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**CATEGORIZATION OF UNMODALIZED AND
MODALIZED STATEMENTS IN ACADEMIC
ENGLISH: AN EXTENSION OF HYLAND'S
TAXONOMY OF SCIENTIFIC HEDGES**

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ABSTRACT

Modality may be divided into deontic and epistemic modality. It has been generally acknowledged that in academic English papers only epistemic modality is used. We have come to the conclusion, however, that the use of epistemic or deontic modality depends on the specific field. We have compared three different groups of academic papers from literary criticism biology and medicine and we have detected distinct differences in the use of both epistemic and deontic modality in these research articles. We conclude suggesting a new classification of academic statements which modifies Hyland's (1996) initial categorization of modality in academic research articles.

1. INTRODUCTION

The organization and characteristics of the research article has been a major concern of scientific writers for many years. Particularly its organization has received much attention in the last two decades (Atkinson, 1992; Gosden, 1995; Holmes, 1997; Nwogu, 1997; Posteguillo, 1999; Fortanet, 2002, among others), although not so much in terms of characteristics. Despite this apparent neglect in regard to specific

characteristics, however, hedging and modality has been present in many academic articles related to scientific writing.

Alcaraz (2000: 139-140) characterizes academic research articles (RAs) according to four major linguistic and rhetorical features: (a) a specific macrostructure, (b) modalization (i.e., the use of modalized or hedged statements), (c) their main communicative purpose (i.e., scientific claim), and (d) academic politeness (i.e., acknowledging other scientists' research by means of references). In this paper, we will focus on the study of modalization.

Modalization, or the use of hedges, has also become a major line of investigation in relation to RAs, both from a synchronic (Gosden, 1995; Grabe & Kaplan, 1997; Meyer, 1997; Gledhill, 2000) as well as from a diachronic perspective (Atkinson, 1992; Skelton, 1997; Salager-Meyer, 1998). There is also a recent interest in the disciplinary variations to be detected regarding the use of hedging in RAs, as the works of Butler (1990), Pérez-Llantada (1994), Hyland (1996), Crompton (1997), Meyer (1997), and Lewin (1998) illustrate.

However, most of these studies have not taken into consideration a significant linguistic categorization of modalized or hedged statements which has been present in linguistic theory since the late 70s, namely the division of modalized statements into epistemic and deontic assertions. Notable exceptions are Simpson's (1990) study, as we indicate below, and more recently, Vihla's (1999) research on medical writing, as well as Piqué-Angordans et al. (2001, 2002) on modality and disciplinary variation.

Mood and modality express the speaker's attitude or opinion regarding «the contents of the sentence» (Palmer, 1986: 14) or «the proposition that the sentence expresses» (Lyons, 1977: 452). The expression of some kind of intrinsic human control over events would signify «permission», «obligation», and «volition». This has been termed as deontic modality according to Lyons (1977), Palmer (1986), and Downing and Locke (1992). On the other hand, where such intrinsic control is not involved, the meaning would indicate «possibility», «necessity», and «prediction» (i.e., epistemic, using Lyons', Palmer's, and Downing and Locke's terminology). The terms epistemic and deontic are the ones consistently used in this paper.

According to these premises the objectives of this paper are as follows:

a) The analysis of deontic (DeM) and epistemic (EpM) modality usage in three different corpora of academic papers pertaining to three distinct academic disciplines (namely, medicine, biology and literature);

b) In the light of the results obtained, the consideration of how these data may yield conclusions to modify Hyland's (1996) classification of scientific statements to produce a larger analytical framework to account for unmodalized and modalized statements in academic discourse.

2. METHOD OF STUDY

We have focused on modality as expressed by modals (even though modality is a far more complex phenomenon, since modality may be expressed by means of several linguistic devices such as modal adjectives, nouns or adverbs, some *if*-clauses, intonation patterns, etc.). We have selected modal verbs as one of the most representative indicators of modality usage in a text.

We have selected a corpus of medical RAs (C1), a corpus of RAs in biology (C2), and a third corpus of literary criticism RAs (C3). Even though we may consider that medicine and biology fall within the umbrella category of health sciences, we have included both in our corpus. In medicine, authors usually deal with people, whereas in our biology corpus this is not necessarily the case and, consequently, some differences might be expected in their results. Thus, we were interested in detecting whether this fact generated any differences in the use of modals. Corpus 1 (C1), containing 51,199 words, is made up of different RAs from the following medical journals: *British Medical Journal*, *Heart & Lung*, *Hypertension*, *JAMA* (*Journal of the American Medical Association*), and the *Journal of Clinical Epidemiology*. Corpus 2 (C2), with a total of 50,335 words, contains biology RAs from the journals *Behaviour*, *BioEssays*, *Biological Review*, *FEBS Letters*, *Journal of Chemical Technology and Biotechnology*, *Journal of Structural Biology*, and *Systematic Biology*. Finally, corpus 3 (C3), with 51,313 words, is composed of RAs in literary criticism from the following journals: *Early Modern Literary Studies*, *PMLA* (*Publications of the Modern Languages Association*), and *Victorian Literature and Culture*. All journals

are relevant academic periodicals in each of the disciplines being studied; in these publications, a homogeneous expert audience is assumed.

The modals selected for this study, following Quirk et al. (1985) and Downing and Locke (1992), are: *can, could, dare, may, might, must, need, ought, shall, should, will, and would*. Using Scott's *WordSmith Tools* (1996), we listed and individually analyzed all the modal and semimodal verbs contained in the three corpora.

3. RESULTS

Our results are summarized in the figure 1. The increase of deontic modality in literary criticism is noticeable in comparison with RAs in medicine and biology.

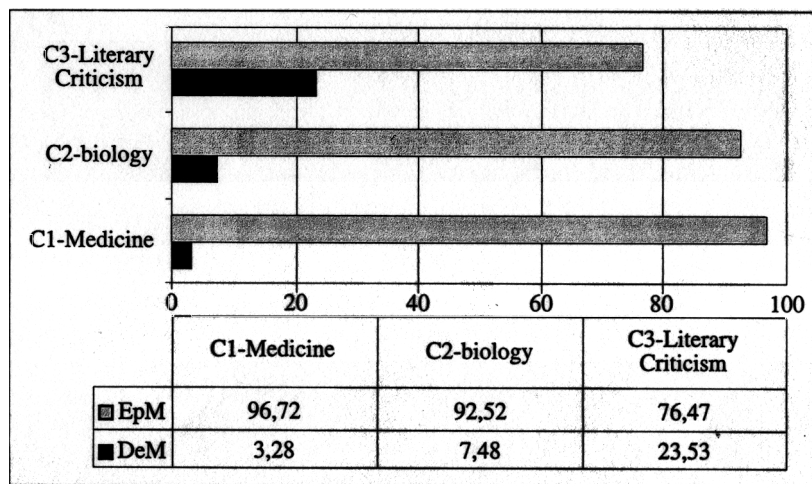


Figure 1. Deontic (DeM) and epistemic (EpM) modality as expressed by means of modal verbs.

Examples (1) to (4) below show the use of modality by means of modal verbs in medical research articles:

- [1] C1-EpM *Tricyclic antidepressants, however, can also have significant adverse effects, such as arrhythmias, postural hypotension, sedation, dry mouth, constipation, confusion, and urinary retention.*
- [2] C1-EpM *The quantities of the factors could limit the amount of renin mRNA that can be produced, even under conditions of normal salt loading and in the absence of pharmacological interventions.*
- [3] C1-EpM *These observations suggest that a local spiral artery renin-angiotensin system may play a role in pregnancy-induced remodeling of these vessels.*
- [4] C1-EpM *Since 80% of the protein-bound serum calcium, which represents half of the total serum calcium, is bound to serum albumin, some authors [5,6] have suggested that the observed effect of serum albumin on blood pressure might be actually due to serum calcium.*

Examples (5) to (8) illustrate the use of epistemic and deontic modals in biology RAs:

- [5] C2-EpM *Thus, some other factor must be important in determining the behavior of these snails.*
- [6] C2-DeM *The lesson that the Equidae pose in socio-ecology is that studies of variation in social and spatial organization must be more judicious in their use of comparative field observations.*
- [7] C3-EpM *He therefore bases his reasoning on what appears a fairly sensible notion: that from the records of prosecutions for publishing obscene books one must presume the existence of a trade in obscene literature.*
- [8] C3-DeM *But my readers must not therefore suppose that I intended to discourage the collection of really good specimens of art manufacture.*

Examples (9) to (12) show instances of modals in literary criticism academic discourse. In this case, we have focused on illustrating the specific use of deontic modals, since this is the distinguishing feature in this corpus:

- [9] C3-DeM Any publication judged by British legal authorities after 1727 to be obscene and to display a tendency to corrupt the morals of the general population could be suppressed and prosecuted for obscene libel.
- [10] C3-DeM If Credit represents the historically progressive power of aesthetic imagination, we might say that the tyrant embodies a kind of pernicious, historically backward anesthesia.
- [11] C3-DeM Feminists, in particular, have often been at the vanguard of personal criticism, arguing that traditional forms of academic language need to be replaced by a more personal voice.
- [12] C3-DeM I would like to suggest that a different picture arises when the same generic and historical questions are considered from the point of view of cultural reception and legal history.

4. DISCUSSION

We may now consider and interpret these results taking into account Hyland's (1996) taxonomy of scientific hedges (i.e. modalised statements). In his analysis of hedges in science RAs, he recalls the above-mentioned study by Simpson (1990) and acknowledges how he detected a specific use of hedging by F. R. Leavis in literary criticism. Hyland further recalls how this way of using modalization via modal verbs is different from modalization via modal verbs in scientific RAs. In our opinion, however, the key element in Simpson's paper is precisely the distinction between DeM and EpM. Hyland (1996) proposes a highly developed classification of hedges, distinguishing among different categories depending on how these modal verbs modalize assertions. He differentiates (see figure 2 below) between factive and non-factive statements, and then generates a detailed subclassification of non-factive statements.

This classification, as he explains, is relevant and applicable to science RAs. What we suggest is a modification –in the form of an enlargement of Hyland's diagram–, as shown in figure 3 below. Our diagram encompasses a broader context. Instead of considering *scientific* statements as the initial element, we take *academic and professional* statements as the umbrella term in the classification. These statements are then divided into two main broad categories: unmodalized statements and modalized

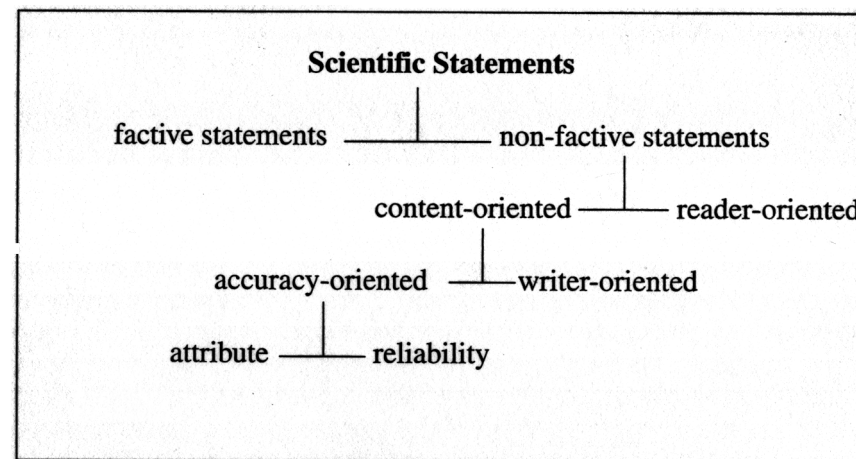


Figure 2. Hyland's (1996) categorization of scientific hedges.

statements. Unmodalized statements may then be divided into epistemically oriented (i.e., declaratives or interrogatives) and deontically oriented statements (i.e., imperatives).

In this classification, unmodalized epistemically oriented statements correspond to Hyland's *factive* ones. It should be noted here the relevance of this enhanced framework to facilitate the study of disciplinary variations in verb usage in academic texts beyond the scope of modalization. In this respect, Swales et al. (1998), in an extensive study on the use of imperatives in RAs in ten different disciplines, found that imperatives were far more frequently used in RAs in statistics, in experimental geology, or in linguistics, while they were non-existent in political science and communication studies. Interestingly, they detected that in literary criticism, imperatives –which as we have noted in figure 3 are deontically oriented– are rarely used in literary criticism. This might be thought to be a contradiction of Simpson's (1990) findings and our own results where deontic modalized expressions are quite common. In fact, we believe that these findings are not contradictory but complementary. The problem lies in the ambiguous *mood* status of imperatives. In relation to this, Palmer (1986: 29) says:

In several respects the imperative holds a relation to the deontic system similar to that of the declarative to the epistemic, though it seems not to have been argued (as it might be) that the imperative is 'deontically non-

modal'. It would be included among Searle's 'directives' in exactly the same way as the indicative is included in the 'assertives', but the question is whether it should be treated as the unmarked term in the deontic system.

In our understanding, the deontic system covers an area of unmodalized statements as well as an area of modalized statements –as the square in figure 3 illustrates. In literary criticism the deontic system is especially relevant to generate argument and debate; however, authors in this discipline increase the realization of *modalized* deontic statements so much that, as a compensation, they diminish the use of the other deontic branch, i.e., unmodalized deontically oriented statements or imperatives. This, then, would explain the reduction in the use of imperatives in literary criticism, as described in Swales et al. (1998).

Continuing with our classification, modalized statements are divided into *deontically modalized* statements and *epistemically modalized* ones. Epistemic statements correspond to Hyland's non-factive ones. The subcategories of epistemically modalized statements (or non-factive statements) do remain the same.

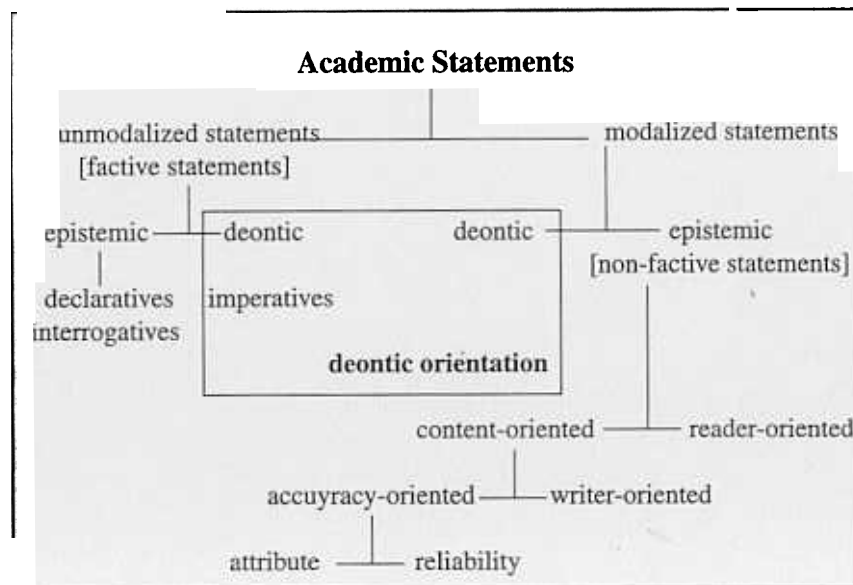


Figure 3. Categorization of unmodalized and modalized statements in academic English.

Our proposal is *not* a criticism of Hyland's (1996) classification but an enhancement of his work, merging with his diagram Palmer's (1986) and Simpson's (1990) contributions. Hyland's framework allows an analysis of hedges in science RAs. With our suggested enhancement this analysis can be extended to other academic and professional contexts besides those of scientific and academic research.¹ The framework, as outlined in figure 3, also allows one to compare Simpson's findings on the use of DeM, or Swales et al.'s (1998) analysis of imperatives, with the results of other researchers who have focused on hedging in scientific and technical texts. In fact, it is possible to show within this framework how experimental science (as represented by medicine and biology) and literary criticism epistemologies are opposed at least in the realization of the epistemic/deontic dichotomy in RAs (see figure 4).

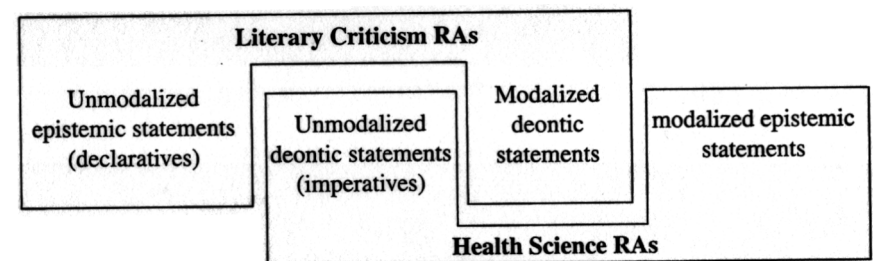


Figure 4. Literary criticism and health science (medicine and biology) RAs distinct realizations of the deontic/epistemic dichotomy.

We agree with Hyland (1996: 452) when he affirms that

hedges in scientific texts are the result of informational, rhetorical, and personal choices which cannot be fully understood in isolation from

1. For instance, we have already applied this methodology to the analysis of EpM and DeM in the professional field of journalism. Interestingly, we have found a significant preference for EpM (with 91.2%). DeM is reduced to only 8.8%. This leaves literary critics in academic RAs as a discourse community more deontically oriented than journalists. It must be noted, however, that these results on the newspaper language use of modals expressing EpM and DeM are exploratory where all types of newspaper articles have been grouped together. It is subject of future research to explore whether, for instance, editorials incorporate more deontic modals and semimodals than other newspaper articles.

social and institutional contexts. ... Research articles clearly reveal the relationship between a discourse community, standards of knowledge, and textual representations, and it is these in combination which motivates the use of hedges.

We believe that the enhanced analytical framework depicted in figure 3 allows modalization studies to be extended to further academic and professional discourse settings. This may, in turn, aid applied linguists in academic English studies to complement the description of the complex linguistic phenomenon of modality use in academic and professional settings with applied ends such as language teaching.

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