

# Stand-Alone Conclusion Section in Open-Access Research Articles: Organizational Structure

Budsaba Kanoksilapatham <sup>1,2</sup> 

<sup>1</sup> Silpakorn University, Phetchaburi, Thailand

<sup>2</sup> Academy of Arts, Royal Society of Thailand

## ABSTRACT

**Background:** Research articles (RAs) have been highlighted as one of the most essential channels for academicians to disseminate knowledge. Typically, RAs consist of a nomenclature of the four sections of introduction, methods, results, and discussion, commonly known as IMRD, with each section governed by an organizational structure determined by genre analysis. However, due to the increasing prevalence of the stand-alone conclusion section in recent years and the expansion of open-access journals, understanding how this conclusion section is constructed can benefit scholars in an academic endeavor.

**Method:** This study aims to identify the organizational structure of the stand-alone conclusion section in open-access journals. An original dataset of 55 open-access journal RAs from four major academic disciplines honored as “Articles of the Year 2021” was analyzed. Only the RAs with stand-alone conclusions within a calculated word range were selected, yielding a final dataset of 25 comparable conclusion sections. Then, anchored on genre analysis, the compiled dataset was analyzed quantitatively and qualitatively.

**Results:** Based on the genre analysis conducted, a set of three moves and their pertaining steps were identified, forming various organizational patterns but one compelling one. Furthermore, the full-fledged two-layer rhetorical structure of the section depicting the frequencies of occurrence of individual moves and steps is quite revealing, highlighting the crucial significance of restating the findings generated from the study being reported. The results demonstrate not only how established this section is but also how it is currently structured, performing its critical function of concluding RAs.

**Conclusion:** This study has provided insights into integrating analytical elements to successfully stage persuasive arguments in the conclusion section, a skill that needs to be inculcated in novice or early-career researchers and seasoned researchers alike.

## KEYWORDS

stand-alone conclusion section, genre analysis, move analysis, open-access journal, research article, structural organization

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### Correspondence:

Budsaba Kanoksilapatham,  
kanoksib@hotmail.com

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## INTRODUCTION

Currently, academicians are strongly encouraged to be actively involved in research so that their knowledge and expertise can be put into action, yielding discoveries and moving a field forward. Upon completing a research study, publishing their research discoveries is another significant but challenging step. Research articles (RAs) have been recognized as one of the most important channels to disseminate discoveries or findings. RAs are known to consist of a

typical nomenclature of the four major sections of introduction, methods, results, and discussion, commonly known as IMRD. Swales' genre analysis (1990; 2004) has provided a tool for deciphering the structure of each RA. Based on genre analysis, each RA section is regulated by an organizational structure consisting of several “moves” and “steps.” A move refers to a portion of a text that performs a principal communicative function. In turn, each move can be substantiated by one or several steps, the sub-units of a move. In fact, the fully developed analyt-

ical framework of genre analysis by Swales in 2004, facilitating the task of RA writing, has expedited the flourishing field to an exponential rate, resulting in a multitude of studies on the RA genre.

Prior to presenting research studies utilizing Swales' genre analysis (1990; 2004), a crucial observation relevant to this study is needed. Based on a common practice adopted by RA authors, RAs can be divided into clearly separated or stand-alone sections. As an illustration, an introduction section performs its function of introducing the topic, whereas the methods section highlights the study's research methodology. These sections are easily recognized by the accompanying and corresponding labels such as "introduction" or "methods." Nevertheless, such definite and distinct boundaries between the RA sections have been compromised. For example, in some RAs, authors can combine the results and discussion sections, yielding the "results and discussion."

To illustrate the constant and growing interest in and the pervasiveness of Swales' genre analysis (1990; 2004) as a tool to demystify the rhetorical structuring of the RA genre, a plethora of studies have concentrated on individual or so-called stand-alone sections of RAs written in English and in various academic disciplines (e.g., applied linguistics discussions by Amirian et al., 2008; dentistry discussions by Basturkmen, 2012; scientific abstracts by Cross & Oppenheim, 2006; engineering introductions by Kanoksilapatham, 2012). Several research studies focus on two stand-alone RA sections (abstracts and introductions by Affandi Adrianto et al., 2021), whereas many studies focus on the combined sections (e.g., results, discussions, and conclusions by Ruiying & Allison, 2003; results and discussions by Suherdi et al., 2020). Few studies analyzed RAs in their entirety (e.g., Kanoksilapatham, 2005 and 2015 in biochemistry and engineering, respectively; Stoller & Robinson, 2013 in chemistry). In addition, a multitude of studies was conducted comparing and contrasting the rhetorical structures of particular sections across disciplines (e.g., conclusions in psychology, Persian literature, and applied linguistics by Adel & Ghorbani Moghadam, 2015; results in sociology and organic chemistry by Bruce, 2009; methods from over 30 disciplines by Cotos et al., 2017; abstracts from three engineering sub-disciplines by Kanoksilapatham, 2013) and across languages (e.g., Iranian and English by Ahmadi, 2022; English and Russian by Elena, 2017 and Zanina, 2017; Chinese and English by Juan & Tao, 2013; Thai and English by Kanoksilapatham, 2007; Malay and English by Loi et al., 2021; English and Spanish by Martin, 2003 and Moreno, 2021; Filipino and Japanese conclusions by Morales, 2012; English and Indonesian abstracts by Pratiwi & Kurniawan, 2021).

The implementation of Swales' analytical framework (1990; 2004) has also been successfully extended to other academic genres, be they written or oral, such as master's theses (Chen & Kuo, 2012), academic presentations (Hu & Liu, 2018; Vera & Williams, 2020), and dissertation acknowledgements

(Yang, 2012). Furthermore, genre analysis proved to be effective in discerning the structural organizations of professional genres (e.g., TED Talks by Compagnone, 2015; manuals by Danquah et al., 2020; corporate annual reports by Qian, 2020; story genre by Salmaso, 2017). All in all, genre-based studies, as exemplified above, have demonstrated that Swales' genre analysis has rendered a tremendous contribution pedagogically and scientifically.

As reviewed above, the conclusion section seems to be not as extensively examined as the other RA sections. Ruiying and Allison (2003) are the first scholars who analyzed the combined section of results, discussions, and conclusions using genre analysis. The application of genre analysis on 20 combined sections in applied linguistics from prestigious journals led them to propose a seven-move model. Based on their seven-move model for the combined section, the last three moves were identified to belong to "the allegedly conclusion section."

At this point, an examination of Ruiying and Allison's (2003) model proposed for the combined result-discussion-conclusion section is relevant. Even though the seven-move model was initially established for the combined section of RAs, subsequent scholars adopted the last three-move structure of the model as a taxonomy and an analytical framework to analyze stand-alone conclusions (e.g., Adel & Ghorbani Moghadam, 2015; Morales, 2012; Zamani & Ebadi, 2016). However, it needs to be remarked that these studies do not primarily seek to decipher the rhetorical pattern of the stand-alone conclusion section. Instead, they congruently aimed to pinpoint cultural features manifested in the rhetorical structures. To elaborate, Morales (2012) analyzed 16 RA conclusions authored by Filipino and Japanese writers in English from the field of applied linguistics. Even though the section from the two datasets somehow conformed to Ruiying and Allison's model structure, the cultural influence manifested in the rhetorical organization of this section was elucidated. Moreover, Zamani and Ebadi (2016) investigated 20 conclusions written in English and Persian from the fields of civil engineering and applied linguistics. The detected structural organization was generally compatible with Ruiying and Allison's 2003 model, revealing some discernible variation. However, no statistically significant differences regarding the move structure and frequencies were found.

As far as the conclusion section is concerned, two observations can be made here. First, whereas the structural organizations of the combined section of results, discussions, and conclusions seem to be elucidated by previous studies presented above, no single study concentrating on the stand-alone conclusion section is yet available. Second, several journals are presently enforcing an increasingly widespread guideline that requires RAs to have a stand-alone conclusion. Thus, it is intriguing to examine how the stand-alone conclusion is organized rhetorically. It is recognized that the RA genre has evolved. For example, the rudimentary and

established IMRD nomenclature has been attested. Some examples of the evolutionary features include the combined section of results and discussion, the combined discussion and conclusion section, and the recommended inclusion of the conclusion section by several academic journals. This development path may indicate that academicians are anxious to learn more about the results, and thus the discussion of the results is essentially integrated into the results. The conclusion section is possibly required to accommodate the readers' needs who want to quickly grasp the big picture of the study being reported and the writers' arguments. Although some RA writers merge the conclusion section with the discussion section, many writers still prefer to include this succinct stand-alone section at the end of RAs.

In scrutiny, exponentially developed communication technology has triggered and expedited the evolution of academic writing. According to Mering and Hovee (2020), due to the free availability of the public internet, open-access journals (as opposed to traditional print-based academic journals) have emerged as a crucial source of full RAs available online. Consequently, scholarly communication and publications can be instantly accessible. It turns out that open-access journals can help alleviate many problems encountered, including the exuberantly high demand for publishing channels and the high cost of printing. Last but not least, to make the ultimate advantage of open-access journals and the final section of the conclusion in which arguments based on the results must be staged persuasively and powerfully, a look at the organizational structure of this RA section in open-access journals is quite illuminating.

With all the above factors combined (i.e., the uncontested conclusion model since 2003, the dynamic nature of scholarly publications, the emergence and gained popularity of open-access journals, and the section position that bears tremendous significance), this study aims to examine the current practices of scholars when crafting RA conclusions by characterizing the structural organization of the section. Specifically, this study seeks to determine the organizational structure commonly followed in the stand-alone conclusions in open-access journals. These insights will provide a better understanding of how the section is currently organized, allowing researchers to successfully communicate and disseminate their discoveries with the audience in a manner that conforms to the current expectations of specific communities.

## METHOD

This study used a mixed-method research design. To elaborate, genre analysis is inherently qualitative; however, this study chooses to substantiate the qualitative findings with

both quantitative data and additional qualitative evidence based on the conclusions' excerpt instances. The methodological procedures are described in detail in the following sub-sections.

## Objectives

Previous genre-based studies, as demonstrated, typically focus on non-open-access and prestigious journals to elucidate best practices in writing RA conclusions. However, given the current phenomenal popularity and proliferation of open-access journals that meet the need for rapid publication while also accommodating the availability and accessibility of published RAs made possible by information technology, RAs published in open-access journals deserve our attention. As a result, this study aims to determine the organizational structure of stand-alone RA conclusions published in open-access journals. Furthermore, comparing the organizational structure of this study with that of Ruiying and Allison (2003) will shed light on the evolution of this particular section, highlighting structural similarities and discernible deviations after two decades of the known taxonomy.

## Dataset Compilation

Compiling datasets is critical in genre analysis because it can substantially impact the analysis results. Basic tenets regarding dataset compilation include the representativeness and comparability. Whereas non-open-access journals are generally indexed for prestige (e.g., Web of Science or WoS and SCOPUS), and journal quality is regularly assessed or monitored, such evaluation does not seem to be available for open-access journals. The widespread popularity of open-access journals, on the other hand, piques our interest. One of the commercial publishers of scientific, technical, and medical literature with over 230 peer-reviewed open-access journals and approximately 20,000 articles per year announced on its website in October 2022 that 55 original and review articles were recognized as the "Article of the Year 2021" (<https://www.hindawi.com>).<sup>1</sup> According to the commercial publisher's website, these articles represent the four major academic disciplines (biological sciences; mathematics, engineering, and computer science; medicine; and physical sciences). They were selected by the corresponding chief editors based on their high academic impact, and they are freely downloadable at <https://www.hindawi.com/post/article-year-2021/>.<sup>2</sup>

## Dataset Preparation

These articles were published in 2021, as indicated in the award title. According to the journal's website, the first glance at these 55 award-winning articles revealed that not

<sup>1</sup> Hindawi. (2023, October 22). Open-access publishing for the scientific community. <https://www.hindawi.com>

<sup>2</sup> Hindawi. (2023, October 22). Article of the year 2021. <https://www.hindawi.com/post/article-year-2021/>

all of them are RAs. Two award-winning articles are review articles and thus were excluded from this study dataset, leaving 53 RAs. Further examination of individual RAs revealed that 46 (or 84%) of the 53 RAs contain the conclusion section (combined or stand-alone). This relatively high occurrence suggests that the section has a rather established and preferential status, at least in this dataset. To maintain the dataset's homogeneity and avoid potential confounding results, two RAs with the combined conclusion section were excluded. A closer look at the remaining 44 stand-alone conclusions revealed another issue with comparable word length: some are quite short, with only 57 words, while the others are quite long, with around 600 words. A significant difference in word counts could have a negative impact on the rhetorical orientation and genre analysis outcomes. As a result, the average length of the 44 conclusions was calculated. Based on this average value of 186.36 words, the word range of 100-300 was arbitrarily used as a criterion to finalize the dataset of 25 stand-alone conclusions. All procedures described were to improve the comparability and homogeneity of the final dataset. They are not intended to support or indicate the quality of the conclusions.

These 25 conclusions were coded to facilitate subsequent genre analysis and references. Each code is made up of two information pieces enclosed in parentheses. The first part has three initial letters that correspond to the disciplines to which they belong (i.e., *Bio* for biological sciences; *Mat* for mathematics, engineering, and computer science; *Med* for medicine; and *Phy* for physical sciences). The second part is a number assigned reflecting the sequence in which the selected articles are presented on the website. For example, (*Bio1*) refers to the conclusion of biological sciences and is the discipline's first article. Meanwhile, (*Phy7*) refers to the physical sciences' conclusion, and it is the seventh of the discipline. The RA content remains intact. That is, no modification was made to the conclusion content.

## Analytical Framework

As previously stated, Ruiying and Allison (2003) conducted one of the most widely recognized genre-based studies on the combined result-discussion-conclusion section. From an analysis of 20 applied linguistic sections selected from prestigious journals, they concluded that the organizational structure consists of seven major moves. Based on the model, three out of seven moves presumably belong to the "allegedly conclusion section." They are *Move 1: Summarizing the study*; *Move 2: Evaluating the study*; and *Move 3: Deductions from the research*. For Move 1, no steps were posited. Move 2 consists of three steps (*Step 1: Indicating significance/advantage*; *Step 2: Indicating limitations*; and *Step 3: Evaluating methodology*) and Move 3 consists of two steps (*Step 1: Recommending further study* and *Step 2: Drawing pedagogic implication*). This study was anchored on Ruiying and Allison's 2003 taxonomy as an analytical framework to analyze the stand-alone conclusion dataset.

## Dataset Analysis

Typically, genre analysis units are determined by the communicative functions of the texts rather than syntactic structures (phrases, clauses, sentences, or extended sentences). Individual conclusions were subjected to genre analysis under this tenet. Multiple readings of individual conclusions were performed to obtain a general understanding of the texts and follow the thread of argument presented, as expected in any genre analysis. In the event of doubt or ambiguity, the researcher reread all of the RAs.

Using Ruiying and Allison's 2003 taxonomy, genre analysis was performed three times, each time at one-week intervals, resulting in a clear understanding of the texts and increased confidence in the move/step segmentation. Given that each move can be realized by several steps that share the same communicative function, it is possible that new steps were discovered and thus added to the existing taxonomy. Similarly, if a taxonomy step were not found in the dataset, it would be removed. The removal and addition of moves/steps result in a modified organizational structure that is currently accurate in describing the conclusion texts in the dataset. After the genre analysis was completed, the frequencies of individual moves and steps were recorded.

According to Kanoksilapatham (2012, 2015), the status of individual moves (obligatory, conventional, and optional) can be quite gratifying. This feature aids in determining how stable each move is and how frequently it occurs. To elaborate, "obligatory" refers to a move's very stable status; it appears in every text. Meanwhile, "conventional" and "optional" refer to a move's not-so-stable status. As the labels suggest, "conventional" indicates that the presence of a move is present but not as frequently as "obligatory," and "optional" refers to a relatively unstable status or a move that occurs infrequently. Finally, the organizational structures of individual conclusions were summarized based on the data regarding the presence of moves and steps, their frequencies of occurrence, and their sequence in the conclusions.

## RESULTS AND DISCUSSION

The 25 stand-alone conclusion dataset analysis reveals the presence of three moves, as included in the original 2003 taxonomy. Typically, the move and step labels are self-explanatory and transparent, reflecting specific communicative functions, and each move can perform its function or be supported by one or more steps. To facilitate a comparison with Ruiying and Allison's original taxonomy (2003), efforts were made to adhere to the labels used initially, and changes, if necessary, were kept to a minimum. The following sections present a qualitative and quantitative description of each move and step, accompanied by frequencies of occurrence and corresponding excerpts taken directly from the

dataset with the codes attached at the end in parentheses referring to their sources.

### Move 1: Summarizing the Study

Move 1 is to summarize the study reported, and it was found in all 25 conclusions (or 100%), thus earning the status of obligatory. Interestingly, this high occurrence rate was concurrently reported by Morales (2012) and Zamani and Ebadi (2016), who analyzed the conclusion section. This move establishes the context for an argument to be subsequently developed in Moves 2 and 3. In other words, this move reiterates and reinforces the background information of the study, from which further arguments can be developed in the subsequent moves of the section.

Whereas Ruiying and Allison (2003) did not report any step of this move in their framework, nor did Morales (2012) or Zamani and Ebadi (2016), the current study reveals that this move consists of four steps, reiterating different aspects of the study reported. These details about the study being reported are usually presented in the introduction and methods sections of RAs; thus, to reflect this nature, these steps identified were labeled with the word “restating” (i.e., *Step 1: Restating background, Step 2: Restating objectives, and Step 3: Restating methods, and Step 4: Restating findings*). Of all the four steps of Move 1, Step 4 (*Restating findings*) was most frequently used (in 21/25 conclusions, or 84%), whereas the other three steps (*Restating background, Restating objectives, and Restating methods*) were used much less frequently (in 40-48% of the conclusions).

Move 1, as found in this dataset, can be represented by using only one single step or a combination of steps to accomplish the move function. To illustrate, the excerpts representing these four steps are presented below, with certain linguistic features or constructions highlighted to reflect the association between language use and communicative functions. It is in the best interests to include corresponding step excerpts from the four disciplines. However, not all conclusions of any disciplines in the dataset use all the steps. As a result, only some steps are accompanied by four excerpts. The only change made to the excerpts is that selected linguistic features, lexical or grammatical, are highlighted.

#### Move 1 Step 1: Restating Background

- *The chitosan-β-glycerophosphate hydrogel 259 is an intelligent drug system **widely used** to deliver hydrophilic and hydrophobic drugs to different parts of the body. (Bio2)*
- *Since artificial intelligence **has greatly changed** the data link form, IoT technologies **are making significant progress** these years, where ontology matching **plays an advance role** [47–51]. (Math6)*

- *The **recent** outbreak of COVID-19 is **affecting many** countries **worldwide** including Iran as one of the **top 10 most** affected countries. (Med2)*
- *With the **rapid** advancement of nuclear power, storage of spent nuclear fuel and transportation safety **have become unavoidable issues**. (Phy4)*

#### Move 1 Step 2: Restating Objectives

- *The role of distinct landscape fragmentation thresholds on the reemergence of YFV in Brazil **was tested**. (Bio1)*
- ***This paper proposes** a novel asymmetric magnetic pole PMSM for automobiles. (Mat2)*
- ***We provide** a proof of conceptual investigation of brain tumour tissues by a multimodal spectroscopy approach. (Med9)*
- ***In order to better understand** the conformable fractional derivatives and integrals, ... (Phy5)*

#### Move 1, Step 3: Restating Methods

- ***Experimental conditions comprise** a constant-torque experiment and an acceleration-and-deceleration experiment. (Mat3)*
- *Due to a combination of three different spectroscopic methods, an overall spectroscopic-based **PCA-DA model was developed** to characterize brain tumour tissues with regard to the degree of malignancy. (Med9)*
- *The Al7075/B<sub>4</sub>C (50 μm) composites **were fabricated** by stir casting using a vacuum furnace. The characterization of composites with different weight fractions of reinforcement materials (6, 8, 10, and 12 wt.% of reinforcements) **was carried out**. (Phy2)*

#### Move 1 Step 4: Restating Findings

- *The estimated value of the CG basically **converges** to the reference value in the simulation and experiment. (Mat3)*
- *... calves from the synbiotic group **showed better results** in virtually all parameters. (Med7)*
- *Using ..., **we demonstrated that** formalin fixation is a suitable sample preparation method for spectroscopic investigations. (Med9)*
- ***Our simulation work shows that**, in the laser energy and duration range considered here, the laser pulse*

*duration only has a small influence on prompt doses and activation. (Phy 7)*

In short, Move 1 provides a summary of the study. This move is very stable, being employed in all of the conclusions analyzed. Moreover, this move features four possible steps or strategies to help accomplish the move function. Move 1 Step 4: Restating findings is remarkable as far as its frequency of occurrence is concerned.

## Move 2: Evaluating the study

The conclusion section does not only summarize the study as demonstrated in Move 1. Move 2, in turn, substantiates Move 1 by offering evaluative comments related to the reported study. This move was found in 17 (68%) conclusions, earning the conventional status. In congruence with Ruiying and Allison's taxonomy (2003), this move can be represented by a maximum of three steps (*Step 1: Indicating significance or advantage, Step 2: Indicating limitations, and Step 3: Evaluating methodology*). Through this move, the RA writers begin to offer critical comments on their study, contributing to compelling, rational, and valid arguments. The occurrence frequency rates of these steps are relatively much lower than those of Move 1. That is, they were found in six, three, and eight conclusions (or 24, 12, and 32%), respectively. Here are the excerpts corresponding to the three steps of Move 2, with selected linguistic features highlighted.

### Move 2 Step 1: Indicating Significance or Advantage

- *These new systems are **more efficient than** chitosan beta-glycerophosphate hydrogels. (Bio2)*
- *This work's dense cross-attention mechanism **can jointly distribute** the attention weights horizontally and vertically. As a result, it can efficiently mine the most representative features of the hyperspectral data. (Mat5)*
- *... our result **could be useful** in preparing for future outbreaks as well as the current one by considering the results in public health decision-making. (Med2)*

### Move 2 Step 2: Indicating Limitations

- ***However, the lack of** nonelectrical test data for transformers and circuit breakers in this study is **not comprehensive enough**. (Mat1)*
- *As the results of our study are very promising but the significance of these results was **not always clear**. (Med7)*

## Move 2 Step 3: Evaluating Methodology

- *The **important feature of the proposed real-time estimation method** is that it is suitable for FREWL dynamics and operational characteristics and that it enhances our ability to solve strong nonlinear problems while avoiding the problem of a negative-definite Cholesky factor. (Mat3)*
- *Considering the implementation of high pretest probability, cardiac markers testing, particularly hs-cTnI, **is advised on** admission for selected patients, such as older adults and those with preexisting cardiovascular comorbidities. (Med 1)*
- *For glucose sensing in the food and pharmaceutical sectors, for the long-term usage of nanostructured glucose biosensors, reliability and longevity in extreme environments such as heat/cold, saline, and acid/primary conditions **need to be taken into account**. (Phy3)*

In short, Move 2 aims to present evaluative accounts associated with the study being reported. In congruence with Ruiying and Yang's 2003 model, three steps were identified. This move and the associated steps had substantially lower frequencies when compared with those of Move 1 and its four steps.

## Move 3: Deducing from the Study

Move 3, if used, tends to be the last move concluding the section by offering deductions from the study's findings. The same rate of occurrence as Move 2 was found (in 17 conclusions or 68%), and thus similarly conventional. In line with Ruiying and Allison's 2003 model, this move features two possible steps that help project the study into the future (*Step 1: Recommending further studies and Step 2: Drawing implications*). These steps have a slightly higher frequency than those of Move 2 but are still lower than those of Move 1. That is, they were found in nine and eight conclusions (36 and 32%, respectively).

### Move 3 Step 1: Recommending Further Studies

- *Due to this drug delivery system's desirable features, it is predicted that the drug-containing formulations from this drug system **will enter the global market in the future**. (Bio2)*
- ***In the next work**, we will try to describe the similarity between matching pairs by applying a new method and improve the extraction method to make it more suitable for the characteristics of the sensor ontology. (Math6)*

- **Future research work** will not only include the investigation of other tumour types but also consider the common paraffin embedding procedure. (Med9)

**Move 3 Step 2: Drawing implications**

- Furthermore, such predictions **may help other countries** that are now battling the outbreak to be more prepared. These measures are also essential to control the epidemic, protect frontline health workers, and reduce the severity of patient outcomes. (Med2)
- ... erythrocyte-related indicators **can provide more clinical information** and can be used to monitor the progression of diabetes and its complications. (Med6)
- This work **can provide a theoretical basis** for the optimization design and experimental preparation of novel neutron shielding materials. (Phy4)

Similar to the 2003 taxonomy, the closing move or Move 3 was represented by two steps. Similar to Move 2 and its pertaining steps, the move and step frequencies are much lower than those of Move 1.

Based on the description of individual moves and steps accompanied by their corresponding excerpts and their frequencies of occurrence presented above, Table 1 presents a conclusion taxonomy delineating the three moves found, the typical sequence of moves and steps, and their frequencies of occurrence which provide a criterion for their status.

To substantiate the qualitative descriptions in the previous section and to justify the above taxonomy, Table 2 illustrates the quantitative descriptions of individual conclusions in the

dataset, including a variety of organizational patterns identified and the steps employed in each conclusion as well as their total occurrence frequencies across the 25 conclusions.

As far as the move sequence is concerned, which forms an organizational pattern in the conclusion dataset, Table 2 demonstrates that not all 25 conclusions follow the same pattern. The analysis reveals that four patterns were discovered and are presented here in descending frequency order: 1-2-3, 1-3, 1-2, and 1. Despite a range of patterns, the 1-2-3 pattern was the most common, appearing in 11 conclusions and accounting for 44% of the dataset. The other patterns are more sporadic, appearing in only 6, 5, and 3 conclusions, respectively. Corresponding with the previous descriptions of individual moves and substantiating previous studies in this section, Move 1 is always present. If all three moves are present, the pattern of 1-2-3 is the most common. Finally, it is confirmed that Move 1, the most solid and prevalent move of the conclusion section, can be very powerful, as reflected by its exorbitantly high rate of occurrence.

To focus on the comparison of the organizational structure obtained with that of the original taxonomy (Ruiying & Allison, 2003), a level of congruence can be observed. As detailed in Table 2, Move 2 and Move 3 and their pertaining steps are identical to the original taxonomy, indicating their relative stability over the two decades. It needs to be noted that this study and the previous studies on the conclusion section reviewed earlier (Morales, 2012; Zamani & Ebadi, 2016) were anchored on the same analytical framework of Ruiyang and Allison’s 2003 model. Interestingly, the occurrence of the steps associated with Move 1 was not reported. However, the significance of these steps of Move 1 cannot be underestimated either. In this regard, two interpretations of this phenomenon are possible. First, it is plausible

**Table 1**

*Conclusion Taxonomy Depicting Move/Step Frequencies and Move Status (n = 25)*

Move/Step	Move Status	Frequency (Percent)
Move 1: Summarizing the study	Obligatory	25 (100%)
Step 1.1: Restating background		12
Step 1.2: Restating objectives		12
Step 1.3: Restating methodology		11
Step 1.4: Restating findings		21
Move 2: Evaluating the study	Conventional	17 (68%)
Step 2.1: Indicating significance		6
Step 2.2: Indicating limitations		3
Step 2.3: Evaluating methodology		8
Move Move 3: Deducing from the study	Conventional	17 (68%)
Step 3.1. Recommending further studies		9
Ste Step 3.2: Drawing implications		8

**Table 2***Quantitative Data of Individual Conclusions: Move Sequence and Step Presence (n = 25)*

No.	Sequence	Move 1				Move 2			Move 3	
		1.1	1.2	1.3	1.4	2.1.	2.2	2.3	3.1	3.2
1.	12		✓		✓	✓				
2.	123	✓	✓			✓			✓	
3.	123	✓		✓	✓		✓		✓	
4.	1		✓	✓	✓					
5.	123			✓	✓			✓	✓	
6.	123		✓	✓	✓			✓	✓	
7.	12		✓		✓	✓		✓		
8.	123	✓	✓	✓	✓			✓	✓	
9.	12		✓		✓			✓		
10.	123	✓	✓			✓				✓
11.	13				✓					✓
12.	13	✓								✓
13.	123	✓			✓			✓	✓	
14.	123	✓			✓	✓				✓
15.	123				✓		✓		✓	
16.	13		✓		✓					✓
17.	13		✓	✓	✓				✓	
18.	123				✓	✓			✓	
19.	1				✓					
20.	12			✓	✓			✓		
21.	12	✓		✓	✓			✓		
22.	13	✓			✓					✓
23.	13	✓	✓	✓						✓
24.	123			✓	✓		✓			✓
25.	1		✓	✓	✓					
		10	12	11	21	6	3	8	9	8

that the previous studies concentrated on cross-cultural comparison analysis of the rhetorical structure of the section across languages. Consequently, adhering to the original 2003 taxonomy would facilitate the comparison of the two cultural contexts. Second, given that the full scheme of the 2003 model was meant for the combined result-discussion-conclusion section, adopting the model to analyze the stand-alone conclusion section might not be precisely justifiable. These interpretations, however, remain speculative and need to be elucidated by subsequent research studies.

At this juncture, it is evident that Move 1 Step 4 (*Restating findings*) seems to be the most vital, with the highest occurrence rate of 84% (in contrast with the other steps, of which

their frequencies are quite low or relatively peripheral in the dataset). A pertinent question arises: What are some of the justifications for this phenomenon? To address this question, at the move level, the relatively high occurrence rate of Move 1, compared with those of Moves 2 and 3, suggests that this move is not serendipitous but quite pervasive. At the step level, the high occurrence rate of Move 1 Step 4 (*Restating findings*) may be attributed to its function of highlighting specific findings, acting as a crucial springboard and providing a core element for further arguments to be developed in Move 2 and Move 3. The scrutiny of the dataset reveals that Step 4 of Move 1 co-occurred with at least another step of this move in all (but one) conclusions, implying that the findings must be stated scrupulously to ensure that



they are not only contextualized but also solidly and convincingly presented. In this scenario, the first three steps of Move 1 could thus be employed to set the scene, contextualizing the announcement of findings in Step 4. Overall, the findings suggest that Move 1 is potentially the most central, powerful, and established. Meanwhile, Step 4 of Move 1 is distinctly pivotal, paving the way for subsequent arguments in Move 2 and Move 3.

Move 2 aims to evaluate various facets of the study being presented and Move 3 projects to the future. The existence of these tactics indicates that scholars need to possess critical thinking skills, an essential asset to execute these moves. Since this section comes at the end of the RA, it possibly serves as a closing reminder to the audience about the points the writers wish to restate and to make a strong final positive impression on the audience. This section effectively conveys a sense of completeness by providing a synthesis of the main ideas in Move 2 while highlighting the important takeaways from the study in Move 3, which projects future directions, calls for actions, or offers an overview of potential future research topics.

Another pertinent question is what triggers the need to end a RA with powerful closure. As remarked by Musselin (2018), the academic environment has become increasingly competitive. Therefore, every effort has been simultaneously mobilized to enhance educational institutions' competitiveness. This has led to the emergence of new competition formats, channels, platforms, and a new type of competition. In response to this competitiveness, RA publications have been employed as one of the measures to determine the standing of higher education institutions. Plausibly, quality rivalry in the RA genre has spawned a more elaborate rhetorical structure, encouraging scholars to emphasize Move 1 by including the four steps and further develop arguments analytically and futuristically using Move 2 and Move 3. As such, the conclusion section represents the writers' final opportunity to capitalize on it by making a lasting positive impression on the audience.

Finally, this study has provided a current structural organization of the stand-alone conclusion section in open-access journals from four academic disciplines. Pedagogically, the structural pattern can substantially facilitate the task of RA writing. As illustrated in this study, the conclusion section incorporates moves and steps. The findings imply that without the pattern delineated, it is highly likely that novice scholars will find the RA writing task overwhelming, demanding, and challenging. They will struggle to figure out what content to include in the conclusion section and how to linguistically express it. With the patterns displaying moves and steps and sample excerpts of individual moves and steps, the task can be substantially scaffolded. Furthermore, a greater understanding of the rhetorical structure can contribute to the more appealing nature of the RAs and escalate the commu-

nity's level of competition. Specifically, with particular attention to the conclusion section, the last opportunity for the RA writers to manifest or express their strife for competitiveness will be successfully exploited.

## CONCLUSION

This study aims to accomplish two goals: identifying the organizational structure of 25 stand-alone conclusions from open-access journals using Swales' genre analysis (2004) and determining structural differences in comparison to Ruiying and Allison's 2003 taxonomy. The findings, which are partly consistent with previous research, show that the section comprises three major moves and several steps. The findings, however, shed light on an intriguing feature of Move 1, which was discovered to be more prominent in terms of frequency of occurrence and more extensive in terms of the numerous steps it contains. Based on these findings, a current version of the RA conclusion taxonomy is proposed to reflect the current writing practices of this section.

At this juncture, given the narrow focus on four academic disciplines and award-winning RAs from open-access journals from one commercial publisher, and although the dataset was systematically compiled, the resulting taxonomy cannot claim to be utterly representative of "the conclusion section." The modified taxonomy proposed in this study needs to be tested or verified by additional studies in other disciplines and on a larger dataset to determine its validity. It should be noted that this study did not attempt to link the award-winning status to the quality of the conclusion section. Finally, future research is needed to fine-tune this modified taxonomy.

Notwithstanding these limitations, pedagogical implications could be drawn from the current findings to benefit and empower early-career researchers embarking on their academic journey, particularly aspiring to publish in international and prestigious journals. As elucidated in this study, in addition to the skills in conducting research, the knowledge to use academic language and expressions, and the tactics for powerfully reporting scientific discoveries, the ability to stage persuasive arguments in the conclusion section cannot be overlooked. This particular skill must be systematically cultivated, fostered, and nurtured. These implications are bolstered by the fact that, currently, many prestigious journals strongly recommend the inclusion of this section, be they open-access or non-open-access. Hence, a better understanding of how the conclusion section is constructed and regulated will be pedagogically advantageous, assisting novice scholars to successfully embark on an academic journey and sharpening their awareness of academic conventions or expectations.

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## DECLARATION OF COMPETING INTEREST

None declared.

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