

Writing Abstracts for Research Articles: Towards a Framework for Move Structure of Abstracts

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Received: June 7, 2022

Accepted: August 22, 2022

Online Published: September 19, 2022

doi:10.5430/wjel.v12n6p492

URL: <https://doi.org/10.5430/wjel.v12n6p492>

Abstract

The abstract as a sub-genre of the research article has been explored in many studies, particularly with regards to its rhetorical move structure. However, these studies have mainly focused on the macro-structures of abstracts in terms of the main moves present based on pre-existing models by Swales (1990), Dos Santos (1996), and Hyland (2000). Studies analyzing the micro-structures of abstracts in which the sub-categories under each main category are lacking. This study identifies the main moves of abstracts, the steps and sub-steps within each move to propose a comprehensive framework for abstract structure. Using a move based analysis, 100 research article abstracts in the field of social science and humanities were analyzed at the sentence level, where each sentence was coded and assigned a move. Based on the analysis, five main moves consisting of 12 steps and 25 sub-steps were identified. The frequency of occurrence revealed that Move 2: Introducing Study and Move 4: Presenting Findings were conventional, while Move 1: Situating Research, Move 3: Describing Methodology, and Move 5: Describing Implication and Recommendation were optional. This study has implications for research on the genre analysis of abstracts as well as the teaching of abstract structure in the academic setting.

Keywords: abstract, move, move-based analysis, steps, sub-steps, structure

1. Introduction

The research article is an essential genre in academia, primarily as a means of disseminating specific knowledge among different discourse communities in order to further contribute to the wealth of research in various disciplines. Careful attention should then be given towards the publication of research articles so that high quality articles that meet the standard of reputable journals are produced. In writing a research article, there are indeed many aspects to consider, each of which plays a distinct role in communicating information in relation to the research conducted, such as the study's methodology or findings. Another important aspect that may often be overlooked is the abstract of a research article.

The research article abstract typically appears at the beginning of the article and plays an important role in providing readers with an overview of the article's contents. Since the abstract is the readers' first encounter with the article, a well written abstract is crucial in giving a good initial impression to readers so as to compel them to read further into the article. Well written abstracts provide the necessary information about the article in a concise manner, and should accurately represent the contents of the article (Lorés, 2004); this helps readers save time by promptly determining whether the article contains what they are looking for and so decide to continue reading or not (Dos Santos, 1996).

In writing an abstract, while appropriate academic writing conventions, language, and registers should be considered, the organization of the abstract in terms of its rhetorical structure should first be understood in order that a preliminary groundwork may be laid so as to ensure coherence when writing. To that end, many studies looking at the abstract as a genre and analyzing its rhetorical structures have been conducted (e.g., Tseng, 2011; Can, Karabacak, & Qin, 2016; Suntara & Usaha, 2013). A number of models have been proposed as a result of these studies, two of the more prominent ones being those suggested by Dos Santos (1996) and Hyland (2000). Both these models consist of a five-move structure, but with slight variations in the naming of each move. Many other subsequent studies have since then used these models as a basis for analyzing abstracts of articles written in various disciplines

(Kanoksilapatham, 2013; Pho, 2008; Saeew & Tangkiengsirisin, 2014; Cross & Oppenheim, 2006; Amnuai, 2019).

While much research have been done to further shed light on the rhetorical structure of abstracts across different disciplines, a majority of these studies have only analyzed the macro-structure of abstracts in terms of their major moves, rather than look in detail at the micro-structures present within each move (Tseng, 2011; Darabad, 2016; Doró, 2013). Also, most of these studies have analyzed abstracts using pre-existing models in which the major moves have already been defined, such as Swales' model (e.g., Khansari, Chan, S. H., Chan, M. Y., & Tan, 2016), Dos Santos' model (e.g., Tseng, 2011; Pho, 2008), and Hyland's model (e.g., Darabad, 2016; Saeew & Tangkiengsirisin, 2014).

Having considered these points, this study was carried out with the aim of identifying the micro-structures present within abstracts so as to further extend the work of previous authors by suggesting a more detailed and comprehensive framework for the rhetorical structure of abstracts. It is thus the hope of this study that a more extensive and deeper understanding surrounding the abstract as a genre would be developed.

2. Abstract as a Genre of Academic Writing

Research into the analysis of abstracts as a genre began with the work of Swales (1990), who looked specifically at the introduction section of research articles in order to describe the communicative functions present through the use of a move analysis. Swales (2004) defines a move as a "discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse" (p. 228-229), and within each move are steps (Swales, 1990), which are smaller rhetorical elements that make up the particular move. Based on the analysis of introduction sections of research articles, Swales (1990) proposed the CARS (Create a Research Space) model, where he identified three main moves: (1) establishing a territory, (2) establishing a niche, and (3) occupying the niche. Swales also established a number of steps for each move; for instance, under Move 1, claiming centrality, making topic generalizations, and reviewing items of previous research are three steps that function to establish a territory.

The work of Swales (1990) has since sparked interest in studies exploring the rhetorical structure of research articles and, later on, further extended to research article abstracts with the use of move analysis. For instance, Bhatia (1993) suggested a four-move structure for abstracts on the basis that an abstract should provide information about the research in terms of what the author did, how the author did it, what the author found, and what the author concluded; the moves proposed by Bhatia were thus reflective of these aspects. These moves were (1) introducing purpose, (2) describing methodology, (3) summarizing results, and (4) presenting conclusions (pp. 78-79). Other prominent authors in later years however, such as Dos Santos (1996) and Hyland (2000), proposed a five-move model for the rhetorical structure of abstracts by adding on another move preceding the move which introduces the purpose of the study. This first move would function to establish context of the study by setting the scene through topic generalizations. In Dos Santos' (1996) model, the five moves are (1) situating the research, (2) presenting the research, (3) describing the methodology, (4) summarizing the findings, and (5) discussing the research. Similarly, Hyland's (2000) five-move model (i.e., introduction, purpose, method, product, and conclusion) reflects the same functions as the moves in Santos' model, although Hyland uses the label "product" as an alternative for "findings". Dos Santos' (1996) model however, compared to Bhatia (1993) and Hyland's (2000) models where only the major moves are identified, reflect Swales' (1990) CARS model in that a number of sub-moves (called steps in Swales' model) under the major moves are established, such as Move 1 (situating the research) consisting of sub-moves 1A: stating current knowledge, 1B: citing previous research, 1C: extending previous research, and 2: stating a problem; not all moves in Dos Santos' model have sub-moves though.

Using these pre-existing models as frameworks for abstract organization, many studies have utilized the move analysis in order to thoroughly examine not only the rhetorical structure of abstracts, but also the linguistic realizations for each move. Such analyses have been done for research article abstracts across various disciplines, such as civil engineering (Kanoksilapatham, 2013), applied linguistics (Tseng, 2011), educational technology (Pho, 2008), environmental science (Saeew & Tangkiengsirisin, 2014), linguistics (Khansari et al., 2016), literature (Doró, 2013), protozoology (Cross & Oppenheim, 2006), and accounting (Amnuai, 2019). These studies sought to determine the move structure specific to certain disciplines. With reference to the pre-existing models, it was generally found that not all abstracts contained the five moves, and that certain moves were more conventional than others based on calculations of frequencies of occurrence for each move in the abstracts analyzed. Various studies determined conventionality of moves by having a 60% cut-off point, as proposed by Kanoksilapatham (2005) and Pho (2008), whereby the occurrence of a move in more than 60% of abstracts in a corpus would indicate the move to be conventional. Based on the studies conducted, it was generally found that moves involving the purpose, method, and findings were conventional and the background move optional (Tseng, 2011; Can et al., 2016; Khansari et al.,

2016; Kanoksilapatham, 2013); the conventionality of the discussion move, however, showed variation. For instance, Tseng (2011) and Kanoksilapatham (2013) found the discussion move in linguistics and civil engineering abstracts to be conventional as the percentage of move occurrence was slightly over the cut-off point (75% and 66.7% respectively), but nowhere near as high as the frequencies of other conventional moves. Doró (2013), however, found the discussion move in both linguistics and literature abstracts to be the least used among the five moves, and not the background move, contrary to other studies.

Another important point to note is that despite the general consensus concerning the conventionality of moves, even within the conventional moves, different studies report varying frequencies of occurrence. Can et al. (2016) found in applied linguistics abstracts that the method move was most frequently used (present in all abstracts) while Khansari et al. (2016) found that the purpose move had the highest frequency in linguistics abstracts. On the other hand, Kanoksilapatham (2013), Cross and Oppenheim (2006), and Melander, Swales, and Fredrickson (2011) found that in civil engineering, protozoology, and biology abstracts respectively, both the method and findings moves were more frequently used. It seems that in the abstracts of articles in the science fields, these two moves are more focused on; this is also a finding by Viera (2019), when comparing between the move structure of abstracts in the humanities and science fields. It can be inferred that with regards to move frequency, disciplinary variation exists, whereby certain moves are given greater emphasis and play more prominent roles in abstracts of certain disciplines. Doró (2013) adds that even within the same discipline, arriving at a final conclusion regarding move structure is challenging. There is however a general consensus, based on many studies, that the background move is optional in abstracts, regardless of discipline (Pho, 2008; Darabad, 2016; Saeew & Tangkiengsirisin, 2014; Suntara & Usaha, 2013). A majority of the studies exploring abstract move structure constructed their corpora centering on abstracts of published research articles, but a study conducted by Lon, Tan, and Abdullah (2012) looked instead at computer and communication system engineering abstracts selected from among students' final term papers. Interestingly, the study found that the background, purpose, and method moves had the highest frequency of occurrence, with the purpose move being the highest, and that most abstracts omitted the findings and discussion moves. This finding was dissimilar to many other studies. Lon et al. (2012) goes on to suggest that overall, the lack of text organization in students' abstracts demonstrated their preference for a more direct approach when writing, in which the main goal was merely to give an introductory line so as to inform concerning what the study was about. Furthermore, the lack of the findings and discussion moves indicates that students may lack the ability to synthesize a meaningful discussion.

Besides disciplinary variation, studies have also been done to compare between move structures of abstracts written by those who use English as the first language (English as L1) and abstracts written by those who use English as the second/foreign language (ESL/EFL). An interesting finding is that while the more generally conventional moves (i.e., purpose, method, findings moves) are used frequently among both English as L1 and ESL/EFL writers, English as L1 writers tend to use the background and discussion moves in their abstracts more often than ESL/EFL writers do (Al-Khasawneh, 2017; Amnuai, 2019). These studies seem to suggest that, compared to ESL/EFL writers, international authors regard background and significance of study as important aspects to be included in their abstracts (Amnuai, 2019). This finding however may not be generalizable to all ESL/EFL speaking groups, seeing as the cultures and languages of ESL/EFL speakers vary widely. For instance, a study by Martín (2003) looking at English and Spanish journals in the discipline of experimental phonetics and psychology showed that although the frequency of the discussion move tended to be higher in English written abstracts, overall, there was not a significant difference between the two datasets, while the findings move tended to be omitted in Spanish written abstracts when compared to the English abstracts. Behnam and Golpour's (2014) study also mirrors Martín's (2003) findings in that the presence of the background and discussion moves in both English and Persian journal article abstracts in the discipline of applied linguistics showed no significant difference in occurrence; however, when compared with mathematics abstracts, language use did influence occurrence of moves such that Persian abstracts had a higher frequency of both findings and discussion moves than in the English abstracts, which is contrary to what other studies report. These findings indicate the variation in abstract move structure that exists even within different groups of NNE writers. Besides that, it is also interesting to note that within certain fields, cultural differences might influence the abstract structure writing more so than in other fields, such as seen in Melander et al.'s (2011) study, who reports that abstracts in both Swedish and English journal articles were mainly homogenous in structure in biology, but not so when it came to linguistics abstracts, which displayed greater variation in structure when comparing between the two cultures. Based on these findings, it can be inferred that cultural backgrounds, discourse practices, intellectual styles, academic writing instruction, the context of publication, and the relationship between the author and discourse community are factors that come into play that may influence the structure of abstract

writing (Viera, 2019; Martín, 2003). To illustrate this point, Melander et al. (2011), found that Swedish writers wrote in a way such that their abstracts had a slightly detached status from the article itself as compared to American writers, which may be, as Melander et al. suggest, due to the view Swedes have towards abstracts as being independent units rather than part of the article, as opposed to the view of the American writers that abstracts are an integral part of the article, and thus a more overt use of persuasive strategies are made in consideration of publishing efforts. Additionally, Behnam and Golpour (2014) reports that Persian authors preferred an indirect way of writing abstracts, which may hinder the promotion function of abstracts, whereas English writers consider these aspects, as they have to deal with the challenging rivalry in the wider international discourse community in order to stand out.

Besides analyzing the rhetorical structure of abstracts, many studies have also identified the linguistic realizations of moves in terms of verb tense (Tseng, 2011; Darabad, 2016), voice (Kanoksilapatham, 2013; Darabad, 2016), authorial stance (Pho, 2008), and metadiscourse (Lon et al., 2012). From these studies, certain linguistic features proved to be more prominent in certain moves; for example, that the background, purpose, and discussion moves were mostly written in the present tense, while the past tense was more dominant in the method and findings moves (Tseng, 2011; Saeew & Tangkiengsirisin, 2014). The use of present tense, such as in the background move, helps to indicate the current state in a field, or to generalize a topic (Kanoksilapatham, 2013), while the use of past tense in the method move is because writers retell the story of their research project and the methodology that has already been employed in the study; by doing so, writers are also able to stay objective (Dos Santos, 1996; Suntara & Usaha, 2013). With regards to the findings on moves, Dos Santos (1996) adds that writers may use past tense such that a narrower claim may be made by referencing the writer's own research, causing the reporting to be more objective. Some authors however, may prefer to use the present tense when reporting findings, giving the impression of a generalization of the findings beyond the study (Suntara & Usaha, 2013). Besides verb tense, some moves also tend to display formulaic-like patterns, along with particular lexical items which help in signaling the move. This has been clearly observed in the purpose move, in which reporting verbs preceded by determiners and nouns indicating inquiry types are used such as *this study investigates*, or *the article reports* (Santos, 1996; Kanoksilapatham, 2013; Suntara & Usaha, 2013). In the findings on moves on the other hand, usage of evaluative terms such as *important*, *significant*, *difference* to describe findings can be seen (Cross & Oppenheim, 2006; Dos Santos 1996); whereas the use of modal verbs (e.g., can, may, could) as hedging devices is more often found in the discussion move (Pho, 2008). In addition, authorial stance may also be used by authors in which the first person pronoun is used (e.g., I, we) in certain moves such as in the purpose move (Pho, 2008); the use of personal pronouns in certain moves could indicate that researchers become more argumentative and assertive in their stance on reporting (Saeew & Tangkiengsirisin, 2014). As with move structure, studies have also found linguistic variation to be present in abstract writing across disciplines (Darabad, 2016; Saeew & Tangkiengsirisin, 2014) and across cultures/languages (Amnuai, 2019; Martín, 2003).

While most of these studies have explored the move structure of abstracts within specific disciplines, almost all of them have done so with complete reference to either Dos Santos (1996), Hyland (2000), or Swales' (1990) model, using these authors' frameworks as a basis for their analysis, although there are studies that do not fully utilize these frameworks, of which are few. Kanoksilapatham's (2013) study is one of them, where Swales' (1990) model is used merely as a starting point by which to identify and categorize the main moves present in civil engineering abstracts. However, this study primarily identifies the macro-structures i.e., main moves present, with brief descriptions for each move. Another study by Khansari et al., (2016) also partially utilized the moves and steps in Swales' model, particularly to categorize the introduction move. The identification and categorization of other moves however, was based on a composite framework consisting of separate models adopted from various studies; each of which looked at distinct sections of the research article and not the abstract.

At present, attempts at re-defining the rhetorical move structure of abstracts and refining the categorization of moves have been largely overlooked. Hence, this study seeks to analyze both the macro- and micro- structures in order to specifically identify the categories and sub-categories present in research article abstracts. In this study, abstracts from research articles in fields of social science and humanities were selected, particularly in four disciplines: education, linguistics and language, sociology and political science, and communication. Not many studies have explored the general abstract structure of articles from the wider context of the social science field from across a variety of disciplines; instead, most studies have tended to look specifically at one particular discipline (or disciplines, for the purposes of making cross-comparisons), such as those that have been described previously. Moreover, aside from the specific disciplines of linguistics and applied linguistics (Tseng, 2011; Khansari et al., 2016; Can et al., 2016; Doró 2013), other than Viera (2019), who looked at the disciplines of education and sociology, very few studies have explored other disciplines within the field of social science and humanities. It is not the purpose of this

study however, to investigate the differences in abstract structure across these four disciplines, but rather propose a framework that generally encompasses these disciplines within the same field i.e., social science and humanities.

3. Research Methodology

A total of 100 research article abstracts constituted the corpus for the study, all of which were extracted from articles published across 10 peer-reviewed and indexed journals, and the articles selected were published from 2015 to 2019 in four disciplines within the field of social sciences and humanities. The corpus of this study is displayed in Table 1.

Table 1. Names of journals and number of research articles selected according to discipline

Discipline	Journal / Number of Research Articles Selected
Education	• American Educational Research Journal (AER) / 10
	• Journal of Teacher Education (JTE) / 10
	• Review of Educational Research (RER) / 10
	• TESOL Quarterly (TQ) / 10
Linguistics and Language	• International Journal of Applied Linguistics (IJAL) / 10
	• Journal of College Reading and Learning (JCRL) / 10
Sociology and Political Science	• Asian Journal of Social Psychology (AJSP) / 10
	• Sociological Quarterly (SQ) / 10
Communication	• Journal of Applied Communication Research (JACR) / 10
	• Journal of Intercultural Communication Research (JICR) / 10

In order to identify the rhetorical moves present in the abstracts, Dos Santos' (1996) framework of five-moves (M1: Situating the research, M2: Presenting the research, M3: Describing the methodology, M4: Summarizing the findings, and M5: Discussing the research) was used as the starting point for categorization. The unit of analysis was a sentence, following the analyses done in many previous similar studies (e.g., Suntara & Usaha, 2013; Tseng, 2011; Can et al., 2016). However, many of these studies also looked at the clauses and phrases within sentences, as it was discovered that a single sentence may contain more than one move, such as a sentence having the occurrence of both the purpose and method moves, which has been commonly found (Khansari et al., 2016; Dos Santos, 1996; Can et al., 2016; Cross & Oppenheim, 2006). This overlapping of moves is known as move embedding (Dos Santos, 1996). In this study, a different approach is taken; for the sake of consistency in the analysis of all abstracts, the unit of coding will strictly be at the sentence level, where each sentence will be categorized as a single move, and if the sentence contains embedded moves, the sentence will be categorized based on the more dominant move. Studies that have reported instances of move embedding in sentences have shown that the embedded move usually plays a secondary role, and that the amounts of information provided is usually brief, causing the data presented under the embedded move to be short (Suntara & Usaha, 2013; Dos Santos, 1996); thus, categorizing the occurrence of an embedded move in a similar manner as with a complete move that is present within a distinct and separate sentence seems to be inconsistent, as the embedded move plays a more minor role and is overshadowed by the dominant move in the sentence compared to the complete move in a sentence by itself. To address this issue, the researchers categorize sentences with embedded moves as separate and distinct sub-categories i.e., as sub-steps. There may be instances however, although not commonly found in previous studies, that both the moves in a sentence having dual moves are equally dominant. In such cases, only then will the sentence be categorized as having two moves.

The sentences in the abstracts were first analyzed and categorized into moves, then subsequently within each move, sentences were categorized into finer sub-categories known as steps, then within each step, into sub-steps. The coding of sentences into their respective moves, steps, and sub-steps were done based on a combination of the top-down and bottom-up approaches, where both the content and linguistic features of the sentences in the abstracts were considered. Using both these approaches helps mitigate the subjectivity in evaluation due to the absence of clear rules for categorization, such as if only the top-down approach was used, which has been the subject of criticism in the work by Swales (1990). Furthermore, subjectivity in manual coding of sentences was minimized through inter-rater checking by the researcher, a senior lecturer, and a professor, as suggested by Kanoksilapatham (2005) and Pho (2008). Finally, to determine the conventionality of each move, a 60% cut-off point was used. The frequency of occurrence of each move across the 100 abstracts was calculated, and if the move occurred in more than 60% of the abstracts, the move would be deemed as conventional, but optional if the move frequency was below 60%.

4. Findings and Discussion

Based on the analysis, a five-move structure similar to that of Dos Santos' (1996) framework was identified to be present in the abstracts, although there were some differences in the naming of moves, and in particular, the categorization of Move 4 and Move 5.

The five moves identified were named as M1: Situating Research, M2: Introducing Study, M3: Describing Methodology, M4: Presenting Findings, and M5: Presenting Implication and Recommendation. When compared with Dos Santos' model, Move 1 and Move 3 retain the same labelling, while instead of naming Move 2 as presenting the research, it was decided that introducing study was more apt, seeing as the re-labelling of this move not only carried a similar meaning, but was more specific in indicating the function of the move. Move 4 and Move 5 on the other hand, were categorized differently.

When it came to Move 4 (presenting findings), it was felt that including both the findings and the discussion/interpretation of findings under this move, rather than as separate moves, was more appropriate, as both these aspects were seen to be closely related and linked together; even in many research articles, both the findings and discussion are presented together in a section, and when they are presented in separate sections, still the discussion section closely refers to the findings. There was slight difficulty at times however, in identifying whether a sentence was reporting or discussing findings, which some researchers have also commented on (Khansari et al., 2016; Martín, 2003). Hence, due to the close relation of the findings and discussion, grouping them under one move was deemed appropriate in this study. The final move i.e., Move 5, would then function to describe aspects, such as implications and recommendations, both of which play a role in extending the findings of the study to relevant areas and beyond the study itself. The main difference between the framework proposed in this study and other pre-existing models is with regards to the placing of the discussion/interpretation of findings from under Move 5 to Move 4.

In the following section, specific findings for each of the five moves are described in more detail in terms of their steps and sub-steps, with selected sentences extracted from abstracts used to illustrate each sub-category. Due to space limitations in this report, only one or two sentences are given as examples for each sub-category. The abbreviated name of the journal and year from which each research article abstract is taken from is stated at the end of each sentence. The complete framework with all its moves, steps, and sub-steps can also be found in Appendix A. Following these findings, based on a cut-off point of 60%, the conventionality of each move will be described in terms of frequency of occurrence.

4.1 Move 1: Situating Research

The first move that was identified to be present in the abstract was M1: Situating Research. Sentences that were categorized under M1 were those that did not directly mention about the study conducted, such as its purpose, procedures and findings. These sentences instead described subject matter/topics/situations, issues, and research gaps through different steps. The main function of M1 is to provide a background which introduces the study; this is achieved by bringing to attention certain knowledge surrounding an area in which the study is interested to explore. Additionally, M1 is used to engage prior knowledge and help readers familiarize themselves with a particular subject matter related to the study.

Three steps were found under this move: S1: Establishing Context, S2: Addressing Issue and S3: Addressing Gap. All three steps function to situate the research in different ways.

S1 establishes context by describing general situations or explaining topics related to the area of study.

- (1) *Studies on student teaching continue to suggest that preservice teachers' feelings of dissonance **are related to** disparate views of teaching and learning between universities and schools. [JTE-70(4)-2019]*
- (2) ***Students' strategic processing** is foundational to reading and success and can inform reading and instruction in postsecondary education. [JCRL-49(1)-2018]*

Sentence (1) highlights the association between two variables with the phrase "are related to", while sentence (2) explains the topic of "students' strategic processing", both of which provide general information. S1 is perhaps the most commonly used step as it allows authors to simply and directly describe a situation or topic in a general way.

S2 (Addressing Issue) is similar to S1 in that it can be used to establish context. However, it does so by highlighting and describing a problem instead. There are two sub-steps under S2: (a) describing issue, and (b) describing response to issue. Authors may not always employ both sub-steps when addressing an issue. Overall, Sub-step (a) is more commonly used.

- (3) *Courtroom language is renowned for being strategic and a powerful means of manipulation, which may **explain why criminal cases can sometimes result in a wrongful conviction.** [IJAL-28(3)-2018]*

- (4) *Full-service community schools aim to reduce educational inequality by addressing the multifaceted needs of low-income children and youth. [AERJ-54(1)-2017]*

Sentence (3) is an example of Sub-step (a), describing the issue of how courtroom language leads to wrongful conviction, while sentence (4) makes use of Sub-step (b) to show the response of full-service community schools in addressing the issue of educational inequality.

The third step commonly found under M1 is S3: Addressing Gap. In comparison to S2 (Addressing Issue), S3 is more commonly used by authors in their abstracts. This may be due to how the main goal of any study is to fill a certain gap in research, practice, or policy that has been identified prior to the study. The gap can be addressed through three different sub-steps: (a) stating lack of attention, (b) making comparisons, and (c) describing uncertainty.

- (5) *However, studies that evaluate rigorously the effects of DBDM on student achievement are scarce. [JTE-69(3)-2019]*
- (6) *Prior meta-analyses have evaluated school-based intervention effects; however, no systematic review meta-analysis has evaluated the effectiveness of interventions implemented in classrooms with students with ADHD. [RER-89(4)-2019]*
- (7) *However, in a context where LL is often criticized for profusion of errors or substandard expressions, it is doubtful whether the LL still holds pedagogical appeals for language teachers. [IJAL-30(1)-2019]*

Sub-step (a) is used in sentence (5), where the phrase “are scarce” indicates lack of attention given to studies on the effects of DBDM. Sentence (6) however makes use of Sub-step (b), in which a comparison between prior and current studies is made to show what is lacking. In sentence (7), sub-step (c) is employed, where the phrase “it is doubtful whether” shows uncertainty towards a particular area of study.

4.2 Move 2: Introducing Study

The second move present in the abstracts is introducing the study. Sentences categorized under M2 describe what the study is about and what it sets out to do. These sentences were identified through the use of phrases, such as “this study ...” or “this article ...” in the sentences; these phrases are then followed by specific actions taken in the study (e.g., investigates, documents, assesses). Sentences that are constructed based on these phrases were categorized as S1: Describing the Study. Additionally, there were sentences that did not contain such phrases but were still categorized under M2, as these sentences also do introduce the study by describing certain aspects of the study; such sentences were labelled as S2: Describing Other Aspects of the Study.

Under S1 (Describing the Study), three sub-steps were identified: (a) describing action directly, (b) giving context to study, and (c) explaining purpose of study. Sub-step (a) is most commonly used by authors in which sentences clearly describe what the study does, while sub-steps (b) and (c) build upon/extend sub-step (a) either by providing additional information about the study, or by giving the study a more purposive direction.

- (8) *This study investigates the potential benefits for incidental vocabulary acquisition of implementing a particular sequence of input–output–input activities. [TQ-53(1)-2018]*
- (9) *Drawing insights from the social identity perspective, this article examines the relationships between social context, interpersonal networks, and identity dynamics of a mujahid based on a single case of terrorist recidivism in Indonesia. [AJSP-23(1)-2018]*
- (10) *This study aimed to investigate how Grade 1–2 English language learners (ELLs) differ in their performance on a writing test in two test modes: paper and online. [TQ-53(2)-2019]*

Sentence (8) is an example of sub-step (a), indicated by the phrase “this study investigates”, while sentence (9) employs sub-step (b), in which additional context is given with regards to the approach taken, as seen in the phrase “drawing insights from the social identify perspective”. Sentence (10) however, makes use of sub-step (c) by giving a sense of direction and goal to the study through the use of the phrase “aimed to”.

In S2 (Describing Other Aspects of the Study), two sub-steps were found: (a) describing approach and (b) stating scope. While aspects, such as approach and scope (e.g., sample, area of study), can be mentioned as additional context when describing the study, such as in S1b, authors may at times choose to highlight these aspects in a separate sentence. Compared to S1 however, S2 is not as commonly used when introducing the study.

- (11) *It draws upon both general and discipline-specific research in three promising areas for reading instruction: metacognition, modeling via “thinkalouds,” and background knowledge. [JCRL-49(2)-2019]*
- (12) *One hundred and seventeen group design studies yielding 592 effect sizes constituted the current sample. [RER-89(2)-2019]*

In the above sentences, sub-step (a) is used in sentence (11) to indicate the approach taken by describing the underlying influences of the study, while sub-step (b) is employed in sentence (12), in which information about the sample size is provided.

4.3 Move 3: Describing Methodology

The third move found in the analysis of abstracts was describing methodology. Sentences which fall under this move function to inform readers about how the study was conducted; this would include aspects, such as the data collection and data analysis processes as well as the procedures carried out in the study. Specific content-based words/phrases indicating the instruments used, the techniques applied, and the actions taken throughout the study were considered when grouping sentences under M3. The three main steps identified in M3 are thus S1: Describing Data Collection, S2: Describing Data Analysis and S3: Describing Procedure.

In S1, two different sub-steps are used to describe data collection: (a) describing sources of data, and (b) elaborating on data collected. In sub-step (a), how the data was collected, such as the instruments used, are described, whereas in sub-step (b), further details about the data collected are provided.

- (13) *A total of 151 third-year students and 133 lecturers in a teacher-training college answered separate **questionnaires** consisting of open- and closed-ended questions. [JCRL-48(2)-2018]*
- (14) *One hundred thirty-six school teachers completed a **self-report questionnaire** measuring diversity-related burnout and self-efficacy, approaches toward cultural diversity, attitudes toward multiculturalism, and demographics. [JTE-69(4)-2017]*

Sentence (13) above is an example of sub-step (a), which indicates that questionnaires were used to collect data, while sentence (14) uses sub-step (b) by providing further information about what was measured in the questionnaire administered.

S2 (Describing Data Analysis) is somewhat similar to S1 when it comes to the sub-steps identified, where one sub-step describes the process and the other gives a further elaboration. These two sub-steps are (a) describing process of data analysis, and (b) elaborating on data analysis.

- (15) *The data obtained from 833 learners in high schools and universities was analyzed using structural equation modelling (SEM) and multi-group structural equation modelling (MSEM). [IJAL-30(2)-2019]*
- (16) *Students’ writings were analyzed quantitatively and qualitatively in terms of task completion, fluency, and complexity. [TQ-53(2)-2019]*

Sub-step (a) is used in sentence (15), where the specific technique applied is stated to show how the analysis was done, whereas in sentence (16), an elaboration is given concerning what the analysis is looking at.

Besides data collection and data analysis, sentences indicating specific actions taken in the study are also categorized under S3 (Describing Procedure) and can be broken down further into two sub-steps depending on the party who does the action; these sub-steps are (a) describing participant action, and (b) describing researcher action.

- (17) *More specifically, **learners of English as a foreign language (EFL; n = 32)** were asked to watch a TED Talk video, orally sum up its content in English, and then watch the video once more. [TQ-53(1)-2018]*
- (18) *A one-page essay was elicited from an ESL learner enrolled in an intensive English program and was manipulated to incorporate error patterns often observed among Chinese- and Spanish-speaking learners. [TQ-51(2)-2017]*

For instance, sub-step (a) is taken such as in sentence (17), where the participants are specified and the actions taken by them are stated. When it comes to sub-step (b) as demonstrated in sentence (18) however, sentences are usually written in the passive voice so that the researcher as the subject is not explicitly mentioned, but readers presuppose that the actions are indeed taken by the researcher.

4.4 Move 4: Presenting Findings

The fourth move identified was presenting findings. Sentences were categorized as M4 when words indicating findings were present, such as “findings”, “results”, and “analysis”, along with verbs that signal the presentation of those findings, such as “indicate”, “reveal”, “show”, “identify”, and “suggest”. In the analysis however, there were sentences that did not explicitly make use of these words, but were also categorized as M4 on the basis that these sentences appeared directly after M3 (Describing Methodology) in the abstract. It was thus deduced that, based on the general structure of abstracts (and the organization of research articles), sentences following the methodology would describe findings.

Since M4 is used to present what was found in the study, it was decided that both the findings and the interpretation/discussion of said findings would fall under this move. This categorization is indeed different when compared to previous abstract structure models, however, the main justification for this categorization is that in the research article, the findings and discussion section is closely tied together due to how the discussion segment discusses the findings so as to offer a further elaboration and explanation of the findings. Thus, both the findings and discussion can be seen as two important aspects of presenting findings, both of which were categorized as separate steps, which are S1: Reporting Findings and S2: Discussing Findings.

In S1, findings are reported directly without any interpretations given, such as in the sentences below:

- (19) **Mediation analyses revealed a strong relationship between teaching practice and student learning.** [AERJ-56(4)-2018]
- (20) **The findings show that convergence strategy is more dominant than divergence strategy and local wisdom found in Buneng is designed to maintain harmony between village members rather than voicing distinction amongst plural identities occupying the same public sphere.** [JICR-48(4)-2019]
- (21) **Schooling was described as providing upward mobility but conflicting with education at home, which was seen as fostering traditional values.** [JICR-48(4)-2019]

Sentences (19) and (20) explicitly indicate reporting of findings through the use of the phrases “mediation analyses revealed” and “the findings show that” when compared to sentence (21), in which the reporting of findings are inferred from the phrase “schooling was described as”, indicating results based on data collected from participants either through surveys/questionnaires or interviews (based on M3).

In S2, the findings reported are further discussed. Three sub-steps were identified: (a) stating theories/hypotheses/concepts used, (b) stating focus of discussion, and (c) describing interpretation. Sub-step (a) is used for stating certain concepts, theories, or perspectives used for interpreting findings, sub-step (b) is used when authors decide to indicate the topics of discussion rather than give specific points, and sub-step (c) is used to give specific interpretations arrived at based on the findings.

- (22) **These findings are interpreted with reference to Swain’s (1995) output hypothesis, Laufer and Hulstijn’s (2001) involvement load hypothesis, and Nation and Webb’s (2011) technique feature analysis.** [TQ-53(1)-2018]
- (23) **The collaborative and non-collaborative functions served by these linguistic features are discussed.** [TQ-5391)-2019]
- (24) **These orientations suggest that how members discursively construct the relationship between policy and practice is subject to interpretations that impact policy implementation.** [JACR-47(4)-2019]
- (25) **This context prevents bystanders from reporting what they have observed and places those with a lack of social support at a significant disadvantage when dealing with negative behavior.** [SQ-60(3)-2019]

Sub-step (a) is used in sentence (22), where the theories used to interpret findings (theories are underlined) are stated, while sub-step (b) is applied in sentence (23), in which only the topics of discussion (topics are underlined) are provided.

Sentences (24) and (25) make use of sub-step (c), both of which provide a conclusion of sorts arrived at from the findings, but are written in different ways; in sentence (24), the phrase “suggest that” indicates a proposition, which is then followed by the interpretation of findings (interpretation is underlined), whereas no such phrase is used in sentence (25), instead, the phrase “this context” may imply a direct continuation from the previous sentence which reports a finding.

4.5 Move 5: Presenting Implication and Recommendation

The final move identified from the analysis of abstracts was presenting implication and recommendation. Compared to the pre-existing models which included the discussion of findings under M5, in this study however, it was decided that categorizing only the implications and recommendations under M5 was appropriate, since these two aspects differ from the discussion of findings in that they extend the findings beyond the study itself by highlighting any impacts and/or contributions as well as provide practical suggestions. These two aspects were thus categorized into two steps: S1: Describing Implication and S2: Making Recommendation.

Sentences were identified as S1 when the word “implication” appeared in the sentences. However, there were also sentences in which the word was not used, but indicated implication through the use of phrases that showed impact, significance, or contribution of findings. Under S1, three sub-steps were identified: (a) addressing stakeholders, (b) highlighting areas of implications, and (c) stating implications.

- (26) ***Our findings serve as a cautionary note to researchers who intend to administer the PANAS in future studies as well as to researchers interpreting the results of past studies involving respondents from Asian countries.*** [AJSP-23(1)-2019]
- (27) *Theoretical and practical implications of the findings are discussed.* [RER-5391]-2019]
- (28) ***Implications for teacher preparation are discussed.*** [JTE-70(4)-2018]
- (29) ***These results provide novel empirical insights on the role of religious identity in interreligious conflicts in the South Asian context, especially Indonesia.*** [AJSP-23(3)-2019]

In sentences (26) and (29), implications are indicated through the use of phrases that show significance or contribution of findings (phrases in bold) as compared to sentences (27) and (28) in which the word “implication” appears. Sub-step (a) is used in sentence (26) by pointing out the particular stakeholders (stakeholders are underlined); sub-step (b) is employed in sentences (27) and (28) in which the general areas (i.e., theory and practice) and specific areas (i.e., teacher preparation) are highlighted without further elaboration by providing specific points; and sub-step (c) is present in sentence (29), in which specific points relating to implications are stated.

Sentences identified as S2 generally had the word “recommendation” present in the sentences. There were however sentences that did not, but words/phrases indicating recommendation, such as the use of modal verbs (e.g., should) and phrases suggesting a call to action such as “need to” were used. Similar to the sub-steps under S1, S2 was also broken down into three sub-steps: (a) addressing stakeholders, (b) highlighting areas of recommendation, and (c) stating recommendation.

- (30) ***Recommendations are made for practitioners interested in designing and delivering diversity training online in an interactive learning environment.*** [JTE-70(4)-2019]
- (31) ***We conclude with recommendations for theory, research, programs, and policy for STEM identity development among young women, informed by a social identity perspective.*** [RER-88(4)-2018]
- (32) ***Future research should focus on possible interventions with teachers on the ways in which approaches to cultural diversity are developed, negotiated, and adopted.*** [JTE-69(4)-2017]

Sentence (30) uses sub-step (a), in which the stakeholders are addressed (i.e., practitioners), while sub-step (b) is seen to be employed in sentence (31) where the areas of recommendation are highlighted (areas are underlined). Both sub-steps (a) and (b) do not provide specific recommendations as compared to in sub-step (c), such as is used in sentence (32) where the recommendation is stated (recommendation is underlined).

4.6 Conventionality of Moves

Based on a 60% cut-off point, from the 100 abstracts analyzed, if a move occurs in more than 60% of the abstracts, it is deemed as a conventional move, whereas the move is deemed as optional if it occurs in less than 60% of the abstracts. The frequencies of occurrences of moves and their conventionalities are summarized in Table 2.

Table 2. Frequency of occurrence of moves and conventionality

Move	Frequency of occurrence	Conventionality
Move 1: Situating Research	51/100 (51%)	optional
Move 2: Introducing Study	93/100 (93%)	conventional
Move 3: Describing Methodology	50/100 (50%)	optional
Move 4: Presenting Findings	92/100 (92%)	conventional
Move 5: Describing Implication and Recommendation	56/100 (56%)	optional

The findings of this study somewhat mirror that of other studies, but certain differences can be seen. As with almost all other studies referenced in the literature review (e.g., Tseng, 2011; Can et al., 2016; Kanoksilapatham, 2013), Move 1 was found to be optional, while Move 2 was found to be conventional, with Move 2 having the highest frequency of occurrence, which is similar to the findings of Khansari et al. (2016).

Interestingly, Move 3 was found to be optional, contrary to the findings of many studies. However, such a contrast may not in actuality exist as found in the study, but may likely be due to how the moves were categorized in the first place. Since the majority of studies referenced considered Move 3 to occur even when embedded with other moves, it makes sense that the frequency of occurrence of the move would be higher in those studies, as compared to how this study only considered the move to occur if it was the more dominant move that was typically present in a separate sentence.

Similarly, due to the way in which moves were categorized in this study, a direct comparison to other studies cannot be made for Move 4 and Move 5, since all other studies group the discussion of findings as part of Move 5 and not Move 4. Even then, despite these differences in categorization, the conventionality of Move 4 across most abstracts is similar to the findings of the majority of studies cited. Move 5 on the other hand, was found to be optional, a finding which is also reflected in a number of studies (e.g., Pho, 2008; Doró, 2013).

5. Conclusion

This study began with the aim of developing a comprehensive framework for the rhetorical structure of abstracts by analyzing 100 research article abstracts from four disciplines within the field of social science and humanities. From the analysis, a five-move structure, consisting of a total of 12 steps and 25 sub-steps to realize the five moves, was identified (the complete framework can be found in Appendix A). Additionally, by using a 60% cut-off point to determine conventionality of moves, Move 2 and Move 4 were found to be conventional, while Move 1, Move 3, and Move 5 were deemed optional.

The findings of this study contribute to the field of the genre analysis of research article abstracts by extending the pre-existing frameworks for abstract structure via the refining of the categorization of moves into the more detailed sub-categories of steps and sub-steps present within each move. Moreover, the study contributes to the literature on abstract genre analysis by offering an alternative for the categorization of moves, such as the categorization for Move 4 and Move 5, where the discussion of findings is part of Move 4 rather than Move 5; also, in the categorization of sentences having dual/embedded moves as separate and distinct sub-categories, rather than as two major moves.

This study has implications for research, particularly in the way move analysis is carried out in determining the micro-structures present within each move. Besides that, there are also implications for practice, such as how abstract structure can be effectively taught in academic settings e.g., academic writing classes. To that end, the framework presented in this study can be used as an instructional tool to help novice writers in their understanding about abstract structure in their efforts to write high quality abstracts for journal article publication. Novice writers who may be new to academic writing, such as undergraduate and perhaps even post-graduate students intending to write their own theses, dissertations, or academic reports, may be able to use the framework proposed as a guide to better abstract writing, especially if they intend to have their work published in peer-reviewed indexed journals.

Finally, further research can be done, looking specifically at other aspects such as the conventionality of steps/sub-steps within each move, as seeing that even within a conventional move, certain steps/sub-steps may more often be found. Future research can also explore disciplinary variation that may exist in abstract micro-structure (rather than only macro-structure) in order to identify which steps and sub-steps are more prevalent in specific disciplines. In addition, this study can be further extended in the analyzing and the identification of the steps and sub-steps present in abstracts of other fields and disciplines apart from that of the social science and humanities field. Lastly, this study did not cover in detail the linguistic realizations/features for each sub-step, such as the grammatical constructions, which future studies can consider.

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Appendix A

Move structure of abstracts in the field of Social Science and Humanities

Moves (M)	Steps (S)	Sub-steps
M1: Situating Research	S1: Establishing Context	
	S2: Addressing Issue	a. Describing Issue b. Describing Response to Issue
	S3: Addressing Gap	a. Stating Lack of Attention b. Making Comparisons c. Describing Uncertainty
M2: Introducing Study	S1: Describing Study	a. Describing Action Directly b. Giving Context to Study
	S2: Describing Other Aspects of Study	a. Describing Approach b. Stating Scope
M3: Describing Methodology	S1: Describing Data Collection	a. Describing Sources of Data b. Elaborating on Data Collected
	S2: Describing Data Analysis	a. Describing Process of Data Analysis b. Elaborating on Data Analysis
	S3: Describing Procedure	a. Describing Participant Action b. Describing Researcher Action
M4: Presenting Findings	S1: Reporting Findings	
	S2: Discussing Findings	a. Stating Theories/Hypotheses/ Concepts b. Stating Focus of Discussion c. Describing Interpretations
M5: Presenting Implication and Recommendation	S1: Describing Implication	a. Addressing Stakeholders b. Highlighting Areas of Implications c. Stating Implications
	S2: Making Recommendation	a. Addressing Stakeholders b. Highlighting Areas of Recommendations c. Stating Recommendations

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