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Schematic Structure of Literature Review in Research Articles: A Cross-Disciplinary Investigation

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Abstract

This article scrutinizes a schematic analysis of integrated Literature Review (LR) sections drawn from Research Articles (RAs) across two disciplines. The analysis mainly focuses on the schematic structure, namely the constituent moves and steps. The structure of LR in these articles is explored via coding and genre analysis. Manual move analysis is used to identify similarities and differences between these two groups of articles. To this end, 30 published integrated LRs from two disciplines of Neuroscience and Neurology (all published in high indexed journals) are selected randomly. Manual coding procedures are accomplished through two different move models proposed by Fryer (2012) and Nwogu (1997). Both models are composed of 3 Moves with several sub-moves. The results compare and contrast the prototypical move patterns of each discipline. A new model is proposed in this study and the significance of integrated LRs is discussed. This study discusses pedagogical implications for the practitioners in ESP and EAP fields. The move structures proposed in this study may help students and novice writers be better able to deal with the structuring difficulties they face in writing LRs. Furthermore, the findings of this article may assist novice researchers and article writers to cope with the hardships of high indexed journal submission.

Keywords: Literature review, Moves, Steps, Discipline, Genre

1. Introduction

Genre analysis has been considered as one of the most significant themes in ESP, discourse analysis, and research realm. It is not surprising that many scholars have been studying genre, discourse community, academic writing and the neglected issues related to various disciplinary distinctions among university students especially master students around the world. Ideally, freshmen need to be not only educated seniors but also professional scholars

who dream of writing fabulous unique theses and dissertations or submitting their research articles in indexed journals. Furthermore, the growth of qualified researchers can be beneficial for both society and individuals. Although we all belong to various communities simultaneously, the understanding of how to define and categorize the communities is complicated when it comes to distinguishing the differences among discourse communities and disciplinary varieties. As a consequence, genre and discourse community are highlighted.

One of the objectives of needs analysis of discourse community members is the need of master and doctoral students to achieve the acceptance of prestigious journals in order to continue their education either in their own country or abroad. In both circumstances, they have to publish their research articles in acceptable and well-known journals to reach their goals. Another important issue is the urge of having international professional communication in order to be successful in academic and career improvement. Consequently, investigation in this field has been attracting remarkable attention.

Swales is pioneer in this field since he proposed his genre analysis (1984) and CARS (1990, 2004) models. His models were created focusing on introductory sections. Due to its beneficial function, many researchers and authors have been trying to propose different models for different sections of various written or spoken genres. According to all models proposed by researchers, a considerable number of them is related to isolated sections of written genres such as abstracts, introductions, literature reviews, methods, results and discussion, and conclusions mainly in research articles and theses (e.g. Basturkmen, 2012; Bunton, 2002; Crookes 1986; Hopkins & Dudley-Evans 1988; Hsiao & Yu, 2012; Jian, 2010; Kanoksilapatham, 2005; Kwan, 2006; Pho, 2008; Salager-Meyer, 1992; Swales 1984, 1990, 2004; Swales & Najjar 1987). On the other hand, other researchers have proposed models to analyze the move structure holistically (Skelton, 1994; Gosden, 1992; Nwogu, 1997; Fryer, 2012)

Even though numerous studies have been conducted on all sections as the most important parts, the lack of studies on the bulkiest section, namely Literature Review, requires more consideration. Literature is the starting point of each article, thesis or dissertations since scholars need an initial review of literature before composing the rest sections. As Hart (1998) puts it:

"Initially we can say that a review of the literature is important because without it you will not acquire an understanding of your topic, of what has already been done on it, how it has been researched, and what the key issues are. In your written project you will be expected to show that you understand previous research on your topic. This amounts to showing that you have understood the main theories in the subject area and how they have been applied and developed, as well as the main criticisms that have been made of work on the topic. The review is therefore a part of your academic development — of becoming an expert in the field (p. 1)". Moreover, Knopf (2006) specifies the benefits of literature review in other words:

• giving you a general overview of a body of research with which you are not familiar;

• revealing what has already been done well, so that you do not waste times "reinventing the wheel";

• proposing you new ideas to use in your own research;

• assisting you to determine where there are problems or flaws in existing research;

• enabling you to place your research in a larger context, so that you can show what new conclusions might result from your research. (p. 127)

Literature review is a specific genre and postgraduates must familiarize themselves with its peculiarity during their course of study (Hsiao, 2015). In various disciplines like Medical Science, it can be obviously seen that literature review section is considered as an integrated section into introduction. It seems logical to consider the mentioned integrated part as an introductory section includes both introduction and literature review. There are several reasons to decide between merged and separate literature reviews. These patterns are significant since the move analysis of each pattern, either integrated or separate Literature review (henceforth LR) is completely unique. It has been proved that most postgraduate students and novice writers and scholars have been encountering hardships when they decide to write their own articles, papers, theses, dissertations and all academic written documents. Hence, assisting students in this way is worthwhile. Thus, explore the literature review genre of Medical and Life science Research Article (henceforth RA) RAs seems to be useful since LRs move structure is neglected while they are the most influential parts as they lead the students to reach a full-fledged concept of their own path.

2. Literature review

Genre is delineated as a classification referring to artistic and aesthetic composition. Based on the definition in *Longman Language Teaching and Applied Linguistics*, genre is defined as a discourse in a special context with distinctive patterns (Richards & Schmidt, 2013). However,

its simple definition goes far beyond when it refers to its use in rhetorical studies. Several writers have specified the concept of genre (Berkenkotter & Huckin, 1993; Devitt, 1993; Hyland, 2002; Hyon, 1996). Nonetheless, Swales (1990) has defined it meticulously: A genre consists of communicative events, the members of which share some set of communicative aims. These aims are distinguished by the expert members of the parent discourse community, and hence form the rationale for the genre. This rationale organizes the schematic frame of the discourse and effects and restricts the choice of style and content.

Recently, genre analysis has been developed drastically and linguists use this powerful method to describe different text types. The growth of its use widely related to the importance of communication among different communities. Specifically, discursive knowledge transmission has attracted attention for its potential authority. Furthermore, genre analysis is greatly used since an abundant source of electronic corpora and different kinds of software to accelerate its use are available. Consequently, researchers and scholars use genre analysis to illustrate unique characteristics of special language with particular objectives among intended individuals defined as a discourse community. Swale's models of structural moves are the most well-known ESP genre analysis moves. These moves, defined as "discoursal or rhetorical units that perform a coherent communicative function in a written or spoken discourse" (Swales, 2004, p. 228). Two figures below depict the similarities and differences between his two models.

Move 1. Establishing a Territory
Step 1. Claiming centrality and/or
Step 2. Making topic generalizations and/or
Step 3. Reviewing items of previous research
Move 2. Establishing a Niche
Step 1.A. Counter-claiming or
Step 1.B. Indicating a gap or
Step 1.C. Question-raising or
Step 1.D. Continuing a tradition
Move 3. Occupying the Niche
Step 1.A. Outlining purposes or
Step 1.B. Announcing present research
Step 2. Announcing principle findings
Step 3. Indicating RA structure

Figure 1. The CARS Model for RA Introductions (Swales, 1990, p.141)

Swales received various comments for weaknesses of his model. One problem was that he was not conservative in defining the obligatory and optional moves and steps. Hence, he refined his model and proposed the new CARS model.

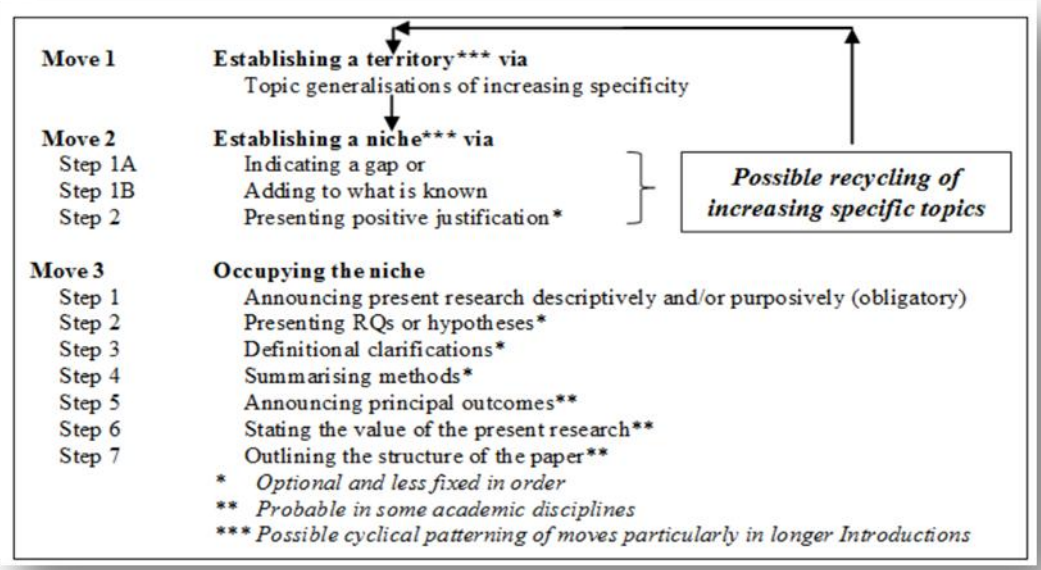

Figure 2. Swales' Revised CARS Model (2004)

Swales (2004) designed the moves more functional; however, Holmes (1997, p.325) describes a move merely as "a segment of text that is shaped and constrained by a specific communicative function." In his new model, Swales (2004) added new definitions like *PISF* to show the probability of some moves and steps in some fields and disciplines. Nonetheless, there were many other comments on his work.

Later, the lack of a model for different sections of theses, dissertations, and research articles led the scholars and researchers to create new frameworks to illustrate schematic and rhetorical move structures in other sections like results and discussion, abstract, literature review, etc. Kwan (2006) proposed her specific model defined for literature review chapters. Nonetheless, there was no practical model for LRs in RAs. Jian (2010) strived to find a solution and fill the gap. The following table shows Jian's move model which is suitable for LR section in RAs and its comparison with Swales' CARS model.

Table 1. Comparison between Jian and Swales' models

	Jian's move model (2010)		**Swale's CARS model (1990)**
Move 1	**Establishing a thematic territory**	**Move 1**	**Establishing a territory**
S. 1A	Making topic generalizations	Step 1	Claiming centrality and/or
S. 1B	Claiming centrality	Step 2	Making topic generalization(s) and/or
S. 1C	Giving background information	Step 3	Reviewing items of previous research
Move 2	**Surveying and summarizing previous research**		
S. 2A	Constructing reference to the published work		
S. 2B	Making positive/negative evaluation		
S. 2C	Making general/summary statement		
Move 3	**Creating a research niche**	**Move 2**	**Establishing a niche**
S. 3A	Counter-claiming	Step 1A	Counter-claiming or
S. 3B	Gap-indicating	Step 1B	Indicating a gap or
S. 3C	Question-raising	Step 1C	Question-raising or
S. 3D	Asserting the relevancy	Step 1D	Continuing a tradition
S. 3E	Establishing theoretical framework or position	**Move 3**	**Occupying the niche**
Move 4	**Occupying the research niche**	Step 1A	Outlining purposes or
S. 4A	Announcing aims/research questions	Step 1B	Announcing present research and
S. 4B	Announcing theoretical framework or position	Step 2	Announcing principal findings
S. 4C	Indicating RA structure	Step 3	Indicating RA structure

As it is illustrated in above table, there are many commonalities and a few differences between two depicted models by Jian (2010) and Swales (1990). As mentioned before, Swales' (1990) CARS model is the pioneering starting point for all researchers trying to propose their own models and it is not far-fetched to find overlapping through the comparisons.

In line with the aims of all discussed models for schematic and rhetorical analysis, and the importance of considering the discourse communities and their specific characteristics, Nwogu (1997) applied Swale's CARS model to analyze medical research article introductions. In his study, he discussed the limitations and after observing the results, he proposed his own model which was asserted to be prototypical criteria for mentioned discipline.

Nwogu (1997) suggested an overall model explain the moves and discourse functions in Medical Science. The generic structure includes all parts, namely IMRD, with 11 moves (seven of which were mandatory). The following table depicts the introduction part in details.

Table2. Nwogu's model for Medical RA Introductions (1997)

Move 1	Presenting background information: By 1) Reference to established knowledge in the field. 2) Reference to main research problems.
Move 2	Reviewing related research: By 1) Reference to previous research. 2) Reference to limitations of previous research.
Move 3	Presenting New Research: By 1) Reference to research purpose. 2) Reference to main research procedure.

Later, Fryer (2012) recommended his disciplinary specified model which was suitable for Medical Science. As shown below in Table3., the introduction section in his model consists of three main moves with several sub-moves. Each move includes a series of steps, which are considered either "optional" (<100%) or "obligatory" (100%) based on their frequency of occurrence. The frequency of occurrence is a significant issue which is discussed in many scholarly works. Swale's (1990) widely-known CARS model underwent partial changes for the mentioned reason. In his revised model (see Fig.2.), Swale (2004) was more conservative to alleviate the criticisms in line with obligatory and optional steps.

Table 3. Fryer's (2012) move model for Medical RA Introductions

Fryer (2012)
Introduction **To present the study in relation to previous research**
1) Presentation of study background a) established knowledge
2) Identification of gap(s) in existing research a) lack of data (or questionable data) in specific area related to established field; b) reason for need to fill gap
3) Statement of research purpose a) hypothesis/objective; b) brief description of material/methodology

Jian (2010) has proposed his own model to clarify the move structure of Literature Review sections in Research Articles. His work was unique since there was no specific model considering LR in RA. Although his model was appropriate for separate LRs, merged and integrated LRs which are extremely common in RAs in Science Field like Medical Science are neglected. It is a gap which should be considered since many students in those fields do

not know how to benefit from critical review of previous studies in order to find their own path to commence their research article composition.

To sum up, based on all models illustrated above, the current study adopts two last models, namely Nwogu's (1997) and Fryer's (2012) models, to conduct the coding procedure. Because these models are designed for Introduction sections of research articles in particular principles which are our concern. Furthermore, the reason for adopting such models (while the main concern is LRs) will be thoroughly discussed in Results and Discussions. As a consequence, the current study is an attempt to answer the following questions:

1. What are the differences in LR section in RA in Medical Science and Life Science disciplines?
2. What are the frequent moves and steps in both disciplines?
3. What are the prototypical move structures in both?

3. Methodology

3.1 The Corpus

The current study includes 30 IMRD RAs, 15 Neuroscience RAs and 15 Neurology RAs. The publication date of all RAs is around 2016 and 2018 in order to decrease the effect of time fluctuation. Three RAs with separate LRs were put aside to eliminate the (side) effect of generic structural differences. Initially, the researcher decided to check the SJR [https://www.scimagojr.com/journalrank.php] website, which stands for *Scimago Journal & Country Rank*, in order to find high indexed prestigious journals. Open access journals with special subject areas and categories, namely Neuroscience and Neurology, were checked. After certainty about the appropriate journals, the articles were downloaded to analyze. After checking the main website of selected journals, the Original Research Articles were downloaded out of several different documents like reviews, mini-reviews, short communications, case reports, and notes.

3.2 Coding and procedures

After scrutinizing several models, the researcher decided to code each text in each discipline twice. As a result, two models of Nwogu (1997) and Fryer (2012) were selected. All intended sections were transferred to Microsoft Word in order to alleviate the negative effect of length difference and to increase the validity of the study. Each text was analyzed

via two different models simultaneously. Thus, there were 30 coded texts in each discipline and 60 coded texts totally.

Initially, the schematic move models were studied meticulously. After deciding on the selected models, namely Nwogu's (1997) and Fryer's (2012), their moves and steps were analyzed in order to show the relevance and appropriateness of them. In first coding procedure, each introductory section in each text was read carefully. After skimming, the text was read for the second time and the moves and steps of both mentioned models were probed simultaneously. Each marker was highlighted and commented to ease the coding procedure. There were two coding procedures, once for Neuroscience Articles and once for Neurology Articles. After coding procedures, the resulted patterns were written in a table in a way that the comparison between two coding move models can be seen. The similarities and differences between two disciplines based on two different coding systems were analyzed to find the answer to one of the research questions. Thereupon, the frequency and number of occurrence for each move and step were analyzed. Frequency was necessary to show the prototypical pattern of each discipline. Based on resulted frequencies, it was discussed that which moves or steps are optional, conventional and obligatory. As a consequence, the dominant prototypical patterns for both disciplines were extracted by evidence. Eventually, based on observations of weaknesses and strengths of the utilized models, this study proposed its new move model to solve the problem of coherence. One of the limitations in this study was the impossibility of inter-coding reliability. In order to compensate the shortage, intra-coding reliability has been done. Accordingly, the researcher coded all texts once. Then, all those texts were re-coded after a period of one week. The results were similar except 4 steps which were analyzed to solve the mismatches.

4. Results and discussion

The schematic patterns of the introductory sections of Medical and Life Science RAs were analyzed and compared with each other. Based on our aims and research questions, the pattern analyses of two disciplines, namely Neuroscience and Neurology, will be discussed to show the commonalities and differences between them. Then, the frequent moves and steps based on two different models will be illustrated. Finally, their prototypical pattern will be elaborated.

Furthermore, the two utilized models for analysis in this study will be criticized thoroughly. Afterward, a new model will be proposed as a novel and revised move structure model, and metaphoric nature of introductions in Medical and Life Science Research Articles will be demonstrated. Due to what has been mentioned, hereafter, the introduction sections will be exhibited as *"Introductory Sections"* consisting of [I+LR]. Table 1 illustrates a comparison between Neuroscience RA Introductory section move patterns using Fryer's (2012) and Nwogu's (1997) models.

Table 4. Comparative Illustration of Move Structure in Neuroscience RA Introductory Sections

Text	Fryer (2012)	Nwogu (1997)	Word Count
NS1	*M1a - M2a - M3a - M3b*	*M1s1 - M1s2 - M2s1 - M2s2 - M2s1 - M2s2 - M3s1 - M3s2*	***1070***
NS2	*M1a – M3b - M3a - M3b*	*M1s1 - M1s2 - M2s1 – M3s2 – M3s1 – M2s1 - M3s2*	***910***
NS3	*M1a – M2a – M3a – M3b*	*M1s1 – M2s2 – M2s1 – M1s2 – M2s1 – M3s1 – M3s2*	***649***
NS4	*M1a – M2a – M3a*	*M1s1 – M2s2 – M2s1 – M3s1*	***566***
NS5	*M1a – M3b – M2a – M3*	*M1s1 – M3s2 – M2s1 – M3s2*	***677***
NS6	*M1a – M3a – M3b*	*M1s1 – M3s1 – M1s1 - M3s2*	***772***
NS7	*M1a – M2a – M3a*	*M1s1 – M2s1 – M2S2 – M3s1*	***449***
NS8	*M1a – M2a – M2b – M3a – M2a – M2b – M3b – M3a – M3b*	*M1s1- M2s1 – M2s2 – M3s1 – M2s2 – M3s2 – M3s1 – M3s2*	***579***
NS9	*M1a – M2b – M3a*	*M1s1 – M2s1 – M1s2 – M2s2 – M3s1*	***434***
NS10	*M1a – M2a – M2b – M3a*	*M1s1 – M1s2 – M2s1 – M2s2 – M3s1*	***682***
NS11	*M1a – M2a - M2b – M2a – M3a*	*M1s1 – M2s1 – M2s2 – M2s1 – M2s2 – M3s1*	***563***
NS12	*M1a – M2a – M3a – M3b*	*M1s1 – M2s1 – M1s2 – M3s1 - M3s2*	***788***
NS13	*M1a – M2a – M3a – M3b*	*M1s1 – M2s1 – M2s2 – M2s1 – M3s1 – M3s2*	***952***
NS14	*M1a – M2a – M2b - M3a – M3b*	*M1s1 – M1s2 – M2s1 – M2s2 – M3s1 – M3s2*	***573***
NS15	*M1a - M2a - M2b - M3a*	*M1s1 - M1s2 - M2s2 - M3s1*	***738***

* NS stands for Neuroscience.

In the table above it can be seen that a text from one discipline shows different move structures. It can be inferred that Fryer's (2012) model indicates the moves in a more linear structure by 60% (see Table 5) while pattern analyzed by Nwogu's (1997) model show more recursive structures (66.6%).

Table 5: Development Patterns in the Introductory Sections of Neuroscience

Pattern	Fryer	Nwogu
Linear	9 (60%)	5 (33.3%)
Recursive	6 (40%)	10 (66.6%)

It can be discussed that in Fryer's model, move and steps are defined simply and generally. That is, it can be seen that some steps in Nwogu's model are skipped in Fryer's model. Hence, it can be assumed that the reason of inclination toward linearity in Fryer's model is due to its simplicity while the high percentage of recursivity in Nwogu's model indicates a more precise and accurate move structure model. Consequently, it can be argued that the model of Fryer, which shows different pattern considering recursivity and linearity in comparison with Nwogu's model, may need to be revised.

Table 6: Comparative Illustration of Move Structure in Neurology RA Introductions

Text	**Fryer (2012)**	**Nwogu (1997)**	**Word Count**
NL1	*M1a – M2a – M3a*	*M1s1 – M2s1 – M2s2 - M3s1*	***615***
NL2	*M1a – M3b – M3a – M3b*	*M1s1 – M2s1 – M1s2 – M3s2 – M3s1 – M3s2*	***623***
NL3	*M1a – M2a – M3b*	*M1s1 – M2s1 – M2s2 – M3s2 – M2s1 – M3s2*	***718***
NL4	*M1a - M3a - M2b - M3a - M2a - M3a*	*M1s1 - M1s2 - M2s1 - M3s1 - M2s2 - M3s1*	***605***
NL5	*M1a – M2a – M3a – M3b – M3a*	*M1s1 – M1s2 - M2s1 – M2s2 – M2s1 - M2s2 – M3s1 – M3s2 – M3s1*	***926***
NL6	*M1a – M3b – M3a*	*M1s1 – M2s1 – M1s2 – M2s1 – M3s2 – M3s1*	***890***
NL7	*M1a – M2a – M2b – M1a – M2a – M1a – M2a – M1a – M3a – M3b*	*M1s1 – M1s2 – M2s1 – M2s2 – M2s1 - M1s2 – M2s1 – M3s1 – M3s2*	***741***
NL8	*M1a – M2a – M1a – M3a – M3b*	*M1s1- M2s2 – M2s1 – M3s1 – M3s2*	***565***
NL9	*M1a – M2a – M1a – M2a – M3a – M3b*	*M1s1 – M1s2 – M2s1 – M2s2 – M3s1 – M3s2*	***676***
NL10	*M1a – M2a – M1a – M2a – M3a*	*M1s1 – M2s2 – M2s1 – M1s2 – M3s1*	***435***
NL11	*M1a – M2a – M2b – M3a – M3b*	*M1s1 – M2s1 – M2s2 – M3s1 – M3s2*	***637***
NL12	*M1a – M2a – M2b – M3a – M3b*	*M1s1 – M2s1 – M2s2 – M1s2 – M3s1 – M3s2 – M2s1 – M3s2*	***698***
NL13	*M1a – M2a – M2b – M3a – M3b*	*M1s1 – M2s1 – M2s2 - M1s2 – M3s1 – M3s2*	***452***
NL14	*M1a – M3a – M2a – M3b*	*M1s1 – M2s1 – M1s2 – M2s1 – M3s1 – M2s2 – M3s2*	***891***
NL15	*M1a – M2a – M3a – M3b*	*M1s1 – M2s1 – M2s2 – M3s1 – M3s2*	***967***

* NL stands for Neurology.

Table 6 depicts a comparison between Neurology RA introduction move patterns using Fryer's (2012) and Nwogu's (1997) models. Similarly, a text shows two different move structures. Analogous findings related to Table 7 can be implied in this part.

Table 7: Development Patterns in the Introductory Sections of Neurology

Pattern	Fryer	Nwogu
Linear	6 (40%)	4 (26.6%)
Recursive	9 (60%)	11 (73.3%)

Surprisingly, both move models in analyzing Neurology Introductory Sections show recursive patterns. It can be debated and needs more considerations to find the reason. It can be implied that the nature of Neuroscience and Neurology disciplines are different.

Recently, there are many studies discussed linearity and recursivity of structural moves. Most of them agree about the effect of complexity of disciplines. It has been argued that complex texts exhibit more numbers of moves with recursive structures. On the contrary, Ozturk (2007) argued the issue and asserted that it can be different based on the nature of disciplines. Samraj (2005) stated the difference between "established" and "emerging" fields and explored the relationship between the nature of those fields and their move structures. Moreover, Hyland (1999, cited in Samarj, 2005) stated that in less established, namely emerging, disciplines on the "problem areas and topics are generally more diffuse and range over wider academic and historical territory, and there is less assurance that questions can be answered by following a single path" (p. 354).

Putting all discussed issues aside, it is crucial to pay attention to the distribution of moves, steps, and strategies to show the obligatory, conventional and optional elements. As it can be seen in the following Table in Neuroscience Introductory section, Moves 1, 2 and 3 are obligatory by the frequent occurrence of 100%. Moreover, a reference to established fields which is the sub-move of Move 1 is also obligatory. That is, giving General information, namely mini introduction, is necessary.

Nodoushan (2012) and Jian (2010) discussed the distribution of moves and sub-moves. Nodoushan (2012) compared his own findings with similar results by Rasmeenin (2006, cited in Nodoushan, 2012). He restated Rasmeenin's (2006) assertion about moves and steps classifications and discussed that moves can be categorized as obligatory (100%), conventional (66% to 99%), or optional (less than 66%). Furthermore, Jian (2010) not only

discussed the distinctions between obligatory and optional elements, but he argued the nature of steps and strategies: Elements that are obligatory and sequential are referred to as "steps". Elements that are non-obligatory and non-sequential are referred to as "strategies" (p. 18).

Comparing the distribution of moves and steps in Nwogu's model with Fryer's model shows same frequencies of Move 1 and 3, while Move 2 is not obligatory but conventional (66% to 99%). It seems weird since Move 2 should be obligatory but it is conventional in Fryer's model. It may show that the definition of Move 2 is not satisfying and comprehensible in his model and he did not focus on previous studies which are specific to each field. He just defined one part for background knowledge in Move 1 part (a) which is not appropriate to refer to review of previous research. Consequently, Nwogu's model outperforms Fryer's in this part.

Other sub-moves are obviously seen in tables 8 can be discussed through the percentages described above. For instance, [Move 1 Sub-move 2] by the percentage of 53.3% is considered as an optional element since it is less than 66%. Thereupon, M2s1, M2s2, M3s1, and M3s2 are all considered as conventional elements in. in table 8, M2b and M3b are optional by the percentages of 40% and 60%, respectively.

Table 8: Distribution of Move Structure found in Neuroscience Introductory [I+LR] Section based on Nwogu's (1997) model

	NS 1	**NS 2**	**NS 3**	**NS 4**	**NS 5**	**NS 6**	**NS 7**	**NS 8**	**NS 9**	**NS 10**	**NS 11**	**NS 12**	**NS 13**	**NS 14**	**NS 15**	**Freq.**
Move 1 Presenting Background Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Established Field	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
2 Ref. to R Main Problems	✓	✓	✓	×	×	×	×	×	✓	✓	×	✓	×	✓	✓	**53.3%**
Move 2 Reviewing Related Research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Previous Research	✓ ✓	✓ ✓	✓ ✓	✓	✓	✓	✓	✓	✓	✓	✓ ✓	✓	✓ ✓	✓	×	**93.3%**
2 Ref. to limitations of previous research	✓ ✓	×	✓	✓	×	×	✓	✓ ✓	✓	✓	✓ ✓	×	✓	✓	✓	**73.3%**
Move 3 Presenting New Research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Research Purpose	✓	✓	✓	✓	×	✓	✓	✓ ✓	✓	✓	✓	✓	✓	✓	✓	**93.3%**
2 Ref. to Main Research Procedure	✓	✓ ✓	✓	×	✓ ✓	✓	×	✓	×	×	✓	✓	✓	✓	×	**66.6%**

* Double checkmarks show the number of occurrence of one step in a text.

Table 9: Distribution of Move Structure found in Neuroscience Introductions based on Fryer (2012) model

	NS1	**NS2**	**NS3**	**NS4**	**NS5**	**NS6**	**NS7**	**NS8**	**NS9**	**NS10**	**NS11**	**NS12**	**NS13**	**NS14**	**NS15**	**Freq.**
Move 1 Presentation of study background	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100 %**
a) established knowledge	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100 %**
Move 2 Identification of gap(s) in existing research	✓	×	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	**80%**
a) lack of data (or questionable data) in specific area related to established field	✓	×	✓	✓	×	×	✓	✓ ✓	✓	✓	✓ ✓	×	✓	✓	✓	**73.3 %**
b) reason for need to fill gap	×	×	×	×	×	×	×	✓ ✓	✓	✓	✓	×	×	✓	✓	**40%**
Move 3 Statement of research purpose	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100 %**
a) hypothesis/objective	✓	✓	✓	✓	×	✓	✓	✓ ✓	✓	✓	✓	✓	✓	✓	✓	**93.3 %**
b) brief description of material/methodology	✓	✓ ✓	✓	×	✓ ✓	✓	×	✓ ✓	×	×	×	✓	✓	✓	×	**60%**

* Double checkmarks show the number of occurrence of one step in a text.

The same discussion is needed for two following tables (Tables 10 and 11) in order to argue the obligatory, conventional and optional elements in move structure of Neurology Introductory Section. In table 10, Moves 1, 2 and 3 are obligatory (100%). M1s1 and Ms2s1 are also obligatory and it shows the significance of Reviewing Related Research which is absent in Fryer's model and because of this Move 2 in his model (see Table 10) is not obligatory. Other elements in Table 4.7 are conventional by the percentage of 66% to 99%.

Table 10: Distribution of Move Structure found in Neurology Introductory [I+LR] Section based on Nwogu's (1997) model

	NL1	NL2	NL3	NL4	NL5	NL6	NL7	NL8	NL9	NL10	NL11	NL12	NL13	NL14	NL15	Freq.
Move 1 Presenting Background Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Established Field	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
2 Ref. to Research Main Problems	×	✓	×	✓	✓	✓	✓ ✓	×	✓	✓	×	✓	✓	✓	×	**66.6%**
Move 2 Reviewing Related Research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Previous Research	✓	✓	✓ ✓	✓	✓ ✓	✓ ✓	✓ ✓ ✓	✓	✓	✓	✓	✓ ✓	✓	✓ ✓	✓	**100%**
2 Ref. to limitations of previous research	✓	×	✓	✓	✓ ✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	**86.6%**
Move 3 Presenting New Research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100%**
1 Ref. to Research Purpose	✓	✓	×	✓ ✓	✓ ✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**93.3%**
2 Ref. to Main Research Procedure	×	✓ ✓	✓ ✓	×	✓	✓	✓	✓	✓	×	✓	✓ ✓	✓	✓	✓	**80%**

* Double checkmarks show the number of occurrence of one step in a text.

The results shown in Table 11 is approximately similar to the findings have been discussed about Table 9 by an exception of the last element, namely M3b, which is conventional and obligatory in Neuroscience and Neurology disciplines, respectively.

Table 11: Distribution of Move Structure found in Neurology Introductions based on Fryer (2012) model

	NL1	NL2	NL3	NL4	NL5	NL6	NL7	NL8	NL9	NL10	NL11	NL12	NL13	NL14	NL15	Freq.
Move 1 Presentation of study background	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100 %**
a) established knowledge	✓	✓	✓	✓	✓	✓	✓✓ ✓✓	✓ ✓	✓ ✓	✓	✓	✓	✓	✓	✓	**100 %**
Move 2 Identification of gap(s) in existing research	✓	×	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	**86.6 %**
a) lack of data (or questionable data) in specific area related to established field	✓	×	✓	✓	✓	×	✓✓ ✓	✓	✓ ✓	✓ ✓	✓	✓	✓	✓	✓	**86.6 %**
b) reason for need to fill gap	×	×	×	✓	×	×	✓	×	×	×	✓	✓	✓	×	✓	**40%**
Move 3 Statement of research purpose	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100 %**
a) hypothesis/objective	✓	✓	×	✓ ✓ ✓	✓ ✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**93.3 %**
b) brief description of material/methodology	×	✓ ✓	✓	×	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	**80%**

* Double checkmarks show the number of occurrence of one step in a text.

Three intended research questions were answered by displaying the results. There are two peripheral issues which are beneficial to discuss in this section as follows. First, this research concludes that the use of term "Introduction" in some disciplines is "metaphoric" and it should be elaborated. It offers another generic form as follows:

IMRD ⇨ [ILr]MRD

[ILr] = Introductory section including mini general Introduction and mini specific Literature Review

Based on this assertion, it can be implied that in some fields regarding several reasons like their "established and emerging" natures, readers of the research articles need specific schemata to reach the level of being qualified to understand such academic writings. Consequently, they do not need to compose the lengthier body of the literature review. So they merge *mini literature* and *introduction* sections. However, they use an umbrella term "introduction" to include both. Although it does not seem problematic, neglecting literature review cannot be acceptable because the previous research sheds light on the process of research and it paves the path for other sections. Even in both models utilized in this study analyses, it can be obviously seen that the literature review section cannot be omitted. The introductions and their moves cover just general backgrounds in both models. Hence, when it comes to specific background, it cannot be called introduction anymore.

Based on these discussions, this study suggests reconsideration of this fundamental section namely literature review. It may be criticized that the scholars do not have any problems with merged literature reviews as they exist, but the important issue is the developmental process of students and novice researchers. Because they need to learn more about the structure of literature review as a basic and predominant section, not as a

subsection. It is necessary to reconsider this significant section because of its facilitating nature and its effects on alleviating the excruciating nature of research.

The second issue refers to creating a new move model. Despite the differences based on the nature of disciplines, it may be significant to pay attention to the validity of proposed move models interrelated with their disciplines. According to what has been mentioned, after precise study of previous models, this study relied on the move structure more specified for Medical and Life Science. After comparing two appropriate models regarding Medical and Life Sciences, it can be assumed that the move structure which is applied in order to analyze patterns may affect the recursivity and linearity of moves! For this reason, a novel model for schematic structures has been proposed.

Proposed Move Model

Move 1 General Presentation of Background Information		***S1A** ⇨ Reference to established filed
Move 2 Probing and Criticizing Previous Specific Literature to Find Niche(s)		***S1A** ⇨ Reference to previous studies ***S1B** ⇨ Reference to (statement of) the main problems ***S1C** ⇨ Reference to limitations and creating niche(s) ***S1D** ⇨ Significance of the niche-filling
Move 3 Presentation of New Research		***S1A** ⇨ Reference to Research Aims ***S1B** ⇨ Hypotheses and research questions ***S1C** ⇨ Brief procedure

** FS (Flexible Strategies)*

5. Conclusion

In this study, the introductory [I+LR] sections of 30 high indexed research articles, 15 Medical Science and 15 Life Science, were analyzed through two distinctive move models. This study concludes that both disciplines are similar when they are coded by the same move model. On the other hand, there are differences between two patterns derived from two different model analyses in one text. After arguing about the similarities and differences, the prototypical move patterns for each discipline have been proposed based on the frequencies of moves and steps. Furthermore, the weaknesses and strengths points about each utilized model have been discussed and based on the discussion, a novel model has been proposed.

Based on the proposed model in this study, it can be useful to standardize the suggested model via comparing and contrasting it with other widely used models. Moreover,

utilizing the proposed model to code aimed texts in similar disciplines seems to be necessary to ascertain its validity and reliability.

There were some limitations like the restricted number of appropriate high indexed journals due to the nature and uniqueness of selected disciplines. The distinction between clinical Neurology and Neuroscience articles was extremely hard to distinguish and most of the articles were considered as clinical. Hence, the number of selected journals was limited. Due to this, the results of this study cannot be generalized. Another limitation in this study was related to time pressure and the improbability of having access to someone who was expert in coding or expert in Neurology and Neuroscience disciplines. Thus, there was no chance to conduct any inter-coding reliability.

According to all details have been discussed and the comparisons to find similarities and differences, this study concludes that flexibility of models is indispensable in each discipline. It is possible to have numerous models in line with numerous disciplines. The complexity of written genres and even the level of writers in each discipline based on their abilities in writing skill in academic circumstances and environments are determinative factors to the flexibility of moves and steps in functional schematic and rhetorical move structure analyses.

Consequently, rethinking of EGP seems to be necessary. The traditional EGP is abolished and impractical for students who study in this real world. The new world of science is communicative with abundant communities who need to communicate to share their science. Instead of rooting it out, we may need to look at EGP from another perspective and redefine it. We need to consider the evolutionary developmental process that steers the students from the initial steps to their ultimate goals. Paying attention to these matters is helpful since many hardships and pressures related to revolutionary changes in the mentioned process will be decreased. Students need gradual and logical improvements from the first year of their education at university toward the end. Hence, it is strongly recommended for teachers, instructors, material developers and syllabus designers to change their ideas about same EGP classes for various students from different disciplines. It is improbable in this era. It can be invaluable to activate students' schemata to facilitate their career and academic life. To reach this aim, this study addresses academic institutions and universities in order to pay more attention to the predominant nature of preliminary basic courses. Furthermore, it seems

vital to creating new plans including compulsory academic disciplinary writing courses. Based on Needs Analysis, material developers are responsible to link students' needs to discourse analysis and develop disciplinary-biased materials.

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