Persuasion and context: The pragmatics of academic metadiscourse

Ken Hyland*

Abstract

Metadiscourse refers to aspects of a text which explicitly organise the discourse, engage the audience and signal the writer’s attitude. Its use by writers to guide readers and display an appropriate professional persona is an important aspect of persuasive writing. Its role in establishing and maintaining contact between the writer and the reader and between the writer and the message also makes it a central pragmatic concept. Based on a textual analysis of 28 research articles in four academic disciplines, this paper seeks to show how the appropriate use of metadiscourse crucially depends on rhetorical context. The study identifies a taxonomy of metadiscourse functions and suggests that metadiscourse reflects one way in which context and linguistic meaning are integrated to allow readers to derive intended interpretations. It is argued that metadiscourse provides writers with a means of constructing appropriate contexts and alluding to shared disciplinary assumptions. The study of academic metadiscourse can therefore offer insights into our understanding of this concept and illuminate an important dimension of rhetorical variation among disciplinary communities.

1. Introduction

Metadiscourse, commonly characterised as ‘discourse about discourse’, is a relatively new concept but one which is increasingly important to research in composition, reading and text structure. Based on a view of writing as a social and communicative engagement between writer and reader, metadiscourse focuses our attention on the ways writers project themselves into their work to signal their communicative intentions. It is a central pragmatic construct which allows us to see how writers seek to influence readers’ understandings of both the text and their attitude towards its content and the audience.
Metadiscourse is defined here as those aspects of the text which explicitly refer to the organisation of the discourse or the writer’s stance towards either its content or the reader. While the term is not always used in the same way (cf. Swales, 1990: 188), discussions of metadiscourse have been heavily influenced by Halliday’s (1973) distinction between the ideational elements of a text and its textual and expressive meanings. Thus the term is used to refer to non-propositional aspects of discourse which help to organise prose as a coherent text and convey a writer’s personality, credibility, reader sensitivity and relationship to the message (Crismore et al., 1993). Metadiscourse is the author’s linguistic and rhetorical manifestation in the text in order to “bracket the discourse organisation and the expressive implications of what is being said” (Schiffrin, 1980: 231). While some analysts have narrowed the focus of metadiscourse to features of textual organisation (Mauranen, 1993; Valero-Garces, 1996) or explicit illocutionary predicates (Beauvais, 1989), such an extension draws attention to the means by which writers reveal both themselves and their communicative purposes.

Metadiscourse is a ubiquitous aspect of our everyday language, and a major feature of the ways we communicate in a range of genres and settings. Studies have suggested the importance of metadiscourse in casual conversation (Schiffrin, 1980), school texts (Crismore, 1989), science popularisations (Crismore and Farnsworth, 1990), undergraduate textbooks (Hyland, in press a), postgraduate dissertations (Swales, 1990), Darwin’s *Origin of the Species* (Crismore and Farnsworth, 1989) and company annual reports (Hyland, in press b). It appears to be a characteristic of a range of languages and genres (Mauranen, 1993; Crismore et al., 1993; Valero-Garces, 1996). It has also been shown to be a critical feature of good ESL and native speaker student writing (Intraprawat and Steffensen, 1995; Cheng and Steffensen, 1996) and an essential element of persuasive and argumentative discourse (Crismore and Farnsworth, 1990; Hyland, in press b). In summary, metadiscourse is recognised as an important means of facilitating communication, supporting a writer’s position and building a relationship with an audience.

Importantly, while there is a tendency to focus on surface forms and the effects created by writers, metadiscourse is not an independent stylistic device which authors can vary at will. It is integral to the contexts in which it occurs and is intimately linked to the norms and expectations of particular cultural and professional communities. Writing is a culturally situated social activity and effective metadiscourse use is critically dependent on a rhetorical context and the writer’s observation of appropriate interpersonal and intertextual relationships. To understand the pragmatics of metadiscourse, then, it must be located in the settings which determine its use and give it meaning.

Research writing is one domain where an orientation to the reader is crucial in securing rhetorical objectives. While often considered predominantly propositional and impersonal, the act of convincing an academic audience of the veracity of one’s arguments involves making linguistic choices which that audience will conventionally recognise as persuasive. That is, the effectiveness of these choices lies in their cognitive and cultural value to a community. Metadiscourse can therefore be seen as one means of facilitating the social interactions which contribute to knowledge pro-
duction within academic disciplines. Moreover, if metadiscourse is a type of rhetorical activity whose use and meaning is only relevant to and operative within a particular socio-rhetorical situation, it is likely to vary between such communities.

This study seeks to both investigate this prospect and demonstrate the importance of audience to metadiscourse by examining its frequency and role in 28 research articles from four academic disciplines. I begin by providing an overview of the importance of metadiscourse to academic writing in English before suggesting a taxonomy of its functions in published articles. I then go on to discuss the disciplinary differences in its use. So, in addition to offering a pragmatic characterisation of metadiscourse through a description of its use in four communities, the paper also points to some of the rhetorical knowledge competent academics in different fields must possess. By investigating their metadiscoursal practices then, the study helps to reveal some of the assumptions writers’ possess about the issues they address and the means of presenting their arguments most effectively. Analysing texts in this way can thus both help sharpen our theoretical understanding of this fuzzy term and shed light on rhetorical variations among different discourse communities.

2. A pragmatic view of academic metadiscourse

Academic communication is a social activity which functions in disciplinary cultures to facilitate the production of knowledge. Writers must organise data and observations into meaningful patterns for readers, so part of an academic’s competence involves familiarity with the conventional discursive practices of a particular disciplinary community (Bruffee, 1986; Swales, 1990, 1996). While there is now a tendency to see discourse communities as rhetorical constructs which “persist by instantiation and engagement, rather than existing through membership and collectivity” (Swales, 1993: 696), their influence on the rhetorical practices of writers is no less important. Significant genres, such as the research article (RA), are integral to a discipline’s methodology as they ensure that information is conveyed in ways that conform to its norms and ideology. Thus for writers to publish and influence their fields, they must exploit their understanding of these genres. The notion of discourse community therefore provides a means of accounting for the possibility of shared presuppositions, and the metadiscourse strategies which can be employed to evoke these.

A writer’s sense of audience is critical because gaining acceptance of academic claims involves both rational exposition and the manipulation of rhetorical and interactive features. A wealth of sociological research has shown the accreditation of knowledge to be a social process involving argumentation before an audience. If we view knowledge as “the social justification of belief” (Rorty, 1979: 170), 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, 1985). Thus academic writers seek to produce texts that realise 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: 289).

In other words, successful academic prose involves relating illocutionary acts to perlocutionary effects. A writer wants a message to be understood (an illocutionary effect or uptake) and to be accepted (a hoped for perlocutionary effect). But relating these two factors is complicated by the fact there is no independent, objective means of distinguishing observation from presumption. There is always more than one plausible interpretation for a given piece of data and readers always retain the option of rejecting the writer’s message. This need for ratification thus reveals the negatability of statements, and also the active role readers have in their construction. Metadiscourse is one indication of a writer’s response to the potential negatability of his/her claims; an intervention to engage the reader and anticipate possible objections or difficulties of interpretation. Its role in academic discourse is therefore rhetorical, concerned with galvanising support, expressing collegiality, resolving difficulties and avoiding disputation.

Opposition to statements comes from two principal sources. First, readers may reject a statement on the grounds that it doesn’t correspond to what the world is thought to be like, i.e. it fails to meet adequacy conditions (Hyland, 1996a). Claims have to display a plausible relationship with reality, and writers must take care to satisfactorily demonstrate this using the specialised rhetoric of the discourse community. In this respect, metadiscourse provides cues to the pragmatic presuppositions which help readers process the text, encoding relationships between ideas and ordering material in ways that the potential audience will find appropriate and convincing. It enables readers to recover an interpretation consistent with their epistemological understandings and discipline-specific rhetorical expectations in terms of textual coherence, intertextuality and assistance with decoding ideational material. The writer here must make assumptions about the reader’s processing abilities, contextual resources and disciplinary knowledge.

Second, statements have to incorporate an awareness of interpersonal factors, addressing acceptability conditions. Metadiscourse here attends to the need to focus on the participants of the interaction, with the writer adopting a professionally acceptable persona and a tenor consistent with the norms of the disciplinary community. In this sense metadiscourse seeks to establish an appropriate, discipline-defined balance between the researcher’s authority as expert-knower and his/her humility as disciplinary servant. This is principally accomplished through a judicious balance of tentativeness and assertion, and the expression of a suitable relationship to one’s data, arguments and audience. Mastery of the situationally appropriate rhetorical conventions of one’s discipline thus enables the writer to address an audience with skill and exhibit a professional interpersonal competence which influences the effectiveness of the argument.

In sum, metadiscourse can be seen as reflecting writers’ attempts to negotiate academic knowledge in ways that are meaningful and appropriate to a particular disciplinary community. It indicates the writer’s assessment of the cognitive demands the text makes on the reader and an acknowledgement of the community’s interpersonal conventions. Metadiscourse is thus an aspect of language which provides a link between
texts and disciplinary cultures, helping to define the rhetorical context by revealing some of the expectations and understandings of the audience for whom a text was written. Differences in metadiscourse patterns may therefore prove to be an important means of distinguishing discourse communities and accounting for the ways writers specify the inferences they would like their readers to make. Put simply, the significance of metadiscourse lies in its role in explicating a context for interpretation, and suggesting one way which acts of communication define and maintain social groups. Such considerations are integral to the study described in the next section.

3. Corpus and procedure

The corpus consists of 28 research articles written in English (totalling over 160,000 words and an average length of 5,729 words) with seven RAs from each of four academic disciplines: Microbiology, Marketing, Astrophysics and Applied Linguistics. The 28 serials (listed in the Appendix A) were nominated by specialist informants as among the leading journals in their fields, and the articles were selected at random from current issues. RAs were studied to compare texts with similar functions within a discipline and only those arguing from original data were selected to allow a comparison of linguistic features.

A conventional definition of metadiscourse was used to identify individual cases, isolating the features used to explicitly organise the text, engage the reader and signal the writer's attitude. The analysis is therefore functional rather than linguistic and recognises that many items can be either propositional or metafunctional depending on their context. Clearly, many features contribute to these objectives in a text. Thus metaphors can help focus attention, allusion is often used to forge a common bond with readers and adjective choice can convey subtle shades of affect. This analysis however focuses on explicit textual devices generally interpreted as metadiscourse, and considers other features to be propositional.

Both quantitative and qualitative approaches were used to analyse the corpus. Given the highly contextual nature of metadiscourse and the fact that a particular form can serve either a propositional or metadiscoursal function, items were coded manually rather than by computer. First a sample of articles were examined to classify instances as either textual or interpersonal metadiscourse and to devise a more delicate schema of functional subcategories. All papers then received a detailed analysis by myself and two departmental colleagues working independently to identify all metadiscourse items and code them according to the schema. An inter-rater reliability of 0.85 (Kappa) was obtained for this analysis, indicating a high degree of agreement. The features of the categorisation system and the findings of the study are discussed below.

4. A metadiscourse schema

A variety of metadiscourse taxonomies have been proposed (Beauvais, 1989; Crismore, 1989; Mauranen, 1993; Nash, 1992; Vande Kopple, 1985). The system
adopted here follows Crismore et al. (1993) in distinguishing textual and interpersonal types and further classifying more specific functions within these. This approach was seen as potentially useful as it effectively characterises the need of writers to address the conditions of adequacy and acceptability central to successful academic argument. Crismore's schema was heavily modified during analysis however to accommodate the meanings expressed in academic articles. These modifications also helped to more clearly identify rhetorical functions by eliminating formal categories and minimising functional overlap. The schema is summarised in Table 1.

Table 1
Functions of metadiscourse in academic texts

<table>
<thead>
<tr>
<th>Category</th>
<th>Function</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Textual metadiscourse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical connectives</td>
<td>express semantic relation between main clauses</td>
<td>in addition / but / therefore / thus / and</td>
</tr>
<tr>
<td>Frame markers</td>
<td>explicitly refer to discourse acts or text stages</td>
<td>finally / to repeat / Our aim here / we try</td>
</tr>
<tr>
<td>Endophoric markers</td>
<td>refer to information in other parts of the text</td>
<td>noted above / see Fig 1 / table 2 / below</td>
</tr>
<tr>
<td>Evidentials</td>
<td>refer to source of information from other texts</td>
<td>according to X / Y, 1990 / Z states</td>
</tr>
<tr>
<td>Code glosses</td>
<td>help readers grasp meanings of ideational material</td>
<td>namely / eg / in other words / such as</td>
</tr>
<tr>
<td><strong>Interpersonal metadiscourse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedges</td>
<td>withhold writer's full commitment to statements</td>
<td>might / perhaps / it is possible / about</td>
</tr>
<tr>
<td>Emphatics</td>
<td>emphasise force or writer's certainty in message</td>
<td>in fact / definitely / It is clear / obvious</td>
</tr>
<tr>
<td>Attitude markers</td>
<td>express writer's attitude to propositional content</td>
<td>surprisingly / I agree / X claims</td>
</tr>
<tr>
<td>Relational markers</td>
<td>explicitly refer to or build relationship with reader</td>
<td>frankly / note that / you can see</td>
</tr>
<tr>
<td>Person markers</td>
<td>explicit reference to author(s)</td>
<td>1 / we / my / mine / our</td>
</tr>
</tbody>
</table>

4.1. **Textual metadiscourse**

**Textual metadiscourse** refers to devices which allow the recovery of the writer's intention by explicitly establishing preferred interpretations of propositional meanings. Devices in this category help form a convincing and coherent text by relating individual propositions to each other and to other texts. Their use is dependent on the knowledge relationships between participants and the writer's assessment of what needs to be made explicit to an academic audience. It therefore represents the presence of the audience in the text in terms of the writer's awareness of processing constraints and the extent to which the writer wishes to restrict the reader's selection of alternative interpretations. Items in this category perform five broad functions.

**Logical connectives** is a term again borrowed from Crismore to refer to items, principally conjunctions, which help readers interpret pragmatic connections between ideas by signalling additive, resultive and contrastive relations in the writer's thinking. The texts were carefully examined to ensure that items performed a metadiscoursal role, helping the reader interpret links between ideas, rather than a purely syntactic role, simply contributing to well-formedness by co-ordinating sentence elements. **Frame markers** are explicit references to text boundaries or ele-
ments of schematic text structure, either introducing shifts in the discourse or preparing for the next step in the argument. This category combines several of Crismore's groups and includes items used to sequence (such as first, then, numbers and letters), to label text stages (to conclude, in sum), to announce discourse goals (I argue here, my purpose is) and to indicate topic shifts (well, now). Items in this category therefore provide interpretive framing information about longer elements of the discourse.

Endophoric markers are expressions which refer to other parts of the text (e.g. see Table 2, as noted above). These play an important role in making additional ideational material salient and therefore available to the reader in aiding the recovery of the writer’s argumentative intentions. Evidentials perform a similar metadiscoursal role by indicating the source of textual information which originates outside the current text. They therefore assist in guiding the reader’s interpretation and establishing intertextuality, capturing the need for academics to display knowledge of other texts in the field. While reporting another’s views often predicts an appraisal of that author (Tadros, 1994), it is important from a metadiscoursal viewpoint to distinguish citation from evaluation (Thomas and Hawes, 1994: 129). Citations are seen here as both reporting previous work and providing an assessment of that work. Evidentials advance the writer’s position by demonstrating an awareness of prior research and acknowledging an allegiance to the academic community. Explicit evaluation of the validity of such work is seen as contributing to the interpersonal tenor of a text and was coded as hedges, emphatics and attitude markers.

Finally, the term code gloss refers to the writer’s act of supplying additional information to ensure the reader is able to recover the writer’s intended meaning, either by explaining, comparing or expanding what has been said. Code glosses reflect the writer’s predictions about the reader’s knowledge-base or ability to understand text content and are introduced by phrases like such as, in other words, for instance, or are included in parenthesis.

4.2. Interpersonal metadiscourse

Interpersonal metadiscourse alerts readers to the author’s perspective towards both the propositional information and the readers themselves, thus contributing to a writer-reader relationship and anticipating the subjective negatability of statements. Metadiscourse here is essentially interactional and evaluative and expresses a writer’s persona, the “created personality put forth in the act of communicating” (Campbell, 1975: 394). In academic writing this is socially defined by the discourse community and influences such matters as the author’s intimacy and remoteness, the expression of attitude, degree of reader involvement, apparent commitment to propositional content and so on. This aspect thus relates to the tenor of the discourse, concerned with controlling the level of personality in a text. Again, I have identified five subcategories in my corpus.

Hedges are items such as possible, might and perhaps which mark the writer’s reluctance to present or evaluate propositional information categorically (Holmes, 1988; Hyland, 1996a,b). Emphatics such as it is obvious, definitely and of course, on the other hand, imply certainty and emphasise the force of the proposition. The
balance of these epistemic categories plays an important role in academic prose. The strength of statements not only convey the extent of the writer’s commitment to text content, but must also recognise the face needs of readers (Myers, 1989) and observe the community’s rules concerning rhetorical respect for colleagues’ views (Hyland, 1997). Hedges can thus mark statements as provisional and seek to involve readers as participants in their ratification.

**Attitude markers** express the writer’s affective attitude to textual information in a more varied way than hedges, conveying surprise, obligation, agreement, importance, and so on. **Relational markers** are devices that explicitly address readers, either by selectively focusing their attention or by including them as participants in the text situation. Both attitude and relational markers comment on propositional content and are often difficult to distinguish in practice because writers frequently indicate attitudes for interpersonal reasons. However, cases of affect are typically writer-oriented and are signalled by attitude verbs, necessity modals and sentence adverbs. Relational markers focus more on reader participation and include second person pronouns, imperatives, question forms and asides that interrupt the ongoing discourse. Finally, **person markers** reflect the importance of the degree of author presence in contributing to the variability in tenor of a text. This was simply judged by the frequency of first person pronouns and possessive adjectives to present both propositional and metadiscoursal information.

While this schema offers a comprehensive and pragmatically grounded description of the data, no taxonomy can do more than partially represent a fuzzy reality. The imposition of discrete categories on the fluidity of actual language use inevitably conceals its polypragmatic character. Thus meta- and propositional discourse cannot always be distinguished and types of metadiscourse do not exclusively perform either textual or interpersonal functions. ‘Textual’ contrastive connectives like **but** and **however**, for example, can also act interpersonally by indicating politeness or a shared emphasis when soliciting a positive response to claims (Barton, 1995). Similarly, code glosses not only reveal the writer’s assessments of shared subject matter, but also imply an authoritative position vis-a-vis the reader. These difficulties are compounded when distinguishing subcategories, so classifying hedges exclusively as uncertainty markers neglects their important affective role, while attitude markers also imply a stance towards the reader.

Such pragmatic overlap is motivated by the need to accomplish several objectives simultaneously. Academic arguments have to be won in both subjective and logical arenas which means a writer’s metadiscourse must work to establish credible propositional connections while also conveying an appropriate interactional stance. The fact that hedges and conjunctions have affective meanings as well as epistemic and connective roles simply emphasises that many devices also solicit collusion in persuasive writing. Writing effectively means anticipating the needs of readers, both to follow an exposition and to participate in a dialogue as equals, and it should be no surprise that many devices are used to perform both functions at once. A classification schema nevertheless performs a valuable role. Not only does it impose an order on disparate forms to help determine the functions that writer’s seek to perform, but it also provides a means of identifying and comparing the rhetorical patterns...
employed in different discourse communities. The patterns which emerged from the articles in my corpus are discussed below.

5. Findings

Overall, the quantitative analysis indicates the importance of metadiscourse in persuasive academic writing, with an average of 373 occurrences per paper; about one every fifteen words. It should be noted here that the calculation of devices according to a word count is not intended to represent the proportion of a text formed by metadiscourse. Clearly, metadiscourse typically has clause-level (or higher) scope and I have standardised the raw figures to a common basis merely to compare the occurrence, rather than the length, of metadiscourse in corpora of unequal sizes.

Table 2 shows that writers used more textual than interpersonal forms in this corpus, and that hedges and connectives were the most frequent devices followed by code glosses and evidentials. The numerical preponderance of textual devices emphasises the common interpretation of metatext as guiding the reading process by indicating discourse organisation and clarifying propositional connections and meanings. In particular, all disciplines showed a high use of logical connectives, despite the fact that much of the reasoning was coded grammatically rather than explicitly. The most frequent subcategory however is hedges which constitute over half of all interpersonal uses and are the only non-textual subcategory among the top ranked items. This reflects the critical importance of distinguishing fact from opinion in academic writing and the need for writers to evaluate their assertions in ways that are likely to be persuasive to their peers, presenting claims with both appropriate caution and deference to the views of their discourse community. In general, then, academic writers’ use of metadiscourse demonstrates a principal concern with expressing arguments explicitly and with due circumspection.

Turning to the comparative data, there were a number of differences and similarities in the use of metadiscourse between the four disciplines. Table 3 shows the density per 1,000 words and the percentage of total metadiscourse used per subcategory for each discipline.

As can be seen, the density of metadiscourse was remarkably similar across disciplines, although the marketing articles contained about 20% more items than papers in the other three subjects. This is largely explained by a heavier use of relational markers, framing devices and, in particular, hedges, with one hedging device every 50 words in that corpus. The density of textual markers is also broadly similar, although the comparative figures reveal that their numerical preponderance, noted above, is largely due to their high frequency in the microbiology and astrophysics articles where they constituted about 65% of all metadiscourse use. The data for interpersonal metadiscourse however shows considerable variation with the marketing articles containing over 90% more cases than those in biology. The percentages show that interpersonal forms constitute a much higher proportion of metadiscourse use in applied linguistics and marketing than in biology and astrophysics, forming about half of all examples in the former and only a third in the latter.
Table 2
Ranked metadiscourse categories (Combined disciplines)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total no. of items</th>
<th>Items per 1000 words</th>
<th>% of total metadiscourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textual</td>
<td>5721</td>
<td>35.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>4666</td>
<td>29.1</td>
<td>44.9</td>
</tr>
<tr>
<td><strong>Subcategory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedges</td>
<td>2417</td>
<td>15.1</td>
<td>23.3</td>
</tr>
<tr>
<td>Logical connectives</td>
<td>2045</td>
<td>12.8</td>
<td>19.7</td>
</tr>
<tr>
<td>Code glosses</td>
<td>1134</td>
<td>7.1</td>
<td>10.9</td>
</tr>
<tr>
<td>Evidentials</td>
<td>1109</td>
<td>6.9</td>
<td>10.7</td>
</tr>
<tr>
<td>Frame markers</td>
<td>796</td>
<td>5.0</td>
<td>7.6</td>
</tr>
<tr>
<td>Endophoric markers</td>
<td>637</td>
<td>4.0</td>
<td>6.1</td>
</tr>
<tr>
<td>Attitude markers</td>
<td>634</td>
<td>4.0</td>
<td>6.1</td>
</tr>
<tr>
<td>Person markers</td>
<td>629</td>
<td>3.9</td>
<td>6.0</td>
</tr>
<tr>
<td>Emphatics</td>
<td>627</td>
<td>3.9</td>
<td>6.0</td>
</tr>
<tr>
<td>Relational markers</td>
<td>359</td>
<td>2.2</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Grand totals</strong></td>
<td>10,387</td>
<td>64.8</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3
Metadiscourse in academic disciplines per 1,000 words (% of total)

<table>
<thead>
<tr>
<th>Category</th>
<th>Biology</th>
<th>Astrophysics</th>
<th>App. Ling</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical connectives</td>
<td>11.3 (18.8)</td>
<td>14.2 (23.7)</td>
<td>11.1 (18.1)</td>
<td>13.8 (18.7)</td>
</tr>
<tr>
<td>Frame markers</td>
<td>5.2 (8.6)</td>
<td>3.0 (5.0)</td>
<td>4.7 (7.6)</td>
<td>6.6 (9.0)</td>
</tr>
<tr>
<td>Endophoric markers</td>
<td>4.6 (7.7)</td>
<td>6.2 (10.4)</td>
<td>2.5 (4.1)</td>
<td>3.2 (4.4)</td>
</tr>
<tr>
<td>Evidentials</td>
<td>9.8 (16.2)</td>
<td>9.4 (15.5)</td>
<td>4.5 (7.3)</td>
<td>5.9 (8.0)</td>
</tr>
<tr>
<td>Code glosses</td>
<td>9.3 (15.4)</td>
<td>5.3 (8.8)</td>
<td>7.4 (12.1)</td>
<td>7.1 (9.6)</td>
</tr>
<tr>
<td><strong>Textual</strong></td>
<td>40.1 (66.8)</td>
<td>38.1 (63.4)</td>
<td>30.1 (49.2)</td>
<td>36.6 (49.7)</td>
</tr>
<tr>
<td>Hedges</td>
<td>12.2 (20.0)</td>
<td>9.9 (16.5)</td>
<td>15.7 (25.6)</td>
<td>19.9 (27.0)</td>
</tr>
<tr>
<td>Emphatics</td>
<td>3.5 (5.8)</td>
<td>3.0 (5.0)</td>
<td>4.6 (7.4)</td>
<td>4.2 (5.7)</td>
</tr>
<tr>
<td>Attitude markers</td>
<td>1.3 (2.2)</td>
<td>2.3 (3.9)</td>
<td>5.3 (8.8)</td>
<td>5.2 (7.0)</td>
</tr>
<tr>
<td>Relational markers</td>
<td>0.7 (1.2)</td>
<td>1.4 (2.4)</td>
<td>2.5 (4.1)</td>
<td>3.3 (4.5)</td>
</tr>
<tr>
<td>Person markers</td>
<td>2.4 (4.0)</td>
<td>5.3 (8.9)</td>
<td>2.9 (4.8)</td>
<td>4.4 (6.0)</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>19.9 (33.2)</td>
<td>22.0 (36.7)</td>
<td>31.0 (50.8)</td>
<td>37.0 (50.3)</td>
</tr>
<tr>
<td><strong>Grand totals</strong></td>
<td>59.9 (100)</td>
<td>60.1 (100)</td>
<td>61.1 (100)</td>
<td>73.6 (100)</td>
</tr>
</tbody>
</table>

Data for the subcategories also show substantial differences. Hedges were the most frequently occurring metadiscourse feature in all disciplines except astrophysics, where it was second behind logical connectives. Biologists used more evidentials and code glosses than other groups, physicists more endophoric markers and applied linguists more emphatics. The widest range of differences between disciplines were for the categories of relational markers, attitude markers and endophoric markers, largely as a result of particularly low frequencies in biology for the first two and high uses in astrophysics for the third. However, the greatest variability,
measured by standard deviations, was found in hedges, evidentials and attitude markers, where there was a close relationship between microbiology and astrophysics on one hand, and applied linguistics and marketing on the other.

A similar picture begins to emerge when we rank the different disciplines according to their preferred patterns of metadiscourse use (Table 4). This summary, again based on density per 1,000 words, shows that writers in biology and astrophysics not only accounted for the highest frequencies in most textual subclasses and the lowest in most interpersonal ones, but also reversed their rankings in the two major categories. This pattern was particularly evident in the use of interpersonal features, where only a relatively high use of person markers by writers in astrophysics displayed any deviation from fairly consistent rankings along these lines.

Table 4
Disciplines ranked according to use of metadiscourse categories

<table>
<thead>
<tr>
<th>Total metadiscourse</th>
<th>Textual metadiscourse</th>
<th>Interpersonal metadiscourse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>Microbiology</td>
<td>Marketing</td>
</tr>
<tr>
<td>Applied Linguistics</td>
<td>Astrophysics</td>
<td>Applied Linguistics</td>
</tr>
<tr>
<td>Astrophysics</td>
<td>Marketing</td>
<td>Astrophysics</td>
</tr>
<tr>
<td>Microbiology</td>
<td>Applied Linguistics</td>
<td>Microbiology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>connective</th>
<th>name marker</th>
<th>endophoric</th>
<th>evidentia 1</th>
<th>code gloss</th>
<th>hedge</th>
<th>emphatic</th>
<th>attitude</th>
<th>relation</th>
<th>person</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP</td>
<td>MK</td>
<td>AP</td>
<td>MB</td>
<td>MB</td>
<td>MK</td>
<td>AL</td>
<td>AL</td>
<td>MK</td>
<td>AP</td>
</tr>
<tr>
<td>MK</td>
<td>MB</td>
<td>MB</td>
<td>AP</td>
<td>AL</td>
<td>AL</td>
<td>MK</td>
<td>MK</td>
<td>AL</td>
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<tr>
<td>MB</td>
<td>AL</td>
<td>MK</td>
<td>MK</td>
<td>MB</td>
<td>MB</td>
<td>AP</td>
<td>AP</td>
<td>AL</td>
<td>AL</td>
</tr>
<tr>
<td>AL</td>
<td>AP</td>
<td>AL</td>
<td>AP</td>
<td>AP</td>
<td>MB</td>
<td>MB</td>
<td>MB</td>
<td>MB</td>
<td>MB</td>
</tr>
</tbody>
</table>

AP = astrophysics; MK = marketing; MB = Microbiology; AL = applied linguistics

6. Discussion

It is clear that the use of metadiscourse to explicitly signal text organisation, evaluate its contents and convey attitudes to readers is important in each of these academic fields, although to different degrees and in different ways. While differences in text type have been found to influence the type of metadiscourse used (e.g. Crismore and Farnsworth, 1990), these results contribute evidence to support the view that metadiscourse is a universal feature of professional rhetorical writing in English. More interestingly however, the results also indicate disciplinary variability, suggesting that academics in marketing and applied linguistics may perceive metadiscourse, particularly interpersonal metadiscourse, as more central to effective writing than those in microbiology and astrophysics. In general, interpersonal features were more frequent in these papers and represented a greater proportion of the total metadiscourse used. The astrophysics and biology data on the other hand revealed lower densities overall and a preponderance of textual forms (Tables 3, 4).
It is interesting to speculate on the reasons for these differences. It is possible, for example, that preferred uses of metadiscourse might reflect broad areas of intellectual inquiry, knowledge structures and their associated forms of discourse. Most institutionalised forms of communication are now recognised as being socially constructed and interpreted (e.g. Bhatia, in press; Myers, 1995; Swales, 1990). In other words, there is no universal means of structuring knowledge above the social practices of the particular disciplinary communities which bestow meaning, legitimacy and appropriacy on discourse forms. Research articles and other channels of academic communication are sanctioned by a consensus among community members which both constrains the use of particular discursive forms and authorises permitted variations within them. It would be surprising indeed if such constraints applied only to propositional aspects of discourse and ignored the encoding of textual and interpersonal meanings.

The different textual practices observed in this corpus therefore suggest the possibility that metadiscourse is socially authorised and contextually constrained by the disciplinary communities in which it occurs. To associate surface features of discourse with the knowledge domains and academic realities in which texts participate however requires a principled means of distinguishing disciplinary activities. While academic disciplines differ on a variety of dimensions, they can be usefully distinguished in terms of how community members see the epistemological characteristics of their knowledge forms. Research on faculty perceptions (Biglan, 1973) and learning style differences (Kolb, 1981) provide a practical set of categories based on a typology which distinguishes abstract conceptualisation (hard knowledge) and concrete experiencing (soft) on one hand, and active experimentation (applied) and reflective observation (pure) on the other. This perspective suggests some broad affinities between particular groups of knowledge fields and offers an effective means of contrasting our four disciplines.

In this framework, microbiology and astrophysics can be broadly characterised as ‘hard-pure’ disciplines. They are predominantly analytical and structuralist, concerned with quantitative model building and the analysis of observable experience to establish empirical uniformities. Explanations thus derive from precise measurement and systematic scrutiny of relationships between a limited number of controlled variables. Knowledge is characterised by relatively steady cumulative growth, predictability of problems and clear criteria of acceptability. Applied linguistics and marketing, on the other hand, fit more comfortably into the ‘soft-applied’ domain. They are typically directed towards practical ends and inquiry often involves showing how human actions influence events. Variables are therefore more varied and causal connections more tenuous. These fields tend to employ synthetic rather than analytic inquiry strategies and exhibit a more reiterative pattern of development with less scope for reproducibility (Becher, 1989: 12–17; Kolb, 1981).

While this categorisation does not capture the full complexity and variation of intra-disciplinary inquiry norms and knowledge structures, it nevertheless offers a useful representation of the contexts in which academics work and write. The division also receives support from the metadiscourse variations observed in this study,
which indicate one way in which writers may respond rhetorically to the exigencies of these differences.

The fact that scientists typically work with issues and within boundaries that are relatively clearly defined and circumscribed may suggest one reason why metadiscourse was less frequent in the ‘hard-pure’ domains. The immediate audience of a scientific paper is likely to consist of readers engaged in similar highly specialised research who can be assumed to have a particular body of understandings to draw on (Bazerman, 1985; Myers, 1989). The context is thus relatively more transparent to such audiences and they might be expected to require less guidance and author intrusion in argumentation than the more diffuse readership of soft-applied papers. The high proportion of interpersonal forms found in the applied linguistics and marketing RAs, on the other hand, suggests a different rhetorical stance. These features assist authors to both make a personal standing in the text and acknowledge an audience’s need for involvement and negotiation in knowledge-making. Their presence thus suggests that successful communication depends to a greater extent on the need to invoke an intelligent, reasoning reader and a credible, collegial writer, presenting an authorial self firmly established in the norms of the discipline.

In the hard-pure disciplines the writer’s ability to create a successful text seems to depend particularly on an ability to construct appropriate and mutually significant aspects of context through a higher use of overt intertextuality. Evidential markers help locate and justify individual contributions and the predominance of this metadiscourse form in the science articles demonstrates the importance of mobilising a web of prior knowledge to more persuasively present a claim. To a greater extent than the soft disciplines, new hard-pure knowledge is typically generated by linear growth, building on prior research which subsumes the originality of a paper in a highly structured schema of knowledge. More than writers in applied linguistics and marketing it seems, scientists must not only present the relevant facts, but also ensure that those facts are appropriately placed in the wider discipline in order to persuade colleagues of the efficacy of their claims.

Another possible reason for the differences observed may be related to the fact that genre conventions instantiate aspects of a community’s values and epistemology. An important aspect of a positivist-empirical epistemology is that the authority of the individual, and of personal relationships, is subordinated to the authority of the text. The limited use of interpersonal metadiscourse in the biology and astrophysics articles studied here may therefore reflect the textual practices of the hard-pure disciplines to construct a narrative of events which reinforces what scientists call a ‘phony story’: “a view of scientific activity as collective, inductive and cumulative” (Berkenkotter and Huckin, 1993: 499). In particular the low frequencies of attitude and relational markers in these texts compared with those in the soft-applied domains suggests a reluctance to project a prominent authorial presence in presenting claims to their target community.

In the science texts moreover, attitude markers tended to reveal the author’s opinions or character only through emphasising what readers should attend to and how
the writer would like them to respond to information (1). So while these devices sub-
ttlely display affect, their principal role in the science texts appears to be to be per-
suasive by communicating propositional attitudes and evaluation. That is, they tend
to refer to issues the writer sees as important, interesting or unexpected in order to
fit claims appropriately into the anticipated background understandings of the reader.
The soft/applied texts on the other hand tended to show far greater variability in the
use of affective signals (2):

(1) ... line emission can give an *important* additional contribution ... (AP2)
There are three key issues that *must be addressed* ... (AP3)
... concentration of Hg(II) added in the sublethal study *should have* ... (MB1)
This is a *promising approach* for improving ethanol yields, but is ... (MB7)

(2) Although *intuitively appealing*, the interaction between time pressure and ... (MK5)
The *ideal product* to use in this study would be one that is perceived as ... (MK6)
McCarty and Carter (94) were *absolutely right* in going as far as stating ... (AL1)
*It is natural to wonder why*, if /j/, /w/, and /r/ have the same status in ... (AL3)
*... this would seem to be a sensible strategy.* (AL4)

Relational markers, used to directly address or appeal to the reader, were also
sparingly employed in the hard-pure articles and appeared to exhibit field specific
conventions, performing more restricted rhetorical functions than in the soft RAs.
While writers in all four disciplines principally used these devices to capture atten-
tion and engage readers in the argument (3), there appears to be additional possibil-
ities in applied linguistics and marketing for them to help writers manifest a personal
style (4):

(3) Are these goals reachable with ground-based or balloon-based experiments? (AP2)
*One can see* the difference in the relations for maxima and minima. (AP4)
*We might say that* the very frequent diphongization of /e/ as compared ... (AL3)
*Note that* the time of incipient clump separation in our model ... (AP7)
*Consider the following excerpt* from an EC paper ... (AL7)
*To see this, note that* when there is no forward buying, some units are ... (MK1)
*Recall that* one potential explanation of the package size ... (MK6)

(4) ... could no longer reduced to enabling students (and teachers) to transmit ... (AL1)
... if we consider young people to be a different group than children (those people
we have informally polled do). (AL7)
... reflects an attempt to avoid accusations of selfishness or gluttony (socially
tantamount to ‘taking the last piece of pizza’). (MK6)
(For very readable reviews of the history of sex stereotyping and gender repre-
sentation in advertising see ...) (MK7)
A ‘phoney story’ is therefore not simply a mere representation of cold, hard data. While the fact that these biology and astrophysics articles contained fewer interpersonal forms may reflect conventions of impersonality, they were not devoid of interactional elements. In particular, the science texts displayed a considerable degree of hedging and a comparable use of personal pronouns to the soft-applied RAs.

Hedges are abundant in all 28 texts studied and clearly constitute a central aspect of academic argumentation in presenting claims for ratification. As noted above, hedges perform both epistemic and interpersonal functions, enabling writers to anticipate possible opposition to claims by expressing statements with precision, caution and humility. The fact that the science RAs tended to underrepresent interpersonal metadiscourse forms may lead us to expect fewer reader-oriented occurrences in these papers. However, this does not seem to be the case. Differentiating the two functions is, of course, hazardous due to the polypragmatic nature of surface features and the desire of writers to perform functions simultaneously. But a close analysis of a sample of RAs from each discipline did not show significant variations in the use of devices carrying mainly reader-oriented functions. This may be because experimental and statistical quantification techniques are also common in the marketing and applied linguistics literature, and the uncertainties of explaining human behaviour in terms of the quasi-empiricist orientation of these disciplines makes the use of epistemic mitigation equally essential. As much in the soft as in the hard disciplines, claims can rarely be presented as well-established truths and judgements have to be suitably hedged against possible refutation.

The science articles however do appear to include a higher proportion of attribute hedges (Hyland, 1996b: 440–441). These devices have a restricted scope and act to mitigate the connection between reality and the language used to describe it, enabling writers to precisely specify attributes by expressing the extent to which results approximate to a conventional cognitive schema:

(5) Although strength must have been virtually zero, the friction angle ... (AP7)
... their mutant phenotypes are generally rather weak ... (MB2)
... which causes about 15% of infections, particularly among the elderly. (MB4)
Temperature fluctuations are usually decomposed in spherical harmonics. (AP2)
... both fusions were expressed more or less equally in the wild-type ... (MB2)
... most but not all HCG’s are embedded in looser systems. (AP6)
... this specificity is at least partially lost in soj-spoOJ mutants. (MB2)
... enzymatic reaction gave approximately the same sensitivity of 1.4 CFU. (MB6)

Attribute hedges thus enable writers to construe a situation in terms of variations from how the discourse community conventionally structures the world. They allow deviations between the discipline’s idealised cognitive models of nature and actual instances of measured behaviour.

Clearly decisions concerning the degree of precision to employ in particular cases are at least partly influenced by Grice’s Quantity Maxim, and variations in the use of these hedges might therefore suggest different levels of tolerance for exactitude and
appropriate precision. Alternatively, and more speculatively, they may reveal disciplinary differences in the ways communities mark non-salient information and thereby invoke shared knowledge by referring to a schema of relevant knowledge. If approximators point to what can be safely taken for granted by subordinating information, their greater use in the science papers may suggest a more cohesive body of consensual knowledge than typically found in the soft-applied fields, but such a possibility remains unverified.

Turning to variations in the use of person markers, the suppression of personal agency is often considered to be a means of concealing the constructedness of accounts. However, the data revealed that astrophysics articles contained the highest frequency of person markers and that there was a large intra-discipline variability in its use. This suggests that a writer’s use of first person to intrude into an argument may be an area where a degree of freedom to manipulate conventions is permitted, allowing authors to mix ‘private intentions’ with socially recognised communicative purposes (Bhatia, 1993) and to present a personal dimension of their professional persona.

It is worth noting that in all four disciplines this explicit intrusion often co-occurs with verbs conveying reasoning or possibility, and largely performs text-internal functions. Thus writers tend to intervene to help organise the argument or to justify decisions or interpretations. Most commonly the author appears to signal text frames (6), introduce research activities (7) or indicate their attitude to methods or findings (8):

(6) In this paper we show that wild-type cyanthece sp. BH68K... (MB3)
    We now explain how and why we used the concept ... (AL 7)
    In section 2 we will discuss the problems posed by ... (AP2)

(7) we asked content-area professors at four different institutions ... (AL5)
    Hence, our proposed estimation procedure trades off ... (MK3)
    To test this we used fluorescence microscopy to examine ... (MB2)

(8) In our batch experiment glycerol proved to be a useful substrate ... (MB5)
    we were surprised that neither the main effect of diversity ... (MK6)
    We suppose that in the case of NGC7469, at the maximum ... (AP4)

Thus the first person is mainly used to construct the text and present decisions, rarely it is used to question the object studied, which is taken to be independent of personal perception. So while the use of first person appears to be variable in how writers decide to indicate intellectual activities, references to real-world phenomena are generally impersonal.

To summarise this discussion, the use of metadiscourse in these texts appears to reflect an intimate connection between discourse practices and the social organisation of disciplinary communities. How writers establish interpersonal bonds and intertextual contact displays an awareness of socially meaningful relationships particular to the shared contexts within which the generation and ratification of knowledge occurs. While the rhetorical decisions of academic writers may, on different occasions, reflect conscious choices or unreflective practices, the results presented
here suggest that what constitutes appropriate argument involves a community sen-
sitive deployment of linguistic resources to represent writers, their texts and their
readers.

7. Conclusion

I have argued above that there is an indivisible relationship between metadis-
course and its rhetorical context and that this relationship constitutes an essential
aspect of successful academic writing. Metadiscourse is seen here as critical to the
overall purpose of language use, rather than merely an adjunct to it. It is a spe-
cialised form of discourse carrying the expressive and referential functions without
which readers would be unable to contextualise a text and writers unable to gain
acceptance for their work. In other words, metadiscourse is not a subjective question
of style, but a central pragmatic feature: the means by which writers portray a disci-
plinary awareness of how best to represent themselves and their research.

This study is only a first step in examining the effects of disciplinary context on
metadiscourse and the results need to be confirmed in different disciplines and gen-
res. It suggests however that preferred uses of metadiscourse may contribute to
rhetorical patterns which reflect broad areas of intellectual inquiry and knowledge.
Such uses cannot, of course, be characterised as completely determined, but the par-
ticipation of individuals in disciplinary cultures demands an informed pragmatic
understanding of how to construct and interpret key genres. In this way academic
argument can be seen as an independent creativity shaped by accountability to
shared experience and shared conventions of discourse practices. The research
reported here therefore provides further support for the view that social relationships
within discourse communities exercise strong constraints on the use of language in
academic genres. Equally, an analysis of linguistic features such as metadiscourse,
reveal a great deal about the norms and epistemology of those who use them.

Appendix A: Journal corpus

Marketing
Marketing Science
Journal of Marketing Management
Journal of the Academy of Marketing Science
Journal of Marketing Research
Journal of Marketing
Journal of International Consumer Marketing
International Journal of Research in Marketing

Microbiology
Applied and Environmental Microbiology
Molecular Microbiology

Applied Linguistics
International Review of Applied Linguistics
Applied Linguistics
English for Specific Purposes
Research in the Teaching of English
TESOL Quarterly
System
Second Language Research

Astrophysics
Experimental Astronomy
Astrophysics and Space Science
Astronomy and Astrophysics
The Astronomical Journal
World Journal of Microbiology and Biotechnology
Current Microbiology
Journal of Industrial Microbiology
Applied Microbiology and Biotechnology
International Journal of Food Microbiology

Icarus
Astrophysical Letters and Communications
The Astrophysical Journal

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Ken Hyland is an Associate Professor at The City University of Hong Kong. He has taught EAP and applied linguistics in Britain, Sudan, Saudi Arabia, Malaysia, Papua New Guinea and New Zealand. His main research interests include academic communication, language teaching and written discourse analysis. His papers in these areas have appeared in a number of international journals including Applied Linguistics, Written Communication, ESP Journal and Language Awareness. He has a Ph.D. from the University of Queensland.