Rhetorical Structure Challenges Facing Egyptian Researchers in Writing English Research Articles for International Publication(*)

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Abstract

This study has aimed to identify the rhetorical structure challenges facing Egyptian researchers in writing their Scientific, Technical, and Medical (STM) research to be published in international journals. In order to publish a research article (RA) internationally, the researcher should be able to write in an organized and convincing way. Egypt's status concerning the quality and quantity of research publications internationally needs improvement. Therefore, there is a need to provide guidelines and specified educational programs for Egyptian researchers to help overcome the rhetorical challenges they face while writing research in English. The rhetorical structure of unedited first drafts of 20 STM RAs, selected based on a set of criteria, was analyzed based on 3 models of analysis: Swales' Create A Research Space (CARS) model (1990; 2012) to analyze the Introduction and the Discussion sections, Peacock's model (2011) to analyze the Methods section, and Kanoksilapatham's model (2007) to analyze the Results section. Overall, the analysis showed that 90% of the analyzed RAs had rhetorical structure issues, whether in fulfilling main moves or abiding by the standard order of moves. The most problematic sections were found to be the Introduction and the Discussion. These findings, thus, highlight areas of difficulty to Egyptian researchers and hence help provide guidance to avoiding them, which is ultimately a step towards improving the status of Egypt's scientific research.

Keywords. Genre, Genre Analysis, Academic Discourse, Rhetorical Structure, CARS Model

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الملخص

هدفت هذه الدراسة إلى التعرف على التحديات التي يواجهها الباحثون المصريين في إعداد أبحاثهم العلمية ليتم نشرها في الدوريات الدولية من خلال تحليل نصي لأقسام البحث المختلفة. من أجل نشر مقال بحثي دوليًّا، يجب أن يكون لدى الباحث القدرة على عرض محتوى البحث بشكل منظم ومنسق. عدم تنظيم الأفكار في البحث هو من الأسباب الرئيسة التي قد تؤدي إلى رفض نشر المقالات البحثية دوليًّا. ولذلك، هناك حاجة لتوفير إرشادات للباحثين المصريين لمساعدتهم على التغلب على التحديات التي يواجهونها أثناء إعداد الأبحاث باللغة الإنجليزية للنشر الدولي. تم تحليل البنية البلاغية للمسودات الأولى غير المحررة من ٢٠ مقالة بحثية كتبها باحثون مصريون بناء على ٣ نماذج للتحليل: نموذج CARS Swales 1990; 2012 لتحليل أقسام المقدمة والمناقشة، نموذج Kanoksilapatham 2007 لتحليل قسم المنهج، ونموذج Peacock 2011 لتحليل قسم النتائج. عند تحليل البنية البلاغية للأقسام المختلفة للبحث، أشارت النتائج إلى أن ٪٩٠ من الأبحاث المستهدفة لديها مشاكل في تحقيق وتنظيم الأفكار والمعلومات، وأكثر الأقسام التي كانت بها صعوبات للباحثين كانت المقدمة والمناقشة. لقد سلط تحليل البنية البلاغية في العينة المختارة الضوء على المشكلات التي يواجهها الباحثون المصريون في بناء الأبحاث العلمية باللغة الإنجليزية، وهو ما سيساعد في نهاية المطاف على تفادي تلك المشكلات وزيادة جودة وحجم البحوث التي ينشرها الباحثون المصريون دوليًّا؛ وهي خطوة تجاه تحسين مستوى البحث العلمي في مصر.

الكلمات المفتاحية

نوع الخطاب، تحليل نوع الخطاب، الخطاب الأكاديمي، الهيكل البلاغي، نموذج CARS

Statement and Rationale of the Research Problem

Publishing research is mandatory for Egyptian researchers to get a degree and to get promoted academically. Researchers are encouraged to publish research internationally as per the weight added to the research published in them. In spite of this requirement, Egypt contributes with a share of only 0.6% of world research publications and 11% regionally, according to Scopus (2016). As per the Egyptian Ministry of Higher Education and Scientific Research (MOHE), in 2016, 18,876 RAs were published in international peer-reviewed journals. The majority of this international research production is in the Scientific, Technical, and Medical (STM) fields. Concerning the quality of Egyptian research, Egyptian articles' citation impact is 0.9 according to 2015 statistics, which is below average (Academy of Scientific Research and Technology, 2016).

To publish an RA internationally (and even locally), the researcher should be able to write a highly organized and well-supported argument. One reason that can stand against Egyptian researchers when attempting to publish research internationally is the way they write and organize the RA. Lack of the required skills for research writing to publish internationally is one of the major challenges facing Egyptian researchers according to Shehata and Eldakar (2018). The genre of RAs follows a set of rules that govern how the researcher should present and shape his/her argument. Lack of organization of ideas according to major publishers (e.g., Springer, Elsevier, Wiley) is one of the reasons that may result in having RAs written by academics rejected from publishing (Springer, n.d.; Thrower, 2012; Eassom, 2018). Therefore, there is a need to probe into the exact nature of the rhetorical structure inadequacies so as to provide guidelines for Egyptian researchers. However, this need is not sufficiently met by previous research. Hence, this study attempts to fulfill this need through analyzing how Egyptian researchers write their RAs in English in STM fields to be published internationally. Furthermore, this analysis is conducted on the unedited first drafts of the RAs prior to publication, which is an approach that has never been adopted by previous research on the topic.

Scope of the Study

The current study is limited to analyzing the rhetorical moves in RAs written by Egyptian researchers, in the fields of STM, and submitted to international peer-reviewed journals. Any research in a non-STM discipline, or in a local journal, or written by a non-Egyptian researcher is out of the scope of this study. Moreover, the analysis is conducted on the main body of the RAs, excluding the front matter (i.e., the journal's information, the researcher's information, and the abstract), the back matter (i.e., any supplementary sections to the article [e.g., Acknowledgments, Appendix, etc.]), the tables and figures, and the References list.

Background to the Study and Literature Review

Definitions of genre have depended on Bakhtin's 1986 work. Bakhtin defines genres as "relatively stable types" (p. 60) of communicative

utterances which distinguish the unique nature of the language used in the different spheres in terms of the content, the style of language, and the discourse structure. He states that genres are as rich and diverse as language itself, since they go hand in hand with human activities which are numerous and in a constant state of development. Bakhtin also divides genres into primary and secondary genres. Primary genres are the 'simple' genres which are formed in a direct way from the speech community without alteration. They are the sources from which secondary or 'complex' genres are formed. Secondary genres, such as novels, dramas, RAs, and so on, develop from the alteration of a collection of primary genres, resulting in a more complex and organized form of discourse. Bakhtin further adds that genres may show different levels of individuality, or the author's voice in the discourse. The genres which show a higher level of individuality are those which require creativity and focus on the author's style of language, such as arts and literature. In contrast, genres such as business, legal, and military documents show the least level of individuality, since they necessitate a standard form of discourse which is used by all individuals.

Building on Bakhtin's views, Swales (1990) formulates his working definition for the genre:

> 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 institute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style…In addition to purpose, exemplars of a genre exhibit various patterns of similarity in terms of structure, style, content and intended audience (Swales, 1990, p. 58).

A genre is then an attribute of the whole discourse community and not of

single individuals. A discourse community according to Swales is a sociorhetorical network whose members share common communicative features and goals, hence sharing the same genre. A genre also includes the text/speech in addition to their encoding and decoding processing as related to the role of the text/speech and the environment in which it is used. This processing is called a task. Therefore, the discourse community, the genre, and the task, all bound by the communicative purpose, are the main factors when dealing with language in a given community.

Bhatia (2013; 2014) has major contributions towards the definition of genres. He highlights the main characteristics of genres which are being a conventionalized and highly standardized form of language in a certain social group to serve its communicative goals. These characteristics are sufficient and accessible so that individuals can resort to them in order to recognize and differentiate between the different genres. Bhatia also agrees with the previous definitions in the fact that genres are not fixed but may change as per the changes in the community. He adds, however, that genres may impose constraints on language choices which language users should abide by. He points out that these constraints can turn into a resource for creativity, adding special effects to language in cases where the individual is familiar enough with the genre. Expert members of a community can shape their language and structure choice to create new patterns to serve their intentions but on the condition of staying within the shared boundaries of the genre in question. Bhatia finally mentions that there can be intermingling among genres resulting in mixed or hybrid genres. Some genres may even have internal disciplinary variations such as academic genres. For instance, a scientific RA may cut across the disciplines of science and business.

Genre Analysis

Genre analysis is a deeply rooted approach to analyzing texts. It is defined as "the study of situated linguistic behaviour in institutionalized academic or professional settings" (Bhatia, 2014, p.26). Genre analysis is based on the notion of discourse analysis. As Hyland (2011) defines it,

discourse analysis is "studying language in action, looking at texts in relation to the social contexts in which they are used" (p. 5). Discourse analysis thus seeks investigating language use in the different contexts in society. Genre analysis, however, has been offered as a more detailed and insightful type of discourse analysis.

This development of discourse analysis towards genre analysis has followed three stages (Bhatia, 2014). The first stage is analyzing the language patterns in specialized discourse areas. The second stage is the move towards the general scope, analyzing the language patterns of discourse generally without specialization. The third and the most recent stage is moving towards the specific scope, through the analysis of language patterns in professional and academic genres. This latter stage is realized in the examination of the interaction between the writer and the reader, the discourse structure, and the characteristics of specialist discourse. The third stage has also witnessed the rise of genre analysis and the 'move' as a unit of discourse. Moves as Hyland (2011) defines them are "the rhetorical steps which writers or speakers routinely use to develop their social purposes" (p. 6).Swales and Feak (2012) also define the move as "a stretch of text with a specific communicative function"(p. 291). The move as a communicative discourse unit can vary in length from a single clause to more than one paragraph (Swales & Feak, 2000).

The movement from discourse analysis to genre analysis is found to fill two main gaps. First of all, genre analysis highlights the rationale behind the various types of discourse. It demonstrates and explains the boundaries and sets the expectations of the different genres. Adding to this, genre analysis gives more attention to the communicative conventions and discourse organization of the various types of discourse. Genre analysis thus provides useful insights into the construction and interpretation of texts. It also acts as a liaison among functional explanation of language, rhetorical interpretations of organizational/institutional language use, and the application for the purposes of language teaching (Bhatia, 2013).

Academic Discourse

The genre of the scientific RA with which this study is concerned falls under the umbrella of academic discourse. Hyland (2011) defines academic discourse as "the ways of thinking and using language which exist in the academy…Textbooks, essays, conference presentations, dissertations, lectures and RAs are central to the academic enterprise and are the very stuff of education and knowledge creation" (p. 1). Academic discourse is the language used in academic contexts. It is used in educating learners in the academic institutions and building and spreading knowledge to the academic society. It also establishes the academic relationships and roles needed to ensure the sustainability of these purposes.

The most practiced and produced form of academic discourse is the RA. Swales (1990) defines the RA as "a written text (although often containing non-verbal elements), usually limited to a few thousand words, that reports on some investigation carried out by its author or authors. In addition, the RA will usually relate the findings within it to those of others" (p. 93). From the above definition, it is noted that the RA is a piece of writing with a set of standard features aiming at explaining and proving or refuting a certain idea or theory for the best interest of the society in terms of knowledge and progress. The RA is also not an independent work which is fixed and only depends on the thoughts of its writer. It is a work of constant negotiation and interaction, building on the works of others to move a step forward.

According to Swales (1990) and Swales and Feak (2012), the RA consists of 4 main sections: Introduction, Methods, Results, and Discussion (IMRD) as in Figure 1.
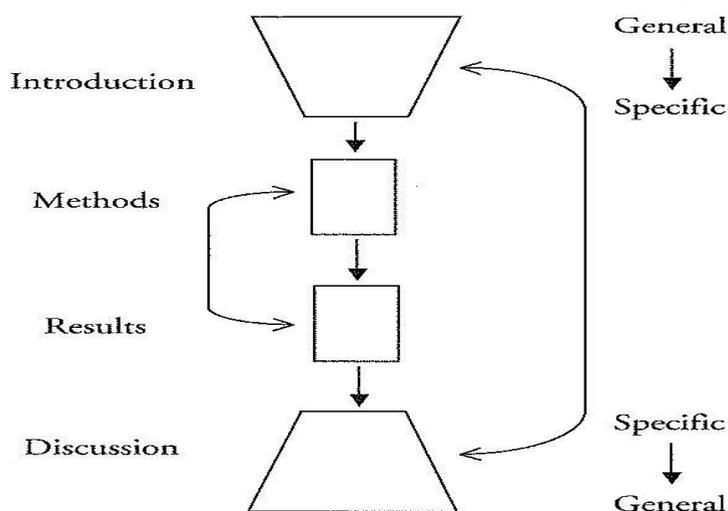
Figure 1: The structure of the research article (from Swales & Feak, 2012)

Each section in the RA consists of a set of moves. A move, as mentioned above, is the rhetorical unit which represents a specific communicative function. As can be seen from Figure 1, the Introduction section moves from the general topic from which the research is incited, to the stance of the previous research about the problem the research is focusing on, to the rationale and the specific questions and hypotheses to be investigated. Swales in his CARS model divides the Introduction section into 3 moves as follows. Move 1 is establishing a research territory, which shows the general research area and reviews the previous research on the matter. It may also provide statement of the research problem, the rationale, the significance of the study, and its relevance to the body of research. Move 2 is establishing a niche, by clearly stating a gap that the study attempts to address. Move 3 is occupying the niche, by discussing how the study will attempt to investigate this gap. This move outlines the purpose/features of the study. It may also list research questions and/or hypotheses, present principal findings, state the value of the study, and indicate the structure of the RA (Swales, 1990).

The Methods section follows the Introduction. According to Swales and Feak (2012), the Methods section is the "narrowest" (p. 285) in the RA.

This section includes details about the research design, the sample chosen (participants or materials), the data collection and analysis procedure, and the limitations or threats to the method adopted. Swales and Feak further point out that the rhetorical structure of the Methods section is understudied. However, one prominent study which provides a working model to analyze the Methods section is Peacock (2011). According to Peacock, it is found that the Methods section consists of 3main moves. Move 1 is describing the materials/participants. It explains and justifies the selection of the sample and the materials used for the study. Move 2 is describing the procedure. It describes the procedures taken for the data collection and testing. Move 3 is describing and explaining the data analysis. These moves are found more in the scientific fields which are the focus of the current study, but may not apply to more theoretical fields such as humanities. Note also that these moves can appear in any order and not necessarily the order provided above.

The Results section comes next. It is the section where the findings are presented and commented on. Swales and Feak (2012) present a number of studies which have analyzed the rhetorical structure of the Results section in different disciplines. A major study that provides a working model to analyze the rhetorical structure of the Results section in scientific RAs is Kanoksilapatham (2007). The Results section can consist of 3main moves (Kanoksilapatham, 2007; Swales & Feak, 2012). Move 1 is restating methods. This move provides a description of aims and purposes, restates research questions, makes hypothesis, and lists procedures/methodological techniques. Move 2 is justifying methodology, where the methods and procedures used are explained and rationalized. Move 3, which is the main constituent of the Results section, is announcing results. In this move, the results are reported and portrayed as novel and worthy to consider.

The final section in the RA is the Discussion section. Unlike the Introduction section, the Discussion section moves from the specific to the general (Figure 1). Also unlike the Results section which presents the results, the Discussion section justifies these results and relates them to the research questions and to previous research (Swales & Feak, 2012). According to Swales and Feak (2012), the Discussion section can include 5

moves. Move 1 is optional where background information is presented, tackling the research purpose, the theoretical background, and the methodology. Move 2 is obligatory, summarizing and reporting key results. Move 3 is also obligatory, commenting on the key results and offering explanations and interpretations to them. Move 4 is optional, where the limitations of the study are stated. Move 5 is also optional, making recommendations for future research. It is also worth mentioning that the concluding remarks on the RA can be mentioned in the Discussion section or in a separate Conclusion section.

Previous Studies

Previous research works focused on analyzing the rhetorical challenges researchers face but from different perspectives. Some studies analyzed the rhetoric of RAs but in non-Egyptian contexts and participants. Thelwall (2019) studied the rhetorical structure of RAs from the dimension of the frequency of the section headings on a multidisciplinary level. He collected the section headings of over one million RAs from the PubMed Central Open Access database. Thelwall found considerable variation between disciplines divided into the 4 main groups of Social Science, Biomedical, Natural Science and Engineering, and Arts and Humanities. It was also found that the scientific disciplines had more standard headings than the arts and humanities which may use more unfamiliar structure and headings. Despite these insightful findings, Thelwall's study tackled the rhetorical structure of RAs from a surface level, that is, the section headings. The internal rhetorical structure of each section of the RA needs to be studied as well to have a full image on the matter.

Abuel (2016) analyzed the rhetorical structure of 50 RAs in science, technology, engineering, agriculture, and mathematics (STEAM) written by Filipino researchers using Swales' CARS model. The study aimed at presenting pedagogical implications for helping produce an appropriately organized and ordered RA. It found that Filipino researchers follow a total of 18 moves in the different sections of the RAs. However, what applies to Filipino researchers might not be applicable to Egyptian researchers.

Fazilatfar (2016) studied the rhetorical structure of 30 randomly selected RAs written by Iranian researchers from 4 Iranian journals of Applied Linguistics in the years 2008–2012. The study found significant difference between the rhetorical moves of Iranian RAs when compared to the standard. Yet, Applied Linguistics is a different discipline from STM and consequently it may have a different rhetorical structure.

Karapetjana and Rozina (2016) focused on exploring the rhetorical structure of dentistry RAs. They aimed at providing the foundation for the conventions and standards in writing RAs in this particular field. They reached the conclusion that the dentistry RA has been Anglicized and that researchers should familiarize themselves with the English rhetorical structure. The study's focus, nevertheless, was dentistry which is only one discipline of the STM fields. Adika (2014) analyzed the rhetorical structure of the Introduction section in 59 RAs published in the *Legon Journal of the Humanities* in the years 2005–2010. He aimed at examining the space that the Ghanaian researchers allot to themselves. He found that the researchers tend to ignore mentioning previous research in the Introduction and to focus on establishing a niche and reinforcing it. This finding, however, applies only to one particular section in the RA and to one particular journal. Shi and Wannaruk (2014) examined the rhetorical structure of agricultural science RAs. Their corpus consisted of 45 RAs from 22 international journals. Building on Kanoksilapatham's model, they found that the RAs follow a 16-move rhetorical structure: 3 for the Introduction, 5 for the Methods, 4 for the Results, and 4 for the Discussion. It was also argued that the patterns followed by agricultural science RAs may be different from those of other disciplines. Therefore, an analysis of the rhetorical structure of other disciplines is needed.

Concerning studies which analyzed the rhetoric of the RAs written by Egyptian researchers, to the best of the researcher's knowledge, very few studies exist in the literature. Awwaad (2012) studied the rhetorical moves of 40 abstracts, 20 in internationally published RAs and 20 in Egyptian Master's degree theses, in Applied Linguistics. He aimed to provide guidelines for Egyptian researchers to write well-organized abstracts. The

findings identified differences in the rhetorical moves as well as of the lexical items used between the two groups. The study thus suggested that these differences should be studied by Egyptian researchers in academic writing courses. This study, however, focused on abstracts only without tackling the rhetorical structure of the different sections of the RA. El-Seidi (2003) performed a contrastive genre analysis between medical RAs written by Egyptian and American researchers. She analyzed the rhetorical structure of the Introduction section of 80 RAs: 40 written by Egyptian researchers and 40 written by American ones. She used Swales' CARS model for the analysis. El-Seidi found that both sets of Introduction sections followed the same rhetorical structure overall with few differences, where the American set showed more tendency to justify their need for research, to speak in the first person, and to mention the aim of research. However, more research is needed to cover the rest of the sections of the RA.

No studies have been conducted that analyze the rhetorical moves of all sections of the RAs written by Egyptian researchers. Also, the current study aims at analyzing the unedited first drafts of the RAs which is an approach adopted by none of the previous studies whose analysis was conducted on the final submitted version of the RA. It is these gaps that the current study attempts to address.

Research Questions

The study seeks to answer the following questions:

1. What are the rhetorical structures used by the Egyptian researchers in their unedited first drafts submitted to be published in STM international journals in comparison to the standard CARS model (Swales, 1990; Swales & Feak, 2012), Peacock's model (2011), and Kanoksilapatham's model (2007)?
   a. To what extent do the Egyptian researchers use the standard moves according to the standard models in the selected sample?
   b. To what extent do the Egyptian researchers abide by the standard order of moves according to the standard models in the selected sample?

Methodology

Research Design

This study follows a mixed methods exploratory design. It is mainly qualitative since the data to be collected and analyzed, the unedited first drafts of STM RAs, is qualitative in nature. However, this qualitative data is quantified through a framework of descriptive statistics, adding strength to the validity and accuracy of the findings. Moreover, the study is exploratory since there is not much previous research to analyze the rhetorical structure by Egyptian STM researchers. Hence, the exploratory design is used to set the foundation on which future research can be built.

Sample

The unedited first drafts of 20RAs are purposefully selected based on a set of criteria to form the sample to be analyzed. The criteria for choosing the sample are as follows: (1) to be a recent RA in the STM disciplines (not earlier than 2016); (2) to be written by Egyptian researchers affiliated to Egyptian institutions; (3) one researcher cannot be the author of more than one RA in the sample; (4) to be submitted for publishing in an international journal. Such criteria are set to ensure that the data to be collected and analyzed are within the scope of the study which focuses on the current challenges facing Egyptian STM researchers in writing their research to be published internationally. These criteria also ensure that the findings are as transferable and representative as possible. The 20RAs whose unedited first drafts are analyzed are selected from a pool of RAs of a major international scientific publisher after informing their authors. This allows the availability of a sufficient number of RAs to cover any possible attrition in the selected sample.

Models of Analysis

Three models of analysis are employed in this study: Swales' Create A Research Space (CARS) model (1990; 2012), Peacock's model (2011), and Kanoksilapatham's model (2007) to analyze the rhetorical structure of the various sections of the RA. The rhetorical structure models are adopted

to explain how the RAs are constructed. They are considered recent tools of discourse analysis, and they have been used in several previous studies (e.g., Nwugo, 1997; El-Seidi, 2003; Fryer, 2007; Shi & Wannaruk, 2014; Abuel, 2016). This serves the purpose of the current study since it sheds light on the extent to which the selected sample of the Egyptian STM researchers follows the standard research rhetorical structure.

Data Collection and Analysis Procedures

The following are the procedures taken to answer the study's research questions. The unedited first drafts of 20 RAs were selected from a major publisher upon preset criteria. This ensured working on the original manuscript of the RAs prior to any professional editing from the publisher's editors, which would help in getting more valid results. The publisher's database was the main data collection instrument. The researcher had access to the database of a major scientific publisher as a result of being one of its senior editors. This access enabled the researcher to collect a pool of RA original manuscripts fitting the selection criteria. The selected sample was then prepared for analysis by excluding the front matter and the back matter of each article. Adding to this, the list of references, the Appendix, the tables and figures, and any supplementary information were excluded as well.

After that, data analysis took place by using Swales' CARS model (1990; 2012), Peacock's model (2011), and Kanoksilapatham's model (2007) for analyzing the rhetorical structure. The types of moves used by the researchers were identified and frequency counts of each move were calculated. After finishing the data analysis, peer checking took place using a sample from the data to ensure the reliability of the analysis and help prevent any errors in the data interpretation. Finally, the outcomes of the data analysis were explained and discussed qualitatively and quantitatively.

Results and Discussion

This study investigates the main rhetorical structure challenges that the Egyptian researchers face in writing scientific research in the English language. In order to answer the study's research questions, the data is

analyzed to identify the rhetorical moves used by the Egyptian researchers and whether these moves fulfill the moves structure and the order of moves according to the standard models (i.e., the CARS model (Swales, 1990; Swales & Feak, 2012) for the Introduction and Discussion sections, Peacock's model (2011) for the Methods section, and Kanoksilapatham's model (2007) for the Results section).

The analysis of the rhetorical structure of the RAs has shown significant results. As stated previously, the RA is mainly constituted of 4 sections (i.e., the IMRD). Each section has its own standard move structure which shapes the argument and makes it more representable and acceptable. Overall, the analysis shows that among the 20 RAs analyzed, only 2 RAs completely abide by the standard rhetorical structure of all IMRD sections, concerning both fulfilling the required moves and following the standard order of moves, which are RAs 6 and 10. This means that only 10% of the analyzed sample provides proper presentation and organization of ideas. This is a very low percentage which signifies that the RA authors mostly find rhetorically constructing a research article a challenging task. This serious deficiency in following the standard rhetorical construction of the RA is found to be the outcome of the combined effect of missed compulsory moves in the different sections and wrong order of moves. Although it is found that 9 RAs (45%) meet the required moves in all IMRD sections—which still is a low percentage—no more than 2 RAs (10%) meet the standard order of moves. Figure 2 exhibits the overall rhetorical analysis results of the 20 RAs.
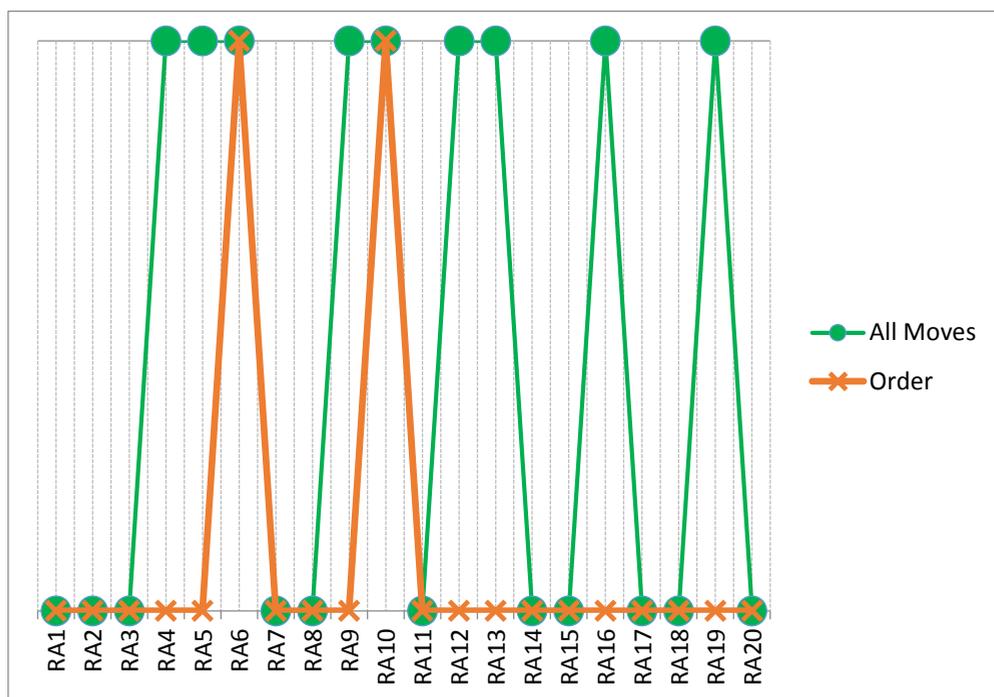
Figure 2: The overall rhetorical analysis results of the 20 RAs.

As shown in Figure 2, the 20 RAs are illustrated in terms of following or not the standard rhetorical structure concerning fulfilling the required moves and organizing them in the standard order. The 'x' stands for the order of moves, while the 'o' stands for fulfilling all the required moves. Also, the top horizontal line holds the RAs that follow the standards, while the bottom horizontal line holds the RAs that do not follow the standards. As demonstrated, the bottom line is much more crowded than the top line, which visualizes what has been stated earlier where the majority of the analyzed RAs (18 RAs, i.e., 90%) have rhetorical issues to address. Next, the rhetorical analysis results of each section are tackled.

The Introduction Section

According to the analysis, the Introduction section is shown to be the most problematic to the analyzed RAs' authors. Taking each move separately, Move 1 (establishing a research territory) is met in all 20 RAs analyzed. All RAs (100%) are found to provide the general foundation on

which the rest of the research is built. All research authors are found to be keen on providing an introductory background on the research topic as well as a review of previous research. For example, RA 1, which tackles the hand hygiene of healthcare workers, starts with "*Annually about hundreds of millions of patients suffer from health care-associated infections HCAI worldwide (WHO, 2009)...*" (RA 1, p. 3). As can be seen, the authors set a general foundation for the topic at hand by stating how important this issue is worldwide and how it is embraced by the world-leading health organization, the WHO. This background goes on for the whole paragraph till the authors find that they can move on to the next step in building their argument.

However, that is not the case concerning Move 2 (establishing a niche). Only 9 RAs (45%) show the logical transition from stating the general facts about the research to clearly stating the specific gap that the research attempts to address. The remaining 11 RAs witness an abrupt jump towards occupying the niche without first paving the way to this move, which is an issue that requires attention from the RA authors. This is one of the critical moves in the whole body of the RA which shows the actual contribution of the RA, and missing it is a huge flaw. One example for addressing this move is RA 12, which offers a new design of one type of medical contact lenses. They clearly indicate the gap they target as follows: "*Most of the previous studies measured the clinical performance of the ScCL in terms of improvement in of VA[13,15–17]. To the best of our knowledge, this is the first study reporting the objective and subjective results of a new design of corneo-scleral contact lens namely Rose K2 XL incases of irregular corneas*" (RA 12, p. 5). The authors point out the approach of previous research, and then they declare the distinction of their new approach. RAs 4, 5, 6, 9, 10, 12, 13, 16, and 19 well address Move 2 of the Introduction. On the other hand, RAs 1, 2, 3, 7, 8, 11, 14, 15, 17, 18, and 20 mark a sudden shift from establishing a research territory to occupying a niche without establishing that niche, which can be confusing to the reader.

Move 3 (occupying the niche) shows excellent fulfillment in the analyzed Introduction sections, where, except for RA 11, all the RAs

analyzed tell how they address the research gap (i.e., 95%). RA 13 is an example of an occupied niche after well establishing it. RA 13 investigates the prevalence of selected eye diseases among North African and Middle Eastern subjects. The authors meet all three moves of the Introduction section. After establishing a research territory, they stress on the gap they address in a very clear manner: "*However, little has always been known about disease patterns in the Middle East and North Africa patients*" (RA 13, p. 3), "*Very little is yet written about the prevalence of glaucoma and ocular hypertension in Egypt, Sudan, Yemen and other countries*" (RA 13, p. 4), and "*It was the scarcity of literature about screening for eye disease in the MENA region that compelled the authors to conduct this study*" (RA 13, p. 4). Afterwards, the authors state the aim and purpose of the study: "*The study aimed at pointing out, among this large number of patients coming from different MENA countries, prevalence of selected ophthalmic diseases that are missed and/or accidentally discovered at first check up*" (RA 13, p. 4). This organization shows a well rhetorically structured Introduction section.

Taken together, it is found that 9 RAs (45%) fulfill all 3 moves, which is a serious indicator of the weak rhetorical structure of the Introduction section in more than half the analyzed sample. The order of the moves reflects a more serious indicator, where only 8 RAs (40%) show proper organization of the 3 moves of the Introduction section. Therefore, the results show that the authors of the analyzed RAs have faced difficulty writing and organizing the Introduction section. Concerning the order of the moves of the Introduction section in the analyzed RAs, the results move in line with those of fulfilling the moves. Only 8 RAs (40%) are found to keep the standard order of the three moves. RAs 4, 5, 6, 9, 10, 12, 13, and 19 are the RAs which follow the standard order. It is to be noted that these RAs are the same RAs which fulfill all three moves of the Introduction section.

The only RA which is found to fulfill all three moves but does not follow the standard order of moves is RA 16. RA 16 investigates the factors of malnutrition in school children in Fayoum, Egypt. The order of the moves in the Introduction of RA 16 is Move 1, Move 2, Move 1 again, and

Move 3. After establishing a research territory at the beginning of the Introduction section ("*Infants and young children are the most vulnerable to malnutrition due to their high nutritional requirements for growth and development*" (RA 16, p. 2)) and then establishing a niche ("*…There is a significant lack of data on the nutritional status of school children, especially in rural areas*" (RA 16, p. 3)), the authors are then seen to provide an extension to the general background ("*According to WHO, nutritional status can be assessed through nutritional indicators based on the anthropometric measurements*…" (RA 16, p. 4)), which goes against the standard order of moves. The Introduction section is then naturally concluded by occupying the niche and stating the aim of the study ("*Our study aimed to calculate the prevalence of malnutrition using anthropometric measures in school children living in the rural area of Manshit El Gamal village in Tamia district of Fayoum Governorate Egypt*" (RA 16, p. 4)). The insertion of moves in a non-standard position is one of the rhetorical errors that the authors committed in the analyzed RAs.

The Methods Section

The Methods section is one of the best rhetorically organized sections in the analyzed sample. Move 1 (describing the materials/participants), Move 2 (describing the procedure), and Move 3 (describing the data analysis) are all fulfilled in the 20 analyzed RAs. To exemplify, RA 20, which is in the field of anesthetics, shows a well-structured Methods section. The Methods starts with a description of the study participants as well as the inclusion criteria (Move 1): "*A double-blind prospective randomized study enrolled forty ASA physical status I or II patients of each sexes, aged ≥ 18 years and undergoing elective tendon repair surgeries of the forearm*" (RA 20, p. 3). The author follows this with a detailed account of the procedure taken (Move 2): "*After history taking, complete clinical examination and laboratory investigations, monitoring of the patient with non invasive blood pressure (NIBP), ECG and peripheral oxygen saturation was performed*…" (RA 20, pp. 3-4). After narrating the different procedures taken, the author highlights the data analysis method, which is mostly statistical (Move 3): "*Data were fed to the computer and*

analyzed using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. Quantitative data were described using mean and standard deviation" (RA 20, p. 5).

Adding to this, most of the analyzed RAs (18 RAs, i.e., 90%) follow the standard order of moves. The only exceptions are found to be RAs 11 and 12, which are shown to insert moves from other sections into the Methods section, which can cause confusion rhetorically while building up the research argument. For instance, RA 11 starts the Methods section with the remaining of Move 3 of the Introduction (occupying the niche). The authors combine mentioning the design of the study, correctly placed at the beginning of the Methods section, with mentioning the aim of the study, which should be mentioned at the end of the Introduction section instead: "*This study was designed as a retrospective multicenter study that aimed to analyze the three-year outcomes of CXL PLUS (combined CXL and Keraring implantation with the use of femtosecond laser) concerning its efficacy and safety*" (RA 11, p. 4). RA 12 also incorrectly places a move from another section, but this time it is Move 3 from the Results section (announcing the results): "*The causes of irregular astigmatism were keratoconus, pellucid marginal degeneration (PMD), post Lasik ectasia and irregular corneas following keratoplasty, intrastromal rings, and corneal traumatism*" (RA 12, p. 6). The authors of this RA report part of the results in the Methods section, which is not a proper organization of the research argument. Despite this, the RA authors have shown excellent performance when structuring the Methods section.

The Results Section

The rhetorical analysis of the Results section shows that this section is also one of the best organized sections in the sample. The main move of this section is Move 3 (announcing results). This essential move appears in all 20 RAs (100%). Move 3 of the Results section (announcing results) occurs in all analyzed RAs (100%), which is a point of strength. RA 15 is an example of the 15 RAs which rhetorically build the whole Results section based solely on this move, which is nothing to take against their authors

though, since the Results section can well stand with this move only. In RA 15, which compares the use of different compounds for the sedation of patients with advanced liver disease, the authors get directly to the point and dedicate the whole Results section to announcing the study findings without any methodological preliminaries: "*As regard to patient characteristics of the two groups, there were no statistically significant differences between the studied groups…*" (RA 15, pp. 6-7).

In regard to Move 1 (restating methods), it occurs in only 5 RAs (25%), which are RAs 3, 5, 6, 9, and 14, while it is found that Move 2 (justifying methods) does not occur in any of the analyzed RAs. However, these two moves are not obligatory constituents of the Results section. Although their presence enriches the Results section and makes it stronger and clearer, their absence does not harm its overall rhetorical structure, since Move 3 is sufficient to make the section stand. For example, in RA 3, which investigates the outcomes of the combination of more than one therapy as a treatment to toxoplasmic retinal infection, the authors start the Results section with restating the number of the study participants and their grouping procedure, which is a realization of Move 1 in the Results (restating methods): "*Thirty eyes of thirty patients with active toxoplasmic retino-choroiditis were divided into two equal groups*" (RA 3, p. 5). This is followed by stating the demographics or the age and gender characteristics of the study participants, which is also part of the sampling methodology: "*The demographic data revealed that the mean age was 36.35 ± 6.29 years in group I and 35.55 ± 4.19 years in group II (no significant difference p value 0.36)*" (RA 3, p. 5). Afterwards, the authors begin announcing the results of the study, without providing justification to the restated methodology techniques, hence moving from Move 1 to Move 3 with no sight of Move 2: "*The mean best corrected visual acuity (BCVA) value before the treatment was 1.08 ± 0.17 in group I and was 1.03 ± 0.15 in group II (no significant difference p > 0.05)…*" (RA 3, p. 5).

As regards the order of the Results section moves, only one RA is found to show incorrect placement of moves. However, this is not because of an incorrect order, more than it is about bringing an outsider move into

the body of the Results. In RA 1, the Results section starts with Move 1 of the Methods (describing the materials/participants). The authors of this RA are found to provide the first mentioning of new information concerning the participants' characteristics which is not mentioned in the Methods as a kick-off to the Results: "*Among the studied cohort, 22 HCWs (55%) were females. The mean working hours per/week was 52 + 20 hours*" (RA 1, p. 6). Despite that RA, 19 RAs (95%) abide by the standard order (whether only consisting of Move 3 or consisting of Moves 1 and 3 in the Results). Therefore, in general, similar to the Methods section, the Results section can be considered one of the best rhetorically structured sections in the analyzed data as well.

The Discussion Section

The Discussion section has two obligatory moves, which are Move 2 (summarizing and reporting key results) and Move 3 (commenting on the key results). Missing any of these moves makes the Discussion incomplete and insufficient. These two moves, however, are fulfilled in all 20 RAs (100%), which reflects rhetorical awareness on the side of the RA authors. RA 6 well meets both moves, for instance. This RA investigates the accuracy of a test to diagnose endometriosis as a uterine cavity abnormality. The authors dedicate the first paragraph of the Discussion as a general background: "*Endometriosis is a common gynecological disorder, its association with infertility is complex and controversial…*" (RA 6, p. 6). Next, they provide an overlap of Moves 2 and 3 of the Discussion. They report a key finding, "*We succeeded to prove that 4D ultrasonography could be a good diagnostic tool for diagnosing abnormal uterine findings with a positive predictive value of 100% and an overall test accuracy of 94%*" (RA 6, p. 6), and they follow it with a commentary concerning this finding, "*After searching the literature we found two studies reporting high prevalence of endometrial polyps in endometriosis patients (18,30) and one study reporting uterine anomalies (31). These studies aimed at just finding a relation or an association between abnormal uterine cavity findings and endometriosis*" (RA 6, p. 6). They repeat this pattern in the next paragraph, with another key finding, "*Our study also evaluated the uterine cavity for*

uterine anomalies and we reported five cases of septate uterus (10%) and two cases of hypoplastic uterus (4%)" (RA 6, p. 7), with a commentary and a comparison to previous studies, "*Jayaprakasan et al studied 1385 infertile cases of which 7 cases (0.5%) had uterine septum (31).Ioannis M, et al studied425 cases with endometriosis and 200 without endometriosis in 2010*" (RA 6, p. 7). Hence, the fulfillment of the obligatory moves in the Discussion is well met in the analyzed data.

The optional moves have occurred in the data as well but with less frequency. Move 1 (presenting background information) is fulfilled in 15 RAs (75%). Although it is an optional move, all RAs analyzed, except for RAs 1, 11, 14, 19, and 20, are found to be keen on building the argument in the Discussion section gradually through starting it with a theoretical background and a restatement of the research purpose and or methodology. To exemplify, RA 2 shows a well-structured Discussion. Having stem cells as its topic, the authors begin the discussion section with a theoretical background about the topic: "*The ability to purify, culture and differentiate stem cells from non-embryonic origin can provide an important cell sources for regenerative medicine…*" (RA 2, p. 13). This background continues till the authors shift to reporting the results of their study, which is Move 2 of the Discussion: "*In this study, cells obtained from bone marrow or adipose tissues were initially characterized relative to their morphology, phenotypic characteristics, proliferation rate and their multilineage differentiation capability…*" (RA 2, p. 13).

Move 4 (stating the limitations of the study) is the Discussion move appearing the least in the analyzed data. Only 9 RAs (45%) are seen to state the study limitations. Although it is an optional move, it plays an important role in clarifying the difficulties and shortcomings of the study. The authors in RAs 1, 4, 5, 13, 14, 16, 18, 19, and 20 are found to dedicate a number of lines to provide the flaws or the things not included in their studies. To illustrate, RA 14, another RA in the field of obstetrics and gynecology, allocates a separate section after the Discussion to state the study limitations, as follows: "*Our study had limitations of being just observational one not having a comparing group, the sample size was small,*

some popular concepts could have resulted in a high cesarean delivery rate and All patients included in the study had not submucosal fibroids" (RA 14, p. 7). However, it is not always the case in the data to allocate a separate section for stating the limitations. RA 5, for instance, provides the limitations and the recommendations for future research in the same lines, which might be an unclear structure, as follows: "*Limitation and future plan: small sample size, future studies are recommended in larger sample size and longer duration of mechanical ventilation*" (RA 5, p. 27).

Finally, Move 5 (making recommendations for future research) has a better status in the data than Move 4, where it occurs in 11 RAs (55%). The authors of RAs 5, 7, 8, 11, 12, 13, 14, 16, 17, 19, and 20 ensure assisting fellow researchers by highlighting possible research gaps that can be covered in future research. Taking RA 19 as an example, the authors end their Discussion with a recommendation for future research, as follows: "*Future studies with more patients and a longer follow-up period might be required to get a more definite conclusion*" (RA 19, p. 9). The authors in RA 20, however, dedicate a section following the Discussion to point out the study limitations and the recommendations for future research: "*The major limitation of present study was the current small sample size since we were able to enroll only 40 patients. More studies with high and sufficient sample sizes are required to confirm these results. We recommend further larger studies to determine the effect of different doses of lidocaine and nitroglycerin and other additives that can affect Bier's block conditions*" (RA 20, p. 8). Thus, although Moves 4 and 5 are not well met in the analyzed data which reduces from the rhetorical structure strength of the Discussion section, this cannot be considered a weakness since both moves are optional anyway. Despite these results, only 3 RAs include all five moves in their rhetorical structuring to the sections (i.e., RAs 5, 13, and 16).

Concerning the order of the moves in the Discussion section, several rhetorical issues are found. Less than half of the analyzed Discussion sections follow the standard order of moves (8 RAs, i.e., 40%). RAs 4, 5, 9, 11, 12, 13, 14, 16, 17, 18, 19, and 20 have confused order of moves in the Discussion. A number of RAs place Move 1 of the Discussion to come after

Move 2 or Move 3 or both. This is shown in RAs 5, 9, 12, 16, and 17. For example, RA 9, which investigates the predictors of laparoscopic cholecystectomy, starts the Discussion section with Move 2 through reporting the key results of the study: "*This study suggested that impacted stone in the neck of the GB, the presence of adhesions in the Triangle of Calot, GB rupture and injury to the cystic artery predicted increase in the likelihood of having difficult LC*" (RA 9, p. 11). However, the RA authors follow this paragraph with a general background about the topic, which is a function of Move 1: "*Currently LC is the standard of care for patients with cholelithiasis and is the first laparoscopic surgical procedure to be performed by general surgery trainees in many teaching hospitals [20]*" (RA 9, p. 11). Directly after, the authors return to reporting another key finding, back again to Move 2: "*This study showed also that surgical trainees, who performed LCs under direct supervision of trained surgeons, had no increase in the LC complications when compared with trained surgeons*" (RA 9, p. 11). This misplacement of moves can be very confusing for the reader who expects a certain flow of ideas.

Another issue found in the analyzed data concerning the order of the Discussion section moves is that some RAs bring Move 4 or Move 5 to a front position, which is a rather odd structure. For instance, RAs 13, 14, 16, 17, and 18 show a rhetorically unacceptable order of moves, placing Move 4 or Move 5 before any of the first three moves. To illustrate, in RA 16, Move 5 is misplaced twice in the body of the Discussion section. It is first mentioned in an early point in the section, following the reporting and the commentary related to the first key finding of the study: "*In the present study, prevalence of stunting, underweight and wasting among school children in Fayoum was (34.2%), (3.4%) and (0.9 %) respectively…However, further investigation is needed to understand the complete picture and map the different economical, nutritional and social factors affecting nutritional status among Egyptians*" (RA 16, p. 12). Then, the authors of the RA mention other key findings and comments on them, but afterwards, close to the end of the section, Move 5 is found to precede Move 4, as follows: "*Further studies are needed to address factors that*

showed effect on nutritional status in other regions but weren't included in
our study due to limited resources…Due to limited resources of this study:
Only rural areas of Fayoum were covered. Different results might be
present in urban areas…" (RA 16, pp. 14-15). This almost random order of
moves is a serious weakness in the rhetorical structure that can stand against
publishing the RA internationally.

Conclusion

The analysis of the rhetorical structure of the unedited first drafts of
20 STM RAs written by Egyptian researchers revealed numerous challenges
facing the researchers in writing their RAs. The rhetorical structure was
analyzed using Swales' Create A Research Space (CARS) model (1990;
2012), Peacock's model (2011), and Kanoksilapatham's model (2007). The
analysis showed that the rhetorical structure was very much challenging to
the Egyptian researchers, especially in the Introduction and Discussion
sections.

All in all, these findings highlight the main areas of difficulty to
Egyptian researchers, and hence guidance can be provided towards avoiding
them. Specifically tailored educational programs and guidelines can be
crafted for Egyptian researchers to help them overcome the rhetorical
challenges they face while writing research in English. Academic writing is
a skill that can be acquired, and writing RAs in proper language and
organization can save time, effort, and cost, which is ultimately a step
towards improving the status of Egypt's scientific research.

Limitations of the Study

The current study has some limitations. A considerable part of the
analysis of the data in the current study is qualitative which is highly
interpretative in nature. Although a framework of validity checks is
employed to face this threat, the understanding of the data may still slightly
differ from one researcher to the other. Also, the study adopts a rhetorical
analysis to all the sections of the RA. A deeper analysis of a particular
section of the RA on a larger sample could produce more specific results.

Recommendations for Future Research

This study has shown the opportunity for a number of possible areas for future research. Concerning the rhetorical structure of the different RA sections, it is found that there is a lack of rhetoric structure models for the Methods and Results sections, which shows a compelling need to further investigate these sections. Other studies may even tackle the Egyptian researchers' compliance with the style standards (APA, MLA, Chicago, etc.). Finally, since this study is an exploratory study of an understudied topic, more studies are needed along the same track to explore more the issue at hand.

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