The Use of Metadiscourse Devices by Non-native Speakers in Research Articles

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Abstract

As a part of pragmatics of language, Metadiscourse (MD) has been widely recognized as playing a pivotal role in the expression and comprehension of messages in academic writing. In view of its significance in effective communication, there have been a lot of attempts to categorize different MD devices within manageable models alongside some descriptive works to demonstrate the use of MD devices on the basis of these models. However, despite all the centrality accorded to MD markers in academic writing, few ESP practitioners have tried to explore the use of these devices by non-native speakers (NNS) who are known to be producing dry, incoherent and sometimes confusing papers - the very shortcomings which might easily be managed by judicious use of MD elements. With the absence of systematic works on the use of MD markers by NNS, there is a paucity of information on their use of MD devices in their productions. This is what the present paper seeks to uncover. Drawing on the Hyland and Tse's (2004) "Interactive and Interactional" model of MD, and their description of the use of MD devices in research articles produced by native speakers (NS) in Hyland (1998), it was set out to document the frequency of MD markers in papers produced by NNS of English and contrast it with that observed in Hyland (1998). For this purpose, 20 RAs written by NNS which had been accepted for publication in the Tabriz Journal of Dentistry were selected after extensive stylistic and linguistic editing, and were compared against Hyland (1998) with respect to the frequency of particular MD elements. The results showed huge discrepancy in the use of all MD devices in general, and some in particular. The findings can provide useful insights in materials development for academic writing classes where learners could receive explicit instructions on the use of MD elements which have been found to be used least frequently.

Keywords: Metadiscourse, ESP, Academic Writing, Native Speakers, and Non-native Speakers

Introduction

Metadiscourse (MD) has been widely recognized as playing a pivotal role in the expression and comprehension of messages in academic writing. Despite all the centrality accorded to MD markers in academic writing, few ESP practitioners have tried to explore the use of these devices by non-native speakers (NNS). Drawing on the Hyland and Tse's (2004) "Interactive and Interactional" model of MD, and their description of the use of MD devices in research articles produced by native speakers (NS) in Hyland (1998), the present study seeks to document the frequency of MD markers in papers produced by NNS of English and contrast it with that observed in Hyland (1998).

Literature Review

The significance of suasion in and relevance of rhetoric to scientific discourse have been underscored since the time of Aristotle (See Hyland 2005), yet these essential aspects of textual communication were essentially swept to the sidelines in the positivistic era when all priority was given to the propositional meaning, with almost all scholars including "…linguists, philosophers and semanticists concentrating on the referential function of language at the expense of all the others" (Coates 1987, p.113). The primacy given to the propositional content or the referential meaning was all the more pronounced in the context of scientific discourse which was regarded as "discourse of truth" and the scientists were excessively concerned with the conveyance of the propositional meaning whose validity would hinge on impersonal empiricism, and conveyance of absolute truth through impeccable reasoning (Lemke, 1995, p.178).

By the early 1980s, there was already a growing discontent with the proposition-dominated view of textual communication, and in response to this now-obsolete view, new conceptualizations emerged to account for the reality of the communication of message through text, and the factors that facilitated such communication. On the other hand, with the inevitable recognition of relativity in scientific discoveries over the past few decades and the increasingly provisional status accorded to scientific findings, writers of RAs as primary means of scientific communication for first hand research findings, found themselves urged to use a style of writing which projects both personal modesty and honesty, along with expression of cautiousness and humility when it came to the expression of their findings or opinions (Salager-Meyer 1994). Accordingly, writers, in an effort to claim a right to be heard, alongside their concern for being dispassionate and objective, reporting their findings on a subject matter, display concerns to accommodate the fellow scientists or other members of the discourse community who hold their own views on those same matters. So an academician's competence in writing an effective RA, besides his expertise, might well lie in his capability to establish a shared community context through the right rhetorical choices providing for interpersonal negotiations and balancing their claims about the significance and originality of their works. It is roughly in this period of time when studies of Meta-discourse assume special significance although the term itself is said to have been coined by Zellig Harris in 1959 to represent a writer's or speaker's attempt to guide a receiver's perception of a text (Hyland, 2005).

Despite a resurgence of interest in this notion as a resource for successful management of textual and interpersonal aspects of meaning in textual communication, the concept of

metadiscourse has yet not been adequately theorized (in Hyland's terms it remains "undertheorized") which is probably one of the reasons why writers in this area have tended to look to the Systemic Functional theory of language for insights and theoretical support. Another reason might have to do with the fact that MD analysis involves taking a functional approach to texts, and can thus easily borrow terminology from the Systemic Functional school although as Hyland (2004, 2005) notes, it is not necessary for the scholars theorizing dynamics of MD to closely adhere to Systemic Functional Linguistics (SFL).

Within Systemic Functional Linguistics (SFL), language is seen as being organized around, and simultaneously realizing, three broad purposes or 'metafunctions' (e.g. Halliday, 1994; Halliday & Matthiessen, 1992). In Halliday's model, unlike propositional and interpersonal meanings, both of which orient to non-linguistic phenomena, the textual function is intrinsic to language. It is referred to as an enabling function which helps organize an ideational message together with interpersonal considerations in the light of context. This message organization is said to happen both at local and global levels; information structure at clause level, and cohesion and coherence or simply texture at the global level. By extension, textual metatext has to be considered at both global and the local levels: at the local level, the relationship between propositions is signaled, and at the global level, the relationship between the proposition under discussion and the overall message of the text are indicated. Thus, if the reader is guided through the text with respect to the organization of the content through explicit guidance the textual MD could be said to be at work. As for the interpersonal metafunction, in SFL model, it is supposed to encompass the expression of writer's feelings, and the projection of his beliefs, and attitudes onto the text together with forms of interaction and social interplay with the participants in the communication situation. The interpersonal MD markers would accordingly include the signals in the text indicating the writer's belief and degree of commitment to a proposition, recognition of the reader's likely reactions, etc.

Thus, the scholars subscribing to this dual distinction in metadiscoursal taxonomies, have built up on each other's theorizations and the lists, some extending the initial list to include wider categories, others manipulating the categories in their own ways, adding, separating, conflating or reorganizing the previous ones to fit the list to the particular view point they hold on the subject (e.g. Vande Kopple, 1985, 2002; Crismore et al., 1993; Hyland, 1998, 2005; Hyland & Tse 2004; Dafouz, 2008) in line with those speculations, essentially drawing on the insights provided by SFL. The first systematic treatment of metadiscoursal categories is attributed to Vande Kopple (1985), who actually elaborated further on the works of Joseph M. William (1981, cited in Kopple 1985, p.83) and Lautamatti (1978) who had already gotten involved in the discussions on metadiscoursal elements.

Rather against the mainstream studies of MD, the textual MD category has been eliminated from Hyland's model on the ground that the distinction between textual/interpersonal MD is misleading because it overlooks the meaning overlap between them. Refusing to acknowledge the binary distinction between textual vs. interpersonal MD is perhaps one of the distinctive features of Hyland's (2004) model, where he places a lot of emphasis on the interactional nature of MD, suggesting that "all metadiscourse is interpersonal in that it takes account of the reader's knowledge, textual experiences, processing needs and that it provides the writer with an armory of rhetorical appeals to

achieve this" Hyland and Tse (2004, p.161). Thus, adopting an essentially interpersonal focus in his revised model, Hyland (2004) drops textual MD from his model, and instead further divides the interpersonal MD into finer aspects which encompass the functions usually attributed to textual MD in other models. Drawing on Thompson (2001) and Thompson and Thetela (1995), Hyland (2004) divides interpersonal MD into interactive and interactional categories;

The Interactive Dimension

This refers to the writer's consciousness of the prospective reader, and he will be accommodating their level of knowledge, background, and rhetorical predispositions. The writer here sets out to produce and manipulate a text to be at the right level for particular readers, presenting the content in a way so as to enable the reader to recover the writer's intended meaning and goals. The use of resources in this category, therefore, addresses ways of organizing discourse, rather than experience, and reveals the extent to which the text is constructed with the readers' needs in mind, it thus provides for reader-friendliness of the text.

Table 1. A model of MD in academic texts (adapted from Hyland & Tse, 2004).

Category	Function	Examples
Interactive resources	Help to guide reader through the text	
Transitions	Express semantic relation between main clauses	In addition / but / thus / and
Frame markers	Refer to discourse acts, sequence, or text stages	Finally / to conclude / my purpose here is to
Endophoric markers	Refer to information in other parts of the text	Noted above / see Fig / in section 2
Evidentials	Refer to source of information from other texts	According to X / (Y, 1990) / Z states
Code glosses	Help readers grasp functions of ideational material	Namely / e.g. / such as / in other words

The Interactional Dimension

This dimension refers to interaction proper that is how it is generally conceived. It concerns how writers engage in interaction, and make their presence felt by projecting themselves onto the message and commenting on it. The writer's goal here is to make his or her views explicit and to involve readers by allowing them to respond to the unfolding text. This is the writer's expression of a textual 'voice', or community-recognized personality, and includes the ways he or she conveys judgments and overtly aligns him- or herself with readers. MD here is essentially evaluative and engaging, expressing solidarity, anticipating objections and responding to an imagined dialogue with others. It reveals the extent to which the writer works to jointly construct the text with readers.

Table 2. A model of MD in academic texts (adapted from Hyland & Tse 2004).

Interactional resources	Involve the reader in the argument	
Hedges	withhold writer's full commitment to proposition	might / perhaps / possible / about
Boosters	emphasize force or writer's certainty in proposition	in fact / definitely / it is clear that
Attitude markers	Express writer's attitude to proposition	Unfortunately / I agree / surprisingly
Engagement markers	Explicitly refer to or build relationship with reader	Consider / note that / you can see that

Self-mentions	Explicit reference to author(s)	I / we / my / our

Method

The Corpus

The corpus consisted of 20 articles published in the *Journal of Dental Research, Dental Clinics, and Dental Prospects,* Faculty of Dentistry, Tabriz University of Medical Sciences. Limitations on the selection of RAs were as follows: the RAs had appeared in 2009-2014 volumes as regular papers. The primary criterion for inclusion in the corpus was the papers having the standard format of IMRD, and the papers which did not have this format, e.g. case reports were not included. The 'Abstract' was excluded from our analyses as it is not considered to be an integral part of RA discourse, but a separate distilled version of it. In view of these limitations, the procedure for selection of the 20 RAs was thus not as random as outlined by Crookes (1986). However, as refereed, published articles, these NNS products of a highly conventionalized genre may be taken as representative of the problems experienced by NNS academicians when they write in English.

Analysis

Given the multifunctionality of MD elements, with the same linguistic elements functioning differently in different contexts, it was a laborious task to decide on the precise function that a particular element served in a given context. Thus, with some subjectivity inevitably creeping into our analyses, another rater, a professor in the field, was brought in the process of assigning MD devices into their respective categories. The researcher and the rater analyzed the MD elements in four RAs independently, having reached a complete agreement on the categorization of MD devices. The inter-rater reliability for the analyses was calculated, using Kappa coefficient. Once a good level of reliability was reached, we began with the actual analysis which included contrasting the frequency of MD elements used by NNS against those used by NS writers as reported in Hyland (1998).

After the tabulation of the frequency of MD devices in our data, we contrasted the total use of MD elements in our study with that of Hyland (1998), which was based on NS productions to be able to see the points of divergence clearly. However, some clarification might be in order here in line with the modifications Hyland himself has employed in his conceptualizations of MD over time. First of all, we used the term interactional and interactive (following Hyland & Tse 2004) for interpersonal and textual MD, respectively. There are also changes of terminology in reference to the MD devices inside the categories as well, logical conncetives are the same as Transitions (TR), Person Markers as Self Mention (SM), Emphatics as Boosters (B), Relational Markers as Engagement Markers (EM), with the remaining devices identified by identical terms.

Another important point which we had to take into account was the difference between the number of words in our data and that in Hyland's, which was about 150% larger than ours in terms of word count. Thus, whereas he has calculated the frequency of occurrence of MD elements in 1000 words, we had to consider that in 400 words to have a comparable basis. Finally, Hyland does not adequately clarify the basis of word count, that is whether or not parentheses or digits are also counted as words or whether they are dropped from consideration. Having determined a rough estimate of the occurrence of such non-word elements in 5 papers, we decided to deduct 100 words from every paper (a total of 2000

words from 31068), the grand total of words in our data being 29000. We have also indicated the word count in different sections, in case interested readers wanted to draw analogies on the basis of the charts and tables illustrating MD use in different sections which were provided above.

Table 3. Word count in the four sections

Article	Introduction	Material & Method	Result	Discussion
1	289	398	350	438
2	308	476	178	215
3	312	397	135	219
4	533	293	77	366
5	366	295	154	411
6	244	273	162	440
7	494	317	87	287
8	586	785	482	485
9	438	263	240	392
10	208	179	156	561
11	328	356	195	422
12	389	259	91	711
13	483	337	127	728
14	254	440	206	1278
15	395	308	150	541
16	679	503	85	800
17	397	238	389	835
18	335	893	180	936
19	507	396	226	413
20	211	772	328	658
Total	7756	8178	3998	11136

Results

As a part of pragmatics of language, MD has generally been known to be notoriously difficult for NNSs to master, and as such we expected to come across frequent instances of divergence in the analysis of our data entirely based on NNS manuscripts. To get a more intimate understanding of what the situation is like in our corpus with respect to the use of MD resources, it might be a good idea to take up the MD elements in the two categories separately as far as possible so that we could be in a better position for the overall comparison of the use of MD devices in our data with those recorded for NS productions in Hyland (1988).

Table 4. Interactive MD Elements

	Introduction	Material & Method	Result	Discussion
TR	39.33%	22.97%	24.14%	44.05%
FM	15.73%	22.97%	17.93%	8.73%
EV	5.06%	4.05%	4.83%	12.30%
CG	16.85%	4.05%	2.07%	3.97%
ENM	8.43%	16.22%	33.10%	15.87%

Transitions

TR category is by far the most frequently employed of MD categories, as well as being the most evenly distributed of all other categories in the four sections (IMRD) of the RAs, as shown in the table above. While their frequency rises in the Discussion Section, and slightly falls in the Materials Section, all four sections get their fair share of TR signals overall. This might have resulted both from the nature of the functions that TR signals serve and the skill of the writers in manipulating these elements. In other words, considering the role of TR markers in expressing and maintaining semantic relations between main clauses, it seems that NNS writers are adequately aware of the need to express the relations between different parts of their writing.

Another reason for this observation might lie in the fact that the writers in our study were all academic staff members, fluent and experienced writers in their own language, and thus most of them were attentive to the use of TR markers, being aware of the significant role that they can play in enhancing the cohesion and coherence of their texts. It is also possible that a combination of these two factors might have contributed to the relatively good performance of our writers in this particular aspect of managing MD elements.

Endophoric Markers (EN)

EN markers were the second most frequently used MD elements (about 14%); however, the writers' apparently good performance in this category should not signify their boosted proficiency level. Because upon closer examination, it is not difficult to see how the writers managed to easily make reference to other parts of their manuscripts - the function of EN- without having a matching proficiency level in other categories. The primary reason, we assume, is the fact that EN actually consists of rather formulaic chunks (e.g. see figure 1, mentioned above), which are not too demanding to acquire after all, especially when one does not feel too obliged to add some variety to the use of such phrases. The seemingly effortless use of this category, therefore, is actually the result of the writers' having mastered a few fixed set of phrases, used again and again with little concern for variety or creativity.

Frame Markers (FMs)

FMs were the third most commonly used of the MD elements observed in the RAs in our study. However, there is a point worthy of note which the digits and percentages in the table above might disguise about the use of this category that appears to be sufficiently good numerically; FMs refer to discourse acts, (e.g. to conclude), or to sequences or stages in the text (e.g. finally, after that), which are important resources aiding the writer in effective text management (Hyland 2005, p.). What was conspicuously unnatural about the instances of the use of FMs in our data was the fact that FMs used in our data were predominantly of the latter type, referring to stages and sequences-hence the highest frequency in the M Section. Their use in the discussion section is, by contrast, the lowest of all other sections. We call this unnatural because FMs are an important source of text management to announce discourse goals, topic shifts etc. which can be done best in the D Section where the writer's own voice is supposed to be echoed.

Thus, a relatively high number indicating high instance of the use of a particular category should not give the impression that the problems have been dealt with in that area. We should probe deeper into the source of the numbers to access the facts behind the figures, and then take the right decisions regarding how to deal with the problems surfacing afterwards. The writers' inability to express the discourse goal, refer to discourse acts, etc. are among the instances of their failure to make their presence felt to the reader, a problem that can significantly compromise the perceived quality of a manuscript. This issue will be elaborated on in the discussion on interactional resources, but as we will see below this particular area is where the overwhelming majority of our writers have problems and has to be fully addressed in our future syllabi for ESP classes.

Evidentials (EV) and Code Glosses (CG)

These two categories are the last and most sparsely used of the interactive MD elements. It is clear that these two categories are different from the other categories of interactive MD in Hyland's model in terms of the frequency of their occurrence, but only after these two categories are compared with those in Hyland's study will we be the true implications of this observation emerge.

Interactional Metadiscourse Devices

This aspect of interpersonal MD is essentially concerned with the writer making himself visible by expressing his views, doubts, evaluation, judgments etc…In other words, it is the writer's expression of a textual 'voice', or community-recognized personality, and includes the ways he imagines and responds to an imagined dialogue with others.

Table 5. Interactional devices in the four sections

	Introduction	Material & Method	Result	Discussion
H	27.40%	14.29%	14.29%	47.00%
B	8.22%	42.86%	14.29%	2.00%
AM	38.36%	42.86%	71.43%	13.00%
SM	1.37%	0.00%	0.00%	6.00%
EM	0.00%	0.00%	0.00%	0.00%

As the tables clearly indicate, there are fundamental differences between the frequency of the Interactive and Interactional categories of MD markers in our data. While our discussion of the interactive elements revolved around different frequencies of those elements alongside possible explanations, there simply are too few instances of interactional MD elements used in the category to allow such discussions. It is premature to arrive at a conclusion at this stage without having a firm ground on which to base our arguments, but the tables do clearly show that these interactional categories are significantly underused compared with the interactive categories whose frequency of use-as we will see shortly - is actually less than half of that recorded for NSs. Thus, we will have only a brief descriptive review of the interactional MD as below.

Hedges

Hedges**,** with 66 total instances of use are perhaps the most frequently used of all interactional categories, which is way below the average rate of their use in NS productions. Iranians are known to use hedging sparsely in their communication, and might be prone to do likewise when they communicate in English, as well.

Attitude Markers and Boosters (AM, B)

AMs are the second most frequently used of interactional categories with 49 instances while a total of only 12 **B**s were counted in the whole corpus.

Endophorics (EM)

Ems were conspicuously absent from our data; interestingly enough there was not even a single instance of EM used in all our data, which is a very significant point to be considered for future work. What is certain is that Ems cannot be structurally so complex as to be elusive to all writers in our data - almost everyone with a basic command of English can manage a few imperative sentence (e.g. note that). So, the reason has to lie somewhere else.

Self Mention (SM)

There were 16 instances of SM in the 20 RAs in our corpus. It has frequently been emphasized that an impersonal tone must be maintained in academic writing, yet, as Gosden (1993) observes, a successful piece of writing would hinge on establishing the right balance between personal and impersonal tone, surely not by underusing one.

Discussion

Having reviewed the use of individual MD elements in our data, it is now time to look at the bigger picture by contrasting the use of all MD items in our data against that recorded for NS writers as reported by Hyland (1998).

Comparison of Total MD Use in our data with Hyland (1998)

Table 6. Adapted from Hyland 1998 p.446

Category	Total no. of items	Items per 1000 words	%of total metadiscourse
Textual	5721	35.7	55.1
Interpersonal	4666	29.1	44.9
Subcategory			
Hedges	2417	15.1	23.3
Logical connectives	2045	12.8	19.7
Code glosses	1134	7.1	10.9
Evidentia1s	1109	6.9	10.7
Frame markers	796	5.0	7.6

Endophoric markers	637	4.0	6.1
Attitude markers	634	4.0	6.1
Person markers	629	3.9	6.0
Emphatics	627	3.9	6.0
Relational markers	359	2.2	3.5
Grand totals	10,387	64.8	100

Table 7. Ranked metadiscourse categories in our data

Category	Total no. of items	Items per 1000 words	% of total metadiscourse
Textual	589	19.0	64.7
Interpersonal	137.0	4.4	15.1
Subcategory			
TR	250	8.0	27.5
EN	127	4.1	14.0
FM	110	3.5	12.1
H	69	2.2	7.6
EV	53	1.7	5.8
CG	49	1.6	5.4
AM	49	1.6	5.4
B	12	0.4	1.3
SM	7	0.2	0.8
EM	0	0.0	0.0
Grand Total	910	29.3	100

After the description of MD devices in our data which was provided above, it is now time to compare the total use of MD elements in our study with that of Hyland (1998) which was based on NS productions. We will be focusing on the table showing the occurrence of MD devices in Hyland's model and contrast it with ours to be able to see the points of divergence clearly. Let us reiterate at the terminological differences again here; we will be using the term interactional and interactive (following Hyland & Tse 2004) for interpersonal and textual MD, respectively. As for the changes of terminology within these two categories, please note that, logical connectives are the same as Transitions (TR), Person Markers as Self Mention (SM), Emphatics as Boosters (B), Relational Markers as Engagement Markers (EM), with the remaining devices identified by identical terms.

Comments on the Comparison

Overall, a total of 910 MD elements were recorded in our data which consisted of 29000 words; on average 1 MD device about roughly every 31 words. This figure in Hyland's work is about 1 MD element every 15 words. That is NS manuscripts, on average, contain twice as many MD markers as the NNS productions in our data. Another big discrepancy that we understand in the light of information gained from Hyland's table is the

disproportionate frequency of occurrence belonging to total use of Interactive and Interactional categories in our table. While the former is less than 20% higher than the latter in NS data, this figure is over 400% in our data.

Thus, before we go on to contrast the individual devices used in the two data sets, we already know enough to say with some certainty that we have, indeed, been able to locate one significant area where there is a marked difference in the way it is handled by NS and NNS writers, and that this might be one of the areas contributing to the NNS manuscripts sounding dry, mechanical and difficult to understand. The huge discrepancy revealed by the comparison of the tables is, as it is, quite a telling observation on its own; however, contrasting the use of individual MD devices might shed more light on the points of divergence, which could serve as a reliable source informing programs of instructions in ESP classes in future, especially with respect to the areas of MD use which call for comparatively more intensive work.

Just a casual glance at the two tables might be enough to fill one with utter astonishment as to how a comparison with NS data could reveal such huge gaps regarding the frequency of occurrence for every MD device in both Interactive and Interactional categories. Of course there are factors, not taken into account yet, which must have contributed to the widening of the gaps and. First of all, the information in Hyland's table is based on the use of MD elements in four disciplines (Biology, Marketting, Applied Linguistics, Astrophysics), two of which are categorized as soft sciences (Ref.) which are known to require more argumentation and a higher degree of MD use. Regarding the difference between hard and soft sciences, Hyland (1987, p.443) observes "theoretical structures and experimental paradigms are quite different, each research domain has complications and elaborations that do not arise in the other", and Shahrokhi et al. (2013, p.201) hold that "soft science articles demonstrate a relatively higher level of sophistication than that of hard sciences". In his later work, Hyland (2004) acknowledges the distinction, and notes that the use of MD, despite being "a universal phenomenon in academic rhetoric" is subject to disciplinary variation. Nonetheless, this point obviously remains unaccounted for in the table in which the information is tabulated with no discrimination between disciplines.

Second, as the word counts reveal it, the lengths of papers are significantly different in in the two data sets, too. While the RAs in our data set contain only 1500 words on average, the papers in Hyland's study contain over 5500 words. We did not find explicit commentary on the specific association between the paper length and the density of MD elements used in it, yet it might not be too unfounded to assume that paper length must be a factor influencing the density of MD use. If a paper contains three to four times more words than another, it is not difficult to imagine that the density of MD might grow exponentially, with the longer paper having 5 or 6 times as many MD elements as the shorter one. The longer a stretch of discourse grows, one would imagine, it would need comparatively more MD elements to maintain or signal the relationships between the materials in different parts of the paper, with the writer expressing his comments and evaluations more frequently. In a shorter paper, by contrast, especially when it is placed in the category of hard sciences, the focus on the expression of propositional content in the tight space might override the concern for guiding the reader or making authorial presence felt through expressing evaluative comments, especially in the production of NNS.

In spite of all these factors which might well have contributed to the huge gap, the difference is so great that even after correcting the data for such factors, we will be left with quite a real chasm to bridge if we want the learners in ESP classes to approximate the NS norms, regarding the use of MD in general, and establishing a logical proportion among different subcategories, in particular. To begin with, TR which were our most frequent devices out of all MD items have appeared in our RAs at only about half the frequency at which Transitions appear in NS corpus. To look at the bright side, one could say that the use of TR is at least, among the most frequently used MD elements, as they are in NS productions, but that does not mean their frequency of occurrence is analyzed near where it ought to be. However, Transitions are perhaps the only subcategory which have occurred as high a frequency as they have in NS manuscripts, and EM are also the subcategory which have been employed the least frequently of all in both tables, the problem being that the low frequency in our data is actually zero - that is never once did a writer in 20 RAs happen to use an Engagement Marker.

Let us reiterate at this point again that, the discipline of dentistry, and the relatively short papers in our data are significant confounding factors whose effects have not been accounted taken into account. To say that TRs should have been used five times more in a paper consisting of 1500 words would be almost the same as saying that the paper should have consisted of only MD and a few propositions. Yet, we have to confess that MD use, in general, has to go a long way to reach the acceptable level, and it might not be an overstatement to say that even the subcategories appearing at the highest frequency in our data should have been used significantly more than they were in our data.

If the confounding factors mentioned above overshadow the accuracy of neat numerical comparisons, we could at least expect the ranking of MD items to bear some similarity to that observed in Hyland's table. However, as the ranked elements in the two tables show other than the two subcategories mentioned above, it is difficult to see any correspondence between the two tables, with the divergence being so great that one could say that the NS norms are the last thing that the pattern of MD devices in our data correspond to. Our data seem to contain just random, erratically distributed and underused sets of MD devices that do not seem to be following a logical pattern, not coming close to NS norms in terms of frequency of occurrence either compared to NS frequencies, or compared to other subcategories in our own data.

First of all, the first two subcategories in Hyland's table are H and TR, belong to Interactive and Interactional categories, but the first three of the most frequently observed devices in our table are all from the Interactive category, with the H subcategory ranked as the fourth. The fifth and sixth positions, with respect to their frequency of occurrence, are also occupied by interactive elements, with the rest of interactional devices ranked from seven to ten, EM, whose occurrence is zero. The fact that Interactive resources have been used more frequently than the Interactional ones is not a major divergence on its own, because after the H which is the most numerous of all MD devices in NS manuscripts, the second to sixth positions are all occupied by the five Interactive subcategories. While there is some mismatch in the relative positions of different subcategories, the true divergence actually lies in the proportion of the two main categories of MD; while the devices are often ranked by a narrow margin in their frequency in Hyland's table, they are separated from each other by veritable chasms in our data.

The conclusion to be drawn from this observation is the obvious fact that all MD subcategories are drawn on, albeit to different extents, in NS manuscripts for the expression of a variety of meaning relations in different parts of the texts that are generally associated with MD elements; "for making authorial presence felt in the text, expressing the writer's direction for how readers should read, react to, and evaluate what they have written about the subject matter" (Adel 2006, p.170). However, in addition to the fact that they are used at about half the frequency of the NS, the MD subcategories in our data, especially the Interactional ones, have been used in a fundamentally different manner, most being significantly underused and one utterly neglected.

It seems that as experienced scientists, the writers in our study have acquired the ability to produce texts of mediocre cohesion and coherence, at least judging from the frequency of interactive MD markers in their products, but utterly lack the capability to interact with their readers, to guide them through the text or to express their evaluative comments in the established norms of the English speaking community. After all, the fact that English is known to be a writer responsible language stresses the need for writers to give the reader adequate guidance and direction to maximize comprehension. This is where the judicious use of MD devices comes in, just as it is emphasized by the scholars in the field e.g. Hyland (2000), cited in Hyland and Tse (2004, p.157)), and Crismore (1984, p.280) believe that the aim of MD is to "direct rather than inform the readers".

Conclusion

The concept of MD has yet eluded a rigorous definition, but its existence as a category significantly influencing the quality of texts is largely undisputed, and the present study was essentially concerned with the practical instances of MD devices in the RAs produced by NNS. The gap between the NS and NNS use of MD elements as revealed by our comparison was not quite unexpected to us, perhaps not to the extent that they actually deviated from NS norms, though. Out of the two categories of MD (Interactive & Interactional), we found the interactive elements far outnumbering interactional elements in each and every section of the RAs, occurring ten times more frequently in certain sections. The rather odd proportion of the two categories could have resulted from a host of factors, but we essentially attributed it to the inability of the writers in establishing and maintaining a successful relationship between themselves and the readers - hence the conspicuous absence of Engagement Markers from the whole data. The underused Metadiscourse elements in NNS RAs might be the real culprit keeping their manuscripts from reading well MD elements could be explicitly taught in ESP classes on writing research articles, which might make the grammatical but dry productions of NNS smoother and easier to follow.

References

Ädel, A. (2006). *Metadiscourse in L1 and L2 English*. London: John Benjamins Publishing.
Crismore, A. (1984). The rhetoric of textbooks: Metadiscourse. *J. Curriculum Studies*, *16*(3), 279-296.

Crismore, A., Markkanen, R., & Steffensen, M. S. (1993). Metadiscourse in persuasive writing a study of texts written by American and Finnish university students. *Written Communication, 10*(1), 39-71.

Coates, R. (1987). Pragmatic sources of analogical reformation1. *Journal of Linguistics*, *23*(2), 319-340.

Crookes, G. (1986). Towards a validated analysis of scientific text structure. *Applied Linguistics 7*(1): 57-70.

Dafouz-Milne, E. (2008). The pragmatic role of textual and interpersonal metadiscourse markers in the construction and attainment of persuasion: A cross-linguistic study of newspaper discourse. *Journal of Pragmatics, 40*(1), 95-113.

Halliday, M. A. (1994). *Functional grammar.* London: Edward Arnold.

Hyland, K. (1998). Persuasion and context: The pragmatics of academic metadiscourse. *Journal of Pragmatics, 30*(4): 437-455.

Hyland, K. (2004). *Genre and second language writing*. Michigan: University of Michigan Press.

Hyland, K., & Tse, P. (2004). Metadiscourse in academic writing: A reappraisal. *Applied Linguistics, 25(2),* 156-177.

Hyland, K. (2005). *Metadiscourse.* New York: John Wiley & Sons, Inc.

Lautamatti, L. (1978). *Some observations on cohesion and coherence in simplified texts*.

Lemke, J. L. (2005). *Textual politics: Discourse and social dynamics*. New York: Taylor & Francis.

Matthiessen, C. M. I. M. (1992). Interpreting the textual metafunction. *Advances in systemic linguistics: recent theory and practice* (37-8). London: Pinter.

Salager-Meyer, F. (1994). Hedges and textual communicative function in medical English written discourse. *English for Specific Purposes, 13*(2), 149-170.

Shahrokhi, M., Sadeghi, A., & Amiri Dehnoo, M. (2013). Lexical cohesion patterns in research articles: Hard science vs. soft science decsiplines. *International Journal of Social Science and Education, 4(1)*, 196-204.

Thompson, G. (2001). Interaction in academic writing: Learning to argue with the reader. *Applied linguistics*, *22*(1), 58-78.

Thompson, G., & Thetela, P. (1995). The sound of one hand clapping: The management of interaction in written discourse. *Text-Interdisciplinary Journal for the Study of Discourse, 15*(1), 103-128.

Vande Kopple, W. J. V. (1985). Some exploratory discourse on metadiscourse. In *college composition and communication*, 82-93.

Vande Kopple, W. J. V. (2002). Metadiscourse, discourse, and issues in composition and rhetoric. In *Discourse Studies in Composition*, 91-113.