Metadiscourse: Mapping Interactions in Academic Writing

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Abstract
Metadiscourse in the argument presented here is based on a view of communication as social engagement and in academic contexts reveals the ways writers project themselves into their discourse to signal their understandings of their material and their audience. In this paper I explore how advanced second language writers deploy these resources in a corpus of 240 doctoral and masters dissertations totalling four million words. The analysis suggests that writers use language to offer a credible representation of themselves and their work in different fields, and thus how metadiscourse can be seen as a means of uncovering something of the rhetorical and social distinctiveness of disciplinary communities.

1. Introduction

Metadiscourse is a widely used term in current discourse analysis and English for Academic Purposes, but it is not always used to refer to the same thing. For some, it is a concept restricted to elements which refer to the text itself, looking inward to those aspects of a discourse which help organise the text as text. This position is represented by the work of Mauranen and Ädel in this volume and given the label of 'the reflexive model' (Ädel, this volume). For others, those taking an 'interactional' position, a writer's commentary on his or her unfolding text represents a coherent set of interpersonal options. This more encompassing model is the one I will employ in this paper, taking metadiscourse as a set of features which together help explain the working of interactions between text producers and their texts and between text producers and users.

This paper, then, develops a view of metadiscourse which responds to a growing interest in the interactive character of academic writing, expanding the focus of study beyond the ideational dimension of texts, or how they characterize the world, to the ways they function interpersonally. It has been particularly valuable to those who study academic writing as the insights and descriptions it has produced of different genres have fed successfully into teaching practices (e.g. Intaraprawat & Steffensen 1995; Jalilifar & Alipour 2007). In this paper I

intend to sketch out what I hope is a coherent view of metadiscourse and employ this to shed some light on a high-stakes academic genre: the postgraduate dissertation. Drawing on a detailed analysis of 240 masters and doctoral dissertations written by Hong Kong students totalling four million words, together with interviews with student writers, I will explore some of the ways that L2 writers negotiate the interpersonal demands of this genre. First, however, I will explain how I understand the term.

2. A view of metadiscourse

Metadiscourse emerged as a way of understanding language in use, representing a writer or speaker's attempts to guide a receiver's perception of a text (Harris 1959) but it is now understood in different ways (e.g. Ädel 2006; Crismore 1989; Hyland 1998, 2005; Mauranen 1993). It has certainly outgrown its early characterisation as simply "discourse about discourse" and come to be seen, in the 'interactive model', as an umbrella term for the range of devices writers use to explicitly organize their texts, engage readers, and signal their attitudes to both their material and their audience (Hyland 2005). This position grows out of the pioneering work of Vande Kopple (1985), Crismore (1989), and others in the 1980s. As Vande Kopple (1985:83) observes, "writers do not add propositional material but help our readers to organize, classify, interpret, evaluate, and react to such material".

Metadiscourse options are the ways we articulate and construct interactions, stressing the fact that, as we speak or write, we negotiate with others, making decisions about the kind of effects we are having on our listeners or readers. In this extract from a hiking guide, for instance, it is clear that the writer is not simply presenting information about the suggested route by just listing changes of direction, but taking the trouble to see the walk from the reader's perspective:

> There is a fine prospect of Penshurst Place as you cross the field and the walk takes you directly to the stone wall surrounding it. Go along this wall and in 200 metres cross the style into the churchyard of St John the Baptist church. Walk through the churchyard—the church is well worth visiting if you have time—and continue out to the road where you turn left, your direction 110 degrees. (Time Out Book of Country Walks 2001: 153)

The use of imperatives, second person pronouns, and evaluative commentary in this text helps the writer to involve himself in the text to both convey information more clearly and to engage the reader as a fellow enthusiast. Removing these metadiscourse features would make the passage much less personal, less interesting, and less easy to follow. If we look at these features systematically, metadiscourse provides us with access to the ways that writers and speakers take up positions and align themselves with their readers in a particular context.

Essentially, metadiscourse emerged as a corrective to earlier views of language which saw it as principally a propositional and expository mode of representation, where the function of communication was to match words to ideas. As Coates (1987:113) points out, "there has been a dangerous tendency among many linguists, philosophers and semanticists to concentrate on the referential function of language at the expense of all the others". The study of metadiscourse therefore reminds us that statements simultaneously have an orientation to the world outside the text and an orientation to the reader's understanding of that world through the text itself. In other words, language is not simply used to convey information about the world. It also acts to present this information to others through the organisation the text itself, on what Sinclair (1982) calls 'the autonomous plane', and engage them as to how they should understand it, on 'the interactive plane'. Metadiscourse thus offers a means of conceptualising communication as social engagement. It illuminates some aspects of how we project ourselves into our discourses by signalling our attitude towards both the content and the audience of the text (Hyland & Tse 2004).

So while some may lament what they see as the over-extension of the term to cover interpersonal uses of language (e.g. Mauranen 1993), it is a convenient way of capturing writing (and speech) as a social and communicative engagement between writer and reader. This emerging understanding of metadiscourse draws attention to the fact that academic writers do not simply produce texts that plausibly represent an external reality, but use language to offer a credible representation of themselves and their work, and to acknowledge and negotiate social relations with readers. This interactive perspective therefore understands metadiscourse as a coherent set of interpersonal resources used to organise a discourse or the writer's stance towards either its content or the reader (Hyland 2000: 109). It brings together the heterogeneous array of features which

help relate a text to its context and helps us to see how readers connect, organise and interpret material in a way preferred by the writer and with regard to the understandings and values of a particular discourse community.

2.1 An interpersonal model of metadiscourse

An orientation to the reader is crucial in securing rhetorical objectives in research writing as writers have to anticipate and respond to the potential negation of their arguments. But the interpersonal dimension of language has two elements which can be distinguished for analytical purposes. Borrowing Thompson's (2001) useful terms, I shall call these *interactive* and *interactional* resources. The former are concerned with ways of organising discourse to anticipate readers' knowledge and reflect the writer's assessment of what needs to be made explicit to constrain and guide what can be recovered from the text. The latter concern the writer's efforts to control the level of personality in a text and establish a suitable relationship to his or her data, arguments and audience, marking the degree of intimacy, the expression of attitude, the communication of commitments, and the extent of reader involvement. These macro-purposes are realised through a heterogeneous array of features as shown in Table 1 and elaborated below.

Table 1. A model of metadiscourse in academic texts

CATEGORY	FUNCTION	EXAMPLES
Interactive	Help to guide reader through text	Resources
Transitions	express semantic relation between main clauses	*in addition / but / thus / and*
Frame markers	refer to discourse acts, sequences, or text stages	*finally / to conclude / my purpose is*
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 meanings of ideational material	*namely /e.g. / such as / in other words*

Interactional	Involve the reader in the argument	Resources
Hedges	withhold writer's full commitment to proposition	*might / perhaps / possible / about*
Boosters	emphasise force or writer's certainty in proposition	*in fact / definitely / it is clear that*
Attitude markers	express writer's attitude to pro-position	*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*

Interactive resources allow the writer to manage the information flow to explicitly establish his or her preferred interpretations. These resources include the following:

TRANSITIONS comprise an array of devices, mainly conjunctions, used to mark additive, contrastive, and consequential steps in the discourse, as opposed to the external world. FRAME MARKERS are references to text boundaries or elements of schematic text structure, including items used to sequence, to label text stages, to announce discourse goals and to indicate topic shifts. ENDOPHORIC MARKERS make additional material salient and available to the reader in recovering the writer's intentions by referring to other parts of the text. EVIDENTIALS indicate the source of textual information which originates outside the current text. CODE GLOSSES signal the restatement of ideational information.

Interactional resources focus on the participants of the interaction and seek to display the writer's persona and a tenor consistent with the norms of the disciplinary community. They include the following subcategories:

HEDGES mark the writer's reluctance to present propositional information categorically. BOOSTERS express certainty and emphasise the force of propositions. ATTITUDE MARKERS express the writer's appraisal of propositional information, conveying surprise, obligation, agreement, importance, and so on. ENGAGEMENT MARKERS explicitly address readers, either by selectively focusing their attention or by including them as participants in the text through second person pronouns, imperatives, question forms and asides (Hyland, 2001a). SELF MENTIONS

suggest the extent of author presence in terms of first person pronouns and possessives.

These categories will be familiar to those who know the work of Crismore and Vande Kopple, but while I have borrowed some of their labels, the conceptual premises are very different. Basically the classification sees discourse as propositional and metadiscoursal. If we recognise that a large proportion of every text is not concerned with things in the world but with the internal argument of the text and its readers, then we can see that metadiscourse is one means by which propositional content is made coherent, intelligible and persuasive to a particular audience. Here I try to avoid the confusion caused by erroneously using Halliday's (1994) *interpersonal* and *textual* labels. While I admit to having been guilty in this regard, following Crismore and others in the use of this distinction to classify metadiscourse is misleading (Hyland 2005; Hyland & Tse 2004). Not only does it ignore Halliday's insistence that these functions are spread throughout the clause, rather than being identified with particular lexical items, but it neglects the difficulties of distinguishing a purely textual role for metadiscourse. Put most simply, unlike propositional and interpersonal meanings, both of which orient to non-linguistic phenomena, the textual function is intrinsic to language. It is what we do when we string words together and create coherent discourse and so exists to construe *both* propositional and interpersonal aspects of texts into a reasoned whole.

Essentially, textual features can be oriented towards *either* the experiential *or* the interpersonal, to either propositional or interactional meanings and so must be seen as enabling these functions, facilitating the creation of discourse by allowing writers to generate texts which make sense within their context. In other words, *all* metadiscourse is interpersonal in that it takes account of the reader's knowledge, textual experiences and processing needs and that it provides writers with an armoury of rhetorical appeals to achieve this (Hyland & Tse 2004). It refers to the linguistic devices writers employ to shape their arguments to the needs and expectations of their target readers.

3. Texts and methods

For this paper I explored the role and distribution of the features mentioned in Table 1 in a corpus of 240 dissertations by L2 postgraduate writers together with interviews with postgraduate students themselves. The students attended five Hong Kong universities and overwhelmingly spoke Cantonese as their first language. The corpus consists of 20 masters and 20 doctoral dissertations from each of six academic disciplines: Electronic Engineering (EE), Computer Science (CS), Business Studies (BS), Biology (Bio), Applied Linguistics (AL), and Public Administration (PA). The scanned texts produced an electronic corpus of four million words, 2.6 million in the PhDs and 1.4 million in the masters' texts.

The corpus was searched electronically for some 300 items which commonly perform metadiscourse functions in academic writing (see appendix in Hyland 2005 for a list of these) using *MonoConc Pro*, a text analysis and concordance programme. All instances were carefully analysed individually to ensure they were performing metadiscoursal functions and the results normalized per 10,000 words to allow comparison across corpora of different sizes. In cases where the counts produced thousands of instances of high frequency devices, such as some modals and conjunctions, 100 sentences containing each individual lexical item in each discipline and degree sub-corpus were randomly generated from the corpus. A final figure was calculated as a proportion of the sample size multiplied by the total number of words in that discipline and degree. In addition, two MA students and two PhD students from each discipline were interviewed as a way of both gaining insights into the text data and of discovering something about their own preferences and thoughts on disciplinary practices.

4. Overall findings: Metadiscourse in postgraduate writing

The frequency counts show the importance of metadiscourse to students writing in this genre with 184,000 cases in the four million words, or one signal every 21 words. The fact that metadiscourse is often realised by signals which can stretch to clause or sentence length means that these figures are not meant to convey the overall amount of metadiscourse in the corpus, but simply compare different patterns of *occurrence* of metadiscourse in corpora of unequal sizes. Table 2 shows that overall

writers used slightly more interactive than interactional forms, and that hedges and transitions were by far the most frequent devices in the corpus.

Table 2. Metadiscourse in postgraduate dissertations (F per 10,000 words)

Category	Masters	Doctoral	All	Category	Masters	Doctoral	All
Transitions	75.8	95.6	89.0	Hedges	86.1	95.6	92.4
Evidentials	40.0	76.2	64.1	Engagement markers	39.7	51.9	47.8
Code glosses	27.4	40.6	36.2	Boosters	31.7	35.3	34.1
Frame markers	20.7	30.3	27.1	Attitude markers	20.4	18.5	19.2
Endo-phorics	22.3	24.0	23.4	Self mentions	14.2	40.2	31.5
Interactive	**186.1**	**266.7**	**239.8**	**Interactional**	**192.2**	**241.5**	**225.0**

The most frequent sub-category in the corpus is *hedges*, which comprise 41% of all interactional uses, reflecting the importance of distinguishing fact from opinion in academic writing and the need for academic writers to evaluate their assertions in ways that are likely to be acceptable and persuasive to their examiners and supervisors. Indeed, we have found similar distributions of features in published academic writing (Hyland 1998; 2005). In fact, *may, could* and *would*, used to present claims with both caution and deference to the views of readers/examiners were among the highest frequency metadiscourse items in the corpus. In general, then, these students' use of metadiscourse demonstrates a principal concern with expressing arguments explicitly and with circumspection.

There is also a large number of transitions in the corpus. Mainly consisting of connectives, these are central to academic writing as they assist readers in recovering how the writer links the argument. Strictly, to qualify as metadiscourse, these conjunctions must mark transitions in the *argument*, rather than linking *events* in the world beyond the text. This means identifying as metadiscourse those cases where transitions, and equally frame markers, are used to link sequences in the argument (1) and discounting those cases where they are used to express relations between processes (2):

(1) The *next* question I want to examine is the relationship between the teacher's language proficiency and teaching effectiveness. (AL MA)

Crops accounted for a significant proportion of heavy metals dietary intake. *The reasons are two fold. Firstly*, crops are the bottom positions of many food chains and food webs. *Secondly*, vegetables are one of the major dietary components of Hong Kong people. (Bio PhD)

(2) In the *next* step, this residual signal is reconstructed by adding the same prediction as was subtracted earlier in the encoding process. (CS PhD)

For the boric acid indicator, *firstly*, 5g of boric acid crystals was dissolved in 200ml of warm distilled water, *secondly*, 40ml of methyl red indicator [0.02% (w/v) in 60% ethanol] and 15ml of bromocresol green indicator [0.1% (w/v) in 60% ethanol] were added to the boric acid solution. (Bio PhD)

This reflects Halliday's (1994) distinction between items which have 'text-internal' functions and those which are 'text-external'. The terms distinguish the roles of linguistic items in referring to either the reality denoted by propositions or the propositions themselves, and also applies to modals. Here, items such as *might* and *possible* can be regarded as interpersonal (or epistemic) features where they express writers' inferences about the likelihood of something, and as propositional (deontic) where they are referring to real world enabling conditions (Coates 1983; Hyland 1998a). Thus (3) comments on the writer's estimation of possibilities, and is thus an example of metadiscourse, while (4) is propositional as it represents an outcome as depending on certain circumstances.

(3) It is *possible that* instruction in one would lead to increased ability in the other. (AL PhD)

Perhaps this paved the way for their significantly better improvement in TL and CT as compared to students at the lower levels of study. (AL MA)

(4) Using this scale *makes it possible to* compare the results of the present study with those of previous socialization studies. (BS PhD)

Perhaps they represent many in the local Chinese community whose voices we never hear often and who could counter the tide of widespread social prejudice as represented by the vocal population. (PA PhD)

In other words, metadiscourse is concerned with interpersonal, not experiential relations, as it is these which reveal the ways writers seek to support their theses and relate their texts to their readers.

4.1 Differences of degree

Since the use of metadiscourse is closely related to the social contexts it helps construct, it is not surprising to find variations across the doctoral and masters sub-corpora. The PhD dissertations contained 35% more metadiscourse overall (per 10,000 words), and almost double the amount of interactive forms. These differences might be explained by the fact that the PhD corpus was twice the length of the masters corpus, making more interactive devices necessary to structure texts with more discursively elaborate arguments. However, while we cannot say that more metadiscourse equals better writing, this might also be seen as a greater awareness of readers and self. Metadiscourse represents a reflective awareness of self, text and audience, and its use here suggests writers' attempts to present themselves as competent academics immersed in the ideologies and practices of their fields.

In the *interactive* categories, for instance, the doctoral writers made far more use of evidentials, with over four times the number of intertextual references compared with the masters students. Obviously citation is a key element of persuasion in academic writing as it helps provide justification for arguments and helps display originality, but for PhD students it is much more than this. It also allows them to present their knowledge of the field's literature and so to display a credible ethos that values a disciplinary research tradition. These interviewees, for example, showed a clear grasp of the rhetorical importance of evidentials:

> References are important not only for showing readers that I've read a lot, but also for evaluating others' work and to justify my own perceptions. Unlike in writing undergraduate thesis when we cited others' as background information, in a PhD we need to be more critical and be able to evaluate what others have done so to make our own opinions prominent. (CS PhD interview)

> It is important to give references, especially in describing the project design. I have to justify the reasons why I do the project, so I need to point out what other people have done and the need of the general market, this requires references to others' work. (BS PhD interview)

In contrast, the masters students seemed less concerned about establishing their academic credentials. These students typically have less investment in their studies: their texts are not only much shorter, but are also completed fairly quickly and in addition to substantial coursework. The students themselves are normally studying part time and are looking forward to returning to their professional workplaces rather than aspiring to a career in academia. Consequently, their reading of the literature, and their desire to demonstrate their familiarity with it, may be less pressing.

The PhD students' attempts to address their audience in understandable and credible ways is also evident in their greater use of transitions, code glosses and frame markers. The PhD students, in fact, were very aware of their audiences and repeatedly raised the issue in the interviews:

> I suppose my thesis does not appeal to the general audience. However, I consider this group of general audience in organising my thesis, as it is my goal to write in a way that even outsiders could understand. When I'm writing the thesis, I consider people outside my field and imagine they will read it, so I write it in a simple way with all the jargons explained. (CS PhD interview)

> As I don't know who exactly would be my examiners, so I've to take all possibilities into account, and this definitely affects my writing. I'd avoid using jargons, because my examiners should be in the same discipline, but there are still many different areas of studies. I'd also include some classic literature as examiners would ask why I didn't. If I were to publish my paper, I'd have a totally different approach. (PA PhD interview)

Similarly, doctoral students employed some 20% more *interactional* metadiscourse markers, with particularly high differences in the use of engagement markers and self mention. While students are often taught to avoid the use of first person, it is a key way in which professional academics gain credit for their research claims (Hyland 2001b). While there are considerable disciplinary variations, PhD writers made far more use of this resource, with the doctoral dissertations containing four times more cases. The points at which these writers chose to metadiscoursally announce their presence in the discourse, moreover, were where they were best able to promote themselves and their individual contributions:

(5) I will demonstrate that a set of formal criteria can be established for interpreting a serial verb construction, and that the indeterminacy of the interpretation of… (AL PhD)

I have exercised care in my analyses and generated some useful observations. (BS PhD)

Using Y chromosome sequences from male fetuses as a marker and the highly sensitive and specific real-time quantitative PCR assay as a tool, I show that circulating fetal DNA is cleared rapidly from maternal plasma, with a half-life of the order of minutes. (Bio PhD)

There was, however, considerably more confusion about the use of self mention among the masters students, who often said in the interviews that they would avoid it:

In our discipline, it is ok to use "I", but only for established scholars. It is not appropriate to use "I" for students as "I" sounds like you are teaching the readers something. That you are powerful. (BS MA Interview)

I don't think the use of "I" is appropriate as it gives personal opinions. (CS MA Interview)

Though I'm not sure if "I" is acceptable, I'd avoid using it because it gives some kind of self opinion while most of the content in a thesis need to be objective. I think my supervisor would also cross out instances of "I". (EE PhD Interview)

So, while the more advanced students may have been slightly more comfortable using self mentions, many saw it as conflicting with the requirement of objectivity and formality in academic writing.

4.2 Differences of discipline

Not only did the use of metadiscourse vary across the two degree corpora, but also across disciplinary communities. In particular, the more "soft knowledge" social science disciplines employed more metadiscourse overall (56% of the normed count) with over 60% of the interactional features (Table 3).

Table 3. Interactional metadiscourse in postgraduate dissertations by discipline (F per 10,000 words)

Category	Applied Linguistics	Public Admin.	Business Studies	Computer Science	Electronic Engin.	Biology
Hedges	111.4	109.7	93.3	55.8	61.5	82.1
Boosters	37.9	39.5	29.8	29.4	28.0	30.5
Attitude markers	20.3	26.1	20.7	16.2	10.6	15.5
Engagem. markers	66.1	42.0	35.8	59.2	32.7	15.4
Self mentions	50.0	22.4	31.6	29.3	18.1	5.7
Total	**285.7**	**239.8**	**211.1**	**190.0**	**150.9**	**149.2**

The greatest differences were in the use of hedges, attitude markers, and self mention, reflecting the greater role that explicit personal interpretation plays in the humanities and social sciences. In these fields, the writer is unable to draw to the same extent on empirical demonstration or trusted quantitative methods and so must work harder to build up a relationship with readers to persuade them of interpretations (e.g. Hyland 2000). The fact that evaluative and epistemic judgements are more prominent indicates the importance of metadiscourse in negotiating arguments and managing the perils of presenting appropriate opinions and degrees of certainty.

The use of hedges to soften categorical assertions is a good example. This is, of course, a feature of all academic writing, but is particularly important in the soft disciplines, represented here by business studies, public administration, and applied linguistics. These fields all deal with human subjects and rely on qualitative analyses or statistical probabilities to construct and represent knowledge. For these reasons, they require elaborate exposition and considerable tentativeness in expressing claims and so contained over 60% more hedges than the natural science disciplines:

> (6) The results of these studies *tend to suggest* that the background characteristics of judges such as age are important factors in error evaluation. (AL PhD)
>
> Nevertheless, it is also *possible that* we *may* overestimate the degree of divergence in per capita income. (BS PhD)
>
> ...it *seems likely that* they were more oriented towards Western medicine than traditional Chinese medicine in coping with their illness. (PA MA)

The sciences, on the other hand, are prepared to trust the results of quantitative methods and express their arguments as proofs based on these, at least in postgraduate genres:

> The findings are certain as they are based on facts. There can be more than one interpretation, but I'd present the one that I think is the most appropriate in a certain way as it is deducted from statistical profile. Even if I were not sure, I will try and express it in a definite way. (Bio MSc Interview)

> In fact in our field it is very practical, statistics is everything, there is no such case as uncertain about the findings. If you ask me, we can't say we are 100% sure about anything, so sometimes I'd be careful, but again in our field we only value sure ideas, you cannot say you are uncertain all the times or your research would not be valuable no matter how many references you use to support yourself. (EE MSc Interview)

Self mention is also far more frequent in the soft disciplines, and for similar reasons. In the humanities and social sciences students are often encouraged by style guides and supervisors to present their own 'voice' and display a personal perspective. While this needs to be supported with data and intertextual evidence, there is a clear implication that writers need to display a discipline-situated stance towards the issues they discuss by making a clearly individual contribution. In the hard fields, and particularly in the more 'pure' sciences, competence in research practices is given a greater priority. A personal voice is thus subsumed by community knowledge and routines. Biology students, for instance, employed only one tenth of the stance markers used by applied linguists.

> My supervisor gave me a lot of ideas on this. His comment was that my own opinions did not stand out in my thesis, it is ok in the literature review section in which you are reporting others' work and though you may have your ideas, you make it hidden. However, he suggested, in later chapters like the theoretical framework and discussion, I should be more prominent and this helps to show that you are not only parroting others. (PA PhD Interview)

> We are taught to use passive voice in writing thesis and avoid "I" as it shows subjectivity, because the focus of the thesis should be on the experiments instead of the student who did them. I expect my supervisor would not agree the use of "I" too. (Bio PhD Interview)

The computer science texts differed from this general picture of scientific impersonality, containing higher frequencies of both self mention and

engagement markers. It is difficult to explain this with any certainty, after all, this is a hard knowledge discipline, largely concerned with impersonal computational calculations and software development. It is, however, also very much an applied discipline, practical in its orientation and concerned with applications in a range of other areas, including internet marketing, machine translation and e-business. Thus, unlike the other two hard fields discussed here, it leans more to the everyday world rather than to the development of discipline-internal theories. As a result, the ways writers use metadiscourse may have evolved to speak to both academics within the discipline and to practitioners outside it, thus mimicking writing which appears more like that in the social sciences.

Table 4 indicates that the use of *interactive metadiscourse* was relatively more balanced between the 'hard and soft' fields, although frequencies showed considerable variation between disciplines.

Table 4. Interactive metadiscourse in dissertations by discipline (F per 10,000 words)

Category	Applied Linguistics	Public Admin.	Business Studies	Computer Science	Electronic Engin.	Biology
Transitions	95.1	97.8	89.1	74.3	76.9	86.6
Frame markers	25.5	29.5	25.3	35.4	24.7	22.5
Endophorics	22.0	15.5	19.6	25.9	43.1	23.0
Evidentials	82.2	55.6	60.7	31.1	20.1	99.5
Code glosses	41.1	36.6	30.0	32.3	30.7	36.0
Total	**265.9**	**240.5**	**224.7**	**199.0**	**195.5**	**267.6**

We can see that transitions tended to be more extensively and carefully marked in the soft fields, for example, perhaps reflecting the more discursive nature of these disciplines and their need to rely more on the careful crafting of a coherent and persuasive discourse. Students in the hard disciplines, on the other hand, employed relatively more endophorics, especially those in engineering, emphasising their greater reliance on the multi-modal character of argumentation in the sciences which requires frequent reference to tables, figures, photographs, examples, and so on:

(7) *Refer to Appendix 3* for a full description of the writing topic. (AL MA)

From Figure 6.6 we see that OD-H maintains a very small miss rate, and is relatively unrattled even under a small slack situation. (CS MSc)

> The C code of the MAE function is *listed in table 3.1, ...* (EE PhD)
> Daily growth rings on the sectioned sagittal otolith of T. lepturus are *shown in Figure 4.9.* (Bio PhD)

Turning to evidentials, it is interesting to note that there were four times more citations in biology than the average for the hard disciplines and they exceeded those of all other disciplines. Evidentials are metadiscoursal features which provide intertextual support for the writer's argument, a frame within which new textual claims can be both anchored and projected. As such they tend to be more prominent in the discourse of the soft disciplines where issues are less dependent on a single line of development (Becher 1989). Because new knowledge follows more varied routes in the soft fields, there can be less assurance of shared understandings and less clear-cut criteria for establishing claims. As a result, writers often have to pay greater attention to elaborating a context through citation to demonstrate a plausible basis for their claims.

Intriguingly, however, biology had the greatest density of citations in the corpus. This emphasis on giving recognition to the ownership of ideas and showing how current research relates to, and builds on, the work of others is also clear in the biology style guides (e.g. Council of Biology Editors 1994; McMillan 1997), papers by undergraduate and postgraduate students (Ädel & Garretson 2006) and in biology research articles (Hyland 2000). The biology students in the study were also conscious of this disciplinary ethos and stressed both the proprietary rights to claims and an interest in how particular research contributes to a bigger scientific picture in their interviews:

> References are important to justify the approach I used, in showing what people in different countries have done, and as basics for arguments in the Discussion section. (Bio MSc interview)

> References are important to support my own ideas. I'd think that more references are better as it may show that you are familiar with the field and that your ideas are common consent with support from other's work. The age of the references doesn't matter, and I don't suppose more recent references are better. For example, some theories dated back to the 1940s but they are still considered as important today, time doesn't change their truth. (Bio PhD interview)

In sum, these advanced L2 postgraduate writers used metadiscourse in different ways to present their research and interact with their readers,

revealing something of the links between patterns of metadiscourse and the socio-rhetorical contexts of its use.

5. Conclusion

The main point I want to emphasise is that an interactional model of metadiscourse, or an 'interpersonal model' in my terms, offers a coherent and principled means of analysing the texts of writers in different communities. The analysis shows that masters and doctoral students, and members of different disciplines, represent themselves and see their readers in quite different ways. What assistance they assume readers will need in making connections between ideas, how they anticipate readers will react to arguments and claims, and how they should project themselves into their texts to present themselves as credible academics and writers is, to some extent at least, indexed in their metadiscourse choices. While it is true that rhetorical decisions may sometimes reflect either conscious choices or unreflective practices, the analysis of metadiscourse use in a large corpus such as this indicates that effective argument involves a community-oriented deployment of appropriate linguistic resources. Metadiscourse, then, reveals how writers seek to represent themselves, their texts and their readers as they frame, scaffold, and present their arguments and research findings in ways recognised and valued by their disciplines.

Seen in this way, then, metadiscourse is a response to the writer's evaluation of his or her readers' need for elaboration and involvement, ensuring that he or she supplies sufficient cues to secure an understanding and acceptance of propositional content. Metadiscoursal analysis is therefore a valuable means of exploring academic writing and of comparing the rhetorical preferences of different discourse communities. For this reason, it offers teachers a useful way of assisting students towards control over disciplinary-sensitive writing practices. Because it shows how writers engage with their topic and their readers, exploration by students of metadiscourse in their own and published writing can offer useful assistance for learning about appropriate ways to convey attitude, mark structure, and engage with readers. Only by employing these interpersonal features in their texts will students be able to get feedback on their practices to evaluate the impact of their decisions more clearly. Assisting students to an awareness of metadiscourse can

thus provide them with important rhetorical knowledge and equip them with ways of making discourse decisions which are socially grounded in the inquiry patterns and knowledge structures of their disciplines.

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