



Persuasion, Interaction and the Construction of Knowledge: Representing Self and others in Research Writing

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ABSTRACT

It is now increasingly accepted that academic knowledge is closely related to the social practices of academic communities, and particularly to their discourses. Texts are persuasive only when they employ rhetorical conventions that colleagues find convincing, and in recent years corpus analyses have helped to underpin this social constructivist position and to reveal some of the ways this is achieved. In this paper I discuss the role of interaction in this process. Based on an analysis of 240 published research papers from eight disciplines and insider informant interviews, I explore the nature of interactive persuasion in this genre. I show here the importance of interaction in academic argument, suggest some of the ways this is achieved, and indicate how these choices reflect and construct disciplinary communities.

KEYWORDS: academic writing; rhetoric; stance; engagement; interaction.

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INTRODUCTION

The view that academic writing is persuasive is not news. It dates back at least as far as Aristotle and is widely accepted by academics themselves. The ways that this persuasion is achieved however is more contentious, and raises a number of important issues, not least those concerning the relationship between reality and accounts of it, the efficacy of logical induction, and the role of social communities in constructing knowledge. In the past decade or so analyses of academic corpora have brought new empirical insights to these enduring debates in epistemology and the sociology of science, challenging the role of induction or falsification and emphasising the importance of rhetorical practices in academic persuasion.

In this paper I bring my own small contribution to the discussion. In particular, I want to look at what rhetorical interactions tell us about the ways persuasion is accomplished in academic contexts and how knowledge is socially constructed. I am interested in what this tells us about writers' ideas of appropriate writer-reader relationships and how this, in turn, contributes to knowledge-making in the disciplines.

II. THE NATURE OF ACADEMIC PERSUASION

I want to begin with a few words about academic persuasion. Academic discourse is a privileged form of argument in the modern world, offering a model of rationality and detached reasoning. It is seen to depend on the demonstration of absolute truth, empirical evidence or flawless logic, representing what Lemke (1995: 178) refers to as the discourse of 'Truth'. It provides an objective description of what the natural and human world is actually like and this, in turn, serves to distinguish it from the socially contingent. We see it as a guarantee of reliable knowledge; a form of persuasion free of the cynicism with which we view the partisan rhetoric of politics and commerce.

This view is most strongly represented by the natural sciences. The label 'scientific' confers reliability on a method and prestige on its users, it implies all that is most objective and empirically verifiable about academic knowledge. As a result it has been imitated by other areas of human inquiry which are often considered softer and more rhetorical in their forms of argument. Underlying this realist model is the idea that knowledge is built on experiment, induction, replication, and falsifiability. Scientific papers are seen as persuasive because they communicate truths which emerge from our direct access to the external world. The text is merely the channel through which scientists report observable facts. A reason, no

doubt, for the marginalization of academic literacies at universities, where writing is typically regarded as just reporting more important things that go on elsewhere.

But scientific methods provide less reliable bases for proof than commonly supposed. Although we rely on induction in our everyday lives, believing that the bus we take to work will pass by at 8am tomorrow if it has passed at 8am every day for the past week, it has been criticized by philosophers of science. They argue that induction offers probabilities rather than proof, and by moving from observations of instances to general statements about unobserved cases, scientists introduce uncertainty. Nor is the widely accepted alternative, Popper's process of 'falsification', which puts theories through experimental testing and replaces those that are defective with more verifiable ones, any more reliable. It is simply not possible to conclusively falsify a hypothesis because the observations that form the basis for the falsification must be expressed in the language of some theory, and so will only be as reliable as that theory.

The problem for scientific knowledge then, is that interpretation always depends on the assumptions scientists bring to the problem (eg Kuhn, 1970). That is, all reporting occurs within a pragmatic context and in relation to a theory which fits observations and data into meaningful patterns, so there is no secure observational base upon which any theories can be tested. As the Nobel physicist Stephen Hawking (1993:44) notes: "a theory may describe a range of observations, but beyond that it makes no sense to ask if it corresponds to reality, because we do not know what reality is independent of a theory".

In other words, there is always going to be at least one interpretation for research data and the fact we can have these competing explanations shifts attention away from the lab or the library to the ways that academics argue their claims. We have to look for proof in textual practices for producing agreement.

III. SOCIAL PRACTICES AND DISCIPLINARY INTERACTIONS

Because writers can only guide readers to a particular interpretation rather than demonstrate proof, readers always have the option of refuting their interpretations. At the heart of academic persuasion, then, is writers' attempts to anticipate possible negative reactions to their claims. To do this they must display familiarity with the persuasive practices of their disciplines, encoding ideas, employing warrants, and framing arguments in ways that their potential audience will find most convincing. They also have to convey their credibility by establishing a professionally acceptable persona and an appropriate attitude, both to their

readers and their arguments. In sum, persuasion in academic articles, as in other areas of professional life, involves the use of language to relate independent beliefs to shared experience. Writers galvanise support, express collegiality, resolve difficulties, and negotiate disagreement through patterns of rhetorical choices which connect their texts with their disciplinary cultures.

Persuasion, then, is accomplished with language. But it is language that demonstrates legitimacy. Writers must recognize and make choices from the rhetorical options available in their fields to appeal to readers from within the boundaries of their disciplines. This involves writers making evaluations about their audience and their own relationship to this audience: how they want to present their readers and themselves in relation to their topics. In other words, academics don't just produce texts that plausibly represent an external reality. They are not just talking about garlic proteins, stress fractures or brains in vats. Instead, they use language to acknowledge, construct and negotiate social relations.

In sum, claims for the significance and originality of research have to be balanced against the convictions and expectations of readers, taking into account their likely objections, background knowledge, rhetorical expectations and processing needs. I will outline below some of the principle ways in which this is achieved.

IV. METHODS AND DATA

The model of interaction in academic persuasion I discuss in this paper has emerged through a series of studies into a corpus of 240 research articles of 1.4 million words and interviews with academics. This corpus was selected to represent a broad cross-section of academic practice and comprises three papers from each of ten leading journals in eight disciplines. The fields are mechanical engineering (ME), electrical engineering (EE), marketing (Mk), philosophy (Phil), sociology (Soc), applied linguistics (AL), physics (Phy) and microbiology (Bio). These sub corpora were searched for 320 potentially productive items based on previous research, grammars and the most frequently occurring items in the texts themselves. The value of a corpus is that it gives us information about the frequency of items and how they are used. This points to systematic preferences in the ways members of different disciplines use language in their arguments and these preferences, in turn, tell us something about how writers see their readers and their disciplines.

The analyses were supplemented with interviews with experienced researcher/writers from the target disciplines to discover respondents attitudes about writing and their own discursal preferences and practices. The next sections briefly sketch out the key resources

of stance and engagement. Then I go on to discuss what differences in their use tell us about the epistemological and social beliefs of disciplinary cultures.

V. INTERACTIONS IN ACADEMIC WRITING

This research has become a heavily populated area of research in recent years and has been conducted under various labels, including *evaluation* (Hunston 1994, Hunston and Thompson 2000), *intensity* (Labov 1984), *affect* (Ochs 1989), *evidentiality* (Chafe and Nichols 1986), *hedging* (Hyland 1998), *appraisal* (Martin, 2000), and *stance* (Biber and Finegan, 1989; Conrad and Biber 2000). The expression of evaluation and stance in academic research writing has been especially productive (e.g., Bondi, 1999; Hunston 1994; Hyland, 2001a) and much of this work focuses on features such as the use of hedging devices to express tentativeness and possibility (Hyland (1998), authorial self mention (Hyland, 2001b) and reporting verbs (Thompson & Ye, 1991; Hyland, 2000). This line of research has been extended by looking at how authors actively try to involve the reader in the communication process through the use of addressee features (Hyland, 2001) and directives (Hyland 2002a).

All of these in some way address the idea of ‘positioning’ and in academic writing this means adopting a point of view to both the issues discussed in the text and to others who hold points of view on those issues. Writers have to display a competence as disciplinary insiders to be persuasive and this is, at least in part, achieved through a writer-reader dialogue which situates both their research and themselves. In other words, claims for the significance and originality of research have to be balanced against the convictions and expectations of readers, taking into account their likely objections, background knowledge, rhetorical expectations and processing needs. All this is done, as I hope to show below, within the broad constraints of disciplinary discourses.

VI. STANCE AND ENGAGEMENT

I want to suggest that interactions are accomplished in academic writing by making choices from the interpersonal systems of stance and engagement. *Stance* refers to the writer’s textual ‘voice’ or community recognised personality. This is an attitudinal, writer-oriented function and concerns the ways we present ourselves and convey our judgements, opinions, and commitments. *Engagement*, on the other hand, is reverse side of interaction. This is an alignment function, addressing the ways writers rhetorically recognise the presence of their readers to actively pull them along with the argument, include them as discourse participants, and guide them to interpretations.

Together these broad interactional macro-functions recognise that statements need to both present the writer and his or her ideas as well as anticipate readers' possible objections and alternative positions, incorporating an appropriate awareness of self and audience. There are a lot of overlaps between these uses, and both are essential to academic persuasion, but it is helpful to separate them out to see some of the differences between knowledge constructing practices in the disciplines. The key resources which realise them are summarised in Figure 1.

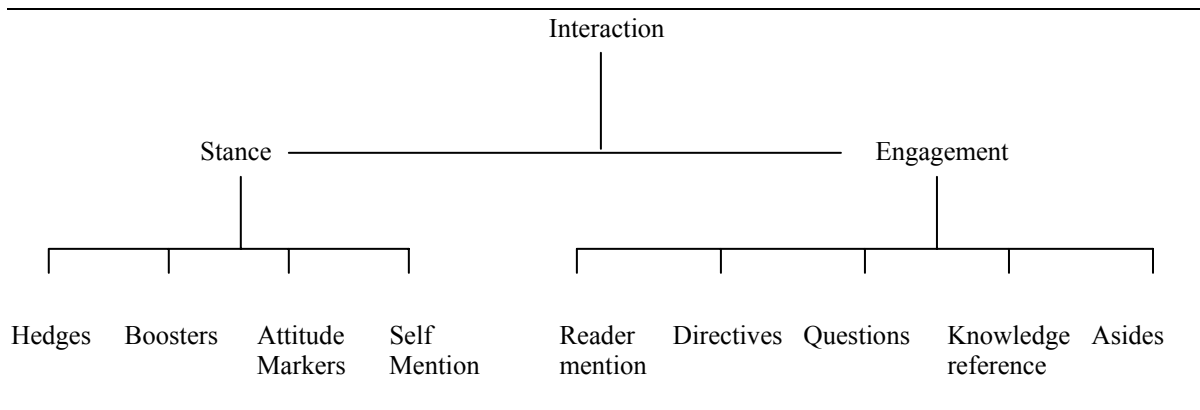


Figure 1: Interactional macro-functions and their realisations

Stance and engagement are two sides of the same coin and, because they both contribute to the interpersonal dimension of discourse, there are overlaps between them. Discrete categories inevitably conceal the fact that forms often perform more than one function at the same time for, in developing their arguments, writers are simultaneously trying to set out a claim, comment on its truth, establish solidarity and represent their credibility. In addition, the marking of stance and engagement is a highly contextual matter as writers can employ evaluations through a shared attitude towards particular methods or theoretical orientations which may be opaque to the analyst. Nor is it always marked by words at all: a writer's decision not to draw an obvious conclusion from an argument, for example, may be read by peers as a significant absence (Swales, 2004). The present study is therefore restricted to grammatical devices that express stance and engagement, identifying predominant meanings to compare the rhetorical patterns in different discourse communities.

Together these resources have a dialogic purpose in that they refer to, anticipate, or otherwise take up the actual or anticipated voices and positions of potential readers (Bakhtin, 1986). Distinguishing between these two dimensions is a useful starting point from which to

explore how voice operates and how interaction contributes to persuasion in academic discourse.

VII. STANCE AND WRITER-ORIENTED INTERACTION

As I mentioned above, Stance concerns *writer-oriented features* of interaction and conveys different kinds of personal feelings and assessments, including attitudes that a writer has about particular information, how certain they are about its veracity, how they obtained access to it, and what perspective they are taking to it and to the reader. I take it to have three main components: *evidentiality*, *affect* and *presence*. Evidentiality refers to the writer's expressed commitment to the reliability of the propositions he or she presents and their potential impact on the reader; affect involves a broad range of personal and professional attitudes towards what is said; and presence simply concerns the extent to which the writer chooses to project him or herself into the text. It is comprised of four elements: hedges, boosters, attitude markers and self mention, which I will briefly mention below. As Fig 1 shows, it is comprised of *hedges*, *boosters*, *attitude markers* and *self mention* and I will discuss each briefly in turn.

i. Hedges are devices which withhold complete commitment to a proposition, implying that a claim is based on the writer's plausible reasoning rather than certain knowledge. Essentially they indicate the degree of confidence the writer thinks it might be wise to attribute to a claim. Claims can challenge readers beliefs and research and so it's often a good idea for writers to tone down their views and avoid being too categorical in their assertions. This serves to open a discursive space for readers to dispute interpretations, as in this example from biology:

(1) We propose several possible reasons for this: (1) pressures increase upon freezing and thus may force bubbles back into solution at the time of thaw; (2) since xylem water is degassed by freezing there is a tendency for bubbles to redissolve at the time of thaw; and (3) xylem water may flow in advance of ice formation and could refill some of the previously embolized vessels. (Bio)

ii. Boosters (like *definitely*, *sure*, *prove*, *etc*), on the other hand allow writers to express certainty in what they say and to mark involvement with the topic and solidarity with readers. While they restrict opportunities for alternative voices, they also often stress shared

information and group membership as we tend to get behind those ideas which have a good chance of being accepted. Like hedges, they often occur in clusters, underlining the writer's conviction in an argument:

(2) This brings us into conflict with Currie's account, for static images surely cannot trigger our capacity to recognize movement. If that were so, we would see the image as itself moving. With a few interesting exceptions we obviously do not see a static image as moving. Suppose, then, that we say that static images only depict instants. This too creates problems, for it suggests that we have a recognitional capacity for instants, and this seems highly dubious. (Phil)

iii. Attitude markers indicate the writer's affective, rather than epistemic, attitude to propositions, conveying surprise, agreement, importance, frustration, and so on, rather than commitment. Attitude can be expressed in a wide range of ways, as Martin (2000) has attempted to show by mapping the options available to speakers in conveying *affect* in his model of *appraisal*. Attitude is most explicitly signalled by attitude verbs, sentence adverbs, and adjectives, and this marking of attitude in academic writing allows writers both take a stand and align themselves with disciplinary-oriented value positions.

(3) Certainly, I find it remarkable that even as proficient a non-native user as Yao should have introduced such an unexpected, subtle and self-evaluative question about her writing into the discussion. (AL)

iv. Self mention refers to the use of first person pronouns and possessive adjectives to present information (Hyland, 2001b). Presenting a discursal self is central to the writing process (Ivanic, 1998), and we cannot avoid projecting an impression of ourselves and how we stand in relation to our arguments, discipline, and readers. The presence or absence of explicit author reference is a conscious choice by writers to adopt a particular stance and disciplinary-situated authorial identity.

(4) This paper describes our attempt to link entropy to the second law of thermodynamics in a way accessible to students. Our primary motivation was to create a contemporary approach to entropy as the heart of a new calculus-based introductory

course we were devising. We have also found this approach to be equally useful in upper-level undergraduate courses. (Phy)

VIII. ENGAGEMENT AND READER-ORIENTED INTERACTION

In comparison with stance, the ways writers bring readers into the discourse to anticipate their possible objections and engage them in appropriate ways has been relatively neglected in the literature. Based on their previous experiences with texts, writers make predictions about how readers are likely to react to their arguments. They know what they are likely to find persuasive, where they will need help in interpreting the argument, what objections they are likely to raise, and so on. This process of audience evaluation therefore assists writers in constructing an effective line of reasoning and, like stance options, also points to the ways language is related to specific cultural and institutional contexts (Hyland, 2001). There are two main purposes to writers' uses of engagement strategies:

1. The first acknowledges the need to adequately meet readers' expectations of inclusion and disciplinary solidarity. Here we find readers addressed as participants in an argument with reader pronouns and interjections.
2. The second purpose involves rhetorically positioning the audience. Here the writer pulls readers into the discourse at critical points, predicting possible objections and guiding them to particular interpretations with questions, directives and references to shared knowledge.

Again, these two functions are not always clearly distinguishable, as writers invariably use language to solicit reader collusion on more than one front simultaneously. They do, however, help us to see some of the ways writers project readers into texts and how this is done in different disciplines. There are five main elements to engagement: *reader pronouns, personal asides, references to sharedness, directives and questions*.

i. Reader pronouns offer the most explicit ways of bringing readers into a discourse. But while *you* and *your* are the clearest way a writer can acknowledge the reader's presence these forms are rare in academic writing, probably because they imply a separation between writer and reader. Instead, there is enormous emphasis on binding participants together through the use of inclusive *we*. There are several reasons for using this form, but most

centrally it identifies the reader as someone who shares similar interests or ways of seeing to the writer as a member of the same discipline. We can see this example:

(5) Our investigation of writing at the local government office comprised an analysis of the norms and attitudes of each individual. We asked the different employees about their norms concerning a good text and a good writer. We also asked them about their attitudes toward writing at work. What we found interesting about this context, however, is the degree of uniformity of their norms and attitudes. (Soc)

ii. Directives are mainly expressed through *imperatives* and *obligation modals* and they direct readers to engage in three main kinds of activity:

- **textual acts:** direct readers to another part of the text or to another text (*see Smith 1999, refer to table 2, etc.*)
- **physical acts** direct readers how to carry out some action in the real-world (e.g. *open the valve, heat the mixture*).
- **cognitive acts** instruct readers how to interpret an argument, explicitly positioning readers by encouraging them to *note, concede* or *consider* some argument or claim in the text.

iii. Personal asides allow writers to address readers directly by briefly interrupting the argument to offer a comment on what has been said. By turning to the reader in mid-flow, the writer acknowledges and responds to an active audience, often to initiate a brief dialogue that is largely interpersonal, adding more to the writer-reader relationship than to propositional development:

(6) And - as I believe many TESOL professionals will readily acknowledge - critical thinking has now begun to make its mark, particularly in the area of L2 composition.

(AL)

He above all provoked the mistrust of academics, both because of his trenchant opinions (often, it is true, insufficiently thought out) and his political opinions.(Soc)

iv Appeals to shared knowledge are marked by explicit signals asking readers to recognise something as familiar or accepted. These constructions of solidarity ask readers to identify

with particular views and in so doing construct readers by assigning to them a role in creating the argument, acknowledging their contribution while moving the focus of the discourse away from the writer to shape the role of the reader:

(7) Tillage as a form of soil disturbance is well known to disrupt hyphal networks and reduce colonization by arbuscular mycorrhizas (Bio)

This tendency obviously reflects the preponderance of brand-image advertising in fashion merchandising. (Mkt)

v. *Questions* are the main strategy of dialogic involvement, inviting engagement, encouraging curiosity and bringing interlocutors into an arena where they can be led to the writer's viewpoint (Hyland, 2002b). Over 80% of questions in the corpus, however, were rhetorical, presenting an opinion as an interrogative so the reader appears to be the judge, but actually expecting no response. This is most apparent when writers answer their question immediately:

(8) Why did impoverished and almost defenseless shantytowns emerge as the center of resistance to authoritarian rule? Why did shantytown residents risk arrest, torture, and even death to fight a regime they seemed to have so little chance of defeating? Why did protests center in some shantytowns, but not others? (Soc)

The process of audience evaluation involved in making choices from the options of stance and engagement clearly assists writers to construct an effective argument, but in addition, it reveals something of how language is related to specific institutional contexts. In the remainder of this paper I explore what these choices tell us about disciplinary communities.

IX. DISCIPLINARY VARIATIONS

Overall there were about 80 stance and engagement features in each paper, about one every 28 words. Table 1 shows that stance markers were about five times more common than engagement, and hedges dominated the frequencies. Questions, knowledge references and aside were less common.

Stance	Items per 1000 words	% of total	Engagement	Items per 1000 words	% of total
Hedges	14.5	46.6	Reader pronouns	2.9	49.1
Attitude Markers	6.4	20.5	Directives	1.932.3	
Boosters	5.8	19.2	Questions	0.58.5	
Self Mention	4.2	13.7	Shared knowledge ref	0.58.2	
			Asides	0.11.9	
Totals	30.9	100		5.9	100

Table 1: Stance and Engagement features in the research articles

Some idea of the significance of these frequencies can be gained by comparing them with other common features of academic writing. The Longman Grammar of spoken and written English (Biber et al, 1999), for example, gives figures of 18.5 cases per thousand words for passive voice constructions and 20 per thousand words for past tense verbs. These overt interaction markers can therefore be seen as an important element of academic prose.

Perhaps more interesting however are the disciplinary distributions. Table 2 shows the density of features in each discipline normalised to a text length of 1,000 words. As can be seen, the more discursive ‘soft’ fields of philosophy, marketing, sociology and applied linguistics contained the highest proportion of interactional markers with some 75% more items than the engineering and science papers.

Feature	Phil	Soc	AL	Mk	Phy	Bio	ME	EE	Total
Stance	42.8	31.1	37.2	39.5	25.0	23.8	19.8	21.6	30.9
Hedges	18.5	14.7	18.0	20.0	9.6	13.6	8.2	9.6	14.5
Attitude Mkrs	8.9	7.0	8.6	6.9	3.9	2.9	5.6	5.5	6.4
Boosters	9.7	5.1	6.2	7.1	6.0	3.9	5.0	3.2	5.8
Self Mention	5.7	4.3	4.4	5.5	5.5	3.4	1.0	3.3	4.2
Engagement	16.3	5.1	5.0	3.2	4.9	1.6	2.8	4.3	5.9
Reader ref	11.0	2.3	1.9	1.1	2.1	0.1	0.5	1.0	2.9
Directives	2.6	1.6	2.0	1.3	2.1	1.3	2.0	2.9	1.9
Questions	1.4	0.7	0.5	0.3	0.1	0.1	0.1	0.0	0.5
Shared knowledge	1.0	0.4	0.6	0.4	0.5	0.1	0.3	0.4	0.5
Asides	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Totals	59.1	36.2	42.2	42.7	29.9	25.4	22.6	25.9	36.8

Table 2: Stance and engagement features by discipline (per 1,000 words)

I do not want to dwell on these frequencies, but it is clear that writers in different disciplines represent themselves, their work and their readers in different ways, with those in the humanities and social sciences taking far more explicitly involved and personal positions

than those in the science and engineering fields. We do not have to search far for an explanation for this. As I noted at the beginning of this paper, the resources of language mediate their contexts, working to construe the characteristic structures of knowledge domains and argument forms of the disciplines that create them. Most centrally, these discourse conventions embody the particular sets of values, practices and beliefs which are held by, and help define, academic disciplines.

In broad terms, rhetorical practices are inextricably related to the purposes of the disciplines. Natural scientists tend to see their goal as producing public knowledge able to withstand the rigours of falsifiability and developed through relatively steady cumulative growth. This is Kuhn's 'normal science'. The fact that this research often occupies considerable investments in money, training, equipment, and expertise means it is frequently concentrated at a few sites and commits scientists to involvement in specific research areas for many years. Problems therefore emerge in an established context so that readers are often familiar with prior texts and research, and that the novelty and significance of contributions can be easily recognised. The people who read these papers are often working on the same things and are familiar with the earlier work. They have a good idea about the procedures used, whether they have been properly applied, and what results mean. This helps reinforce a view of science as an impersonal, inductive enterprise and allows scientists to see themselves as discovering truth rather than constructing it.

The soft-knowledge domains, in contrast, are more explicitly interpretive, producing discourses which often recast knowledge as sympathetic understanding, promoting tolerance in readers through an ethical rather than cognitive progression (Hyland, 2000). Because researchers work with human subjects there are greater possibilities for varied outcomes so writers can't take as much for granted. They have to spell things out, and work harder to establish their credibility and to create an understanding with readers. Personal credibility, getting behind your arguments, plays an important part in creating a convincing discourse in the humanities and social sciences.

X. AUTHORIAL INVOLVEMENT IN KNOWLEDGE CONSTRUCTION

While there are clear dangers in reifying the ideologies of practitioners, these broad ontological representations have real rhetorical effects which are clear in the use of stance markers and particularly apparent in the use of hedges and self mention.

Both hedges and boosters tended to be more common in the humanities and social science papers with about 2½ times as many devices overall and hedges particularly strongly represented. This is mainly because the soft-knowledge fields are typically more interpretative and less abstract than the hard sciences and their forms of argument rely more on a dialogic engagement and more explicit recognition of alternative voices. Research is influenced far more by contextual factors, there is less control of variables, more diversity of research outcomes, and generally fewer unequivocal bases for accepting claims. Writers in the soft fields cannot therefore report their research with the same confidence of shared assumptions. They must rely far more on focusing readers on the claim-making negotiations of the discourse community, the arguments themselves, rather than relatively unmediated real-world phenomena.

One consequence of this is that arguments have to be expressed more cautiously in the soft disciplines, remaining open to heteroglossic diversity in the community by using more hedges:

(9) Wilson leaves us disappointed, it seems to me, in the sense that his theory is far from being general. (Soc)

We tentatively suggest that The Sun's minimalist style creates an impression of working-class language, or restricted code, while the very wordy Times themes remind one of academic, formal discourse. (AL)

But because methods and results are more open to question, writers also work harder to establish the significance of their work against alternative interpretations. This means they have to restrict possible alternative voices by using boosters. This comment from an informant typifies this view:

Its often a good idea to present ideas confidently so that people take you seriously.

(Phil interview)

I'm very much aware that I'm building a façade of authority when I write, I really like to get behind my work and get it out there. Strong. Committed. That's the voice I'm

trying to promote, even when I'm uncertain I want to be behind what I say. (Soc interview)

This kind of commitment is evident in these extracts:

(10) It is certainly true that many arguments involve multiple premises. (Phil)

This particular result is undoubtedly attributable to the impending incorporation of Hong Kong into the People's Republic of China. (Mk)

In the hard sciences positivist epistemologies mean that the authority of the individual is often subordinated to the authority of the text and facts are meant to 'speak for themselves' (Hyland, 1998). Writers generally seek to disguise both their interpretative responsibilities and rhetorical identities behind linguistic objectivity. The less frequent use of hedges and boosters is one way of minimising the researcher's role in this process. This is also achieved through a preference for modal verbs over cognitive verbs such as *think*, *believe* and *suspect*, as modals can downplay the person making the evaluation and more easily be combined with inanimate subjects. So instead of examples like those in (11), we tend to find more like those in (12):

(11) I think this would be a mistake. (Soc)

we suspect that the type of product used in this study may have contributed to the result. (Mkt)

(12) The theory given above simply provided some insight into the various mechanisms that might or might not yield a polarimetric effect. (Phy)

For *V. trifidum*, ANOVA showed a significant increase from L to L' and FI, which could be interpreted as reflecting the dynamics of fungal colonization. (Bio)

Two scientist informants commented on this kind of use:

Of course, I make decisions about the findings I have, but it is more convincing to tie them closely to the results. (Phy interview)

You have to relate what you say to your colleagues and we don't encourage people to go out and nail their colours to the mast as maybe they don't get it published.

(Bio interview)

Self mention is also less common in the sciences, and for similar reasons as writers often downplay their personal role to suggest that results would be the same whoever conducted the research. They are concerned with generalisations rather than individuals and with strengthening the objectivity of their interpretations. By subordinating their own voice to that of nature, they put greater burden on the methods, procedures and equipment used. As this biologist told me:

I feel a paper is stronger if we are allowed to see what was done without 'we did this' and 'we think that'. Of course we know there are researchers there, making interpretations and so on, but this is just assumed. It's part of the background. I'm looking for something interesting in the study and it shouldn't really matter who did what in any case.

(Bio interview)

In contrast, in the humanities and social sciences the first person allows writers to strongly identify with a particular argument and to gain credit for an individual viewpoint. The first person sends a clear indication to the reader that this is a personal perspective which distinguishes the writer's work from that of others. As a result, 69% of all cases were in the humanities and social science papers, with an average of 38 per article, compared with only 17 in science and engineering. Here are two examples:

(13) I argue that their treatment is superficial because, despite appearances, it relies solely on a sociological, as opposed to an ethical, orientation to develop a response.

(Soc)

I bring to bear on the problem my own experience. This experience contains ideas derived from reading I have done which might be relevant to my puzzlement as well as my personal contacts with teaching contexts.

(AL)

While the first person assists soft discipline authors to make a personal standing in their texts and to demarcate their own work from that of others, hard science writers are generally seeking to downplay their personal role in the research to highlight the phenomena under

study, the replicability of research activities, and the generality of the findings. Research usually consists of conducting experiments to propose solutions to specific disciplinary problems and typically involves familiar procedures, broadly predictable outcomes, and relatively clear criteria of acceptability. By electing to adopt a less intrusive or personal style, they suggest that research outcomes are unaffected by individuals, strengthening the objectivity of their interpretations and subordinating their own voice to that of nature. Two respondents expressed this view clearly:

Using 'I' emphasizes what you have done. What is yours in any piece of research. I notice it in papers and use it a lot myself. (Soc interview)

The personal pronoun 'I' is very important in philosophy. It not only tells people that it is your own unique point of view, but that you believe what you are saying. It shows your colleagues where you stand in relation to the issues and in relation to where they stand on them. It marks out the differences. (Phil interview)

XI. PARTICIPANT RELATIONSHIPS AND INTERPERSONAL ENGAGEMENT

In addition to creating an impression of authority and credibility through stance choices, writers also highlight or downplay the presence of their readers in the text. Engagement devices refer to the various ways writers bring readers into the discourse to relate to them and anticipate their possible objections. As we saw in Table 2, engagement devices were far less frequent than stance items, but showed similar variation across disciplines.

Reader pronouns were the most frequent engagement items in the corpus and over 80% of these occurred in the soft knowledge disciplines where they appealed to scholarly solidarity. Here writers emphasised mutual, discipline-identifying understandings linking writer and reader:

(14) Adopting a reflexive and continuously critical approach towards ourselves and our sociological practices is especially necessary because our profession is an all-embracing calling that penetrates our self and collective identities, and serves for many of us as a functional equivalent of ideology or civil-religion. (Soc)

Claiming communality in this way is important to writers in the discursive fields, as several of my informants noted:

I suppose 'we' helps to finesse a positive response – we are all in this together kind of thing. I use it to signal that I am on the same wavelength, drawing on the same assumptions and asking the same questions. (Mkt Interview)

It helps to locate you in a network. It shows that you are just doing and thinking what they might do and think. Or what you would like them to, anyway. (Soc interview)

By weaving the potential point of view of readers into the discourse, writers are able to claim collegiality and authority as they anticipate reader objections, stepping in to voice their concerns and views. Thus *we* claims authority as well as collegiality, helping to guide readers through an argument and towards a preferred interpretation, as can be seen here:

(15) Now that we have a plausible theory of depiction, we should be able to answer the question of what static images depict. But this turns out to be not at all a straightforward matter. We seem, in fact, to be faced with a dilemma. Suppose we say that static images can depict movement. This brings us into conflict with Currie's account, ... (Phil)

Several of my informants were well aware of this more Machiavellian purpose:

Part of what you are doing in writing a paper is getting your readers onside, not just getting down a list of facts, but showing that you have similar interests and concerns. That you are looking at issues in much the same way they would, not spelling everything out, but following the same procedures and asking the questions they might have. (Bio interview)

I often use 'we' to include readers. I suppose it brings out something of the collective endeavour, what we all know and want to accomplish. I've never thought of it as a strategy, but I suppose I am trying to lead readers along with me. (ME interview)

There was an even greater disciplinary imbalance with the use of questions, which were almost exclusively confined to the soft fields. Here they served to structure the text and rhetorically position of readers. Over 80% of questions in the corpus were rhetorical, presenting an opinion as an interrogative, but responding to a question immediately, simultaneously initiating a dialogue to engage readers and closing it to present a claim:

(16) Does the Brain-in-a-vat thereby succeed in including the relation in which it stands to its environment in the extension of its term 'the delusive relation'? There are, I think, compelling reasons to say that it does not. (Phil)

What do these two have in common, one might ask? The answer is that they share the same politics. (AL)

The fact they reach out to readers was seen as a distraction by my science informants:

Questions are quite rare in my field I think. You might find them in textbooks I suppose, but generally we don't use them. They seem rather intrusive, don't they? Too personal. We generally prefer not to be too intrusive. (ME interview)

I am looking for the results in a paper, and to see if the method was sound. I am looking for relevance and that kind of dressing is irrelevant. People don't ask questions as it would be seen as irrelevant. And condescending probably. (EE interview)

In contrast the soft knowledge writers saw them as an important way of relating to readers:

In my field that's all there are, questions. Putting the main issues in the form of questions is a way of presenting my argument clearly and showing them I am on the same wavelength as them. (Phil interview)

Often I structure the argument by putting the problems that they might ask. (Mkt interview)

Finally, directives were the only interactive feature which occurred more frequently in the science and engineering papers than those in the humanities and social sciences. Generally, explicit engagement is a feature of the soft disciplines, where writers are less able to rely on the explanatory value of accepted procedures, but directives are a potentially risky tactic as they instruct readers to act or see things in a certain way. As a result, most directives in the soft fields were textual, directing readers to a reference rather than informing them how they should interpret an argument.

(17) *See Steuer 1983 for a discussion of other contingencies' effects.*

(Mkt)

Look at Table 2 again for examples of behavioristic variables. (Mkt)

For transcription conventions refer to the Appendix. (AL)

Two of my respondents noted this in their interviews:

I am very conscious of using words like 'must' and 'consider' and so on and use them for a purpose. I want to say 'Right, stop here. This is important and I want you to take notice of it'. So I suppose I am trying to take control of the reader and getting them to see things my way. (Soc interview)

I am aware of the effect that an imperative can have so I tend to use the more gentle ones. I don't want to bang them over the head with an argument I want them to reflect on what I'm saying. I use 'consider' and 'let's look at this' rather than something stronger. (AL interview)

The more linear and problem-oriented approach to knowledge construction in the hard knowledge fields, on the other hand, allows arguments to be formulated in a highly standardised code. This helps explain why cognitive directives, potentially the most threatening type, were overwhelmingly predominant in the natural science corpus. These explicitly position readers by leading them through an argument to the writer's claims (18) or emphasising what they should attend to in the argument (19):

(18) Consider a sequence of batches in an optimal schedule. (EE)

... a distinction must be made between cytogenetic and molecular resolution. (Bio)

(19) What has to be recognised is that these issues ... (ME)

It is important to remember that primary electrons induce x rays.

(Phy)

This facilitates succinctness and an economy of expression highly valued by space-conscious editors and information-saturated scientists as several informants noted:

I rarely give a lot of attention to the dressing, I look for the meat—the findings - and if the argument is sound. If someone wants to save me time in getting there then that is fine. No, I'm not worried about imperatives leading me through it. (EE interview)

I'm very conscious of how I write and I am happy to use an imperative if it puts my idea over clearly. Often we are trying to work to word limits anyway, squeezing fairly complex arguments into a tight space. (ME interview)

XII. CONCLUSIONS

These different features, taken together, are important ways of situating academic arguments in the interactions of members of disciplinary communities. They represent relatively conventional ways of making meaning and so elucidate a context for interpretation, showing how writers and readers make connections, through texts, to their disciplinary cultures. My claim has been that effective academic writing depends on rhetorical decisions about interpersonal intrusion and I have suggested a model which attempts to show how writers select and deploy community-sensitive linguistic resources to represent themselves, their positions and their readers. My picture of these interactions, however, has been painted with a very broad brush, focusing on general categories of interaction and broad domains of academic endeavour. There are certainly more fine-grained distinctions to be made, both among these resources and disciplines, which are likely to offer further insights into the rhetorical options available to writers and the patterns of effective persuasion employed by different communities.

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