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PRUDENCE, PRECISION, AND POLITENESS: HEDGES IN ACADEMIC WRITING

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Academic knowledge is now generally recognised to be a social accomplishment, the outcome of a cultural activity shaped by ideology and constituted by agreement between a writer and a potentially skeptical discourse community. A substantial literature has shown that the research paper is a rhetorically sophisticated artifact which displays a careful balance of factual information and social interaction (eg. Bazerman, 1988; Swales, 1990). Academic writers do not only need to make the results of their research public, but also persuasive, and their success in gaining acceptance for their work at least partly depends on manipulating various rhetorical and interactive features. The linguistic resources used to achieve these interpersonal goals have been variously described under the headings of *evaluation* (Hunston & Thompson, 2000), *appraisal* (Martin, 2000), *stance* (Hyland, 1999a) and *metadiscourse* (Crismore, 1989), and one of the key elements examined for their contribution to the negotiation of a successful writer-reader relationship are hedges.

Hedges are the means by which we express tentativeness and possibility, and they are crucial to academic writing where statements are rarely made without subjective assessments of their reliability. As these examples taken from research articles suggest, hedges are a significant resource for anticipating a reader's possible rejection of a proposition and for presenting claims with precision and caution:

> (1) This insertion, which we suspect is the membrane anchor, could associate peripherally with the membrane or might span half the bilayer... (Biology)

> However, it seems likely that the context in which these students study is important in understanding the results. (Applied Linguistics)

> It then seems possible that two types of nucleation behaviour are taking place. These may possibly correspond to nucleation on the substrate surface… (Physics)

The hedges (underlined) indicate interpretations and allow writers to convey their attitude to the truth of the statements they accompany, thereby presenting unproven claims with prudence and softening categorical assertions. In a context where the accreditation of knowledge depends on the consensus of the research community, the need to evaluate evidence, comment on its reliability, and avoid potentially hostile responses, can contribute to gaining the acceptance of research claims.

Because hedges are an important rhetorical device in acknowledging the reader's role in ratifying claims, a better understanding of them can provide insights into the interactional nature of academic writing and the ways that writers persuade readers of their arguments. In this paper I draw on interviews with professional academics, all of whom write and read journal articles, and a series of analyses (Hyland, 1998a; 1998b; 2000) to provide an overview of hedging in the this genre, describing what it is, why it is used, and how it is signaled. First I will briefly outline the role of hedges.

WHAT IS HEDGING?

Hedging has been a subject of interest to linguists since Lakoff (1972) first used the term to describe "words whose job it is to make things more or less fuzzy". Essentially it represents an absence of certainty and is used to describe any linguistic item or strategy employed to indicate either *a)* a lack of commitment to the truth value of an accompanying proposition or *b)* a desire not to express that commitment categorically (Hyland, 1998: 1).

In academic writing hedges signal a writer's anticipation of the possibility of opposition to his or her statements, but it often difficult to pin down precisely what the writer intends. Indeterminacy is a widely recognised feature of modal semantics (eg. Coates, 1983) and attributing a particular function to any given form is hazardous. However, while there is inevitably some overlap, hedges serve three main functions in gaining reader acceptance of claims (Hyland, 1998a).

First hedges allow writers to express propositions with greater precision in areas often characterised by rapid reinterpretation. Hedging here is an important means of attesting to the degree of precision or reliability of a claim and accurately stating uncertain statements with appropriate caution. In the sciences in particular, writing is a balance of fact and evaluation as the writer tries to present information as fully, accurately and objectively as

possible. So writers often say "*X may cause Y*" rather than "*X causes Y*" to specify the actual state of knowledge on the subject.

> (2) Inflation of hyphae during bending may cause a redistribution of the network of narrow hyphae to points where they hyphal length only in the outer flank. (Biology)

> One reason which might exaggerate the solicitors' apparently low usage of Lexis could be the fact that they tend to rely on support staff,… (Sociology)

Hedges here distinguish the actual from the potential, or the known from the inferential, and imply that a proposition is based on the writer's plausible reasoning rather than certain knowledge. Readers are expected to understand that the proposition is true as far as can be determined.

The second reason for using hedges concerns the writers desire to anticipate the possible negative consequences of being proved wrong and the eventual overthrow of a claim (Hyland, 1998; Salager-Meyer, 1994). Academic reputations are built on making novel, interesting, and plausible contributions to knowledge, which means stating the strongest claims possible for any particular evidence. However, writers also need to protect themselves against the hazardous consequences of overstatement. Hedges here help writers avoid personal responsibility for statements in order to protect their reputations and limit the damage which may result from categorical commitments. This usage follows Lakoff in associating hedges with "fuzziness", but I am using the term fuzziness here not to describe connections *between propositions*, but the ways that hedges can blur the relationship *between a writer and a proposition* when referring to speculative possibilities.

One way writers achieve this is to employ evaluative *that* structures with modal devices and non-agentive subjects (Hyland & Tse, 2005). Most commonly this involves use of dummy it (3) or 'abstract rhetors', which attribute judgments to inanimate sources (4):

> (3) Although the error increases when 1/1 is less than 0.01 or larger than 1.0, it seems that the ratio d/1 in the range from 0.01 to 1.0 gives accurate, stable results. (Mechanical Engineering)

> … it appears that sponsorship may generate higher levels of awareness and may lead to the association of a wider range of attributes with the brand promoted. (Business Studies)

> (4) Thermodynamic data suggest that the radionuclide 210 Pb, 212 Pb, 234 U, and 238 U are totally associated with particles in power plants... (Electronic Eng)
> The model implies that the function of grana is to shield varying amounts of… (Biology)

In the sciences writers may hedge in this way because of preliminary results, small samples, doubtful evidence, uncertain predictions, imperfect measuring techniques, and other uncertainties in the experimental process.

Finally, hedges contribute to the development of a writer-reader relationship, addressing the need for respect and cooperation in gaining readers' ratification of claims. Mitigating the force of speech acts is common in conversation where it has been linked to the expression of deference or strategic politeness. In research articles, however, writers must consider both the reader's role in accrediting knowledge, and the need to conform to community expectations on limits of self-assurance. Categorical assertions leave no room for dialogue and are inherently face-threatening as they suggest that the arguments need no feedback and relegate the reader to a passive role. By explicitly referring to themselves as the source of the claim, often with a cognitive or discourse verb, writers are able to mark the statement as one possible position, an alternative view rather than a definitive statement of truth, and thereby indicate a personal opinion awaiting verification:

> (5) We suggest that antecedent variables can be conceptualized as comprising three distinct levels. (Marketing)

> I believe that the incentives argument for inequality represents a distorted application of the difference principle. (Philosophy)

Here hedges appeal to readers as intelligent colleagues, capable of deciding about the issues, and indicate that statements are provisional, pending acceptance by one's peers.

In sum, while there is considerable overlap in these functions and it is often impossible to identify a single motivation for every example, hedging looks three ways: towards the proposition, the writer and the reader.

EXTENT AND DISTRIBUTION OF HEDGING

Given this multi-functional importance, it is not surprising to find academic writing extensively hedged. The literature suggests considerable variability the distribution of hedging across different academic genres however, with greater concentrations in more rhetorical and persuasive types of texts. Salager-Meyer (1994), for instance, shows that editorials and review articles are more heavily hedged than research papers and medical case reports, while genres that present information as accredited knowledge, such as undergraduate textbooks (Myers, 1992) or popular science articles (Fahnestock, 1986), contain fewer hedged propositions.

Several studies have described how levels of certainty are affected by the transformation of statements from new claims in research articles to accredited facts in textbooks. Myers (1992), for instance, observes that textbooks contain a higher proportion of unmodified assertions because they essentially deal with "arranging currently accepted knowledge into a coherent whole" rather than seeking agreement for new claims (Myers, 1992: 9). When qualifications are omitted the result is both greater certainty and less professional deference, reflecting a different attitude to information and readers. The textbook author does not have to persuade an expert audience of a new interpretation or anticipate the consequences of being proved wrong because most claims are presented as accredited facts.

As a result, a comparison of articles and university textbooks in the same three disciplines found that hedges were almost three times more common in the former (Hyland, 1999b). The examples below suggest how statements are differently treated in the two genres. As can be seen, claims about similar issues carry heavier qualification in the articles, revealing the writers' awareness of both the limitations of knowledge and the possibility of expert refutation:

> (6) Transferring the information contained in DNA to form a functional enzyme occurs through protein synthesis, a process accomplished in two stages –transcription and translation. (Biology textbook)
>
> It therefore seems likely that these genes may contribute to a general chromosome-partitioning mechanism of wide importance. (Biology article)
>
> (7) Thus, peer writing conferences foster more exploratory talk, promote cognitive conflict, encourage students to take a more active role in their own

> learning processes and enable students to recognise the impact of their own writing on others. (Applied linguistics textbook)

> It would appear that student writers need more than facts and processes to write successfully and as reviewers need specific techniques if they are to provide useful critiques to each other. (Applied linguistics article)

> (8) Consumers reflect their culture, its style, feelings, value systems, attitudes, beliefs and perceptions. (Marketing textbook)

> It is likely that the variance in consumers' socialisation experiences, in part, directs a shopper's affinity towards certain shopper roles. (Marketing article)

Textbooks do not eschew hedges altogether, of course, and authors frequently use them when they speculate about the future or generalize, or where they seek to clearly distinguish the false assumptions of the past from the certainties of the present, contrasting qualification and emphatics as in this extract:

> (9) It was argued that the simple sporangiospores of the zygomycetes could be developed after only a short period, while the more elaborate fruit bodies of the ascomycetes would require a longer build-up, and the even larger basidiomata of the Coprini would need the longest preparation of all (...). We now know that the various components of the substrate are far from exhausted after the initial flushes of growth and sporulation. What has really happened is that *Coprinus* has seized control by suppressing most of the other fungi. Hyphae of *Coprinus* are actually… (Biology textbook)

Frequencies of hedges, however, do not approach those of research articles. In a study of 26 research articles taken from leading journals in cell and molecular biology consisting of 75,000 words (Hyland, 1998a), for example, I found that hedging represented more than one word in every 50, or about one hedge every two or three sentences. Hedging is also a common feature of scientific letters, a rapid circulation genre of fast-moving scientific specialisms such as physics, chemistry and Microbiology. In a corpus of 90 texts, comprising 143,000 words, hedges averaged 12 per 1,000 words (Hyland, 2000). Nor is hedging restricted to the sciences. In a 330,000 words corpus of 56 articles from eight widely different disciplines, they averaged 14.6 per 1,000 words, or about 85 cases per paper, with *may*, *would* and *possible* comprising the most frequent forms (Hyland, 1999a).

The relative significance of these frequencies can be better appreciated if we compare them with other common features of published academic writing. Biber et al (1999), for instance, give figures of 18.5 cases per thousand words for passive voice constructions and 20 per thousand words for past tense verbs. Hedges can therefore be seen as an important element of academic prose and a number of individual hedges are among the highest frequency content words in academic writing.

HEDGING IN RESEARCH ARTICLES: DISCIPLINARY DIFFERENCES

Hedges are complex textual signals by which writers personally intervene into their discourse to evaluate material and engage with readers. Their presence or absence in a text might therefore be seen as the choices of individual researchers to represent themselves more or less explicitly in their writing, either adopting a clear authorial presence or linguistically suppressing this identity. Clearly these choices are to some extent influenced by individual personality factors, such as self-confidence and experience, and we often regard them as automatic aspects of writing. However, all acts of communication carry the imprint of their contexts, and in academic writing, individual's decisions are socially shaped and constrained by the possibilities made available to them by the discourse conventions of their disciplines.

Research in the social construction of knowledge has shown that knowledge is a cultural product, influenced by the practices of discourse communities and constituted, not just conveyed, by writing (eg. Kuhn, 1970). Academics negotiate the status of their knowledge claims with their peers largely through the medium of research articles, and success at least partly depends on readers being persuaded by a writer's systematic appeal to specific disciplinary meanings (Bazerman, 1988). Writers must shape their evidence, observations, data, and flashes of insight into the patterns of inquiry and knowledge valued by their community, framing their arguments in ways that conform with disciplinary expectations concerning appropriate involvement and interpersonal conduct.

Hedges are one means by which this specific competence is demonstrated, with clear disciplinary preferences for their relative use. Table 1 shows the considerable spread in the frequency of hedges in the corpus of 56 research articles mentioned above, with philosophy containing almost four times as many devices as physics, for example, and a general division between philosophy, marketing, linguistics and sociology on one hand, and physics and the engineering fields on the other, with biology occupying the middle ground. While even the supposedly impersonal and highly abstract

hard science papers contained a notable number of devices, over 70% of all hedges occurred in the humanities/social science papers and were over twice as frequent per 1,000 words in philosophy, marketing and linguistics, as in physics and engineering.

TABLE 1: *Hedges in academic articles (56 articles)*

Discipline	**per paper**	**per 1,000 words**	**Total cases**
Marketing	136.3	20.0	954
Philosophy	137.3	18.5	961
Applied Linguistics	114.3	18.0	800
Sociology	96.3	13.3	674
Biology	78.9	13.6	552
Electrical Engineering	45.6	8.2	319
Mechanical Engineering	39.3	9.6	275
Physics	36.0	9.6	252
Totals	85.5	14.6	4787

Essentially, these findings reflect the fact that research articles express the different epistemological and social assumptions of disciplinary communities. Writers present their work in different ways partly because they have different sorts of work to present (Nash, 1990), but also because they are presenting it to people with different ways of seeing and describing the world. In other words, because academic writing is a form of knowledge-making, differences in the types of problems studied and ways of addressing them help account for disciplinary variations. These regularities therefore offer insights into the knowledge constructing procedures of disciplinary communities, broadly reflecting the types of intellectual inquiry and knowledge structures peculiar to the hard and soft disciplines.

KNOWLEDGE DOMAINS AND KNOWLEDGE CLAIMS

The concept of hard and soft domains of knowledge is not without problems, but it does represent something of actors' own perceptions of their work, and offers a convenient way of examining general similarities and differences between fields.

One distinction between hard and soft fields is that is that scientific knowledge tends to be highly specialised. Research involves heavy investments in money, training, equipment, and expertise which means that research is frequently concentrated at a few specific labs and that scientists are often locked into specific areas of research for many years. As a result,

questions are more likely to emerge from prior questions as research results produce further issues and generates further research, so that knowledge emerges in a more linear way than in the soft fields (Becher, 1989; Hyland, 2000). As my informants confirmed, scientists themselves often see their knowledge as coming from relatively steady cumulative growth:

> My personal view of science is that of a huge volcano and lava is flowing down and I'm at the end of one stream of lava. (Phy interview)

> There are many groups making infinitely small steps forward on a particular problem, eventually someone may make a bigger step and get a Nobel Prize, but if not, the groups will get there anyway. (EE interview)

As a result, many researchers work on relatively few problems, and this tends to mean that issues are clearly defined and readers are often familiar with prior texts and research. It is therefore less important to project a strong interpersonal element into texts as schools of researchers have similar understandings to draw on and writers can presuppose a certain amount of background knowledge, procedural expertise, and technical lexis. This helps reinforce a view of science as an impersonal, inductive enterprise. Scientists can see themselves as discovering truth rather than constructing it.

The soft-knowledge areas however are typically more interpretative and less abstract. Researchers work with human subjects, which means they have less control of variables and there are greater possibilities for diverse research outcomes. Writers frequently draw on more widespread literature sources and there are fewer unequivocal bases for accepting claims. With the exception of philosophy, readers in the soft disciplines are themselves often more heterogeneous, with different academic or professional backgrounds and more varied purposes in reading. Again, my informants stated that they considered this in their writing:

> I like to think that both professionals and academics read my work, I want to make an impact in the workplace so I write with this in mind. Its not just for academics. (Marketing interview)

> I'm bringing in stuff from composition theory, cognitive psychology, and sociology that may not be familiar to linguists. (App Linguistics interview)

Overall, this means that writers in the soft fields can generally assume less about what they can taken as given knowledge and the kinds of claims

that readers are likely to accept. They have to spell out their attitudes to their research claims and work harder to get readers to follow their reasoning and to establish an understanding with them. Because research cannot be reported with the same confidence of shared assumptions, it has to be expressed more cautiously, using more hedges. Writers 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. These typical examples from my corpus give some flavour of this:

> (10) This difference might possibly explain why a congenitally blind person made to see would be thought unable to identify the shapes he sees. (Philosophy)
>
> It seems likely that the complex coordinative challenge that service and quality improvement poses for firms may be better understood by such an approach. (Marketing)
>
> We tentatively suggest that The Sun's minimalist style creates an impression of working-class language, or restricted code, while… (Applied Linguistics)

HEDGES AND AUTHORIAL INVOLVEMENT

In addition to different distributional frequencies of hedges resulting from the varied ways that writers argue, there are also variations in the kinds of assumptions writers make about the role of human actors in knowledge construction.

An important aspect of the positivist-empirical epistemology of the hard sciences is that the authority of the individual is subordinate to the authority of the text. Writers generally seek to disguise both their interpretative activities and rhetorical identities behind linguistic objectivity. Textual representations of research are designed to be faceless and agentless, claiming an appearance of objectivity and neutrality and implying that the same results could be obtained irrespective of the researcher's individual identity. The less frequent use of hedges is one more way of minimising the overt role of the researcher in interpreting data, evaluating claims, and appealing to readers. Other means include framing hedges in agentless environments, such as the use of an embedded clause with an anticipatory or dummy *it* subject as mentioned earlier and illustrated in example (3) above.

Another way in which the science/engineering writers avoided a personal voice when hedging was to employ a higher proportion of discourse-oriented

verbs like *indicate, suggest* and *imply* which carry less subjective connotations than cognition verbs such as *think, believe* and *suspect,* and are also more easily combined with inanimate subjects, as in these examples:

> (11) This figure indicates clearly that the energy absorption levels for all three planes for a concave joint are higher than those for a convex joint. (Mech Eng)
>
> The data suggest that the saturation point of our core material limits the maximum magnetic flux density. (Eelectronic Eng)

This practice of giving prominence to procedures or data, rather than themselves, when interpreting data was recognised by my science informants:

> Its conventional to use these formulas to keep yourself out of the picture. They are just conventional ways of expressing inference. (Mech Eng interview)
>
> We rely very much on statistical appraisal of results to be able to say something is happening or not, but the big difficulty is making a causative link. Generally I think we'd prefer to say the relationship lies in the data than our heads. (Biology interview)
>
> Of course, I make decisions about the findings I have, but it is more convincing to tie them closely to the results. (Physics interview)

Clearly there are different reasons why writers may seek to distance themselves from their interpretations (Hyland, 1998a), but the basic effect is the suppression of the author's voice and the creation of a discourse where the research appears to speak for itself. In the soft fields, in contrast, writers actively introduced themselves into their texts and were more likely to stress subjectivity when hedging statements. This is partly conveyed by a more frequent use of cognition verbs, often linked to first person subjects, which carry a greater sense of personal conjecture and position writers more clearly in relation to their work:

> (12) This stems, I believe, from the fact that lack of ignorance is a root requirement for responsibility. … (Philosophy)
>
> Although further research is needed, we suspect that the type of new product used in this study may have contributed to this result. (Marketing)

> This limited perspective is troubling to us in that we feel it could lead to inadequate theories of composition and …. (Applied Linguistics)

> As far as I know, this account has gone unchallenged. (Philosophy)

My sociology informant observed this was a conscious choice for him, related to his perception of himself as a writer and his relationship to his discipline:

> 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)

A final difference between the ways these two broad knowledge groupings use hedges is that that writers in the soft disciplines also explicitly indicate a strong interpersonal element, structuring a relationship between participants and accomplishing a more receptive reader attitude to claims. Using hedges with inclusive pronouns, writers are able to construct a shared context with their readers and draw on views assumed to be shared with their discourse community:

> (13) One could conceivably conclude from this type of result that the subjects both 1) have different knowledge representations concerning the L2 and 2) this difference is manifested in online processing tasks. (Applied Linguistics)

> We seem to have here a kind of de dicto-de re ambiguity in the verbal form of (3) and without benefit of any intensional operator. (Philosophy)

> Consequently, one may speculate that, given the relative power advantage of suppliers over ED resellers, one-way flow of information…. (Marketing)

In this way, the writer can signal the evidential status of the information given what interlocutors might be expected to know as rational, disciplinary colleagues. This encourages the reader to participate as an intelligent equal in the reasoning process.

CONCLUSION

In this paper I have explored some of the contextual factors which shape the ways writers say what they believe, and want others to accept. I have tried to show that the expression of doubt and possibility is central to the negotiation of claims, and that what counts as effective persuasion is influenced by different epistemological assumptions and permissible criteria of justification. My own use of hedges in this paper, for example, has been shaped by an awareness of the need to temper personal conviction with community practice. Any success I may have had in persuading you of my claims is therefore, at least in part, a consequence of you granting that my commitment to them has been appropriately managed.

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