Available on Gale & affiliated international databases

University of Peshawar

JHSS XIX, No. 1, 2011

Journal of
Humanities & Social Sciences

How do you do?*
Writing Research Article Introductions

Mujib Rahman[a], Humera Rahman[b]

[a] Department of English & Applied Linguistics, University of Peshawar, Pakistan
[b] Government Frontier College for Women, Peshawar, Pakistan

Abstract

Academic writers have reported that research article Introductions are more problematic to write than the rest of the paper. It is because they have to choose from amongst the various options available to them for making a start. The CARS Model beautifully captures these options in functional terms which make it very easy to understand and implement. In this paper, I discuss the model with examples from published geology research articles to show the model's usefulness. However, the model is equally applicable to other disciplines.

Keywords: Genre; research articles (RAs); RA Introductions; CARS model;

Introduction

Research article (RA) introductions are notorious to write. Nearly all writers (even native) find it hard to write the introduction section than the later sections (Swales, 1990). The problem comes not from one's incompetence, but the uncertainty about how to make a start. Swales seminal monograph (1981) paved

* A formal greeting used by people who are being introduced to each other; the response is also 'how do you do?'

the way for researchers to look into the *genre* structure of the introductions section (e.g. Swales, 1984; Lopez; 1982, Zappen, 1983; Bley-Vroman & Selinker, 1984; Cooper, 1985; Crookes, 1986; Dudley-Evans, 1986; Jacoby, 1987; Jingfu, 1987; Hopkins & Dudley-Evans, 1988; Adams-Smith, 1987; Hughes, 1989; Dudley-Evans & Henderson, 1990). Swales' later publication (1990) spurred interest into this area further (e.g., Rahman, 1991; 1995; Hirano, 2008; Cheng, 2009; Kim-Loi & Evans, 2010). Swales' model for RA introductions is based on the assumption that the RA introduction section has a standard rhetorical format which can be delineated for the purpose of teaching student and novice researchers (Johns, 2008; Hyland, 2008) as well as apprising experienced writers to become more efficient.

The model has been found to be of immense value to researchers throughout the world. Similarly, the author has also found this model very useful during the past fifteen years while conducting research-writing workshops. However, the model is little known within Pakistan. Hence, in this paper, we discuss the model with examples from published geology research articles so that the research community may become aware of this model and gain insights into the rhetorical structuring of research article introductions.

The Background

Discourse comprehension and discourse production, in this case the scientific research article (RA), requires not only language competence but also an understanding of the macrostructure of the discourse. The writer of a scientific research article should have knowledge of the following features of the research article in order to be able to write a piece of research acceptable for publication:

1. The conventional pattern of organisation found in a research article; i.e., sections such as Introduction, Method, Result, and Discussion, as well as an Abstract section;
2. The purpose and content of each section; e.g., the Introduction should have a review of past literature and a statement of purpose;
3. The possible choices of lexis and structure conventionally used to express each 'move' used in different sections;
4. Background knowledge of the specialized content area (content schema).

[Jingfu, 1987:81]

By virtue of being a member of a particular discourse community (e.g., geology), the writer of a research article, whether native speaker of English or non-native, must already possess the fourth precondition; but may lack one or more of the other three (Jingfu, 1987:81-82). The realisation of this fact has been instrumental in originating interest in macro-textual, or genre-based, investigation of the scientific research article which has resulted in several studies (see above) dealing with the grammatical, lexical, organisational and rhetorical features of the research article genre from various scientific fields and disciplines, particularly, since Swales (1981) proposed his Four-Move pattern for the RA Introduction. Writing introductions have always been troublesome, even for native English academic writers (Swales, 1990:137), and, a *fortiori*, more so for the non-native scientist. This difficulty arises because it is in the introduction that "the researcher addresses the goals, current capacities, problems, and criterion of evaluation that derive from and operate within that discipline" (Zappen, 1983:130).

The communicative behaviour of the members of a particular discourse community (such as, that of geoscientists) is regulated and determined by pre-established norms and patterns (Weber, 1982:222), which results in text-types that share a great deal in common:

> Recurrent and conventionalized forms of communication do not produce an infinite number of distinct texts but that standardized classes of texts are generated which are characterized by a high degree of uniformity regarding their form, structure, and function.
>
> [Weber, 1982:223]

Weber further argues that the participants in a standardised discourse community "usually carry rather detailed cognitive images of the required text types and their typical textual features" (p. 223). Scientific research article is one such type of text, "a gargantuan genre — in the printed medium unrivalled in number of exemplars" (Swales, 1990:95). In no other genre 'the genre-specific conventions' are more manifest.

Knorr-Certina (1981:106) describes the published RA as "a multilayered hybrid" which is "*co-produced"* by the authors and members of the authors' scientific communities, and the author is obliged to follow the established traditions and conventions prescribed by the scientific community. Since "the *authority* for the rhetoric" rests with the scientific community, "the individual scientist becomes

authoritative only by following the tradition" (Ard, 1985:16, original emphasis). These constraints, as a corollary, lead to "a degree of standardization which suggests that experimental research papers may share common basic structure or schema, or employ common units of discourse" (Crookes, 1986:58) which may be identifiable across RAs in various disciplines. Realising this, Swales (1981; 1990) has tried to capture the rhetorical structure of the RA in a model which he has named ***C****reate* ***A*** ***R****esearch* ***S****pace* (*CARS*).

The *CARS* Model for RA Introductions

Swales (1990:157) terms the introduction section 'a crafted rhetorical artifact', and 'a manifestation of rhetorical maneuver.' In the Introduction section, the researcher is required to address three broad needs (Swales, 1990:141-42):

1. Establishing the significance of the research to be reported;
2. Situating the research in terms of that significance; and
3. Showing how the research will hold its own in the field as a whole.

Although every publishing researcher may be aware of these needs; it is one matter to know them, but quite another to be able to address them adequately in one's RA introduction. The *CARS* model makes it very easy to apprehend as well as execute the same. Corresponding to the three needs, the *CARS* model consists of three broad moves (with steps within) as follows:

Move 1: Establishing a Territory
Move 2: Establishing a Niche
Move 3: Occupying the Niche

Swales is using the ecological analogy of, first, finding a territory for oneself, second, unearthing and establishing a niche, and finally occupying the niche.

Establishing a territory addresses the first need, that of establishing the significance of the research about to be reported. *Establishing a niche* is concerned with situating the research within the field in terms of the significance mentioned in Move-1. And, finally, *occupying the niche* shows how the research will uphold itself in the field as a whole. Let us discuss each Move in detail.

Move 1: Establishing a Territory

The territory is established in three steps: *Claiming Centrality (Step 1.1), Making a Topic Generalisation (Step 1.2),* and *Reviewing Previous Research (Step 1.3).*

Through *Centrality Claims* (Step 1.1) the author of a research article appeals to the scientific discourse community to accept the research as "part of a lively, significant or well-established research area" (Swales, 1990:144). This can be achieved in several possible ways. The authors can:

- claim interest, or importance;
- refer to the classic, favourite or central character or issue; or
- claim that there are many other investigators active in the area.

[Swales. 1990:144]

A few examples, taken from actual RA introductions, are given below:

Examples:

1. With the ever-increasing volume of experimental and empirical data on . . .
2. There are several approaches that have been used to . . .
3. In recent years, applied linguists have become increasingly interested in . . .
4. Over the past 10-15 years, the role of . . .
5. . . . has been a subject of several studies over the last three decades.

Through *Making a Topic Generalisation* (Step 1.2), the author announces the topic which is the subject of his/her research by making a statement about knowledge or practice or a statement about phenomenon.

Examples:

1. There is now much evidence to support the hypothesis that . . .
2. A standard procedure for assessing . . . has been . . .
3. An essential feature of . . . is the ability to identify . . .
4. An elaborate system of . . . is found in the . . .
5. Their . . . characteristics are virtually indistinguishable from . . .

In other words, Step 1.2 is a statement about the current state of the art with regard to the topic the author proposes to investigate (Swales, 1990:144).

The Revised *CARS* Model

MOVE 1: Establishing a Territory

Step 1.1 Claiming centrality
and/or Step 1.2 Making a topic generalisation
and/or Step 1.3 Reviewing previous research

MOVE 2: Establishing a Niche

Step 2.1a Counter claiming
or Step 2.1b Indicating a gap/problem/need
or Step 2.1c Raising a Question
or Step 2.1d Continuing a tradition

MOVE 3: Occupying the Niche

Step 3.1 Announcing present research/purposes
Step 3.2 Describing Methods/Procedures
Step 3.3 Announcing principal findings
Step 3.4 Indicating structure of RA

Figure: The Revised *CARS* model for Article Introductions (Swales, 1990; Rahman, 1995)

In *Reviewing Previous Research* (Step 1.3), the author reviews one or more items of previous research which are directly relevant to the research being reported. The author has to *specify* '*what has been found* (or claimed)', *attribute* —*who has found it* (or claimed it),' — and reveal his/her '*stance* [or attitude] towards the findings themselves' (Swales, 1990:148).

Examples:

1. Wallace (1951) and Bott (1959) suggested that faults . . . (integral)
2. Carey & Brunier (1974) reversed Bott's analysis and . . . (integral)

3. Several other workers (Siddiqui, 1965; Chadhry & Shakoor, 1968; Kemp & Jan 1970; 1980 . . .) have investigated . . . (non-integral)
4. Previous research has shown that . . . (Shah, 1988) (non-integral)
5. The formation has been interpreted (Kassi, 1987) as a deposit of . . . (non-integral)
6. According to Jan (1980) . . . (integral)

Move 2: Establishing a Niche

This is a very important move as it provides the basis, or the reason, for the research. Its absence reflects badly not only on the writer's purpose, but also on the legitimacy of the entire research venture. In the absence of this move, the reader will not know why a particular research was carried out at all. Was it to counter a claim (2.1a), indicate a gap/problem/need (2.1b), raise a question (2.1c), or just to continue a tradition (2.1d). This move typically opens with an adversative, most commonly *however.* Other connectives used are *nevertheless*, *yet*, *unfortunately*, *but,* and so on.

Examples:

1. However, . . . properties … are not always consistent . . .
2. There have been many studies of . . . but … have not been studied . . .
3. . . . alone thus cannot explain . . .
4. The distribution of . . . has not been previously described . . .
5. The factors . . . are numerous . . . and there does not seem to be a consensus . . .
6. Hitherto, no extrusive equivalents of . . . have been reported . . .
7. An important component . . . so far undescribed, however, is . . .

Move 3: Occupying the Niche

The role of Move 3 is to tell the reader how the **niche** established in Move 2 is to be occupied. This creates a strong link between the two moves. The Move opens with a statement of promise (Step 3.1), typically with a deictic reference (*this*) to the present text (paper, report, note, review) or the research activity/inquiry (study, investigation, experiment, etc.). Steps 3.2 to 3.4 are optional. It would depend on the discipline or the nature of the study whether these steps are required or not. The following examples illustrate each step.

Examples

Step 3.1 (Outlining purposes/Announcing present research)

1. In this paper/report, we argue that . . . (standard)
2. This paper argues that . . . (collapsed)
3. The aim/purpose/objective of this paper/report is to . . .
4. The purpose/aim/objective of the study/investigation/research is/was to .
5. This study was designed to evaluate . . .
6. The present study extends the use of the . . .

Step 3.2 (Describing methods/procedures)

1. We have calculated using . . . method . . .
2. Then, using the technique of . . . we . . .
3. We performed . . . analyses on . . . samples . . .

Step 3.3 (Announcing principle findings)

1. The observed . . . indicates that . . .
2. Two advantages of these new methods over that developed by . . . are . . .

Step 3.4 (Indicating structure of RA)

1. The paper begins with a brief discussion of . . .
2. We start by showing that . . .
3. We have organised the rest of the paper in the following way . . .
4. This paper is structured as follows . . .
5. The remainder of this paper is divided into . . . sections.

Let us now see to what extent the *CARS* model can actually capture the rhetorical organisation of the RA introduction by analysing introduction sections from three published geology research articles, one native and two Pakistani.

The *CARS* Model in Action

Let us first analyse the native writer's (NW) introduction.

This introduction consists of two paragraphs; paragraph # 1 has two sentences and paragraph # 2 has seven sentences. As can be seen, the introduction clearly has the three moves, falling into their assigned places; however, Step 1.3 (the

Literature Review Step) is not limited to its assigned position. This is normal since a writer may spread out citations throughout the introduction. This happens when a discipline is rich in research and data. Since geology is a field-work based discipline, data may be available from around the world regarding a particular phenomenon (in this case, *metamorphism*) which the scientist may refer to for achieving different purposes: a general purpose in Move-1, and a more specific purpose in Move-2 and Move-3 — "in the former to the position adopted by the author, and in the latter, to the aims and purposes outlined" (Rahman, 1991:37).

Table 1: Move-Step analysis of NW Introduction.

Mylonite fabric development on Naxos, Greece* I. S. Buik		
Move-1	**(1) Over the past 10-15 years**, the role of extensional tectonics in the development of sedimentary basins, at divergent plate boundaries and in the exhumation of regional metamorphic terrains has been **widely documented**, e.g. McKenzie (1978a,b), Davis & Coney (1979), Davis, (1980), Wernicke & Burchfiel (1982), Davis (1987). **(2)** In particular, theoretical (England & Thompson 1986, England 1987, Sonder et al 1987) and field-based studies (Coney 1987, Dewey 1988, Sandiford 1989) have **led to increased recognition** of the role of extensional processes in the thermal evolution of metamorphic belts.	STEP 1.1
	(3) Studies of metamorphic terrains exhumed during Cenozoic extension in the Basin and Range provinces of North America are **at the forefront of controversy** with regard to the nature of extension of the middle to lower crust.	STEP 1.2
	(4) These 'metamorphic core complexes' typically occur as ductilely deformed metamorphic-plutonic basement domes, separated from an overlying unmetamorphosed, fractured and distended sedimentary carapace by low-angle, normal-sense, brittle tectonic contacts (Davis & Coney 1979, Davis 1987). **(5)** Similar mylonitized metamorphic complexes occur on island which together comprise the Attic Cycladic Massif, within the south-central Aegean area (Fig. 1). **(6)** These metamorphic complexes, which experienced Tertiary polymetamorphism, were rapidly uplifted and exhumed during the Miocene. **(7)** This uplift was suggested by Lister et al. (1984) to have occurred in the footwall of a southerly dipping, low-angle normal-sense shear zone, in a manner analogous to that invoked by some workers for Basin and Range 'metamorphic core complexes'.	STEP 1.3
MOVE-2	**(8)** There is, **however**, **a lack of published information** with regard to the timing of metamorphism and deformation in the Attic Cycladic Massif.	STEP 2.1b

MOVE-3	**(9) In this paper**, recent investigations of the structural and metamorphic evolution of the island of Naxos, within the Attic Cycladic Massif, are presented in order to further investigate the nature, orientation and timing of Miocene ductile deformation in the south-central Aegean.	STEP 3.1
* *Journal of Structural Geology*, Vol. 13, No. 6, pp. 633-655, 1991		

As can be seen, this introduction has clearly marked Moves and Steps. The author has used phrases and clauses that clearly indicate the onset of a Move or a Step. Let us study each Move-Step in a little more detail.

Move-1 (Step 1.1) contains phrases which clearly establish a territory for the author. *Over the past 10-15 years, widely documented*, and *increased recognition* are phrases through which the author *claims centrality.* The author clearly tells the reader that the research about to be reported is central to the discipline.

Topic generalisation (Step-1.2) is achieved by referring to a controversy; note the phrase, *at the forefront of controversy*. This sets the research about to be reported in a proper perspective. And the reader expects that the author's research would try to defuse (or at least, lessen) the severity of the controversy.

Step 1.3 (*Reviewing previous research*) contains only three citations (eleven in Step 1.1), along with some background information, which prepares the ground necessary for the next crucial Move, *establishing a niche*. Note that there is only one integral citation: *Lister et al*. One point of note here is the length of Move 1. Although Move-1 is too long (in comparison with Move-1s from other disciplines), it is understandable because geologists need to give information about the area they are investigating.

Move-2 is clearly indicated by the adversative, *however*. The Step is also clearly 2.1b since it indicates a lack of information. Note that it is the shortest Move in terms of number of words. As already pointed out, it is the most crucial move, since it tells the reader what to expect at the conclusion. Here, we expect that the author would provide that information which he claims is lacking.

Move-3 is also very direct in its onset. Note the deictic in the phrase, *In **this** paper*. The author announces his purpose of further investigating "the nature,

orientation and timing of Miocene ductile deformation in the south-central Aegean." This move also has one sentence (just like Move-2), but it is longer in terms of the number of words.

The structure of this introduction is consistent with the results published by other researchers (already mentioned) who studied the introduction sections of RAs from other disciplines.

Let us now turn to an analysis of an introduction from a published Pakistani geology research paper.

Table 2: Move-Step analysis of Pakistani Introduction.

PETROGRAPHY AND GEOCHEMISTRY OF THE INCLUSIONS FROM THE AMBELA GRANITIC COMPLEX, N. PAKISTAN		
MOVE-1	**(1)** The Ambela Granitic Complex (AGC), which is one of the principal constituents of the Peshawar Plain Alkaline Igneous Province (Kempe and Jan, 1970, 1980; Kempe, 1973, 1983; Butt et al., 1980; Le Bas et al., 1987), has been **a subject of several studies over the last three decades.**	Step-1.1
	(2) Detailed petrographic accounts together with analytical data on major and trace element geochemistry for **the principal lithologies of the complex** (granites and syenites) have been included in **several papers** (Siddiqui, 1965; Siddiqui et al., 1968; Chaudhry et al., 1981; Rafiq et al., 1984; Rafiq and Jan, 1988).	Step-1.2
		Step 1.3
MOVE-2	(3) An important component of the complex **so far undescribed, however**, is the inclusions of intermediate to felsic composition which are contained in both the granites and syenites.	Step-2.1b
MOVE-3	**(4) In this paper**, we present petrographic data and whole-rock geochemistry for a representative set of samples from these inclusions. **(5)** An attempt is made **to decipher their origin** by comparing their trace element composition with their host rocks from the AGC, and country rocks in the surroundings.	Step 3.1

This is a very short introduction consisting of only five sentences, but it neatly fits into the *CARS* model. Like the NW introduction, the authors of this introduction also use phrases and clauses to execute rhetorical moves. However, we do not have a distinct Step 1.3 (*Reviewing Previous Literature*). Rather, non-integral

citations are spread out in Steps 1.1 and 1.2. Although it is possible to mark the five non-integral citations at the end of Step 1.2 as Step 1.3, I have left them where they belong. Again we see that Move-1 is the longest whereas Move-2 is the shortest. This conforms to the general trend in writing RA introductions. Let us now discuss the introduction Move-Step wise.

Move-1 (Step 1.1) contains phrases/clauses similar to those in NW introduction. With the opening sentence —*The Ambela Granitic Complex (AGC) . . . has been the subject of several studies over the last three decades* — the authors claim *centrality* and take the first step in establishing the territory. The authors clearly tell the reader that the research about to be reported is central to the discipline, and that they wish to be counted among all those who carried out research in the designated area over the last 30 years.

By referring to *petrographic accounts*, *major and trace element geochemistry*, and *lithologies of the complex*, the authors make a successful topic generalisation. And it is a topic that has been the subject of *several studies*. From here, the authors go directly to Move-2, *establishing a niche*, bypassing Step 1.3. It appears that the authors deem the non-integral citations sufficient to move on to Move-2.

Move-2 (*establishing a niche*) is clearly executed. The phrase, *so far undescribed*, and the adversative, *however*, clearly indicate that it is Step 2.1b. The reader learns that the authors are taking upon themselves to describe the hitherto *un-described* feature of the AGC.

Move-3 clearly begins with the phrase, *In this paper*, and specifies that the authors are going to *present petrographic data* and to *decipher the origin* of these inclusions. Thus, we, as readers, expect that by the end of the research paper we would be enlightened about the origin of these inclusions.

From a discussion of these two introductions, we learn that the geology RA introductions neatly fit into the *CARS* model with the exception of Step 1.3. However, this cannot be regarded as inconsistency since citations are spread out throughout the introduction. We further learn that Move-1 is usually the longest and Move-2 is the shortest. We also learn that Move-3 develops out of Move-2. Hence, the absence of Move-2 would adversely affect the execution of Move-3. We say this because in our corpus of Pakistani geology RA introductions, forty percent introductions did not have a Move-2 at all, whereas every introduction in

our NW RA corpus had the Move-2. It appears that the Pakistani geoscientists are not aware of the importance of Move-2. Let us now analyse a Pakistani introduction without a Move-2 to see its negative effect on the overall research reported.

Table 3: Move-Step analysis of Pakistani Introduction with missing Move-2

PETROCHEMISTRY OF THE ROCKS FROM BABAJI AREA, A PART OF THE AMBELA GRANITIC COMPLEX, BUNER, NORTHERN PAKISTAN		
MOVE-1	MISSING (?)	Step-1.1
	(1) Syenites, quartz-syenites and granites are the major rock types in the Babaji area of Buner, Swat District. **(2)** These rocks extend from Bagh Banda in the west to Kuliari village in the east (Fig. 1). **(3)** The Babaji rocks constitute the northern portion of the Ambela Granitic Complex and have sharp contacts with metacalcareous rocks towards north. **(4)** The constituent rocks from the studied area are possibly of Early Tertiary age (Siddiqui et al., 1968; Kempe, in press), intruding the Lower Swat-Buner Schistose group of Palaeozoic age (Davies et al., 1963).	Step-1.2
	(5) The region was first geologically investigated by Martin et al., (1962). **(6)** Later, Siddiqui (1965) and Siddiqui et al., (1968) investigated the Babaji syenites and considered them to be comagmatic with Koga syenites. **(7)** Kempe and Jan (1970) and Kempe (1973) included the Ambela Complex in their alkaline igneous province. **(8)** East and west of the Complex, there are abundant occurrences of intimately associated contemporary igneous rocks in an arcuate belt which extends from Mansehra and Tarbela in the east through Utla, Ambela and Warsak to Khyber Agency in the west (Kempe and Jan, 1980).	Step 1.3
MOVE-2	MISSING	
MOVE-3	**(9)** This paper presents a detailed account of the petrography and geochemistry of the three major rock types, i.e., syenites, quartz-syenites and granites from the Babaji area of the complex.	Step 3.1
	(10) A geologic map has been prepared (Fig. 1) on toposheet No. 43B/11 with 1:50,000 scale. **(11)** One hundred and twenty hand specimens were cut in thin sections and studied under microscope, 19 were selected for chemical analyses. **(12)** I.U.G.S. system of nomenclature has been adopted for classification.	Step 3.2

Although this introduction is well-written, it fails to make a case for the study it proposes to undertake. A major question arises: Why "a detailed account of the petrography and geochemistry of the three major rock types, i.e., syenites,

quartz-syenites and granites . . ." is being presented when the same rock types have already been studied by other researchers? Is it because:

(1) The authors feel something is missing (from the earlier studies) that warrants the present study? or
(2) The authors think that there is a problem with earlier interpretations which needs to be corrected? or
(3) The authors have discovered an unanswered question with regard to the complex as a whole or a particular rock-type which needs to be answered? or
(4) The authors feel that the already existing accounts are inadequate and need to be updated? or
(5) A new technique has been found that would throw fresh light on the petrochemistry of the complex?

These are a few of the genuine questions which may arise in the mind of the reader. A sentence or two to this effect —with the adversative, *however* — could have been inserted in the Move-2 position to make a case for the study and avoid such questions.

We also note that the introduction does not have a *centrality claim* (Step 1.1); but this is not problematic since the authors have chosen to foreground their topic, which is fine, though it would have been better had the introduction opened with an appropriate Step 1.1 (*claiming centrality*).

Conclusion

In this short paper, I tried to demonstrate the utility of the *CARS* model for writing RA introductions. It is useful not only for novice researchers but also for experienced writers who may sometime overlook something really important. Swales (1983; 1987), Johns (2008), Hyland (2008) and Lirola & Cuevas (2008) claim that an awareness of academic genre, such as the RA, would help researchers and students write research papers acceptable to their respective discourse communities. The same rhetorical structure underlies thesis introductions, *albeit*, in an elaborate form since thesis Introductions are many times longer than RA introductions.

Since this paper is based upon an earlier unpublished study (Rahman, 1995), let me highlight two important findings from that study relevant to this exercise:

1. The absence of the crucial Move-2 (*Establishing as Niche*) in 40 percent of the Pakistani corpus
2. The absence of *counter claiming or question raising* steps in Pakistani introductions (Mostly, they were of the type of *indicating a gap* or *continuing a tradition*)
3. A vague purposive Move-3 (Step 3.1) in some Pakistani RAs

The absence of Move-2 and a vague Move-3 (Step 3.1) reflect badly on the whole research venture. When a niche is not established, how could it be occupied? And when the purposive Move-3 is vague, the reader would not know why the research was undertaken in the first place. Moreover, it is also possible that the conclusion would also be vague and fuzzy. It should also be noted that the strongest steps in terms of research are *counter claiming* and *question raising*, followed by *indicating a problem/issue*. *Indicating a gap/need* and *continuing a tradition* are the weakest.

On the other hand, the native geoscientists tended to establish the research niche early in the introduction (even before Step 1.3 in some cases), while the Pakistani geologists appeared to delay it, sometimes considerably. It leads to the conclusion that the Pakistani geologists did not give much importance to Move-2 which is consistent with the absence of the move altogether in some introductions.

It would, therefore, serve the Pakistani scientists/researchers well (from every discipline) to pay heed to Move-2 and Move-3 — to establish the niche as early and as clearly as possible and to make their purposes (Move-3) as clear and to the point as possible, telling the reader "this is my niche" and "this is how I am going to occupy it."

References

Adams-Smith, D. E. (1987). Variation in field-related genres. *ELR Journal*, pp. 10-32.

Ard, J. (1985). Vantage points for the analysis of scientific discourse. *English for Specific Purposes*, 4:3-20.

Bley-Vroman, R. and Selinker, L. (1984). Research design in rhetorical/ grammatical studies: A proposed optimal research strategy. *ESP Newsletter*, 82-83:1-4; 84:1-6.

Cheng, An (2008). Analyzing Genre Exemplars in Preparation for Writing: The Case of an L2 Graduate Student in the ESP Genre-based Instructional Framework of Academic Literacy. *Applied Linguistics,* 29(1):50-71

Cooper, C. (1985). Aspects of article introduction in IEEE publications. Unpublished M.Sc. dissertation, University of Aston, U.K.

Crookes, G. (1986). Towards a validated analysis of scientific text structure. *Applied Linguistics*, 7:57-70.

Dudley-Evans, T. and Henderson, W. (1990). The organization of article introductions: Evidence of change in economics writing. *ELT Documents*, 134:67-78.

Dudley-Evans, T. (1986). Genre analysis: An investigation of the introduction and discussion sections of MSc dissertations. In Coulthard, M. (ed), *Talking about text*. Discourse Analysis Monograph No. 13. ELR, University of Birmingham.

Hirano, E. (2009). Research article introductions in English for Specific Purposes: A comparison between Brazilian Portuguese and English, *English for Specific Purposes*, 28(4), pp. 240-250.

Hopkins, A. and Dudley-Evans, T. (1988). A genre-based investigation of the discussion sections in articles and dissertations. *English for Specific Purposes*, 7:113-22.

Hughes, Geraldine (1989). Article introductions in computer journals. Unpublished M.A. dissertation, University of Birmingham, U.K.

Hyland, Ken (2008). Genre and academic writing in the disciplines. *Language Teaching*, 41(4), pp. 543-562.

Jacoby, Sally (1986). The inevitable forked tongue: an analysis of references to other researchers in literary research articles. Unpublished M.A. Dissertation, University of Birmingham, U.K.

Jingfu, Peng (1987). Organisational features in chemical engineering research articles. *ELR Journal*, 1:79-116.

Johns, Ann M. (2008). Genre awareness for the novice academic student: An ongoing quest. *Language Teaching,* 41(2), pp. 237-252.

Kim-Loi, C. & Evans, M. S. (2010). Cultural differences in the organization of research article introductions from the field of educational psychology: English and Chinese. *Journal of Pragmatics*, 42(10), pp. 2814-2825.

Knorr-Certina, K. D. (1981). *The manufacture of knowledge*. Oxford: Pergamon.

Lirola, M. M. & Cuevas, M. T. (2008). Integrating *CALL*† and Genre Theory: A proposal to increase students' literacy. *ReCALL*, 20(1), pp. 67-81.

Lopez, G. S. (1982). Article introductions in Spanish: a study in comparative rhetoric. Unpublished M.Sc. Dissertation, University of Aston, U.K.

Rahman, M. (1991). *Towards an Evaluation of the CARS Model: Article introductions in structural geology papers.* Unpublished MSc dissertation, University of Edinburgh, UK.

Rahman, M. (1995). *A comparative study of native and Pakistani geology research articles (genre, theme, and rhetoric)*. Unpublished PhD Thesis, University of Edinburgh, UK.

Swales, J.M. (1981). *Aspects of article introductions*. Birmingham: University of Aston, Language Studies Unit.

† **C**omputer **A**ssisted **L**anguage **L**earning (cf. *CALT*, **C**omputer **A**ssisted **L**anguage **T**eaching)

Swales, J.M. (1983). Developing materials for writing scholarly introductions. In Jordan, R.R. (ed). *Case studies in ELT*, London: Collins (pp. 188-200).

Swales, J.M. (1984). Research into the structure of article introductions to journal articles and its application to the teaching of academic writing. *ELT Documents*, 117:7-86.

Swales, J. M. (1987). Utilizing the literatures in teaching the research paper. *TESOL Quarterly*, 21:41-67.

Swales, J.M. (1988). Discourse communities, genres and English as an international language. *World Englishes*, 7, 211-220.

Swales, J. M. (1990). Genre Analysis: English in academic and research settings. Cambridge: Cambridge University Press.

Weber, Hartmut (1982). Language for specific purposes, text typology, and text analysis: aspects of a pragmatic-functional approach. In Hoedt, J., Lundquist, L., Pitch, H., and Quistgaard, J. (eds.). (1982). *Pragmatics and LSP: Proceedings of the 3rd European Symposium on LSP*. Copenhagen, August 1981. Copenhagen: School of Economics.

Zappen, J. P. (1983). A rhetoric for research in sciences and technologies. In Anderson, P. V., Brockman, R. J., and Miller, C. R. (eds.). *New essays in technical and scientific communication*, (123-38). Farmingdale, NY: Baywood.