Signposting Propositions: A Study of Interactive Metadiscourse Marking in the Composition of Research Articles Across Sciences

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Abstract

Writers ensure the expected (re)construction of concepts in the mind of the audience through effective signposting of the inevitably linear linguistic stream, which is a main aspect of metadiscourse called *interactive metadiscourse*. In this study, the use of interactive metadiscourse markers in research articles was investigated to examine any probable difference existing between different disciplines and also the two rhetorical sections of research articles. For this purpose, we examined a corpus of 120 research articles from four academic disciplines. The results obtained from the functional-contextual analysis of the corpus revealed no statistically significant difference in the use of these markers across disciplines, which suggested a parallel convention to be at work among academic writers in signposting the propositions. Of course, the sections of articles were different attributable to the difference in their cognitive genre. The findings could offer implications for the teaching and learning of academic writing.

Keywords: Academic writing, Genre analysis, Interactive metadiscourse markers, Research articles

1. Introduction

Academic discourse has been the object of an interesting number of studies (Hyland & Hamp-Lyons, 2002), a great many of which are pedagogically oriented, focusing on student needs and competencies. The proliferation of courses on academic discourse in general and English for academic purposes in particular has entailed increased research activity into what language and communication tools the students must acquire to become fully socialized into their research community. In such contexts, the process of gaining entry into these communities is seen as being dependent on awareness of, and competence in, the writing practices of the relevant discourse community (Hyland, 2004).

According to (Hyland, 2005), the research article (RA) is a genre where an orientation to readers is crucial in securing rhetorical objectives. While it is often considered a predominantly propositional and impersonal genre, the act of

accrediting knowledge is a social process and involves making linguistic choices which an audience will recognize as persuasive. So if we view knowledge as "the social justification of belief" (Rorty, 1979, p. 170), then it is clear that writers must consider the reactions of their expected audience, anticipating its background knowledge, processing problems, interests and interpersonal expectations. Simultaneously, readers are trying to predict lines of thought and interrogate authors from the perspective of their personal research goals (Bazerman, 1988). Thus academic writers seek to produce texts that evoke specific responses in an active audience, both informing and persuading readers of the truth of their statements by seeking to "weave discourse into fabrics that others perceive as true" (Harris, 1991, p. 289).

According to Hyland (2005), RAs are thus broadly concerned with knowledge making and this is achieved by negotiating agreement with colleagues about interpretations and claims. Writers try to consider their readers, imagine what they know and what they need to know, and engage with them effectively. They are not just concerned with cognitive factors, but also with social and affective elements, and this moves analysis beyond an interest in just the ideational dimension of texts to the ways they function interpersonally. Essentially, the writer of an academic article wants his or her argument to be both understood and accepted. But achieving these goals is complicated by the fact that there is no independent, objective means of distinguishing observation from conjecture. There is always more than one plausible reading for data, and readers always retain the option of rejecting the writer's interpretation.

As mentioned in (Hyland, 2005, p. 143) metadiscourse facilitates the social interactions which contribute to knowledge production within disciplines and, because disciplines are different, its use and meaning varies between disciplines.

Persuasion, as part of the rhetorical structure of RAs, is partly achieved by employing metadiscourse (Abdi, 2011). Metadiscourse is defined as self-reflective linguistic expressions referring to communication triangle; the evolving text, the writer(s), and the imagined readers of that text (Crismore, 1989; Hyland, 2004). It is based on a view of writing as a social engagement and, in academic contexts, reveals the ways the writers project themselves into their discourse to engage readers, signal their guiding and organizing attempts, commitments, and attitudes (Hyland & Tse, 2004).

As claimed by Hyland (2005, p. 3) the term metadiscourse, goes back to the work of linguist Zellig Harris. Hyland describes metadiscourse as "the linguistic resources used to organize a discourse or the writer's stance towards either its content or the reader" (Hyland & Tse, 2004, p.157). Crismore (1984, p. 280) believes that the aim of metadiscourse is to "direct rather than inform the readers."

On the whole, metadiscourse is recognition of a belief that the use of language for communication is not just an attempt to transfer information and knowledge, rather such a use is also normally accompanied by organizational efforts, evaluations, feelings, reference to participants, etc.(Abdi, 2009). In the metadiscourse literature, a number of taxonomies can be seen (Abdi et al., 2010; Ädel, 2006; Crismore, 1989; Dafouz-Milne, 2008; Dahl, 2004; Hyland, 2005; Rahman, 2004; Vande Kopple, 1985, 2002). The taxonomies demonstrate a theoretical fine-tuning as time develops.

Hyland (2005) developed a new taxonomy which is summarized in Table 1. His model is based on a functional approach which regards metadiscourse as the ways writers refer to the text, the writer or the reader. It acknowledges the contextual specificity of metadiscourse and, at a finer degree of delicacy, employs Thompson and Thetela's (1995) distinction between *interactive* and *interactional* resources to acknowledge the organizational and evaluative features of interaction (Hyland, 2005, p. 48). The model proposed by Hyland (2005) assumes the two main categories of *interactive* and *interpersonal* for metadiscourse.

Table 1 *An Interpersonal Model of Metadiscourse (Hyland, 2005, p.49)*

Category	**Function**	**Examples**
Interactive	**Help to guide the reader through the text**	**Resources**
Transitions	express relations between main clauses	in addition; but; thus; and
Frame markers	refer to discourse acts, sequences or stages	finally; to conclude; my purpose is
Endophoric markers	refer to information in other parts of the text	noted above; see figure; in section 2
Evidentials	refer to information from other texts	according to X; Z states
Code glosses	elaborate propositional meaning	namely; e.g.; such as; in other words
Interactional	**Involve the reader in the text**	**Resources**
Hedges	withhold commitment and open dialogue	might; perhaps; possible; about
Boosters	emphasize certainty and close dialogue	in fact; definitely; it is clear that
Attitude markers	expresses writers' attitude to proposition	unfortunately; I agree; surprisingly
Self mentions	explicit reference to author(s)	I; we; my; me; our
Engagement markers	explicitly build relationship with reader	consider; note; you can see that

A more recent model was introduced by Abdi, Tavangar Rizi, & Tavakoli, (2010). In this model two maxims are added to complement the Gricean maxims (Table 2, below). Also, the table includes the two newly introduced MSs of collapsers and disclaimers and their maxims. Moreover, the interaction category is added to the already-existing categories of quantity, quality and manner to make the model appropriate to metadiscourse marking. The Overall Orientation column acts as the supermaxims of the relevant categories. All in all, the table represents the CP model hypothesized to be at work in the employment of metadiscourse.

This model, besides providing a framework for the use of MMs, shows a different theoretical conceptualization of metadiscourse. We include the model here to remind that notable different approaches are gradually gaining ground.

Although notable difference can be seen among the models, the significance of metadiscourse in written communication, as well as variations in different contexts, is demonstrated by several studies no matter what theoretical standpoint is supported (Ädel, 2006; Crismore, 1990; Hyland, 2004; Thompson, 2001). Nonetheless, the difference in the theoretical approaches could give rise to various pedagogical orientations and thereby probable varying efficiencies.

Despite the fact that the study of the structure of RAs has developed into a significant field of research, however, until recently, little attention has been paid to the analysis of the most probably unique characteristic features of RAs of specific disciplines and sciences in academic discourse.

Therefore, through analyzing metadiscourse strategies employment in English (as the lingua franca of academic discourse community) RAs, this study made an attempt to find the possible differences in the use of different metadiscourse strategies across disciplines, and the possible differences between subsections of RAs in the use of metadiscourse markers.

Table 2 *Abdi et al.'s CP-Based Metadiscourse Model (2010)*

Metadiscourse strategy	**Maxims**	**Cooperation category**	**Overall orientation**
Endophoric markers	1. Make your contribution as informative as is required. 2. Refer the audience to other parts of the text to avoid repetition. 3. When repetition is inevitable, acknowledge it to avoid inconvenience.	Quantity	Avoiding prolixity to make the text manageable and friendly
Collapsers	Avoid undue repetition by using proper referents.		

Metadiscourse strategy	**Maxims**	**Cooperation category**	**Overall orientation**
Transitions	1. Properly signpost the move through arguments. 2. Be perspicuous.	Manner	Clarifying steps and concepts to make the text comprehendible
Frame markers	1. Be orderly. 2. State your act explicitly.		
Code glosses	1. Avoid ambiguity. 2. Avoid obscurity of expression.		
Evidentials	1. Do not say that for which you lack adequate evidence. 2. Cite other members of the community to qualify your propositions.	Quality	Building on evidence to make the propositions tenable
Hedges	1. Do not say what you believe to be false. 2. Do not say that for which you lack adequate evidence. 3. Mark if evidence is not enough. 4. Do not use hedges in widely accepted or supported propositions.		
Boosters	1. Do not say what you believe to be false. 2. Do not say that for which you lack adequate evidence. 3. Mark if evidence is notable. 4. Do not use emphatics if evidence is not enough.		
Disclaimers	1. Do not say that for which you lack adequate evidence. 2. Outline the framework within which you would like your propositions to be interpreted. 3. Explicitly distance yourself from untenable interpretations.		
Attitude markers	Express your feelings or avoid them, according to norms and conventions.	Interaction	Making people and feelings visible to promote rapport
Self-mentions	Enter your text or sidewalk it, according to norms and conventions.		
Engagement markers	1. Draw the audience in or ignore them, according to norms and conventions.		

Metadiscourse strategy	Maxims	Cooperation category	Overall orientation
	2. Give directions to your readers to follow when appropriate.		

To refer to some related empirical studies, we would like to begin with Crismore, Markkanen, and Steffensen (1993), who investigated cultural and gender variations in the use of metadiscourse in the United States and Finland by asking whether U.S. and Finnish writers use the same amounts and types and whether gender makes any difference. The analyses revealed that students in both countries used all categories and subcategories, but that there were some cultural and gender differences in the amounts and types used. Finnish students and male students used more metadiscourse than U.S. students and female students. Students in both countries used much more interpersonal than textual metadiscourse with Finnish males using the most and U.S. males the least. The study provided partial evidence for the universality of metadiscourse and suggested the need for more cross-cultural studies of its use and/or more attention to it in teaching composition.

Abdi (2002) analyzed a corpus of 55 academic RAs from Social Sciences (SS) and Natural Sciences (NS) suggested that the writers use interpersonal metadiscourse to partly reveal their identity. A comparison of the two disciplines was made, based on the use of interactional metadiscourse through "hedges", "emphatics" and "attitude markers". The analysis showed that the SS writers employed interpersonal metadiscourse more frequently than the NS writers. One-to-one comparison further showed that they varied significantly in their use of hedges and attitude markers but there was little difference in their use of emphatics. However, the use of hedges and emphatics was significantly different within each discipline. A qualitative in-depth analysis revealed that the choice of validity markers was closely related to the type of propositions.

Hyland (2004) investigated the purposes and distributions of metadiscourse in a corpus of 240 doctoral and masters dissertations totaling four million words written by Hong Kong students. The findings revealed how academic writers used language to offer a credible representation of themselves and their work in different fields, and thus how metadiscourse could be seen as a means of uncovering something of the rhetorical and social distinctiveness of disciplinary communities.

Harwood (2005) analyzed a corpus of 40 articles from four disciplines-Physics, Economics, Computing Science and Business and Management-. He tried to investigate how academic writers used the personal pronouns *I* and *we* to help create a self-promotional tenor in their prose. The findings of the study indicated that even supposedly “author-evacuated” articles in the hard sciences can be seen to

carry a self-promotional flavor with the help of personal pronouns. According to Harwood (2005) the thought that academic writers protected themselves against falsification by distancing themselves from their findings and avoiding personal pronouns is losing ground these days.

Since this study specifically intends to study interactive metadiscourse, that is, signposting tools, across sciences, we hope that it provides more insight into the nature of probably unique employment of such rhetorical devices, the results of which can be used in academic writing classes.

2. Methodology

2.1. Corpus

The RAs from four disciplines, from social and natural sciences, were selected as the corpus of this study. In order to select the disciplines, Becher's (1989) taxonomy of the disciplines was used to decide on the corpus content. Becher divides the academic disciplines into soft and hard fields. Becher (1989) uses soft sciences to refer to the humanities and social sciences and hard sciences to refer to natural sciences. The soft and hard fields then further divided into pure and applied groupings. Very broadly, the pure fields can be more reflective and theoretical, while the applied fields are objective and practical (Becher, 1989). It was decided that the corpus would consist of four different disciplines, one from each of Becher's categories. Therefore, Chemistry (as hard-pure), Medicine (as hard-applied), Psychology (as soft-pure) and Applied Linguistics (as soft-applied) disciplines were selected for the purpose of this study.

In the meantime, the corpus was limited to *Introductions* (Int) and *Results and Discussions* (RD) section. *Ints* are known to be problematic for most academic writers since getting started on a piece of academic writing is often regarded difficult. Swales (1990), in his CARS model for RA Ints, states that the main concerns of the Int section of a RA are to contextualize a research study being presented in the relevant literature, claim its novelty, and present main features of the study. Furthermore, according to Swales (1990, p. 133) the *Results and Discussion* section "mirror-images the *Int* by moving from specific findings to wider implications". The main rhetorical function of the *RD* is to contextualize the reported study and relate it to previous work in the field, reflecting a sense of membership in the larger scientific community. Furthermore, the Discussion section is the very part of the RA in which researchers try to persuade their readers.

In the definitions of genre by Bazerman (1988) and Widdowson (1998), the time factor is also very important because, as also mentioned in Abdi (2002), genres are born, change, evolve and decay. To take care of the time factor, all texts culled for this purpose were chosen from among articles published in 2009 and 2010.

A total of 120 articles were randomly selected from among several hundred journals, 30 from each discipline. The selected RAs were obtained directly from the electronic versions of the relevant journals. Totally the corpus included 333165 words.

2.2. Procedure

After building the corpus, five subcategories of code glosses, endophorics, evidentials, frame markers and transition markers as classified by Hyland (2005, pp. 218-220) were selected, and their possible ambiguities and various functions were taken into account. Linguistic realizations of metadiscourse strategies were recognized according to the criteria of the model before and while analyzing. The propositions containing interactive metadiscourse markers were identified functionally and manually throughout the corpus since there is a common belief among scholars that metadiscourse is inherently a fuzzy and a functional category and that the metadiscursive expressions can be multifunctional and context dependent (Ädel, 2006; Crismore, 1990; Crismore et al. 1993; Salager-Meyer, 1994, 1998). The number of IMMs in each category and in each part of the RAs was then counted and the relative frequency of them was calculated per 1,000 words.

Meanwhile, since a single judgment was deemed to be inadequate for identifying IMMs, three colleagues reviewed the data and the results were averaged out to yield one more reliable set of data. Then, the *Chi-square* formula was employed as the appropriate statistical devise to analyze the data.

It should be mentioned that in this study the disciplines were not investigated separately, rather groups of disciplines that are labeled as soft (social) and hard (natural) were compared.

3. Results and Discussion

Table 3 shows the distribution of IMMs across different rhetorical sections of RAs in both disciplines.

Table 3 *The Distribution of IMMs across Different Rhetorical Sections of RA*

	Discipline	Applied Linguistics		Psychology		Total	
		Int	RD	Int	RD	Int	RD
Soft	Total words	27860	74744	31462	65919	29661	70331
	Total IMMs	2841	5677	3315	5373	3078	5525
	Relative frequency	101.974	75.952	105.365	81.509	103.669	78.730

		Chemistry		Medicine		Total	
Hard	Total words	16164	57445	13351	48220	14757	52832
	Total IMMs	1999	3204	1654	4185	1826	3694
	Relative frequency	123.669	55.775	123.885	86.789	123.777	71.282

The relative frequency of IMMs was calculated in two rhetorical sections in soft and hard disciplines. As appeared from the results of the chi-square tests (Table 4), in total (χ^2 = 15.88), in soft disciplines (χ^2 =3.40) and in hard disciplines (χ^2 =14.12), the Int section of RAs had a significantly higher number of IMMs compared to RD section (Table, 4). The identical and notable use of signposting markers among other discursive options suggested that writers in both disciplines consider Int as a major site for convincing the readership about the gap. As it is evident in Thompson (2001) and Swales (2001), academic language across the genres and disciplines is heavily signaled and signposted to live up to convincing quality.

Table 4 *The Results of Chi-square Tests*

	total	soft	hard
Int & RD	15.88	3.40	14.12
	total	Int	RD
Soft & Hard	0.425	1.745	0.427

Although the markers frequency in the Int section in the hard disciplines was apparently higher (123.777) compared to the soft ones (103.669), the results of Chi-square test (χ^2 = 1.745) indicated that there are no significant differences in the distribution of IMMs across two rhetorical sections of RA in the two sciences.

Similarly, despite more IMMs (78.730) in the RD section of soft disciplines as compared to hard ones (71.282), the difference was not significant (χ^2 = .427).

As a result, we can say that IMMs are vital rhetorical devices (Abdi, et al., 2010) with a variety of functions central to build coherence and organization into the RAs. The results also reveal that writers of RAs in both disciplines are apparently equally aware of the importance and contribution of such markers in RAs. In line with Jalilifar and Shooshtari (2011) we could say that while it was true that rhetorical decisions may sometimes reflect either conscious choices or unreflective practices, the analysis of metadiscourse patterns indicated that effective argument

involves a community-oriented deployment of appropriate linguistic resources to represent signposting, organization, and the expectancy rhetoric.

It also appears that the property of being *academic* entails a multitude of generally respected rhetorical conventions among all academia which happens to obscure the so called positivist distinction between soft and hard sciences (Guba & Lincoln, 1994). The recent pragmatic research paradigm could be conceived as playing a role in ironing out the already staunch and opposing positions (Dörnyei, 2007).

Lack of familiarity with such rhetorical resources may cause difficulties for those students, teachers, and researchers who want to be accepted as a member of their relevant disciplinary community. The awareness of IMMs provides this opportunity for learners to meet the needs of the audience (Dafouz-Milne, 2008). Therefore, it seems necessary to devote special attention to the foreign language learners of English in the research or ESP course. Our understanding of IMMs also needs to be sharpened by doing further research in this area of rhetorical competence.

Given the differential rhetorical styles of authors from different cultural backgrounds (Salager-Meyer, Ariza, & Zambrano, 2003; Uysal, 2008), this study could offer pedagogical implications for academic writing teachers, novice academic writers, and ELT students from different cultural and linguistic background. The findings demonstrate that English authors embark on extensive employment and deployment of interactive markers throughout their academic prose.

With extensive support for consciousness raising activities in adults' language learning (e.g., Myles, 2002; Svalberg, 2007), this study also could motivate the tendency to change the implicit instruction to a conscious manipulation of rhetorical structure.

This study attempted to shed some light on some aspects of the complex process of academic RAs' immediately invisible structure. Given the wide variety of rhetorical options and text types, it is hoped that the findings will inspire further research and discussion on the most effective ways to teach academic writing diverse settings.

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