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A Contrastive Genre-Based Study of the Introduction Sections of English and Farsi Computer Sciences Research Papers

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Abstract

This paper seeks to find out the degree of the rhetorical variation between the introduction sections of research papers published in English for international journals and those published in Farsi in the area of computer sciences. To this end, a corpus of 100 Farsi and 100 English research papers were collected and analyzed sentence by sentence based on Swales' 1990 CARS model. The results revealed that the introduction sections of Farsi research papers in this field differ from those written in English in terms of Move 3 which introduces briefly the research: this move was less observed in Farsi papers compared with the English ones. However, some degree of convergence was found, mostly in the frequency of occurrence of Move 1 where the general dimensions of the area of study is presented. The same was found also to be true about Move 2 by which the readership is sought to be convinced that there is enough justification for the study to be carried out. The study generally concluded that there was a significant difference between the frequency of moves and steps applied in the introduction parts of English and Farsi research papers in the area of computer sciences.

Keywords: contrastive genre analysis, move, step, rhetorical variation

Introduction

In recent years, the concept of "genre" has become an important part of language education (Dudley-Evans & St. John, 1998). As a result, analyses of the structure of various genres and types of discourse occurring in a

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particular setting that have distinctive and identifiable patterns of organization with distinctive communicative functions such as research papers, grant proposals, and emails in terms of both academic and professional settings have been carried out.

Genre-based studies date back to the emergence of the field of English for Specific Purposes (ESP) whose major concern was discovering the ways in which language is actually used in real life situations (Widdowson, 1978, cited in Hutchinson & Waters, 1987). To this end, the first attempt made was referred to as register analysis whose main goal was to discover the lexico-grammatical features of the text dealing with the surface level of texts.

Following the emergence of discourse/rhetorical analysis and its emphasis on a deeper level of text organization, i.e. establishment of meaning, and on intersentential relationships in understanding and producing language, register analysis lost its prominence and discourse analysis became the dominant approach in investigating academic styles (Hadley, 2003). This gave rise to genre analysis; "Where the focus of the text analysis is on the regularities of structure that distinguish one type of text from another type, this is genre analysis and the results focus on the difference between text types, or genres" (Dudley-Evans & St. John, 1998. p. 87).

Genre Analysis

Genre analysis deals with discovering and specifying the conventional regularities existing in each genre (Dudley-Evans & St. John, 1998). With its main application in ESP, the major purpose of the emergence and development of genre analysis in this context was to promote the awareness of students concerning difficult texts in order to equip them with better comprehension and production of academic texts.

Recently, genre analysis has been referred to as an efficient and useful means of providing foreign language learners with beneficial frameworks, within which they can promote their linguistic skills and consequently acquire the writing ability. Therefore, a great bulk of recent studies has focused on the concept of genre analysis (Bhatia, 1993; Dudley-Evans & St. John, 1998; Henry & Roseberry, 1998; Holms, 1997; Hyon 1996; Swales, 1990).

According to Swales (1990), among the many research process genres, the preeminent one is that of research papers which is the most typical product of research. Hence, the ability to write research papers in English is

vital for both native and nonnative researchers. It entails writers to develop their genre awareness, i.e. the knowledge of conventions of different sections of the genre or the knowledge of content, structure, and style, in order to be able to write publishable research papers. These merits of genre awareness are also expressed by other scholars of the field (Jordan, 1997; Kay & Dudley-Evans, 1998; Henry & Roseberry, 1998; Holmes, 1997).

Among ESP researches, genre-based studies, especially those focusing on research papers, are the most frequent ones. Some of them seek the generic variation among different cultures (cross-cultural studies) such as the works of Martin (2003) and Eghbal (2002); some, such as those of Holms (1997) and Erzi (1999), compare two different disciplines within the same genre (cross-disciplinary studies). Yet there is another category of studies that focus on the research paper as a whole (Nwogu, 1997; Moosavi, 2004). And ultimately, there are studies that investigate one section from among different parts of a paper (Brett, 1994; Hyland, 2004).

From among the different sections of research papers, analyzing their introduction sections has become the focal point because of its difficulty of construction for researchers (Swales, 1990). As Bhatia (1993) asserts, the introduction section of a journal paper can be regarded as a distinctive genre. Thus, analyzing the genre of the introduction section of research papers can provide foreign language researchers with valuable and beneficial guidelines about the process of writing this section. Such analysis requires a deconstruction of the text in terms of its constituent moves and steps.

Move

Nwogu (1997) defines move as a text segment made up of a bundle of linguistic features such as lexical meaning, propositional meanings, and illocutionary forces which give the segment a uniform orientation and signal the content of discourse in it. Holmes (1997) defines it as a segment of text that is shaped and constrained by a specific communicative function. For Hancioglu, Neufeld, and Eldridge (2008), it has communicative purpose which results in performing specific functions. Some other scholars, however, have defined move in brief, such as “a functional unit, used for some identifiable rhetorical purpose” (Connor & Mauranen, 1999), “a semantic/functional component” (Halleck & Conner, 2006), and “a communicative category” (Brett, 1994). It can be concluded from these definitions that each move has two distinguishing features: (1) it has a communicative purpose which follows and constitutes the main

communicative purpose of the whole text type or genre; (2) it has some lexico-grammatical features which are of great help in identifying and describing genre that embraces it.

Step

Although moves are the most basic units in genre analysis, they are not the smallest ones. Thompson (1994) reminds that in some cases these functional units consist of a number of sub-functional parts called *steps*. Dudley-Evans and St. John (1998) define moves as "lower level text units than the move that provide a detailed perspective on the options open to the writer in setting out the moves in the introduction" (p. 89). These subsections (i.e. steps) are used in move identification (Samraj, 2002); they are "sometimes concurrent, sometimes optional" (Posteguillo, 1999, p. 142). It should be noted that moves are of two major types: obligatory and optional (Tambul ElMalik & Nesi, 2008). Henry (2007) suggests that in order to increase the effectiveness of a given genre, in addition to the incorporation of the obligatory moves which primarily achieve the communicative goals of the genre, one can make use of optional moves, since they do not change the communicative purpose of text (Henry & Roseberry, 1998).

After analyzing a great bulk of introduction sections of research papers in different disciplines, Swales (1990) – whom Widdowson (1998, p. 3) refers to as "the most authoritative and influential figure in the field of ESP" – recognized a pattern with certain functions to be repeated in these texts. In his opinion, every writer by implementing each of these functions is attempting to make a *move* to covey his/her communicative purpose to the readership or in Swales' terminology discourse community. He believes that making these *moves* could be carried out through taking some *steps.*

In line with what has been discussed on genre analysis, moves, and steps, the present study was an attempt to verify the following two null hypotheses:

1. There is no significant difference in the frequency of moves between the introduction section of Farsi and English computer sciences research papers.

2. There is no significant difference in the frequency of steps between the introduction section of Farsi and English computer sciences research papers.

Method

Selection of the Corpus

The corpus of this study consisted of two parts containing the introduction sections of 100 Farsi and 100 English computer research papers published by the Institute of Electrical and Electronic Engineers (IEEE) – the world's leading professional association for the advancement of technology – and also from proceedings of Iranian electrical engineering conferences. The papers were given to the researchers by a computer sciences professional.

Since for those involved in doing research in the area of contrastive move analysis, familiarity with the content of their text genres is to some extent troublesome, the researchers confined the English corpus to the subject of VoIP (Voice over Internet Protocol). This subject-specificity of the English corpus was of great help, since after the analysis of some papers with the assistance of the computer specialist, the researchers acquired a fair familiarity with the content. Also, from among the initial corpus, many of the research papers were deleted based on the computer specialist's opinion. Further detail about the corpus of the study is provided in the following tables.

Table 1 below shows the sources and the number of the English research papers. All papers were published between 2000 and 2009.

Table 1 – Sources and numbers of the English research papers

Source	Number of selected papers
IEEE Transactions	55
IEEE Computer Society	13
IEEE Communications Society	7
IEEE Communications Magazine	4
IEEE Communications Letters	3
IEEE Antennas and Wireless	3
IEEE Transactions on Multimedia	3
IEEE ICSSP	3
IEEE GLOBECOM	3
IEEE Proc.-Commun	2
IEEE MELECON	1
IEEE ICIT	1
IEEE Transactions on ICME	1
IEEE 3G Mobile Communication Technology	1
Total	100

Table 2 represents the source and the number of the Farsi research papers used in this study.

Table 2 – Sources and number of the Farsi research papers

Source	Number of selected papers
Proceedings of the 9th Iranian Conference on Electrical Engineering, Tehran, 2006	34
Proceedings of the 8th Iranian Conference on Electrical Engineering, Kerman, 2005	66

Instrumentation

In order to survey the degree of the rhetorical difference in the corpus, Swales' (1990) CARS Model was used which appears in Table 3 below.

Table 3 – Swales' (1990) CARS Model for investigating the corpus (p. 141)

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

More elaboration together with examples on how this model was applied in this study are provided below.

Procedure

After selecting the corpus, in order to gather the necessary data of the study, all the introductions of the 200 papers were carefully read sentence by sentence through the move analysis process. The data of the study was, in fact, the frequency of the occurrence of each move and its comprising steps. To make sure that the frequencies were calculated as accurately as possible, two raters were used and the inter-rater reliability was also computed. Finally, in order to interpret the obtained results and verify the two null hypotheses formulated in the study, the nonparametric statistical test of chi square was used to see whether there existed a significant difference between the frequencies.

The remainder of this section discusses the process of the move and step analysis with some examples from the corpus.

Move Analysis

The following are two examples from both languages included here to illustrate how the corpus was analyzed. The numbers in the brackets stand for the moves and their constituent steps; for instance, **{3.1A}** means Step 1A of Move 3 which in Swales' model is *outlining the purpose*.

The first example is from an English paper titled *Stability of narrowband dynamic body area channel*.

> **{1.2}** *As sensors and actuating devices become smaller, many electronic devices can be worn or attached to the human body. A wireless communications network of such devices is referred to as a wireless body-area network (WBAN). Characterizing the on-body channel requires understanding of the propagation characteristics.* **{1.3}** *Various studies of propagation characteristics of the on-body channel exist [1]–[11]. The majority of studies use a vector network analyzer (VNA) for measurements, e.g., [2] and [5]. A frequency-scanning approach is applied and the frequency domain channel response is captured. The time domain channel response is obtained by applying an inverse Fourier transform to the captured*

data. These studies inherently assume channel temporal stability over the frequency-scanning period, and thus cannot characterize stability over a shorter period. **{2.1B}** *However, even when both the environment and the human body are still, there is still some variation in the body-area network (BAN) channel, as demonstrated in this letter.* **{3.1A}***The innovation in this study of on-body propagation characteristics is the analysis of the effects of continuous movement of the human body on the temporal stability of the wireless channel in a standard indoor environment.* **{3.1B}***Real-time measurement of transceivers is enabled by using a vector signal analyzer (VSA), which facilitates reliable analysis of temporal stability of the dynamic narrowband body area channel. The temporal stability is quantified by a new parameter, the channel variation factor based on the channel gain variance also characterize the channel coherence time. The channel coherence time – the period over which the channel is essentially static – drives the design of signal packet length and the placement of pilots for channel estimation.*

{1.2} stands for move 1 step 2, i.e. *making topic generalization*, since the word "as" and the content of the sentence states a general scientific fact. **{1.3}** stands for move 1 step 3 which is *reviewing items of previous research*, since it deals with elaborating the previous work in the field. **{2.1B}** stands for move 2 step 1B, i.e. *indicating a gap*, because the word "however" and the content of the sentence reveal a theme of indicating a gap. In **{3.1A}** which is the first step of move three, i.e. *outlining the purpose*, the purpose of the study is declared. **{3.1B}** stands for move 3 step 1B, i.e. *announcing present research* in which the procedure of the study has been explained.

The second example is from a Farsi paper titled:

بررسی عوامل شیوع و گسترش کرمهای اینترنتی و روشهای مقابله با آنها

آخرین اطلاعات آماری گرفته شده بر مبنای مقایسه مجموع آلودگی به انواع بدافزارها در اولین فصل سال ۲۰۰٤ نسبت به همان فصل در سال۲۰۰۳ در نمودارزیر ترسیم شده است. این پرش ناگهانی می تواند به خاطر افزایش سرعت خود شبکه و نیز گستردگی روز افزون آن باشد، از دلائل دیگر این مسئله می توان به قدرتمندتر شدن زبان های برنامه نویسی و راحتی استفاده در عین پیچیدگی از آنها اشاره کرد. **{۲،۱A}** *سیستم های پست الکترونیکی در عین غنی شدن در تنوع سرویس هایی ارائه می دهند، که خود به صورت ناخواسته عامل موثری در پخش آرم های اینترنتی هستند و نویسندگان بد افزارها برای افزایش گستردگی آلودگی، این گونه برنامه ها را در قالب نامه هایی با عناوین فریب دهنده قرار می دهند.* **{۲.۱B}** *امروزه با توجه به مسئله پهنای باند و سرعت در*

امر ارتباطات، این مورد یعنی گسترش کرم های اینترنتی از این جهت که موجب افزایش بار ترافیکی شبکه نیز می شود، حائز اهمیت است. کرم های اینترنتی سالیانه ضررهای مالی بسیاری را به شرکت های مختلف می زند، از آن جهت که با نفوذ به داخل کامپیوتر کاربران این قابلیت را نیز دارند که اطلاعات محرمانه آنها را به سرقت برند و یا آن را در معرض دید دیگران قرار دهند. لذا لازمه مبارزه با این گونه بدافزارها دانستن راه و روشهای نفوذ آنان است . پس بایستی ابتدا این گروه از بدافزارها را بهتر بشناسیم . {۱،۳A} برای این کار می بایست مکانیزم پخش شدن را بررسی کنیم تا بتوانیم با ارائه یك مدل مناسب برای پخش و نفوذ بدا فزارها به بررسی راهکارهای مقابله بپردازیم.

In **{2.1A}** which is the first step of the second move, i.e. *counter-claiming*, the weak point of the email service which here is extending the spasm (بد افزارها) is discussed. **{2.1B}** stands for move 2 step 1B which is *indicating a gap*, since it is an attempt to point out the possible topics or areas that still need research in relation to previous works. **{3.1A}** stands for move 3 step 1A, i.e. *outlining purposes*, since it tries to state the purpose of the study.

Step Analysis

In this section, detailed samples of step analysis (i.e. move analysis in terms of their step frequency) are provided. It should be noted that since the total number of the research papers in each Farsi and English corpus is 100, the percentage of the usage of the steps would equal their frequencies. For example, if the frequency of occurrence of a step in all the corpus of either language registered 54, it means that the percentage of the usage of this step would be 54 too, since the total number of each corpus was 100. But for moves it is not the same, since each move could be implemented in more than one way.

The steps were of course analyzed in terms of their moves and examples of the analysis provided below starting with the first move where – as mentioned earlier – the author attempts to justify the significance of the study through highlighting the importance of the field of study. The necessity of Move 1 (establishing a territory) stems from the fact that the discourse community or the readership of that field of study should be persuaded that the present research is pertinent to the already existing issues of the field. In establishing a territory one can make use of one, two, or all of the following three steps: *claiming centrality*, *making topic generalization*, and *reviewing items of previous research*. The purpose in *claiming centrality* is to convince the readership that the present study deals with central issues of the field. In

other words the readers should be persuaded that the research is part of a well-established tradition. One example from Farsi appears below:

یکی از داغترین موضوعات در بحث تحلیل و طراحی سیستم ، امروزه متدولوژیRUP (Rational Unified Process) است ، لذا در اینجا سعی نموده ایم تا بصورت مختصر و در حد توان این متدولوژی را معرفی نمائیم.

And one example from English:

Today, voice over Internet protocol (VoIP) has emerged as an important application and is expected to carry more and more voice traffic.

As it is obvious in these sentences, the usage of adjectives such as *important* highlights the importance and centrality of the researches.

Making topic generalizations is the second step in establishing a territory in which general explanations about the field of study are provided. An example from the Farsi corpus:

USB یک مدار سریع و قابل انعطاف برای اتصال دستگاه ها به کامپیوتر است.

And an example in English:

As the demand for high quality telecommunications services grows, the various communication networks are rapidly merging together, e.g. merging wire line packet networks and wireless networks.

In these two examples, the usage of words like *as* is an attempt to state general scientific facts.

The third step in establishing a territory is reviewing items of previous research. The following is an example in Farsi:

در سال ۱۹۷۹ اولین طرح آستانه رمز اشتراکی توسط شامیر و بلیکی به طور مستقل ارائه شدند.

And an example in English:

We have previously proposed and demonstrated an EPON that uses an upstream carrier-sense multiple access with collision detection (CSMNCD) protocol.

As it is obvious, both examples review items of previous research in their disciplines.

In the second move (establishing a niche), the work is justified in the field of study. In other words, the research should be related to the present field of study. In order to establish a niche, authors can make use of the following steps: *counterclaiming*, *indicating a gap*, *question-raising*, and *continuing a tradition*.

The first step of this second move (counterclaiming) entails the author's declaration of an idea conflicting to what has been claimed before. Sometimes, this opposition leads to rejection of previous findings. This is one Farsi example:

این روش ها اگرچه مزایایی دارند اما دارای چندین عیب نیز می باشند از جمله می توان از گم شدن رمز عبور، تغییر محتویات در طول انتقال، صرف زمان جهت رمزگشایی و برگردان داده نام برد.

Likewise, this is an English example:

During a call between two locations the line was dedicated to the two parties using the line. No other information could be sent over the line even though additional bandwidth was available.

Both examples highlight the attempt to criticize strongly the weak points of the previous works.

Unlike step 1A above, in step 1B, it is attempted to point out the possible topics or areas that still need research in relation to previous works. It should also be noted that by implementation of this step, the previous works are not completely rejected. The following is a Farsi example:

امروزه با توجه به مسئله پهنای باند و سرعت در امر ارتباطات، این مورد یعنی گسترش کرم های اینترنتی از این جهت که موجب افزایش بار ترافیکی شبکه نیز می شود، حائز اهمیت است.

One example in the English corpus would be:

Therefore, a mechanism called call admission control (CAC) is necessary to reject a new call when enough network spare capacity is not available.

By using words like *therefore*, both examples demonstrate an open area which still needs further research to be carried out.

In this third step of the second move, i.e. *question-raising*, the author raises questions about the uninvestigated areas of the previous works. One such example in Farsi is:

دو سوال به طور طبیعی پیش می آید: چه چیزی هولوگرام ها را از عکسها متمایز می کند؟ وچگونه یك صفحه صاف می تواند یك منظره سه بعدی را ضبط کند؟

And here is an example in English:

An open question is now whether it is also possible to transport low bit rate multimedia actions like VOIP (Voice over IP) over GERAN packet-switched barriers.

Both examples, through direct quote of the word *question*, serve the communicative purpose of the second move of step 1C which is *question-raising.*

The fourth step of occupying a niche is continuing a tradition which has the weakest challenge from among the four steps of the second move. In this step, the research is introduced as a continuation of previous works. Here is an example from the Farsi corpus:

در این مقاله روشی سریع برای تخمین DOA بر پایه الگوریتم MUSIC beamspace ارائه می شود که در آن زمان مصرفی برای محاسبه مقادیر ویژه ماتریس کواریانس داده کاهش می یابد.

Among the examples in English, one would be:

The emergence of such delay-sensitive applications and convergence of services through the Internet will require the next generation IP networks to support scalable QoS assurance and maximize network utilization.

In these examples, by usage of the phrase *based on* in the Farsi example, the research was introduced as a continuation of the previous works.

Having established a territory and niche through implementation of Move 1 and Move 2, the author of a paper has the opportunity to occupy the niche since the necessity and importance of his/her study have been clarified for the readers. Here, s/he attempts to introduce briefly the research by stating its purpose, procedures, findings, and structure. The objective realization of this move is through implementation of the following steps including *outlining*

purpose, *announcing present research*, *announcing principle findings*, and *indicating research paper structure.*

In order to occupy the niche, the first step is to outline the purpose of the study. By highlighting the goals of the research, the reader will better understand the whole work. In this step, the author remarks whether the work is a kind of exploration, examination, offering a solution for a problem, or a review. A Farsi example would be:

دراین مقاله ابتدا به چگونگی ساختارهای چنین محیط هائی پرداخته می شود و سپس در ادامه به روابط حاکم و خواص انتشاری در این محیطها و در پایان به بررسی یکی از کاربردهای این ساختارها یعنی لنزهای کامل٤ پرداخته می شود.

And an example in English:

In this paper, we propose the implementation of an adaptive retransmission timer that is adjustable to the SIP transaction.

Both examples seek to point out the main purpose of the study by implementing the phrase *in this paper* and verbs like *propose* (in the English example) and *deal* (in the Farsi Example).

The next step in occupying the niche is *announcing present research* which prompts the author to explain the procedure. In the realization of step 1B, the author tends to show a preference for using deictic expressions (the, this, etc.) to refer to the present text (paper, study, experiment, etc.) which was usually followed by a verb predominantly in present tense. An example in Farsi follows:

عمل تحریک براساس نوع جریان تحریک به دو صورت تکفاز و دوفاز انجام مي پذيرد. شکل ۱ نمونه جریان تحریک کننده تکفاز و دوفاز را نشان میدهد. در تحریک تکفاز جریان فقط از یک جهت به بار میرسد به این معنی که جریان تحریک یا به بار داده می شود و یا از آن گرفته می شود. اما در روش دو فاز، جهت جریان فاز دوم بر خلاف فاز اول است.

And an example in English:

In [5, 6], the separation of multiple signals at the Rx is performed by extracting energy from two portions of a delay-Doppler spectrum, which requires several hundred snapshots to estimate, constraining ms speed to be low, as for previously-described techniques. FDM sounders that have previously been reported in [7, 8] have limited

instantaneous bandwidth, and would require inordinate Tx powers on outdoor channels due to the absence of processing gains.

These two examples show the procedure of the research by using deictic expressions such as *the* to refer to the paper.

The next step in occupying the niche is *announcing principle findings*. In fact, it is an attempt to report the main results of the study and also a prestigious gesture to declare that the present study ends with noticeable outcomes. Here is an example in Farsi:

به دلیل خواص فیزیکی و آکوستیکی، هنگام انتشار نویز سینوسی در یك کانال ممکن است برخی هارمونیکهای آن نیز ایجاد گردند. این هارمونیکها معمولا در بالای کانال وجود ندارند و ضمن انتشار نویز در کانال تولید می شوند . این مقاله نشان میدهد که در چنین شرایطی سیستم پسخور از عملکرد به مراتب بهتری نسبت به سیستم پیشخور برخوردار می باشد.

Here is an example in English:

Our results show that consideration of an arbitrary number of mobile nodes and random movements significantly impacts the obtained performance results.

The application of phrases such as “our results shows that” or “this paper reveals that” in the above examples announce explicitly the research results.

The last effort in occupying the niche is indicating the structure of the research. The following is a Farsi example:

در این مقاله در بخش سیستم ANC تك کاناله و در بخشهای ۳ و ۴ سیستمهای پیشخور و پسخور تك کاناله ای که از الگوریتم متداول FXLMS استفاده می کنند، به اختصار شرح داده می شوند. در بخش ۵ نتایج شبیه سازی و مقایسه عملکرد دو سیستم مزبور در مقابل یك نویز سینوسی و هارمونیکهای آن ارائه می گردد و نهایتا نتیجه گیری در بخش ۶ آورده شده است .

And an example from the English corpus:

The remainder of this paper is organized as follows. In Section II, we introduce the legacy power management procedures specified in the 802.11 standard, followed by a description of an 802.11-based VoIP over WLAN system in Section III. Then, Section IV explains two legacy power management mechanisms enabled by the 802.11 standard that can be employed to implement a power-efficient

operation in a voice STA using the carrier sensing multiple access with collision avoidance (CSMA/CA) channel access mechanism. We then describe a novel power management mechanism called Unscheduled Power Save Delivery (UPSD) in Section V. The next section compares UPSD performance to those of the legacy power management mechanisms. Finally, Section VII draws conclusions based on the simulation results.

In both examples, the whole structures of the researches are clarified by explaining the research chapters.

Accordingly, this procedure of analysis was conducted on the introduction parts of all the 200 papers comprising the corpus. The results of this analysis and the verification of the hypotheses raised in this study appear below.

Results

The analysis of the corpus was run in two phases. In the first phase, the move order and its consequential steps of the introduction sections of the papers were identified based on Swales' model. During this stage, inter-rater reliability was also run between the two raters of the study to make sure that the identification of the steps and moves was done objectively.

In the second phase, chi square tests were run to probe the null hypotheses of the present research.

Phase 1

Inter-Rater Reliability

A sample of 60 papers (30 Farsi and 30 English) rated by the two raters of this study (one of the researchers and a computer specialist with a master's degree in the field) was randomly extracted and analyzed to check the inter-rater reliability. Table 4 below shows the results of this computation.

Table 4 – English move frequency counted by the two raters with the correlation results

English Papers	Move 1	Move 2	Move 3	Chi Square	df	*ρ*
Rater 1	48	29	62	.00588	2	.97
Rater 2	49	30	62			
Kappa	.98	.96	1.00	.98		

Table 4 reveals that the correlation between the move frequencies of English papers counted by the two raters was 0.98 which is very high allowing the researchers to rest assured that their identification of the moves and steps of the corpus was done with an acceptable degree of objectivity.

Table 5 demonstrates the move frequency of the introduction sections of the Farsi research papers counted by the two raters.

Table 5 – Farsi move frequency counted by the two raters with the correlation results

English Papers	Move 1	Move 2	Move 3	Chi Square	df	*ρ*
Rater 1	37	22	29	.09684	2	.95
Rater 2	38	24	29			
Kappa	.97	.91	1.00	.96		

As it is demonstrated in the Table 5, the correlation between the move frequencies of Farsi papers counted by the two raters was highly acceptable (0.97). Having thus established the inter-rater reliability between the two raters, the researchers felt reassured that the two raters could conduct the subsequent ratings of the move and step frequencies of the corpus of this study.

Move and Step Frequency

Table 6 shows the frequency of the moves and steps in the introduction parts of the papers comprising the corpus of this study.

Table 6 – Move and step frequency of the introduction sections of the research papers

Variables	English Papers	Farsi Papers
Move 1—Establishing a territory	**136**	**124**
Step 1—Claiming centrality	49	43
Step 2—Making topic generalizations	55	63
Step 3—Reviewing items of previous research	32	18
Move 2—Establishing a niche	**95**	**70**
Step 1A—Counterclaiming	8	10
Step 1B—Indicating a gap	72	53
Step 1C—Question-raising	4	5
Step 1D—Continuing a tradition	11	2
Move 3—Occupying the niche	**184**	**94**
Step 1A—Outlining purposes	79	49
Step 1B—Announcing present research	42	26
Step 2—Announcing principal findings	11	4
Step 3—Indicating research paper structure	54	15
All Moves	**415**	**288**

But for moves, the frequencies were not the same and each move could be implemented in more than one way which might lead to this fact that one move occurred more than once in a research paper and consequently to the issue of the sum of the move frequency becoming more than that of the total number of the research papers.

As is obvious in Table 6 above, the most frequent move in English research papers was the third one that is *occupying a niche*, and for Farsi papers, it was the first move which is *establishing a territory*. A common feature of the usage of the third move is the fact that both groups of writers tended to use the first step which is *outlining purposes* more frequently and the third step, i.e. *announcing principal findings* as the least frequent one.

The second move – *establishing a niche* – was the least frequent move observed in both Farsi and English research papers. In this move, *indicating a gap* was favored by both groups of writers. In English papers, the step *question raising* was the least frequent one while for Farsi papers it was the fourth move, i.e. *continuing a tradition*.

The major difference, however, between English and Farsi research papers is seen in Move 3 where the frequency of the usage of all steps in the English corpus was much greater than that of the Farsi one. The most frequent step in both Farsi and English research papers was the first one, i.e. *outlining purposes*, and the less frequent step was *announcing principal findings,* which indicates that the primary function of Move 3 is stating the purpose or purposes of the study.

In comparing the schematic move structure of Farsi and English research papers, it can be noted that the frequency of occurrence of each move was greater in English research papers than that of Farsi ones. Table 7 shows the number of papers both in English and Farsi which contain one, two, and three moves in their introduction section.

Table 7 – Number of moves in the introduction unit of the research papers

	English	Farsi
3 moves	76	39
2 moves	17	45
1 move	6	15
No move	1	1

As demonstrated in Table 7, the most frequent application of the number of moves in Farsi papers registered 45 consisting of two moves, while the highest in English was 76 for three moves. The lowest frequency of application for both Farsi and English papers was six and 15, respectively, for having one move only. It should also be mentioned that from among these 200 introduction sections of research papers, two introductions used no moves, one in Farsi and one in English.

Phase 2

In order to verify the two null hypotheses of the current study, chi square tests were run. The results which are demonstrated in Table 8 below show the difference of move and step frequencies across the introduction sections of English and Farsi computer research papers. In the following table, where the amount of ρ equals or is less than 0.05, there is a significant difference between the number of moves and/or steps used in composing the

introduction sections of research papers in Farsi and English. These instances are marked with asterisk.

Table 8 – Move and step frequency of the introduction section of the research papers with their chi square results

Variables	English	Farsi	Chi Sq.	Df	ρ
Move 1—Establishing a territory	**136**	**124**	**1.64**	**1**	**.200**
Step 1—Claiming centrality	49	43	2.81	1	.194
Step 2—Making topic generalizations	55	63	.69	1	.406
Step 3—Reviewing items of previous research	32	18	3.45	1	.063
Move 2—Establishing a niche	**95**	**70**	**3.51**	**1**	**.061**
Step 1A—Counter-claiming	8	10	.22	1	.639
Step 1B—Indicating a gap	72	53	2.61	1	.106
Step 1C—Question-raising	4	5	.11	1	.740
Step 1D—Continuing a tradition	11	2	6.23	1	.013*
Move 3—Occupying the niche	**184**	**94**	**28.60**	**1**	**.000***
Step 1A—Outlining purposes	79	49	6.62	1	.010*
Step 1B—Announcing present research	42	26	3.76	1	.052*
Step 2—Announcing principal findings	11	4	3.27	1	.071
Step 3—Indicating RA structure	54	15	20.43	1	.000*
All Moves	415	288	25.29	1	.000*

As can be inferred from Table 8, there was no significant difference between the performance of authors in Farsi and English in composing the introduction section of research papers when it comes to observing Move 1 (X^2 = 1.64, df = 1, ρ = 0.2).

The degree of difference for Move 2 was not significant either although ρ was very close to 0.05 (X^2 = 3.51, df = 1, ρ = 0.061). From among the comprising steps of this move, it is only the last step, i.e. step 1D, the degree of difference of which was significant (X^2 = 6.23, df = 1, ρ = 0.013). On this step, English introductions demonstrated higher frequencies (11 compared to 2 in Farsi). In other words, the frequency of this step was significantly different in the two languages.

But for Move 3, the degree of difference was significant (X^2 = 28.60, df = 1, ρ = 0.0005) meaning that the frequency of this move in the introduction sections of papers written in English and Farsi was significantly different. The results in Table 8 demonstrate higher frequencies in English introductions for this move than the Farsi ones (184 compared to 94, respectively).

All in all, when it comes to looking at the three moves together, there was a significant difference between the performance of authors of Farsi and

English papers in writing the introduction section of their papers in terms of observing Swales' 1990 CARS model (X^2 = 25.29, df = 1, ρ = 0.0005). Therefore, the first null hypothesis which states that there is no significant difference between the introduction section of English and Farsi computer research papers in terms of the frequency of moves was statistically rejected. That is, on the whole, English introductions demonstrated significantly higher frequency of moves (415) compared to the Farsi introductions (288).

The second null hypothesis was partially rejected as significant difference was found for step 1D of move 2 (X^2 = 6.23, df = 1, ρ = 0.013), step 1A of move 3 (X^2 = 6.62, df = 1, ρ = 0.010), step 1B of move 3 (X^2 = 3.76, df = 1, ρ = 0.052), and step 3 of move 3 (X^2 = 20.43, df = 1, ρ = 0.000).

Also, by identifying the degree of obligation of the usage of each move and step, another set of useful results might be extracted out of the obtained data. To this end, if the percentage of the usage of a move or a step was more than 50 it was regarded obligatory, otherwise considered optional but those which were close to 50 were regarded moderately obligatory (Li & Ge, 2009; Nwogu, 1997). Therefore, according to this criterion, Table 9 below demonstrates the obligation of each move and step with reference to the related corpus, i.e. English or Farsi.

Table 9 – Degree of obligation of each move and step

Moves and Steps	English Corpus	Degree of Obligation	Farsi Corpus	Degree of Obligation
Move 1—Establishing a territory	**96**	**Obligatory**	**94**	**Obligatory**
Step 1: Claiming centrality	49	Moderate	43	Optional
Step 2: Making topic generalizations	55	Obligatory	63	Obligatory
Step 3: Reviewing items of previous research	32	Optional	18	Optional
Move 2—Establishing a niche	**95**	**Obligatory**	**87**	**Obligatory**
Step 1A: Counter-claiming	8	Optional	10	Optional
Step 1B: Indicating a gap	72	Obligatory	53	Obligatory
Step 1C: Question-raising	4	Optional	5	Optional
Step 1D: Continuing a tradition	11	Optional	2	Optional
Move 3—Occupying the niche	**94**	**Obligatory**	**70**	**Obligatory**
Step 1A: Outlining purposes	79	Obligatory	49	Moderate
Step 1B: Announcing present research	42	Optional	26	Optional
Step 2: Announcing principal findings	11	Optional	4	Optional
Step 3: Indicating RA structure	54	Obligatory	15	Optional

Table 9 above shows that all moves should be regarded obligatory in both Farsi and English research papers, since the concept of move is so general

and comprehensive which could hardly be neglected. But for the steps, it is not the case. Perhaps, it is because of this that they are, in fact, tangible ways for realization of moves. The noticeable issue is the fair accordance of the step obligation of both Farsi and English research papers except in the third step of the third move, i.e. *indicating research paper structure* in which the difference was huge. In all steps, the Farsi and English introductions either had an equal degree of obligation, i.e. step 1C of move 2 for which both were optional, or very close as in step 1 of move 1 that in English was moderate and in Farsi optional. The only large difference is on step 3 move 3 which in English was obligatory and in Farsi optional.

Conclusion

This study attempted to examine whether there was any significant difference between the introduction section of English and Farsi computer sciences research papers in terms of their move and step frequency. The results of the Chi square tests revealed that there was a significant.

The results of this study illuminated to some extent the schematic structures of English and Farsi introduction sections of published computer sciences research papers. The findings confirmed Swales' idea which states that the introduction section of a journal paper might serve as a set of communicative purposes which can be presented in the following order:

Establishing a territory ⟶ *Establishing a niche* ⟶ *Occupying the niche*

Based on the results shown in Table 9, all the communicative purposes – or in Swales' term, moves – have been regarded obligatory on the part of both English and Persian authors.

The results also revealed that the moves of the introduction sections were not of equal frequency. That is, *establishing a niche* appeared as the most frequent move utilized in both English and Farsi introduction sections of the papers. It seems that the primary function of an introduction is to explain about the purpose, method, findings, and the structure of the paper (*occupying the niche)*. In contrast, the least frequent move was *establishing a niche* in both Farsi and English introduction sections of the papers and this move deals with the rationale behind the study.

It seems that in writing their research papers, many Iranian computer specialists do not have a comprehensive idea about what an introduction is,

since one-move and two-move introductions are used in Farsi papers about three times more than English ones and the percentage of the usage of three-move introductions (which is regarded as a comprehensive one) is less than that of the English papers to a great extent.

Martin (2003) argues that the reason for these rhetorical variations in this genre across the two different languages and disciplines could be sought in socio-cultural factors such as different intellectual styles and cultural patterns, the influence (or lack) of academic instruction, or political and historical circumstances, and readership expectations and their relation to the specific discourse community on this genre across different languages.

Perhaps the most noticeable factor from among these, based on the results of the present study, is the lack of academic instruction on how to write a paper introduction which would call for academic writing instructors' provision of some frameworks such as that of Swales (1990) to their students, in order to decrease the influence of students' own intellectual styles and their cultural patterns. Such attempts might also have a contributory role in promoting students' awareness of the readership expectation and consequently more facilitated communication with their discourse community.

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