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## A cross-disciplinary and cross-cultural study of directives in discussions and conclusions of research articles

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### ABSTRACT

The current study provided cross-cultural and cross-disciplinary analyses of the distribution of directives in discussion and conclusion sections of English and Persian research articles (RAs) in disciplines of physics, chemistry, counseling, and sociology, representing hard and soft sciences, respectively. To that aim, 80 RAs from both English and Persian journals between 2000 and 2012 were selected. The RAs were textually analyzed to determine the distribution of directives. Findings revealed a significant difference between Persian hard and soft science RAs in the employment of directives, with soft science writers employing directives more frequently in discussion and conclusion sections in comparison with hard science writers. However, no significant difference was found in the distribution of directives across discussion and conclusion sections of English soft and hard RAs. Moreover, findings did not show a significant difference across Persian and English RAs. Overall, results suggest that Persian and English academic writers tend to follow a similar generic and discursive trend in the employment of directives in their discussion and conclusion sections pointing to the universal nature of directives as persuasive strategies employed by academic writers in canonical branches of science. The findings of the present study might raise learners' awareness of the conventions and lexico-grammatical features of academic writing in Persian and/or English RAs.

**Keywords:** research article; metadiscourse; engagement; directives; discussion; conclusion

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## Introduction

Disciplinary discourse is increasingly regarded as situated in social practice and shaped by the social actions through which it is produced (Myers, 1985). Research has also shown that there are fundamental differences between disciplines, both in what constitutes knowledge and in the way in which it is constructed (e.g., Charles, 2006). Variations in disciplinary culture are thus reflected in academic writing, leaving its trace in the linguistic and rhetorical features of disciplinary texts. Various studies have underscored the difference in the use of rhetorical features within a single discipline (e.g. Kuhl & Behnam, 2011; Lee, 2011) and across disciplines (e.g., Charles, 2006; Harwood, 2005; Hyland, 2009; Jalilifar, 2011). Scientific and academic contributions or the way researchers share their findings with the research community they belong to are influenced by the disciplinary culture they have been socialized into through their academic studies (Farrokhi & Ashrafi, 2009). In this regard, the research article (RA) is a rhetorically sophisticated artifact which displays a careful balance of factual information and social interaction (Swales, 1990). Moreover, research articles constitute one of the key genres used by scientific communities for the dissemination and ratification of knowledge (Kousantoni, 2006).

In academic discourse, writers project themselves into the texts and establish their relationship with the readers in one way or another through metadiscourse. Viewed as an approach to constructing discourse, metadiscourse accounts for the relationship between the writer/speaker, the reader/listener, and the text, which is envisaged as interpersonal used by writers to establish their attitudinal and personal relations with their audience; it also reflects the writer's view of text organization and coherence viewed as textual (Halliday, 1994). Writers use metadiscourse markers to guide their readers by controlling and directing their own content (Fairclough, 1992).

Among the metadiscourse features that writers use to establish and improve the interpersonal relationship with readers, directives are assumed to play an important role. Directives instruct the reader to perform an action or to see things in a way determined by the writer (Hyland, 2001). The present study aims to provide cross-cultural and cross-disciplinary analyses of the distribution of directives in research article (RA) discussion and conclusion sections written in English and Persian. In so doing, the study sheds some light on the distribution and rhetorical function of directives in RAs, and helps to raise learners' awareness of directives as metadiscourse devices which can help enhance the persuasiveness of RAs.

## Literature Review

Directives are the most frequent devices used to initiate reader participation in academic texts (Hyland, 2001). Directives can be seen not only as a rhetorical strategy for writers to explicitly engage their readers but also as an effective way "to manipulate a relationship with readers and indicate the ways they are intended to follow the text" (Hyland, 2002, p. 218). Writers use directives for various strategic purposes such as engaging the reader despite the potentially face threatening nature of imperatives (Swales, Ahmad, Chang, et al., 1998) and their "bold-on- record nature" (Brown & Levinson, 1987, p. 67).

According to Hyland (2001), a number of text-forming devices signal directives, including imperatives (e.g., *notice, let's*), obligation modals addressed to the reader (e.g., *must* and *ought*), and predicative adjectives that allow the writer to judge necessity/importance (*It is necessary to realize ...*). Based on their major goals that they direct readers, Hyland (2002) classifies the directives into three types: textual, physical and cognitive. According to Hyland, textual directives allow writers to guide readers to some textual act, referring to another part of the text or to another text. Physical

directives can be used to instruct readers to perform a physical act, either involving a research process or a real world action. Cognitive directives guide readers towards certain cognitive acts, where readers are ushered to follow an argument or understand a point in a way assumed by the writer (2002).

Hyland (2002) argues that, while the use of directives is governed by the relationship between the writer and the reader, the purposes they realize modify this relationship considerably. Directives allow the writer to see the interactive side of research writing and lead the reader toward an understanding or an action desired by the writer (Hyland, 2001). Some of these directives act as road signs, drawing the reader's attention to the different semiotic resources in the text. Others facilitate text interpretation by throwing light on the arguments into the text, thereby leading readers towards unfolding the text in a particular fashion. Typically, these directives are useful signposts to the writer's argument (Hyland, 2001).

There have been numerous investigations in recent years into the linguistic and rhetorical features of RAs. Nevertheless, studies that have investigated the use of directives are still inadequate to provide a comprehensive account of how they are revealed in RAs. In one study, Hyland (2002) observes enormous variations across disciplines, with the hard sciences using directives more heavily than the soft sciences. Having observed noticeable disparity in the use of directives across various genres and disciplines, Hyland (2002) argues that "the ways academic writers use directives are intimately related to their assessments of appropriate reader-relationships in different generic and disciplinary contexts" (p. 236). Variations in the use of metadiscourse markers across a wide range of genres within a single academic discipline have also been explored (e.g., Kuhi & Behnam, 2011). The use of directives as a rhetorical tool for promoting writer-reader interaction has been explored under different names, including reader involvement via expressing commands through modals of obligation (Chul-Kyu & Thompson, 2010), and imperatives (Swales, et al., 1998). Swales, et al. (1998) explore the use of imperatives in RAs from ten disciplines and find that the occurrence of directives varies widely across disciplines. Chul-Kyu and Thompson (2010) investigate reader involvement in English and Korean science popularizations via obligation modals and observe that English science popularization writers deploy obligation modals for reader involvement more frequently than their Korean counterparts.

Moreover, many studies have investigated the use of metadiscourse elements in research articles across Persian and English (e.g. Abdi, 2011; Faghih & Rahimpour, 2009; Khajavy & Asadpour, 2012; Jalilifar, 2011; Shokouhi & Talati Baghsiahi, 2009; Taki & Jafarpour, 2012; Zarei & Mansoori, 2011). Researchers have examined not only the structure of the RAs across the two languages, but have also evaluated some of the lexico-grammatical features of RAs including metadiscourse elements (Zarei & Mansoori, 2011), interactive and interactional metadiscourse markers (Pooresfahani, Khajavy & Vahidnia, 2012), stance and engagement markers (Taki & Jafarpour, 2012), and hedges and boosters (Jalilifar, 2011). Most of the above studies, however, deal with texts from so-called soft sciences such as applied linguistics, social sciences, and political sciences (for a review of such articles see Crismore & Abdollahzadeh, 2010).

Nevertheless, despite the frequent use of directives in RAs, little attention has been paid to their discourse and rhetorical functions. Informed by the need for studies in this area (Hyland, 2002, 2001), there is a notable absence of specific studies on the use of imperatives in scholarly papers (Swales, et al. 1998). Moreover, the available studies dealing with the directives in Persian RAs compared with their English counterparts still seem to be scanty, considering the size of the articles published by Iranian researchers. To date, there has been no systematic investigation of the directives in RAs published in national and international journals. Given the above shortcoming in the literature regarding the use of directives across Persian and English RAs, a cross-cultural study of directives seems necessary. Hence, this study aims to provide cross-cultural and cross-

disciplinary analyses of the distribution and rhetorical purpose of the directives in research article (RA) discussion and conclusion sections written in English and Persian, in soft and hard disciplines in order to capture the discipline and language specific nature of directives across Persian and English. To carry out this study the following questions are posed:

- 1- How are directives distributed in English and Persian RA discussion and conclusion sections across hard and soft sciences?
- 2- Can any significant difference be observed in the distribution of directives across Persian and English RA discussion and conclusion sections?
- 3- What functions are served by directives in Persian and English RA discussion and conclusion sections?

## **Methodology**

This paper reports a corpus-driven and corpus induced study of how academic writers use directives across hard and soft sciences. Moreover, using a multidisciplinary corpus comprising RAs from the disciplines of counseling, sociology, physics, and chemistry, the study aims to explore the extent that directives are used across academic papers in Persian and English.

### *Corpus*

The corpus used for this study comprised 80 research articles from four disciplines representing the so-called soft and hard sciences in Persian and English. Chemistry and Physics were chosen to represent hard sciences, and counseling and sociology to represent soft sciences. The main motivation for selecting these disciplines was to investigate representatives of the two major branches of science. To ensure that the texts selected represented the hard and soft sciences, Becher's (1989) taxonomy of the disciplines was used to decide the corpus content. In addition, physics and chemistry are, traditionally, viewed as hard sciences, and counseling and sociology are regarded as belonging to the soft sciences.

In order to delimit the study and subsequently make valid generalizations, the discussion and conclusion sections of the RAs were chosen for the study. It is believed that the discussion is a section in which interactional metadiscourse markers (e.g., directives) are most likely to appear (Siami & Abdi, 2012). Moreover, as the discussion and conclusion sections aim to interpret the results, explain new understanding of the problem after taking the results into consideration and have the determining role in persuading readers, it was assumed that directives as a major persuasive device (Swales, et al, 1998) would be applied more heavily in comparison with other sections of RAs. In this regard, directives are used to help the writer to invoke reader participation and add to the persuasiveness of the text.

In this study, the distinction between hard and soft sciences was assumed to lead to possible differences in the use of directives across disciplines. Hence, we explored the use of this metadiscourse resource across disciplines and cultures. To ensure the homogeneity of the corpus, the RAs in which discussion and conclusion sections were coalesced were excluded from the corpus, and as a result the corpus was made up of the RAs in which discussion and conclusion

sections were treated as separate sections in the articles. Table 1 encapsulates the frequency of the papers selected from each discipline.

Table 1

*Distribution of RAs across Disciplines and Cultures*

Discipline	Persian journals	Articles no.	English journals	Articles no.
Physics	Iranian Physics Research Journal	5	Physical Review	5
	Iranian Medical Physics Journal	5	Physical Review Letters	5
Chemistry	Iranian Chemical Engineering Journal	5	American Journal of Chemistry	5
	Iranian Chemistry & Chemical Engineering Journal	5	American Chemical Science Journal	5
Counseling	Counseling Research & Developments	5	The Counseling Psychologist	5
	Job & Organizational Counseling	5	British Journal of Guidance & Counseling	5
Sociology	Iranian Journal of Sociology	5	American Journal of Sociology,	5
	Sociology Letter	5	American Sociological Review	5

*Procedure*

To select the articles, at least five experts from the disciplines in question were consulted, and the two most prestigious journals as suggested by the experts in each discipline were specified. Accordingly, we assumed that the judgments of the experts involved academic qualities of the journals. Then 80 articles published between 2000 and 2012 from those journals were selected. The main criteria for the selection of the RAs were the accessibility of the articles as well as the separateness of the discussion and conclusion sections of the RAs. The discussion and conclusion sections of the RAs were carefully read and reread in search of directives. To ensure consistency of the analysis, the search for the directives was undertaken twice on two different occasions. Once it was determined that a given feature was qualified as a directive, it was highlighted and assigned to one of the categories outlined above (Hyland, 2001, 2002). In order to arrange an external code check, we requested an expert in applied linguistics to analyze 25 percent of the data and recode the text. This forged ahead enlightening discussions on our categorization which led to the revision of our classification. Finally, frequency counts and percentages were undertaken to quantify the distribution of directives in the RAs, as well as to determine the functions served by directives in RA discussions and conclusions.

## Results and Discussion

### *Directives in Persian RAs*

In order to see whether there were differences between the distribution of directives in Persian soft and hard science RAs, frequency counts were undertaken. As Table 2 shows, directives were used more frequently in soft science Persian RAs in comparison with hard science Persian RAs. Of the 61 cases of the employment of directives, 73.8% were found in soft science RAs while directives in hard science RAs made up 26.2% of the total occurrence of the directives (see Table 3). This suggests a marked tendency by soft science academic writers to draw more frequently on directives in the discussion and conclusion sections of RAs in comparison with hard science writers.

Table 2

*The Distribution of Directives in Persian RAs*

		textual	physical	cognitive	total
	articles				
	Physics	---	5	---	5
	Chemistry	---	7	4	11
Persian	percentage	0.0%	75.0%	25.0%	100.0%
	Counseling	---	20	6	26
	Sociology	1	9	9	19
	percentage	2.2%	64.4%	33.3%	100.0%
	<b>Total</b>	1	41	19	

Table 3.

*Directives Crosstabulation in Persian RAs*

			discipline		Total
			soft	hard	
directives	Count		1	0	1
	textual	% within directives	100.0%	0.0%	100.0%
		% within discipline	2.2%	0.0%	1.6%
	Count		29	12	41
	physical	% within directives	70.7%	29.3%	100.0%
		% within discipline	64.4%	75.0%	67.2%
cognitive	Count		15	4	19
		% within directives	78.9%	21.1%	100.0%
		% within discipline	33.3%	25.0%	31.1%
	Count		45	16	61
Total		% within directives	73.8%	26.2%	100.0%
		% within discipline	100.0%	100.0%	100.0%

A chi-square analysis was applied to determine the significance of the distribution of directives. Tables 4 and 5 show the summary of the results of this chi-square. The chi-square analysis indicates a significant difference between the distribution of directives in Persian soft science RAs compared with hard science RAs. Such results have already been attested by Siami and Abdi (2012) who conclude that the different conventions at work among Iranian writers in the use of metadiscursive strategies in the two canonical branches of science reflect the inherent difference in the nature of the two sciences. Swales, et.al (1998), too, argue that the occurrence of imperatives varies widely according to discipline, but they report that directives are used more frequently in the disciplines where mathematical reasoning is either common or is a recognized external influence, and in this regard their prediction is not consistent with the results of the present study. Moreover, the findings of the present study are in line with Abdi (2011) who found that engagement markers were among the most frequently used metadiscourse markers employed by social science writers in results and discussion sections of their articles. Abdi (2011) takes this as expected on the grounds that social science deals with people in the first place and interactional options are critical in dealing with human issues. The results, however, do not lend support to

Hyland (2008) who found that directives were the only interactive features which occurred more frequently in science and engineering articles than those in humanities and social sciences.

Table 4

*Directives Frequencies across Persian soft and Hard RAs*

	Observed N	Expected N	Residual
soft	45	30.5	14.5
hard	16	30.5	-14.5
Total	61		

Table 5

*Chi Square Statistics for Persian RAs*

	discipline
Chi-Square	13.787 <sup>a</sup>
df	1
Asymp. Sig.	.000

The higher frequency of directives in Persian soft science RAs in comparison with hard science RAs can be attributed to the inherent difference in the nature of the two sciences (Siami & Abdi, 2012). Compared with hard disciplines, soft disciplines are more subjective in nature which makes the act of persuading the reader to accept the claims and arguments more difficult. Reader persuasion in academic discourse requires a dialogic interaction between the writer and the intended readers. Directives are devices which signal the dialogic dimension of research writing (Hyland, 2001) and writers in soft disciplines seem to be more willing to resort to this dimension of academic writing and as a result to rely more heavily on these dialogic devices in their endeavor to persuade the readers. On the other hand, argument in hard disciplines is formulated in a highly standardized code (Hyland, 2001), and as a result these disciplines are more objective and the writers are less willing to resort to directives to persuade readers, although the extent of the use of directives in the Persian corpus is considerable.



*Directives in English RAs*

With regard to directives in English RA discussions and conclusions, the frequency counts revealed that directives are used more frequently in soft science English RAs in comparison with hard science RAs (see Table 6). Of the 80 cases of directives observed in the English corpus, 58.5% were observed in soft science RAs and 41.5% were found in hard science RAs (see Table 7). The results point to the fact that like their Persian counterparts (see above), English academic writers in soft science disciplines tend to use directives more frequently than their counterparts in hard science disciplines. This lends support to the generic nature of directives across Persian and English academic discourse.

Table 6.

*The Distribution of Directives in English RAs*

		textual	physical	cognitive	total
	articles				
	Physics	2	9	19	30
	Chemistry	---	3	1	4
English	percentage	5.9%	35.3%	58.8%	100.0%
	Counseling	4	22	5	31
	Sociology	---	14	3	17
	percentage	8.3%	75.0%	16.7%	100.0%
	<b>Total</b>	6	48	28	

Table 7.

*Directives Crosstabulation of English RAs*

			discipline		Total
			soft	hard	
		Count	4	2	6
	textual	% within directives	66.7%	33.3%	100.0%
		% within discipline	8.3%	5.9%	7.3%
		Count	36	12	48
directives	physical	% within directives	75.0%	25.0%	100.0%
		% within discipline	75.0%	35.3%	58.5%
		Count	8	20	28
	cognitive	% within directives	28.6%	71.4%	100.0%
		% within discipline	16.7%	58.8%	34.1%
		Count	48	34	82
Total		% within directives	58.5%	41.5%	100.0%
		% within discipline	100.0%	100.0%	100.0%

A chi-square analysis was applied to see whether the difference between the distribution of directives was significant (See Tables 7 and 8). The analysis did not show a significant difference in the employment of directives in the two disciplines in English RAs. That is, English academic writers tend to use directives frequently as persuasive strategies in discussion and conclusion sections of RAs regardless of discipline. Findings are consistent with Taki and Jafarpour (2012) who studied the engagement and stance markers in the Persian and English RAs and found no considerable difference in the use of directives across the disciplines of chemistry and sociology in the two languages. Findings, however, contradict Siami and Abdi (2012) who reported a significant difference between the distribution of directives in soft science RAs compared with hard science RAs. Neither finding is consistent with Swales, et al. (1998) who reported a more frequent use of directives in hard science RAs compared with soft science RAs. Results revealed that although significant disciplinary differences were observed between soft and hard science RAs in the Persian corpus, the difference was diluted in the English corpus. This can be taken as providing some support for Abdi (2009) who argues for the culture specific nature of directives, although the present study did not find a significant difference on the overall distribution of directives across Persian and English (see research question 2 below). In addition, the fact that the disciplinary difference found in the Persian corpus has been nullified in the English corpus can be attributed

to the dynamic nature of the research articles across languages and cultures since, as Kuo (1999) argues, the use of certain rhetorical strategies is related to the dynamic and paradoxical nature of modern scientific research. The observation, however, is that the same trend found in the Persian corpus is also found in the English corpus, that is, the more frequent use of directives in soft discipline RAs compared with hard discipline RAs.

Table 8.

*Directives Frequencies across English Soft and Hard RAs*

	Observed N	Expected N	Residual
soft	48	41.0	7.0
hard	34	41.0	-7.0
Total	82		

Table 9.

*Chi Square Statistics for English RAs*

	branch
Chi-Square	2.390a
df	1
Asymp. Sig.	.122

*Directives across Cultures*

With regard to the second research question, although directives can act as “bald-on records” (Brown & Levinson, 1987, p. 67), they are a common strategy used by writers in both Persian and English as a way of engaging with the reader. The frequency counts revealed that directives are used substantially in both Persian and English RAs. On the whole, 143 instances of directives were observed in the data. Of these, 42.7% were observed in Persian RAs and 57.3% were found in English RAs.

To determine the significance of the distribution of directives across Persian and English, a chi-square analysis was applied. Tables 10 and 11 show the summary of the relevant chi-square test. The analysis indicated no significant difference across Persian and English RA discussion and conclusion sections. The findings are in line with Abdi (2009) who observed similar employment

of engagement markers (including directives) in both Persian and English research articles. The results are also consistent with Hosseini Fatemi and Mirshojaee (2012) who found no difference in the use of engagement markers across English and Persian linguistic and sociology RAs. Findings, however, contradict Ansarian and Tarlani-Aliabdi (2011) who found that English writers of applied linguistics RAs use directives more frequently than Persian writers. They attribute the difference to the English writing culture in which writers imagine a second voice with whom the writer makes a dialogic conversation throughout the argument. The findings also do not lend support to Zarei and Mansoori (2011) who observed that Persian research articles outweighed their English counterparts by capitalizing more on metdiscourse elements.

Table 10

*Directives Frequencies across Persian and English*

	Observed N	Expected N	Residual
Persian	61	71.5	-10.5
English	82	71.5	10.5
Total	143		

Table 11.

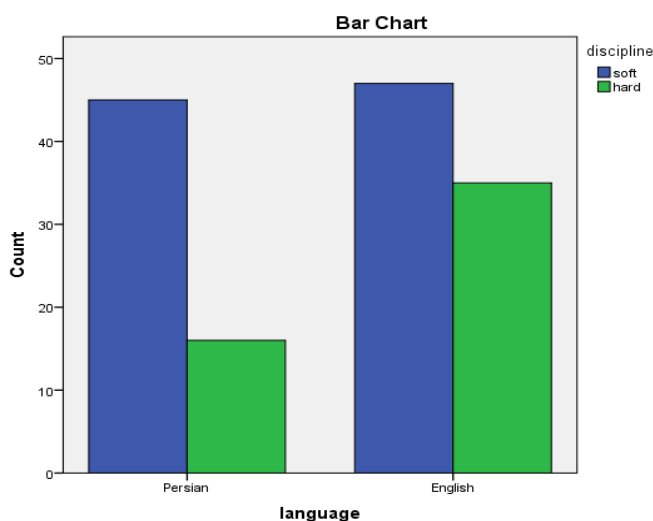
*Chi Square Statistics for Directives across Persian and English*

	language
Chi-Square	3.084*
df	1
Asymp. Sig.	.079

Furthermore, the considerable frequency of directives in the discussion and conclusion sections of English and Persian RAs is in line with Ansarian and Aliabadi (2011) who studied engagement markers in English and Persian applied linguistics articles and found that directives were the second noticeable engagement markers in all three groups of the articles that they studied. Directives were also the most frequent engagement markers in the research articles studied by Kuhi and Behnam (2011). The findings, however, contradict Taki and Jafarpour (2012), and Lee (2011) who did not observe a high frequency of directives in their studies. Directives were the least frequently used engagement markers in the research articles studied by Lee (2011).

Findings suggest that when it comes to the overall pattern and frequency of directives, RAs in both Persian and English tend to follow a generic and discursive trend rather than being culturally motivated as claimed by Abdi (2009). In Abdi (2009), the conventions of employing interactional metadiscourse markers (e.g. engagement markers) were shown to be a function of national culture rather than generic and discursive norms of the broader academic community. Hence, Abdi (2009) argues that the choice of interactional metadiscourse markers is culturally motivated. Findings also do not lend support to Hinkel (2009) who acknowledges the culturally dependent nature of directives. Hinkel (2009) found that non-native students employ directives in their essays significantly more frequently than native students, arguing that such a variation is culturally dependent. Moreover, the greater frequency of directives in the Persian corpus implies the Persian academic writers' tendency to explicitly orient to the readers. Findings are not consistent with Shokouhi and Talati Baghsiahi (2009) who investigated metadiscourse functions in sociology research articles in Persian and English and concluded that the Persian writers are less interested in explicitly organizing the texts and orienting to the readers.

The frequency counts presented in Tables 2 and 6 clearly show that the overall pattern of the use of directives in both languages is broadly consistent, with soft science writers employing directives more frequently than hard science writers (see Figure 1).



*Figure 1.* Directives across Languages and Disciplines

The frequency counts reveal that directives as persuasive strategies are used frequently in discussion and conclusion sections of RAs in both Persian and English pointing to the universal nature of directives across cultures. This is in line with Marandi (2003) who argues for the universality of metadiscourse and at the same time acknowledges the influence of culture/mother tongue on the use of metadiscourse. The frequent use of directives in both Persian and English

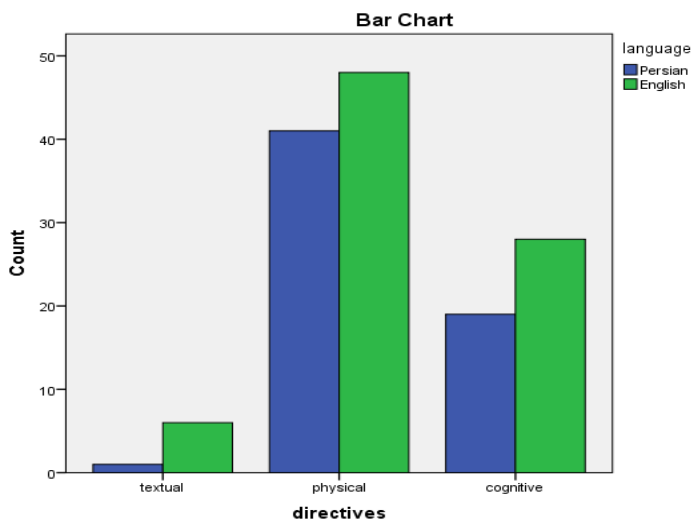
RAs can be attributed to the multifunctional nature of directives. Swales et al. (1998) looked at imperatives as one form of directives and claimed that imperatives in research articles can illustrate the argument, further the discussion of some point, serve as (sub)topic initiator which signals topic switch, function metadiscursively, function as an attention-getting device, and introduce a hypothetical situation in order to further the discussion.

On the whole, the higher frequency of directives in soft science RAs was predictable as some studies attribute it to the very nature of soft disciplines (Abdi, 2011; Hyland, 2008; Kuhl & Behnam, 2011). That is probably because the subjective nature of soft disciplines necessitates resorting to more dialogic and direct strategies to persuade readers. On the other hand, the noticeable frequency of directives in both Persian and English hard science RAs can be attributed to the fact that argument in the hard knowledge fields is formulated in a highly standardized code, and directives allow writers to cut directly to the heart of key issues in the text (Hyland, 2008).

#### *Functions of Directives*

In the analysis of the functions (Hyland, 2002, 2001) served by directives in discussion and conclusion sections of RAs, it was found that in the Persian corpus writers tend to use physical directives most frequently in comparison with textual and cognitive directives. Physical directives made up 67.2% of the total occurrence of the directives, acknowledging a tendency among Persian academic writers to guide their readers to a real world task. Cognitive directives were the next most frequent in the corpus of Persian RAs amounting to 31.1% of the observed frequencies, while textual directives were the least frequently employed, comprising only 1.6% of the occurrence of the directives (see Table 3). The results are not consistent with Hyland (2009, 2001) who predicts that most directives in soft science disciplines are textual because other categories of directives may be seen as assuming unwarranted authority and so encourage a hostile response and a rejection of the claim being made. The results of the present study revealed that textual directives were the least frequently used category of directives in soft science RAs discussion and conclusion sections in both Persian and English. Hyland (2009) also predicts that because of the nature of the hard science disciplines, a high proportion of cognitive directives is found in hard science fields. In the case of the English hard science corpus, the results support Hyland's prediction. But this trend is not followed in the Persian hard science RAs with physical directives being used more frequently than cognitive directives. The chi-square analysis, though, did not show a significant difference across the use of directive categories in Persian RAs. In this regard, national culture seems to override generic and discursive norms observed in previous studies (e.g. Hyland, 2009), and, as a result, providing support for metadiscourse markers being culturally motivated as attested by Abdi (2009) at least when it comes to categories of directives.

A similar trend was observed with regard to the functions served by directives in discussion and conclusion sections of English RAs (see Figure 2). English academic writers, too, tended to use physical directives most frequently in comparison to other categories of directives. In the English corpus, physical directives comprised 58.5% of the total occurrences of directives, with textual and cognitive directives making up 7.3% and 34.1% of the total occurrence of directives, respectively. In the case of English RAs, the chi-square analysis showed a significant difference in the employment of categories of directives in RAs.



*Figure 2.* Functions Served by Directives

## Conclusion

The results of the present study lend support to the ubiquity of metadiscourse markers, specifically directives, in the discussion and conclusion sections of RAs across English and Persian. The prevalence of directives in RAs despite their face threatening practice "can come from a variety of sources, such as tradition, the recognized need for word economy, stylistic variation, and a concern to capture the reader's attention at certain key junctures and selectively focus her gaze (Swales, et.al, 1998, p. 117).

Moreover, the results suggest that there are similarities between Persian and English academic texts regarding the use of directives in the discussion and conclusion sections of RAs. Directives are used frequently in discussion and conclusion sections of RAs in both Persian and English. The high frequency of directives in English and Persian RAs can be attributed to the generic and discursive norms of the writing in academic discourses. Moreover, the results suggest a tendency on the part of both Persian and English academic writers to use physical directives most frequently compared with other categories of directives. This tendency once more points to the universality of the functions served by directives. Directives are also, to a lesser degree, used to serve cognitive and contextual functions.

Overall, the research articles in both Persian and English soft and hard science RAs seem to follow a more generic and discursive trend in the employment of directives in their discussion and conclusion sections. The considerable frequency of directives may be attributed to the fact that in the discussion, as an intriguing RA section, authors consider the arguments for and against the results, evaluate the various opinions and eventually present their own views by which they develop their academic ethos (Hyland, 1998).

To join a disciplinary discourse community, EAP writers must be familiar with the writing conventions at work in that community. This is especially important in EFL contexts where multitude of factors deny such familiarity to the non-native academic writers. The findings of the present study can to some extent contribute to raising EAP students' awareness of the academic writing conventions in both Persian and English. This awareness can equip EFL students with the insight into rhetorical resources of the target language employed by academic writers in their respective disciplines, assisting them in their attempt to become a member of the community. In addition, findings of the present study may inspire EAP teachers, especially in an EFL context like Iran, to explicitly raise their students' awareness of the use of directives as a prevalent metadiscourse resource and override misconceptions about the use of such bold on record strategies in academic writing.

Caution must be exercised in generalizing the results of this study. Firstly, the study covered a limited number of RAs; hence the representativeness of the corpus may undermine the generalizability of the findings. Secondly, the analysis was limited to the discussion and conclusion sections of the RAs. Since the communicative aim of the various rhetorical sections influences the writers' involvement, and authorial persona characterized by different linguistic expressions (Abdollahzadeh, 2001), it is likely that the use of directives is genre specific, hence, it seems necessary to investigate the manifestation of directives in other rhetorical sections such as introduction and methodology, among hard and soft disciplines in order to achieve more comprehensive findings in this regard.

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