Using English Discourse Markers: A Comparison of Persian and English Dentistry Authors

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Abstract—With regard to the role of discourse markers as key elements in creating any coherent and natural piece of languages, the present study aimed at investigating the implementation of English discourse makers in academic papers written by Persian and English dentistry researchers. To this end, 20 papers by Persian authors and 20 by English-speaking authors were selected and analyzed line by line. The findings revealed that discourse markers were more frequent in papers produced by English-speaking researchers. However, the papers in both groups contained almost an equal range of discourse markers. In addition, distribution of discourse markers among different sections of papers and under different sub-classes of discourse markers was almost similar in the two groups. Despite similarities in the implementation of discourse markers between papers produced by Persian and English researchers, the papers written by Persian authors still lacked coherence; this could be attributed to the underuse and misuse of discourse markers in these papers and the fact that discourse markers are not the only elements that make a text coherent.

Index Terms—discourse markers, coherence, dentistry academic papers

I. INTRODUCTION

Discourse markers can help us as language speakers get the attention of our interlocutors. Simultaneously, they can help us convey our intended meaning more effectively through restricting the contextual assumptions available to our hearer and guiding his/her interpretation process. It can be stated that the use of discourse markers can reduce the cognitive load imposed on the hearer in processing information, improve the emotional quality of communication, and help in maintaining mutuality (Blakemore, 1993).

Richards and Schmidt (2002) define discourse markers as "expressions that typically connect two segments of discourse but do not contribute to the meaning of either. These include adverbials (e.g. however, still), conjunctions (e.g. and, but), and prepositional phrases (e.g. in fact)" (p. 162). More precisely, Fraser (1999) describes discourse markers as:

a class of lexical expressions drawn primarily from the syntactic classes of conjunctions, adverbs, and prepositional phrases. With certain exceptions, they signal a relationship between the interpretation of the segment they introduce, S2, and the prior segment S1. They have a core meaning, which is procedural, not conceptual, and their specific interpretation is "negotiated" by the context, both linguistic and conceptual. (p. 931)

Obviously, inappropriate use of discourse markers can lead to miscomprehension. This is particularly true when communicating in a foreign language because some foreign language learners misuse, overuse, or underuse discourse markers (e.g. Rahimi, 2011; Rezvani Kalajahi, Abdullah, & Baki, 2012; Zhang, as cited in Lahuerta Mart ńez, 2004). In the next pages, some of the studies on the implementation of English discourse markers by EFL speakers have been presented.

II. LITERATURE REVIEW

The use of discourse markers by FL learners have been investigated in many studies so far. Discourse markers can be studied with regard to their frequency, their nature, and their effect on quality of a specific skill, such as writing; a classification which has been proposed by Rahimi (2011). Research studies on discourse markers can be divided into three general categories. The first category includes studies which has investigated the use of discourse markers with regard to one of the four macro-skills of speaking, listening, writing, and reading (e.g., Assadi Aidinlou & Shahrokhi mehr, 2012, with regard to EFL learners' performance in close tests; Khazaee, 2012, with regard to EFL teachers' use of discourse markers in classroom; Jalilfar, 2008, Lahuerta Mart ńez, 2002, 2004, & Rahimi, 2012, with regard to writing). In the following paragraphs, some of these studies will be presented. Heydari (2009) made an error analysis of the use of cohesive devices, which have conjunction in common with discourse markers, in the writing of EFL learners. His participants were 67 undergraduate students at Shiraz Islamic Azad University and they were further divided into three groups based on their proficiency levels. They had to write a text of at least 250 words about one of the memories,

or they had to select from one of the topic introduced by the researcher. The analyses of these compositions revealed that errors in and conjunction cohesion was not so much common among the three groups of students as compared to errors in references and lexical cohesion.

Jalilfar (2008) investigated the application of discourse markers in descriptive compositions of 90 Iranian students. His findings revealed that discourse markers in their order of frequency included elaborative, inferential, contrastive, causative, and topic relating markers, respectively. The results also revealed a positive relationship between the number of well-functioned discourse markers and coherent of the text. Besides, there was a positive relationship between the students' proficiency level and cohesion and coherence of their works. The more proficient students used more well-formed discourse markers of various kinds than the less proficient ones who misused or overused discourse markers.

Lahuerta Mart ńez (2004) investigated the use of discourse markers in the expository compositions of 78 Spanish students of English. The study was done based on Fraser's (1999) framework. Based on his results, elaborative and contrastive discourse markers were more frequent than the other markers. Furthermore, there was a positive relationship between students' use of contrastive, elaborative, and topic relating discourse markers and their quality of writing.

Liu and Braine (2005) investigated the use of cohesive devices in 50 argumentative compositions created by Chinese undergraduate non-English majors. In their analysis they benefited from Halliday and Hasan (1976). Their findings indicated that conjunctives were among the most frequently used cohesive devices in participants' compositions. They further found that as the number of the cohesive devices, especially the lexical devices increased, the quality of the students' works increased.

The second category of studies on discourse markers includes those studies which have compared the use of discourse markers in two or more different styles or genres within the same language. Rahimi (2011), for instance, investigated the implementation of discourse markers in argumentative and expository writing of Iranian EFL learners. Based on his findings, the average number of discourse markers in argumentative essays was higher than that in the expository essays. Furthermore, the same hierarchy of the use of discourse markers was observed in both essay genres, that is to say in both studies, the most frequent discourse markers were elaborative markers, followed by contrastive and inferential markers. Finally, no significant relationship was observed between participants' quality of writing and their use of discourse markers.

Sharndama and Yakubu (2013) analyzed the use of discourse markers in different sections of five randomly-selected research projects of Language and Communication Arts produced by Nigerian students. Based on their findings, literature review section contained the highest number of discourse markers and discussion and conclusion, introduction, and methodology sections came into the next places, respectively.

Wang and Cho (2010) used "Coh-Matrix" which is an efficient computational instrument for text analysis to examine two major academic genres of writing: argumentative and technical writing. They focused on cohesive devices in examining differences between these two genres. The participants were among students of history and physics. Students of history were asked to write argumentatively while those of physics had to write technically. The findings of their study revealed that causal cohesion was used in argumentative genre more than in technical genre.

Finally, the third category consists of those studies which have compared two or more languages with regard to the use of discourse markers in a specific genre or style. Lahuerta Mart ńez (2002) did a study on the use of English and Spanish discourse markers by native speakers of Spanish. All the participants were university students of English majors and were required to write a paper on applied linguistics, however, the first group in English but the second group in Spanish. Then, the conclusion section of the papers was analyzed and it was revealed that Spanish native speakers used discourse markers appropriately and extensively in both English and Spanish. However, more variety was observed in the use of discourse markers in Spanish papers.

With regard to English language, perhaps it can be stated that discourse markers have been investigated more in writing, or more specifically in academic writing, than in the other three language skills. This can be justified because a large group of EFL learners need to be competent in writing, as an important language skill. Indeed, many learners are learning the language in the hope of reaching their academic and professional goals and they know that they cannot seek promotion without being able to write coherently, appropriately, and naturally.

Coherence can be partially secured by the use of discourse markers. Therefore, understanding how well learners implement these elements of language can be helpful in adopting appropriate teaching methods, techniques and materials and, as a result, in promoting students' proficiency. Previous studies on discourse analysis have also focused on the frequency and nature of English discourse markers used by EFL learners in different writing genres, perhaps because familiarity with different writing styles is a necessary condition for writing appropriately in the academic contexts.

But coherence and appropriateness are not the only necessary conditions for producing a piece of acceptable language. EFL learners should learn to produce as much natural language as possible if they intend to affect their interlocutors. As it was mentioned above, many EFL learners overuse, underuse, or misuse discourse markers in their academic works. One way to find whether a produced piece of written work in a foreign language can be regarded as natural or not is to compare it with the stylistically equivalent authentic work of the native speakers of that language. To the researchers' knowledge not many studies have compared the use of discourse markers in a specific style by speakers of two or more different languages. Of course, a few studies have been done in this regard, for example the study done

by Lahuerta Mart ńez (2002). Yet, there exist some problems in these studies. For instance, the applied materials in these studies mostly include students' compositions or a few sections of students' academic projects which are usually limited in quantity and, in the case of compositions, very general in terms of their topics. Therefore, they might not be good representatives of learners' writing proficiency. Furthermore, as the title of these studies suggest, they have manly claimed that they have investigated implementation of discourse markers with regard to a specific style, such as the expository style. However, it is possible for a coherent, appropriate, and natural piece of written work to be composed of more than one writing style, as it is true of most of well-written texts.

Taking the aforementioned shortcomings into account, the primary objective of this study was to compare the frequency and nature of English discourse markers in papers prepared by Persian dentistry researchers and English-speaking dentistry researchers. Furthermore, the two groups of papers were also compared with regard to their implementation of discourse markers in their different sections, namely abstract, introduction, method, results, discussion, and conclusion. Based on the mentioned objectives, the present study aims at answering the following research questions:

1. Is there any difference in the frequency and type of English discourse markers used by Persian and English dentistry researchers?

2. Is there any difference in the implementation of English discourse markers in different sections of papers written by Persian and English dentistry authors?

The following section provides the theoretical framework which was used in conducting this study.

Theoretical framework of the study

This study has used Fraser's (1999) taxonomy of discourse markers categories because as Rahimi (2011) states "this taxonomy, as compared to the similar taxonomies of discourse markers, is mainly used for the classification of written discourse and seems to be the most comprehensive classification in written discourse" (p. 71). Fraser (1999) states, "there are two types [of discourse markers]; those that relate the explicit interpretation conveyed by S2 with some aspect associated with the segment, S1; and those that relate the topic of S2 to that of S1." (p. 931).

Considering the first type, Fraser enumerates the following sub-classes: contrastive, elaborative, inferential, and reason discourse markers. Contrastive discourse markers signal that S2 content is in contrast with S1 content. Through elaborative discourse markers, the message of S1 is paralleled, augmented or refined by the message of S2. Inferential discourse markers show that S2 is a conclusion for S1 while reason discourse markers indicate that S2 is a reason for S1. Table I shows the discourse markers within these four sub-classes distinguished by subtleties of meaning.

TABLE I.
THE FIRST CLASS OF DISCOURSE MARKERS

Contrastive	Elaborative	Inferential	Reason
a. but b. however, (al)though c. in contrast (with/to this/that), whereas d. in comparison (with/to this/that) e. on the contrary, contrary to this/that f. conversely g. instead (of (doing) this/that), rather (than (doing) this/that) h. on the other hand i. despite (doing) this/that, in spite of (doing) this/that, nevertheless, nonetheless, still, still and all	a. and b. above all, also, besides, better yet, for another thing, furthermore, in addition, moreover, more to the point, on top of it all, too, to cap it all off, what is more c. I mean, in particular, namely, parenthetically, that is (to say) d. analogously, by the same token, correspondingly, equally, likewise, similarly e. be that as it may, or, otherwise, that said, well	a. so b. of course c. accordingly, as a consequence, as a logical conclusion, as a result, because of this/that, consequently, for this/that reason, hence, it can be concluded that, therefore, thus d. in this/that case, under these/those conditions, then e. all things considered	after all, because, since

With regard to the second type of discourse markers, Fraser (1999) mentions topic-relating markers and explains that with these markers S1 is contributing to the topic related to the topic presented by S2. Topic-relating discourse markers have been presented in Table II.

TABLE II.
THE SECOND CLASS OF DISCOURSE MARKERS

Topic Relating Discourse Markers
back to my original point, before I forget, by the way, incidentally, just to update you, on a different note, speaking of X, that reminds me, to change to topic, to return to my point, while I think of you, with regard to

It should be mentioned here that in her study on discourse markers in the expository writing of Spanish university students, Lahuerta Mart ńez (2004) encountered some conclusive and exemplar discourse markers, such as in short, in conclusion, for example, etc. which were not mentioned in Fraser's (1999) classification and considered them as two groups of elaborative markers. Furthermore, in a more recent account of discourse marker Fraser (2009) has enumerated them under the second sub-class of discourse markers, namely elaborative markers. Therefore, in the present study, we also consider the following groups of markers as elaborative discourse markers. "Conclusive" discourse markers: in short, in sum, in conclusion, to sum up. And "Exemplifiers": for example, such as, for instance.

III. METHOD

This study was aimed at comparing the implementation of English discourse markers in the academic papers written by Persian and English dentistry researchers. The following sections reveal how the data for conducting this study was collected and analyzed.

A. Materials

To conduct this study, 40 papers written in English by dentistry researchers were utilized. Of these 20 papers were written by Persian and 20 by English-speaking researchers who were from England, the USA, Canada, and Australia. All the papers had been written or published between 2010 and 2014. The reason for selecting dentistry papers as the materials used for conducting this study was that the present researchers observed that some Persian dentistry researchers, due to their failure in writing coherent English papers but despite their ability to carry out academic research, were not so much successful at demonstrating their findings to their colleagues around the world. Then, it was hypothesized that part of the problem might be related to ineffective use of English discourse markers by them. In order to have a better insight on the probable areas where their problems in the use of discourse markers lay, therefore, the present researchers decided to compare the application of discourse markers in papers by Persian and English dentistry researchers.

B. Data Collection Procedure

Most of Iranian dentistry journals are published in English. Therefore, for the Persian researchers to be able to publish their papers in either internal or external journals, they need to be proficient enough in academic writing or to have their professional editors edit their works. For conducting this study, 20 papers which had to be edited were selected. Case-reports, case study articles, were not considered in this study because they did not include some common sections of an article, sections such as Materials and Method and Results. It should be mentioned here that prior to conducting this study, the researchers got permission from the authors and promised that the identities of the authors would be completely kept in secret.

Then, papers produced by English researchers were selected from among online research papers. They were published between 2010 and 2014. The criteria for selecting those papers were the following: the papers were taken from well-established dentistry journals published in English, and they were written by native English speakers. In order to make sure that the authors were native speakers of English, the researchers of the present study paid attention to the authors' names and affiliation and, when possible, read about researchers' biographies online.

It is worth mentioning that the researchers analyzed more than one hundred pages of research papers in each group and estimated that papers in the two groups were equivalent in terms of length. However, because the articles were selected from among journals published both inside and outside the country and because each journal has its own publishing format in terms of page layout, font size, etc., the researchers avoid giving an exact report of the number of pages which underwent analysis.

C. Data Analysis Procedure

All the papers were analyzed word by word, and to ensure dependability of the findings, intrarater method or code-record strategy (Ary, Jacobs, Razavieh, & Sorensen, 2006) was used and the data were reanalyzed by the researchers after a while. Then, the frequency and nature of each discourse marker were determined in the whole papers as well as in different sections of it. The researchers then turned the frequencies into percentages so that they could better compare the use of discourse markers in the two groups of papers and could notice if there was any underuse, overuse, or misuse of English discourse markers in papers written by Persian researchers. Then, the average number of discourse markers and the variety in their use for the papers in the two groups were determined. Then, the two groups of papers were compared in terms of the obtained data. The results of this study have been provided through the following sections.

IV. RESULTS AND DISCUSSION

After analyzing the obtained data, the frequency and type of discourse markers in each paper and in each of the two groups were determined. But as presenting the results on the frequency and type of discourse markers in each paper is beyond the space of this article, the overall findings will be presented with regard to the application of discourse markers in the two groups of papers.

TABLE III.
DISCOURSE MARKERS IN PAPERS PRODUCED BY PERSIAN AND ENGLISH-SPEAKING DENTOSTRY RESEARCHERS

	By Persian researchers	By English-speaking researchers
Total no. of Markers	705	871
Types of Markers	40	41

As Table III indicates, the overall number of discourse markers in the papers prepared by Persian authors was 705 and it was 871 in papers written by English researchers. It can indicate the underuse of discourse markers in the papers by Persian researchers. Nevertheless, as the table shows, the two groups of papers are almost similar in terms of variety

in the use of markers because as it can be seen Persian researchers have used 40 different types of discourse markers and English researchers 41 types. So, the researchers' initial assumption that Persian dentistry researchers, as compared to English dentistry researchers, use a more limited variety of English discourse markers cannot come true. However, One can still state that the Persian researchers underuse discourse markers in their academic papers.

After obtaining the overall numbers and types of discourse markers used in the two groups of papers, the researchers then computed the average number of markers as well as the range of discourse markers, on average, for each paper.

TABLE IV.
THE AVERAGE NUMBER AND RANGE OF DISCOURSE MARKERS PER PAPER

	By Persian researchers	By English researchers
Average no. of Markers	35	44
Types of Markers	10	12

Again, one can see that the average number of discourse markers for each of the papers produced by Persian researchers is 35 and it is 44 for each of the papers published by English researchers. Furthermore, each English researcher has used an average number of 12 different types of discourse markers while each Persian researcher has used an average number of 10 discourse markers in his/her research papers. Next table depicts distribution of markers, used in the two groups of papers, among different discourse marker sub-classes.

TABLE V.
DISTRIBUTION OF THE IMPLEMENTED MARKERS AMONG DIFFERENT SUB-CLASSES OF DISCOURSE MARKERS

Sub-class of Discourse markers	By Persian Researchers		By English-speaking Researchers	
	Frequency	Percentage	Frequency	Percentage
Contrastive	157	22.27	211	24.22
Elaborative	438	62.13	509	58.44
Inferential	74	10.50	111	12.74
Reason	34	4.82	36	4.13
Topic-relating	2	0.028	4	0.46
total	705	100	871	100

Although discourse markers have been more extensively used in papers written by English-speaking researchers, the two groups of papers have been almost similar in terms of the percentage of discourse markers in different sub-classes. Elaborative markers have been the most frequently used markers by both Persian researcher (62.13%) and English researchers (58.44). Contrastive markers with 22.27% of occurrence in papers of Persian researchers and 24% of occurrence in papers of English researchers have been the second most frequent discourse markers. The third most frequent discourse markers with 10.50% of occurrence in papers of Persian researchers and 12.74% of occurrence in papers of English researchers have belonged to the sub-class of inferential markers. Then reason (with 4.82% of occurrence in papers of Persian researchers and 4.13% of occurrence in papers of English researchers) and Topic-relating markers (with .028% of occurrence in papers of Persian researchers and 0.46% of occurrence in papers of English researchers) have been the least frequent discourse markers. Obviously, topic-relating markers enumerated by Fraser (1999) are mostly informal and perhaps this is why they have been less frequently used than the other markers. Again, one can see that there is no significant difference among the two groups of papers in terms of distribution of discourse markers among different sub-classes. The following table depicts distribution of discourse markers among different sections of papers.

TABLE VI.
DISTRIBUTION OF DISCOURSE MARKERS AMONG DIFFERENT SUB-CLASSES OF DISCOURSE MARKERS

Sections of Papers	By Persian Researchers		By English-speaking researchers	
	Frequency	Percentage	Frequency	Percentage
Abstract	47	6.66	58	6.66
Introduction	139	19.72	178	20.44
Materials and Methods	139	19.72	155	17.79
Results	59	8.37	105	12.05
Discussion	305	43.26	353	40.53
Conclusion	16	2.27	22	2.52
Total	705	100	871	100

Interestingly, a look through Table VI reveals that the Abstract sections in both groups of papers have contained only 6.66% of all the discourse markers. The Introduction and Materials and Methods sections in papers produced by Persian researchers contained 19.72% of their implemented discourse markers while the Introduction and Materials and Methods sections in papers written by English researchers contained 20.44% and 17.79% of all the discourse markers in them. The percentages of occurrence of discourse markers in the Results section of papers produced by Persian and English dentistry researchers were 8.37% and 12.05%, respectively. The discussion section in the both groups had the largest number of discourse markers (43.26% of occurrence in papers written by Persia researchers and 40.53% of occurrence in papers produced by English researchers). Finally, the Conclusion sections in both groups of articles had the smallest number of discourse markers (2.27% and 2.52% of occurrence in papers written by Persian and English

researchers, respectively). Therefore again no significant difference was observed among the two groups of researchers in the implementation of discourse markers in different sections of their papers. Table VII depicts the frequency and percentage of each of the implemented discourse markers in the two groups of papers.

TABLE VII.
THE FREQUENCY AND PERCENTAGE OF INDIVIDUAL DISCOURSE MARKERS USED IN THE PAPERS

No.	Persian			English		
	Markers	Frequency	Percentage	Markers	Frequency	Percentage
1.	and	288	40.85	and	338	38.80
2.	also	85	12.06	however	96	11.02
3.	but	53	7.51	also	71	8.18
4.	however	44	6.24	therefore	48	5.51
5.	although	29	4.11	although	47	5.40
6.	Such as	29	4.11	but	35	4.02
7.	because	22	3.12	Such as	30	3.44
8.	so	22	3.12	Because	25	2.87
9.	therefore	20	2.84	in addition	25	2.87
10.	whereas	14	1.98	so	14	1.61
11.	since	12	1.70	then	14	1.61
12.	thus	11	1.56	thus	14	1.61
13.	on the other hand	8	1.13	furthermore	12	1.38
14.	too	8	1.13	hence	12	1.38
15.	in addition	6	0.85	since	11	1.26
16.	furthermore	5	0.71	for example	9	1.03
17.	of course	5	0.71	whereas	8	0.92
18.	consequently	4	0.57	or	6	0.69
19.	in contrast	4	0.57	though	6	0.69
20.	moreover	4	0.57	in particular	5	0.57
21.	it can be concluded that	3	0.42	instead	5	0.57
22.	nevertheless	3	0.42	nevertheless	4	0.46
23.	similarly	3	0.42	similarly	4	0.46
24.	as a result	2	0.42	with regard to	4	0.46
25.	for example	2	0.42	moreover	3	0.34
26.	hence	2	0.42	on the other hand	3	0.34
27.	or	2	0.42	still	3	0.34
28.	that is	2	0.42	as a result	2	0.23
29.	then	2	0.42	consequently	2	0.23
30.	accordingly	1	0.14	in conclusion	2	0.23
31.	because of	1	0.14	in contrast	2	0.23
32.	by the way	1	0.14	namely	2	0.23
33.	for instance	1	0.14	as a consequence	1	0.11
34.	in conclusion	1	0.14	conversely	1	0.11
35.	in this case	1	0.14	for this reason	1	0.11
36.	likewise	1	0.14	in comparison	1	0.11
37.	namely	1	0.14	in this case	1	0.11
38.	still	1	0.14	it can be concluded that	1	0.11
39.	though	1	0.14	likewise	1	0.11
40.	With regard to	1	0.14	of course	1	0.11
41.	…	…	…	otherwise	1	0.11
Total	40	705	100	41	871	100

The above table shows discourse markers used by Persian and English researchers in their order of frequency. In cases when two or more discourse markers have had the same frequency numbers, they have been arranged alphabetically. It can be seen that 'and' has been the most frequent discourse markers in both groups of papers (40.85% and 38.80% of occurrence in papers by Persian and English researchers, respectively).The next most frequent discourse markers in the both groups have been also, however, but, therefore, such as, and although. One can also see the frequency and percentage of other discourse markers in the table.

With regard to the aforementioned findings, and with regard to the fact that lack of cohesion and coherence in the dentistry papers prepared by Persian researchers evoked the present researchers to conduct this study and find the probable reasons for it, the following question may arise:

If there is not any noticeable difference between the range of discourse markers in the dentistry papers of Persian and English researchers and if the distribution of discourse markers among different sections of papers and among different sub-classes of markers are almost equal, what could be the main causes for lack of coherence in the academic papers produced by Persian dentistry researchers?

Perhaps one can mention the first finding of this study to provide an answer for this question. As it was stated before, Persian dentistry researchers have underused English discourse markers in their papers. Discourse markers are like chains that connect messages and ideas in a text and it is obvious that the absence of them in a text leads to lack of coherence and miscomprehension.

Some of the problems in the application of discourse markers by Persian authors have been enumerated in the following sections. But before illuminating on these problems, it should be mentioned that the asterisk mark (*) next to the following sentences indicates that they are structurally wrong.

A. Underuse of Discourse Markers

a) In Group II patients, functional domains improved highly significantly 6 month after surgery, however psychological domain showed gradual improvement, large changes in psychological domain happened 2 years after surgery*.

There is only one discourse marker in sentence (a). However, the author could benefit from other discourse markers such as 'and', to make the sentence more comprehensible. As the present researchers observed, underuse of discourse markers often made sentences longer and less comprehensible.

In one case, the underuse of a suitable discourse marker had led to the creation of a semantically ill-formed statement:

b) It is in contrast with Group II patients who showed significant improvement* ….

The above statement has not followed the principle of subcategorisation. "The essential principle of subcategorisation is that items are subcategorized with respect to any idiosyncratic (i.e. not predictable from some general rule or principle) complements which they do or do not permit" (Radford, 1988). The phrase 'it is in contrast with' in sentence (b) does not allow the insertion of a word with feature (+animate) after it. If the author had replaced this phrase by the contrastive marker 'in contrast' + a comma (,), sentence (b) were correct and no miscomprehension occurred.

The second cause for the lack of coherence in Persian researchers' papers might be due to the misuse of or other problems in the application of discourse markers in them. So far, many EFL researchers have reported that discourse markers have been misused by participants in their studies (e.g. Assadi Aidinlou & Shahrokhi mehr, 2012; Rahimi, 2011; Rezvani Kalajahi, Abdullah, & Baki, 2012; Zhang, as cited in Lahuerta Mart ńez, 2004). In this study too, while analyzing the data, the researchers found that Persian authors sometimes either misused discourse markers or had some other problems in their implementation.

B. Improper Position of Discourse Markers within the Texts

Sentence (c) includes an elaborative discourse marker which has been inserted in a wrong position.

c) Enamel damages are permanent *such as* enamel cracks, and fractures.*

In order for sentence (c) to be structurally correct, the discourse marker 'such as' should be inserted after the phrase 'enamel damages'.

C. Discourse Markers with No Punctuation

Some of the authors had used discourse markers either with wrong punctuations or with no punctuation at all. However, punctuation markers along with lexical markers, and graphical markers "are three distinct but interdependent systems available in written natural language texts for indicating the structure of discourse …. [and they] do play an important role in indicating structural relations in written discourse" (Dale, 19991, P. 13). Example (d) can shed light on this issue.

d) Furthermore the patients were divided into 3 distinct categories based on* ...

Sentence (d) needs a comma (,) after 'furthermore' to be structurally acceptable.

D. Wrong Selection of a Word or Phrase Instead of a Discourse Marker

e) According to face height index, group I consisted of 13 Long and 7 short face patients*.

In order to modify sentence (e), the topic-relating marker 'with regard to' should be used instead of the phrase 'according to'.

E. Simultaneous Use of Two Incompatible Discourse Markers

f) Although triamcinolone acetonide is less potent, but it has therapeutic effects on the lesions.*

One must omit either 'although' or 'but' to make the above sentence correct. The error can be caused through transfer from Persian language to English language. Yarmohammadi and Rashidi (2009) described the problem as "confusion with subordinator and conjunctions" (p.12) and stated that "in English we use either the subordinator 'although', or the conjunction 'but', but never both … [however,] it is standard to use both subordinator 'and conjunction [in the same statement]. (pp. 12-13).

F. Use of Informal Discourse Markers

g) By the way, the photos to be analyzed must be in good quality*…

According to Oxford Advanced Learners' Dictionary (2010) 'by the way' is an informal expression which is "used to introduce a comment or question that is not directly related to what you what you have been talking about" (p. 1742). Therefore, the expression should be replaced with another suitable expression to make the sentence correct.

G. Wrong Selection of Discourse Markers

h) In spite our attempts, we could not find any research about it.*

For sentence (h) to be acceptable, the grammatically incorrect phrase 'in spite' should be replaced by 'despite' or the word 'of' should be added to the end of it.

It is obvious that all of these problems can affect the coherence, naturalness and appropriateness of an academic written discourse and lead to miscomprehension. Finally it should be stated that, as Basturkmen (2002) has claimed macro patterns and clause relation- the underlying structures that different texts and text types have in common- are also responsible for creating a coherent text. Therefore, the presence of discourse markers in a given text is not the only necessary condition for making it coherent.

V. Conclusion

The findings of this study revealed that the overall number of discourse markers in the dentistry papers produced by Persian researchers was fewer than that in the dentistry papers produced by English-speaking researchers. This is unlike the findings of Lahuerta Mart ńez (2002) who reported that Spanish native speakers used discourse markers appropriately and extensively in both English and Spanish.

Moreover, it was revealed that there was no significant difference among Persian and English-speaking dentistry researchers in terms of the range of discourse markers used in their works. Again, this is in disagreement with the findings of the Lahuerta Mart ńez (2002) who stated that more variety was observed in the use of discourse markers in Spanish papers, as compared to English papers. Based on the other findings of this study, distribution of markers among different sections of papers and also among different sub-classes of discourse markers was almost similar in the two groups of papers.

Finally, it was found that Persian dentistry researchers have underused English discourse markers in their papers. This has led to the creation of semantically ill-formed and long sentences which in turn have caused lack of coherence and miscomprehension. Some other problems in the application of discourse markers included simultaneous use of incompatible discourse markers, use of informal discourse markers, and wrong selection of discourse markers.

Overall, based on the findings of this study, Persian dentistry researchers know different types of discourse markers. However, they are not able to accurately implement them in their works and need to be instructed in this regard.

References

[1]   Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C. (2006). Introduction to research in education (7th ed.). Belmont, CA: Thomson.
[2]   Assadi Aidinlou, N., & Shahrokhi mehr, H. (2012). The effect of discourse markers instruction on EFL learners' writing. *World Journal of Education,* 2(2), 10-16.
[3]   Basturkmen, H. (2002). Clause relations and macro patterns: Cohesion, coherence and the writing of advanced ESOL students. *English teaching forum,* 40(1), 50-56.
[4]   Blakemore, D. (1993). The relevance of reformulations. *Language and Literature*, 2(2) 101-120.
[5]   Dale, R. (1991). The role of punctuation in discourse structure. In Proceedings of the AAAI Fall Symposium on *Discourse Structure in Natural Language Understanding and Generation*, (pp. 13 14). Asilomar, California.
[6]   Fraser, B. (1999). What are discourse markers? *Journal of Pragmatics,* 31, 931-952.
[7]   Fraser, B. (2009). An account of discourse markers. International Review of Pragmatics, 1, 1-28. Retrieved May 12, 2013 from http://dx.doi.org/10.1016/S0378-2166(98)001015.
[8]   Heydari, S. A. (2009). An Error Analysis of Iranian EFL Learners' L2 Writing in the Application of Cohesive Devices. Unpublished M. A. thesis, Shiraz, Shiraz University.
[9]   Jalilifar, A. R. (2008). Discourse markers in composition writings: The case of Iranian learners of English as a foreign language. *English Language Teaching,* 1(2), 114-122.
[10]   Khazaee, H. (2012). Use of discourse markers by Iranian teachers of English as a foreign language. *Journal of Basic and Applied scientific Research,* 2(9), 8912-8917.
[11]   Lahuerta Mart ńez, A. C. (2002). The use of discourse markers in EFL learners' writing. *Revista Alicantina de Estudios Ingleses,* 15, 123-132.
[12]   Lahuerta Mart ńez, A. C. (2004). Discourse markers in the expository writing of Spanish university students, *IB ÉRICA*, 8, 63-80.
[13]   Liu, M., & Braine, G. (2005). Cohesive features in argumentative writing produced by Chinese Undergraduates. *System,* 33, 623-636.
[14]   Radford, A. (1988). Transformational syntax. Cambridge: Cambridge University Press.
[15]   Rahimi, M. (2011). Discourse markers in argumentative and expository writing of Iranian EFL learners. *World Journal of English Language*, 1(2), 68-78.
[16]   Rezvani Kalajahi, S. A., Bt. Abdullah, A. N., & Baki, R. (2012).Constructing an organized and coherent text: how discourse markers are viewed by Iranian post-graduate students? *International Journal of Humanities and Social Science,* 2(9), 196-202.
[17]   Richards, J. C, & Schmidt, R. (2002). Longman dictionary of language teaching and applied linguistics. (3rd ed.). London: Longman.
[18]   Sharndama, E. C., & Yakubu, S. (2013). AN analysis of discourse markers in academic report writing: Pedagogical implications. *International Journal of Academic Research and Reflection*, 1(3), 15-24.
[19]   Wang, X., & Cho, K. (2010). Computational linguistic assessment of genre differences focusing on text cohesive devices of student writing: Implications for library instruction. *The journal of Academic Librarianship*, 36(6), 501-510.
[20]   Yarmohammadi, L., & Rashidi, N. (2009). Practical contrastive analysis of English and Persian with special emphasis on

Grammar. Tehran: RAHNAMA PRESS.

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