting an article by the readers. In the world of discourse and genre analysis, abstracts are showered with considerable attention. Swales analyzes the rhetorical and textual organization of abstracts, followed by authors such as Martin, Hyland and Tse. A number of linguists in the field of discourse conduct contrastive analyzes of this genre by exploring it in different fields. With regard to the rhetorical structure of the abstract, it is, as expected, a reflection, or a mirror image, of the scientific paper itself. If we search deeper into the matter, the content of abstracts do not merely repeat the structure of the article itself, as the former depends on many other factors - mostly on the format required by journals' editorial policies. All of them set a limit to the number of words, necessitating from authors specific structure and organization. The study presents a quantitative and qualitative analyses of the abstracts of research medical articles with regard to their rhetorical structure. It is based on a corpus of 186 abstracts of article in Bulgarian and 129 in English, all excerpted from prestigious high impact factor journals. Of those in Bulgarian, distinct parts have 123 abstracts, while the remaining 63 represent one separate paragraph. Of the abstracts in the English corpus in their turn, only 62 have clearly defined structured parts. The sequence of the moves in both corpora is firmly established with few exceptions. In abstracts with distinct parts, the predominant organization is: Introduction, Aim, Materials and Methods, Results, Conclusion. Analyzing the content of the abstracts, we found that they depend mostly on the format prescribed by the journals themselves. Not all abstracts have the abovementioned structure, and diversity is largely due to the different requirements that editorial policies stipulate. Many journals do not have a firmly established abstracts format (especially those that limit the number of words to 150-200) and there the authors have relative freedom of presentation of the articles' content. The comprehensive analysis of the rhetorical movements of the abstracts suggests that their structure depends entirely on the conventions of the specific editions as well as on the perspective of the scientific discourse community.

Keywords: abstracts, research medical article, rhetorical move

1. INTRODUCTION

Among academic communities today, the research article abstract is regarded as an essential part in identifying the basic content of the report. It is "the first textual part with which the reader faces the title" [1]. Therefore, its communicative function is enormous, as it serves largely as a reference to the information value of the article. Moreover, since most high impact journals require readers to subscribe to their content, free access to abstracts is often the only option for a wider range of audience (especially in third and Eastern European countries) to obtain an overview of the latest developments in science. It is for these reasons that many authors try to convince their potential readers in the value of their work by using various rhetorical means of persuasion. In addition, an increasing number of journals appearing in languages other than English also require a translation of their abstracts in English. All of these arguments prove the immense importance of abstracts, especially those in English, both in purely academic terms and in foreign language learning setting. The importance of abstracts has also drawn many linguists to studying their intricacies and what is more, the former have acknowledged the status of abstracts as being an independent genre form.

As Swales [2] suggests, a genre comprises a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse community and, thereby, constitute the rationale for the genre. As far as the structure and organization of specific texts in a given genre, Swales put forward the idea of rhetorical moves. A move in genre analysis is defined as "a discursual or rhetorical unit that performs a coherent communicative function in a written or spoken discourse" [2]. Swales also

proposed the CARS (Creating a Research Space) model of rhetorical moves in research articles, which has become the keystone in this field of linguistic and discoursal analysis. Since Swales' [2] pioneer work in scientific text analysis, there has been an influx of analytical papers delving into the structures of the various parts of the research article [3]. Swales himself [2,4] analyzed the rhetorical and textual organization of abstracts, followed by scholars such as Martin [1] and Hyland and Tse [5]. A large amount of previous research on abstract genre was extensively investigated within particular disciplines [6,7,8] and, by extension, across multiple disciplines [9,10, 11, 12]. Santos [6], for example, conducted a move analysis of research articles abstracts in applied linguistics. Hyland [9] studied abstracts across a vast array of knowledge domains. Samraj [10] performed a comparison of the structural organization of abstracts between conservation biology and wildlife behavior. Martín [13], moreover, contrasted English with Spanish abstracts in experimental social sciences, Kanoksilapatham in biochemistry [14].

With regard to the rhetorical structure of the abstract, it is, as expected, a reflection, or a mirror image, of the scientific paper itself. If we search deeper into the matter though, the content of abstracts do not merely repeat the structure of the article itself, as the former depends on many other factors - mostly on the format required by a journal editorial policies. Needless to say, all journals set a limit to the number of words, necessitating authors to abide by the rules of keeping to a specific structure and organization.

Originally, analysts of this genre offer four moves similar to the research paper, but later Santos introduced a fifth one, situating the research which was adopted by Hyland [5] and Swales and Feak [4]. Hyland's model includes the following Moves: Introduction, Purpose, Methods, Results, Conclusion. What still divides linguists however is the notion of a Move boundary, as the definition of move is somewhat vague and fuzzy. As Davies [15] suggests, some textual boundaries can be discerned easily as they are marked by indentation, headwords or subtitles. That is also typical for abstracts, although it is often a requirement of a journal editorial policy. Clausal boundaries, which are often signaled by coordinating or subordinating adverbs, are sometimes considered a model for discourse relations in text. However, the issue still holds as how to define the limits of a move that cannot be immediately made salient by overt boundaries by headwords or clearly demarcated clauses. A strong line of argument has been proposed by Kanoksilapatham's framework of setting boundaries based on 'content and linguistic criteria'. As each move has a purpose or 'communicative function', visible in the content, it is defined by linguistic cues. Linguistic criteria refer to key words or phrases that act like discourse markers.

2. METHODS

The study presents a quantitative and qualitative analyses of the abstracts of research medical articles with regard to their rhetorical structure. It is based on two corpora of 186 abstracts of articles in Bulgarian and 129 in English, all excerpted from prestigious high impact factor journals. The Move analysis was carried out by using Hyland's model of abstracts' textual organization, presented in Table 1.

Table 1. Hyland's model of the rhetorical structure of abstracts. [5]

Hyland (2000)	
Move	Function
Move 1: Introduction	Establishes context of the paper and motivates the paper
Move 2: Purpose	Indicates purposes, hypothesis, outlines aim behind the paper
Move 3: Methods	Provides information on design, procedures, data analysis, etc.
Move 4: Results	Indicates results, achievements and the argument.
Move 5: Conclusion	Interprets or extends the results, points to applications or wider implications and interpretation scope of paper.

Analysis of move structure was based on the abovementioned definition of move boundary, suggested by Kanoksilapatham's framework [8].

3. RESULTS

Of those articles in Bulgarian, distinct parts have 123 abstracts, while the remaining 63 represent one separate paragraph. Of the abstracts in the English corpus in their turn, only 62 have clearly defined structured parts, most commonly: Background, Methods, Results, and Conclusions. The remaining abstracts consist of one paragraph, with no subdivision of the individual subparts, but most of the above four parts, as well as others, are also accounted for. The sequence of the moves in both corpora is firmly established with few exceptions.

In abstracts with distinct subtitles, the predominant structure is *Introduction, Purpose, Materials and Methods, Results, Conclusion*. The titles of some parts vary, e.g. instead of *Materials and Methods*, some abstracts have the

respective part entitled *Patients and Methods*, which is in concert with either the journal’s policy or the intent of the author. The abstracts contents, although reflecting the structure of the article itself, depend on many other factors - mostly on the format required by the respective journals. All of them limit the number of words, and many also require a particular structure. For example, the Bulgarian journal *Endocrinology* requires the presence of five elements of the abstract that contain the abovementioned moves: *Introduction, Purpose, Patients and Methods, Results, Conclusion*. Other journals, such as the Bulgarian journal *Anesthesiology and Intensive Care*, do not require the Introduction section, and *Pediatrics and Neonatology* (Science Direct) is missing the *Purpose* section. Separately, many journals do not have a firmly established abstracts format (especially those that limit the number of words to 150-200), and there the authors have relative leeway of presentation of the content of the articles. There are also journals (e.g. the Bulgarian one *Pediatrics*, etc.) that do not require an abstract at all, but just keywords.

Table 2: Abstract from an article in Pediatrics and Neonatology – English corpus

<p><i>Ming-Huei Chen et al. Factors Determining Bone Mineral Density in Patients with Biliary Atresia after a Successful Kasai Operation.</i></p> <p>Background: Xepatic osteodystrophy is a common complication in patients with chronic liver disease, however, <u>bone mineral status in patients with biliary atresia has rarely been investigated.</u></p> <p>Methods: Twenty-nine children with biliary atresia were enrolled in our study and their demographic data, bone mineral density (BMD) of lumbar spine and bilateral femoral neck, and biochemical parameters were measured and analyzed.</p> <p>Results: The majority of our patients had osteopenia or osteoporosis over at least one part of the skeleton although none had jaundice. Instead of T helper 1 cell cytokine, interleukin (IL) – 4 had a significant negative correlation with BMD of the right femoral neck ($\beta = -0.251, \rho = 0.027$) and left femoral neck ($\beta = -0.299, \rho = 0.012$) independently by multiple linear regression analysis.</p> <p>Conclusion: We conclude that chronic inflammation with increased expression of IL-4 may be an important factor for compromised bone health in patients with biliary atresia.</p>

In the abstract presented in Table 2, the Purpose is not present, but it is implicit (in the underlined subordinate sentence) by the Step ‘Identifying the research niche’. In other articles, especially in non-English ones, the abstract is shortened to only two or three sentences, probably due to word limitations. In abstracts with clearly delineated sections, moves were easy to define, while the moves in those comprising of one paragraph were defined owing to discourse markers and content.

Table 3: A single paragraph abstract from Pathophysiology - English corpus.

<p>Antoine, St. et al. Pathophysiologic Mechanisms in Heart Failure: Role of the Sympathetic Nervous System</p> <p>Abstract</p> <p>The syndrome of heart failure involves complex pathophysiologic mechanisms and is associated with extremely high- morbidity, mortality and economic costs. This growing global epidemic has diverse etiologies and is fundamentally characterized by dyshomeostasis between heart and kidneys, leading to development and progression of the cardiorenal syndrome. Excessive and sustained sympathoexcitation has emerged as a single prominent factor involved in the structural and functional dysfunction of multiple organ systems during this disease. Studies in experimental models of heart failure indicate that ablation of the renal nerves may help restore renal sodium and water equilibrium as well as the attenuation of adverse cardiac remodeling. With the recent development of minimally invasive endovascular renal denervation in humans, it is anticipated that this technology would become a novel and important paradigm shift in the management of heart failure.</p>

The abstract in Table 2 lacks a clear-cut section structure, but content and language cues can help identify the moves. The first and second sentence provide a background to the research, while the third sentence constitutes the research niche, while the fourth one suggests a solution (purpose of the study). In its initial first part, the fifth sentence alludes to the methods of investigation, while in the main clause the possible outcome and its significance are debated (results and conclusion).

4. DISCUSSION AND CONCLUSIONS

The rhetorical Moves of research medical abstracts are idealized variants, as the availability of all moves is far from a standard position. The abstracts structure and organization, although reflecting the one of the article itself, depends on many other factors - mostly on the format given by journals themselves. Apart from the specific editorial policies of a given journal, we should bear in mind that the latter do not exist in a vacuum, but are subject to the respective

discourse community practice and are representative of the discursive mentality and mindset. As it turned out, Bulgarian and English abstracts do not differ greatly on account of their authorial imprint but the identified organizational patterns diversions are more due to their association with the specific discourse culture.

REFERENCES

- [1] Martín-Martín, P. A Genre Analysis of English and Spanish Research Paper Abstracts in Experimental Social Sciences, *English for Specific Purposes* 22(1): 25–43, 2002
 - [2] Swales, J. M. *Genre analysis: English in academic and research settings*. Cambridge, New York: Cambridge University Press, 1990.
 - [3] Salager-Meyer, F. A Text-type and Move Analysis Study of Verb Tense and Modality Distribution in Medical English Abstracts, *English for Specific Purposes* 11(2): 93–113, 1992.
 - [4] Swales, J. M., and Feak, C., B. *Abstracts and the writing of abstracts*. The University of Michigan Press, Ann Arbor, 2009.
 - [5] Hyland, K. & Tse. Hooking the reader: a corpus study of evaluative that in abstracts. *English for Specific Purposes*, 24: 123-139, 2005.
 - [6] Santos, M. B. The textual organization of research paper abstracts in applied linguistics. *Text*, 16(4), 481–499, 1996.
 - [7] Cross, C., & Oppenheim, C. A genre analysis of scientific abstracts. *Journal of Documentation*, 62, 428-446, 2006.
 - [8] Kanoksilapatham, B. Generic characterization of civil engineering research article abstracts. *3L: The Southeast Asian Journal of English Language Studies*, 19(3), 1-10, 2013.
 - [9] Hyland, K. *Disciplinary discourses: Social interactions in academic writing*. Harlow, Essex: Pearson Education, 2000.
 - [10] Samraj, B. Introductions in research articles: variation across disciplines. *English for Specific Purposes* 21, 1-7, 2002.
 - [11] Pho, P. D. Research article abstracts in applied linguistics and educational technology: a study of linguistic realizations of rhetorical structure and authorial stance. *Discourse Studies*, vol. 10(2): 231–250, 2008.
 - [12] Saeew, S. *Genre analysis of research article abstracts: Rhetorical variation between environmental science and applied linguistics (Unpublished Master's thesis)*. Language Institute, Thammasat University, 2013
 - [13] Martín, P. M. A genre analysis of English and Spanish research paper abstracts in experimental social sciences. *English for Specific Purposes*, 22: 25-43, 2003.
 - [14] Kanoksilapatham, B. Rhetorical structure of biochemistry research articles. *English for Specific Purposes*, 24(3), 269-292, 2005
 - [15] Davies. R.H. *A genre analysis of medical research articles*. PhD thesis. University of Glasgow, 2015
- Abstracts excerpted from:
1. Ming-Huei Chen et al. Factors Determining Bone Mineral Density in Patients with Biliary Atresia after a Successful Kasai Operation. *Pediatrics and Neonatology*, 58, 128e134, 2017.
 2. Antoine, St. et al. Pathophysiologic Mechanisms in Heart Failure: Role of the Sympathetic Nervous System, *The American Journal of the Medical Sciences*, Volume 353, Number 1, January 2017.