

HEDGES IN SPECIALISED VS. POPULAR ACADEMIC INTERACTION: A CASE STUDY OF MEDICAL TEXTS¹

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Abstract

Academic interaction requires information and language management and part of good language management includes information on the speakers' or writers' use of hedges to indicate their stance on a scientific claim, ranging from total support to rejection. Although hedges are a complex phenomenon in function and form, they are considered central to academic interaction. This study analyses lexical hedges in two types of academic writing, specialised academic texts from international Anglo-American journals and web servers and corresponding popular academic texts from a popular science magazine, the *New Scientist*. Medical English was used in this pilot study to investigate whether popular versions contain either more or less hedging than their specialised originals. Different types of hedges were analysed qualitatively and quantitatively.

1 Introduction

1.1 Changes in English for Specific Purposes and the growing importance of specialised and popular Academic English

A major feature of the English language today is that it is used in *lingua franca* situations world-wide, i.e. in non-native contexts where native speakers may not be involved at all. This includes the numerous occasions where English is used for international communication in specific academic fields in higher education and beyond. Traditionally, this wide field has been subsumed under English for Specific Purposes (ESP) and subdivided in different ways, as for instance in the classification by Dudley-Evans and St John (1998: 6, see Fig. 1).

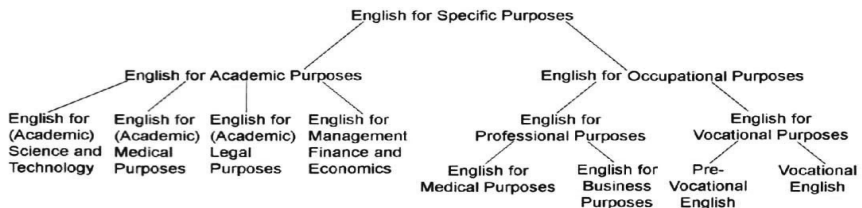


Fig. 1: ESP classification by professional area

Interestingly, Fig. 1 shows two types of English for Medical Purposes (EMP): on the one hand, it is the in-group language used among medical specialists in academic settings, at universities and research institutions and thus a subcategory of English for Academic Purposes (EAP); on the other hand, it is the language in work or pre-work situations, used by practising doctors and students of medicine and thus a subcategory of English for Occupational Purposes (EOP). It is important to distinguish between the different language needs of these groups, which have been affected by internationalisation in different ways. Whereas traditionally practising doctors had to be able to read only a few specialised academic articles in English, but communicated with colleagues and patients in their mother-tongue – they needed EOP only in a country with English as a native or second language, today's medical academics and students mainly need EAP to be able to read textbooks and articles, write essays, and short clinical reports. Over the last few years, EMP has become important also in countries where it is only used as a *lingua franca*, e.g. to prepare papers and presentations for international conferences. EMP is much less important in EOP *lingua franca* situations, e.g. with foreign tourists.

However, the internationalisation of science and technology (cf. Windshuttle & Elliott 1997) has made it necessary to convey research findings in the medical field to the ordinary doctor and even to the non-specialist. Thus, EMP has to be understood not only by the specialist but also by the non-specialist. This leads to a new type of differentiation, that between specialised and popular EAP. Whereas specialised EAP has all features of ESP, popular EAP includes ESP features as well as ELF features, since it has to 'mediate' between specialists and non-specialists, who are usually not familiar with specific (e.g. medical) ESP and its linguistic features. General features of ESP include passives, tenses, and modal verbs on the grammatical level as well as different techniques to expand the technical vocabulary, such as nominalization and word formation (ibid.: 77f), on the lexical level. One special feature of EAP, however, is particularly important for specialists and non-specialists, namely hedging expressions. Generally, hedges are used by writers to distance themselves from a statement, to attain a neutral position, be polite, or soften a statement to mitigate criticism. Since hedges allow the readers to assess the writers' commitment vis-à-vis their statements, they fulfil different functions in specialised and popular academic interaction: they are more writer-specific, defensive in the former and more reader-specific, evaluative in the latter. In specialised EAP, hedges protect the writers from attacks by the readers in case these do not agree; in popular EAP, hedges help the writers to assess the strength of the research results presented. Since popular EAP includes a journalistic component, hedges may be considered

unnecessary, if only the defensive function is seen. However, in this analysis hedges are understood in a wide perspective in form as well as in function (cf. 2 below).

1.2 English for Medical Purposes from a non-native perspective

Medicine is a highly competitive field of international research, thus competition causes an immense increase of knowledge (cf. Busch-Lauer 2001: 849). This knowledge is predominantly published in scientific journals, which requires specific competence of the non-native writer and reader of English. In comparison with other sciences, medical language has a particularly complex character because it is shaped by at least three groups of agents: the international researchers, the practitioners as specialised academic users in the field as customized – and partly at least the legal regulators of the respective national health system. There are three types of communication in which medical language is needed: the scientific communication among experts in theoretical and clinical medicine, the communication of clinical every-day life between doctors or clinical staff, and the communication between doctors (representing the medical scientific community) and patients (representing the society).

In contrast to Fig. 1 above, we would assume a functional cline in EAP according to user from research through teaching to application and a corresponding stylistic cline from most specialised to popular EAP. The breadth of this complex communication cluster is difficult to investigate empirically since there is no representative corpus of texts with the same functions. Only part of the spectrum can be sampled when popular versions of the same topics can be compared with the original research article that they are based on.

The international scientific communication in the field of medicine today is clearly dominated by English. Specialised and popular academic magazines constitute the most important source of information, not only for medical scientists, but also for practising doctors. Although the medical terminology is traditionally based on Greek and Latin, a shift from Latin to English simplifies international agreements nowadays. Unfortunately, Medical English seems to contain more technical terms of Latin-Greek origin than other medical language (like German, which uses *eye-doctor* instead of *ophthalmologist* even in many technical contexts). Thus the lexical conventions cause more language barriers between experts and laypeople, because (as shown in Fig. 1 above) medical language is used in two different domains, science and the health system, and brings specialists (doctors) and non-specialists (patients) together. However, this pilot study concentrates on grammatical discourse features and neglects lexical complexities (cf. Haase 2008).

1.3 The SPACE corpus as an empirical data-base

The availability of specialised and popular academic journals on the world-wide web makes it possible today to collect comparative data in electronic form that can be analysed automatically, giving us a reliable data-base that was unthinkable only a few years ago.

For the analysis presented here, a specific data-base was created, called the SPACE Corpus (cf. Schmied 2007). The acronym stands for a collection of texts from Specialised and Popular ACademic English, which was collected over the last year at Chemnitz University of Technology and will be made available on the world-wide web to the international research community as soon as it is complete. It contains texts from different academic fields, from biochemistry to psychology. The medical texts make up only about a fifth of the texts and were used for the pilot study reported here.

The non-specialist texts on medical topics were drawn from the popular scientific magazine *New Scientist*, which popularises scientific research for an international readership, although it is based in England. Despite its traditional native-speaker background, it can be considered nowadays as a medium that uses English as a lingua franca for academic purposes. In order to guarantee topicality, the 40 texts chosen from medicine were published between January 1998 and August 2006 and had a direct reference to the original scientific article they are based on. Through the indicated sources, their equivalents could be found in leading medical journals like *The New England Journal of Medicine*, *The Journal of Clinical Investigation*, and the *Public Library of Science Medicine*, as well as in online-databases like *arXiv*. These 40 expert articles had basically the same content as the 40 *New Scientist* articles, but were written in a more specialised form, since they aimed at a specialised readership. We thus follow a genre approach like many related corpus studies (Bhatia 1993, Martin 1997 or Swales 1990). The resulting corpus of 80 medical articles was available in electronic form and could thus be analysed qualitatively and quantitatively.

Whereas the readership of the two text-types is clearly discussed in the editorials, for instance, the issue of native vs. non-native writers is not clearly addressed. It can only be deduced from the names of the writers that a considerable number of them may not have acquired English as their first language, although of course they may use English as their primary language of work or at least as an international lingua franca of academic interaction nowadays. Although institutional affiliation and non-native author name were stored in the corpus data-base, they were not used as a variable in this investigation.

2 Functions and forms of hedges in academic writing

As indicated above (in 1.3), hedges are of particular importance for academic communication, but they are not easy to grasp because they are a complex phenomenon in form and function.

2.1 Functions of hedges

The term *hedge* was introduced in linguistics by Lakoff (1972: 194), describing “words whose job it is to make things more or less fuzzy”. According to the definition of Salager-Meyer (1994: 150), hedges are a concept of purposive fuzziness and vagueness. In line with Brown and Levinson’s politeness theory, this threat-minimizing strategy reflects the authors’ modesty for their achievements and avoidance of personal involvement or their unwillingness to make an absolute statement. Hyland (1998: 196) elaborated on this functional definition when he writes that hedges are “used to qualify a speaker’s confidence in the truth of a proposition [...] which we routinely add to our statements to avoid commitment to categorical assertions. Hedges therefore express tentativeness and possibility in communication”. Over the years, further names have been used to indicate the wide functions of hedge expressions, such as compromisers, downtoners, weakeners, downgraders, softeners, backgrounding terms, and pragmatic devices (cf. Hyland 1998: 9).

In academic interaction, hedges are pragmatic devices used in managing information to mitigate a statement or strengthen an idea. If authors of academic texts want to express tentativeness and possibility, they can reduce the strength of commitment to a statement in order to manipulate the readers’ perception. Mostly, they are used as politeness devices to reduce threat to other members of the academic community (Myers 1989). Through this tentativeness, a statement is made more acceptable to the hearer or reader and therefore more likely to be ratified (cf. Salager-Meyer 1994: 150). Such a distanced personal view of the author minimizes the threat to the face of other members of the scientific community, but it also protects his/her own reputation as a scientist. In other words, hedges help avoid direct criticism and show solidarity with the readers, and they make it possible for the writer to express uncertainty, scepticism, and doubt. All in all, hedges are verbal protective shields enabling a communication free of conflicts despite subjective statements, which would normally make an author open to attack. In the end, writers achieve their aims more easily and effectively by an optimised communication, because hedges are

manipulative non-direct sentence strategies of saying less than one means. They occur where the general question of the emotional acceptability of the content

[...] becomes acute. Their aim is to make sentences more acceptable and thus to increase their chance of ratification by the hearer. (Hübler 1983: 23)

Hübler (1983: 11) sees hedges as central to the speaker-hearer (writer-reader) interaction, representing “that part of the illocution which expresses the attitude of the speaker to the hearer”. This theory is extended by the term *hearer-motivated*, which means that the content is hidden behind hedges to make it more acceptable to the hearer (ibid.: 15f). Furthermore, there is a contrast between determinate statements of what is really meant and indeterminate formulations, such as hedges, which emphasise what is really said (ibid.: 21). As a result, the hearer or reader does not feel as harmed by an indeterminate formulation as by a determinate one.

Additionally, Lewin (2005: 166) emphasises the necessity of appearing modest in the scientific community when introducing new findings, especially when one does not agree with the previous work of others. Since sciences are fast-moving, permanently accumulating new knowledge, scientists always have to be aware of the fact that their findings may only be valid temporarily. This is particularly true in the time of pre-publication servers (like *arXiv*) and on-line debates even in academic discourse.

If we see academic discourse as interaction, it is not surprising that hedges are seen as central to successful ‘meaning negotiation’ between writer and reader. Hedges help to present personal claims so that they can be ratified by the colleagues in the field and beyond. In order to be persuasive in their argumentation, writers sometimes have to distance themselves from the material and the reader. On the one hand, the material can be incomplete due to limited results or imperfect experimental conditions. On the other hand, despite the writer’s personal convictions, the reader’s face has to be protected. Thus weakened scientific statements help writers mitigate threats to their self-image and to their colleagues’ at the same time. A claim should always be as strong as possible in order to be convincing, but if it is hedged, it is negotiable. In the end, if writers present their claims, proposals and criticism in a style that sounds convincing and negotiable at the same time, they are more likely to be recognized and cited by colleagues, which may lead to promotion, funds, prizes, etc.

The functions of hedges in popular academic writing are equally debated and can also be subdivided into a writer and a reader perspective: On the one hand, authors like Salager-Meyer (1994: 152) state that this style of writing is necessary and obvious in editorials and research articles, because it makes a text argumentative, persuasive and evaluative. In contrast to that, research papers and case reports are more informative and descriptive and therefore less heavily

hedged. In popular articles, the tentative features of research articles are replaced by facts and definite assertions. Hyland (1998) supports this assumption by saying that by “[t]he reduction or elimination of hedges in textbooks and popularisations [...] the populariser attempts to add to the significance of the subject” (ibid.: 59). On the other hand, Lewin (2005: 164) emphasises that hedging makes a text more reader-friendly, because it allows a relation between the writer and the reader. This suggests that a well-written non-expert article should be more heavily hedged, since it will try to be generally more reader-friendly than an expert article. This present study attempts to investigate these contrasting hypotheses by analysing the frequency of hedges in specialised and popular medical articles.

2.2 Forms of hedges

The linguistic form that hedges can take is as complex as their function. According to Hyland (1998: 1-5) and DiMarco/Mercer (2004: Detecting hedges, para.7), hedges can appear as modal auxiliaries, epistemic adjectives, adverbs, verbs, and nouns; tag questions; and *if*-clauses. Another common way to hedge a statement is the use of the passive voice, which enables the writers to distance themselves from their assertions by avoiding mentioning the agent, making them appear less subjective and debateable. The following tables (Table 2 and 3) present an illustrative classification with a few examples:

Modal Auxiliaries	Epistemic Lexical Verbs		Epistemic Adjectives, Adverbs and Nouns			Hedging Numerical Data
	Epistemic judgement verbs	Epistemic evidential verbs	Epistemic adjectives	Epistemic adverbs	Epistemic nouns	
<i>must/need</i>	<i>propose</i>	<i>show</i>	<i>likely</i>	<i>probably</i>	<i>probability</i>	<i>about</i>
<i>can/could</i>	<i>suggest</i>	<i>appear</i>	<i>possible</i>	<i>apparently</i>	<i>possibility</i>	<i>approximately</i>
<i>will/ would</i>	<i>believe</i>	<i>seem</i>	<i>most</i>	<i>possibly</i>	<i>assumption</i>	<i>some</i>
<i>shall/should</i>	<i>speculate</i>	<i>tend</i>	<i>significant</i>	<i>perhaps</i>		<i>around</i>
<i>may/might</i>	<i>think</i>	<i>look like</i>	<i>clear</i>	<i>often</i>		
	<i>indicate</i>		<i>certain</i>	<i>usually</i>		

Table 1: Lexical hedges

Reference to limited knowledge	Reference to limitations of modal, theory or method	Reference to experimental limitations
<i>Nothing is known about</i>	<i>In the context of the proposed model</i>	<i>Under these conditions</i>

Table 2: Strategic non-lexical hedges

This analysis follows the lists in Hyland (1998: 102-155) and Gillet (2006), distinguishing hedges in lexical and non-lexical form. Since lexical hedges represent the most common means of epistemic modality in English, it is not surprising that they make up 85 per cent of scientific hedging, leaving only 15 per cent to strategic non-lexical hedges. Instead of lengthy definitions of the hedge types, many lexical examples are given here to illustrate the most frequent choices, which will largely be analysed in detail below. Since strategic non-lexical hedges are extremely context-related and therefore even more difficult to count objectively, only lexical hedge expressions were analysed in our case study.

3 Corpus-linguistic analysis

3.1 Frequency of lexical hedges in specialised vs. popular academic texts

In our quantitative analysis all occurrences of lexical hedges were counted in both text types in 80 medical texts of the SPACE corpus and classified according to hedge type and text-type. Unfortunately, hedges do not have a clear formal correlate, so their analysis cannot be automatized, but has to be done “by hand” and is very time-consuming. The correct identification of hedges in the text is difficult, since not all modal auxiliaries are used in an epistemic sense, for instance. The findings were presented in Table 3, which shows the hedge type first in absolute and then in relative frequencies before some specific lexemes are compared.

Since the popular articles are usually much shorter than the specialised ones (less than one tenth), the results have to be compared in percentages. For, although most hedges occur more often in the specialised articles, their relative frequency is higher in the popular texts. Here even a few occurrences make a difference, since the texts are so much shorter.

The final summary demonstrates clearly that, even when the absolute frequency of hedges is lower in popular texts the relative frequency is higher.

Table 3 shows the number of occurrences of hedge types and a few specific lexemes in both types of articles, as well as their percentages according to the total number of words. Nevertheless, before comparing the results, a closer look at the distribution of the different forms of hedges in each type of academic writing will be interesting.

	popular texts	specialised texts
total words	17,350	203,583
mean words per text	433.75	5089.58
modal auxiliaries		
total	154	696
average per text	3.85	17.4
percentage	0.89%	0.34%
<i>could</i>	0.36%	0.06%
<i>should</i>	0.05%	0.03%
<i>would</i>	0.16%	0.055%
<i>may</i>	0.21%	0.16%
<i>might</i>	0.12%	0.04%
epistemic lexical verbs		
total	48	309
average per text	1.2	7.725
percentage	0.28%	0.15%
<i>propose</i>	0.01%	0.01%
<i>suggest</i>	0.12%	0.09%
<i>appear</i>	0.07%	0.03%
<i>believe</i>	0.05%	0.005%
<i>seem</i>	0.03%	0.01%
epistemic lexical adverbs		
total	18	67
average per text	0.45	1.675
percentage	0.10%	0.03%
<i>probably</i>	0.02%	0.01%
<i>possibly</i>	0.02%	0.01%
<i>perhaps</i>	0.01%	0.003%
<i>usually</i>	0.03%	0.006%
<i>often</i>	0.03%	0.01%
hedging numerical data		
total	43	305
average per text	1.075	7.625
percentage	0.25%	0.15%
<i>about</i>	0.07%	0.01%
<i>some</i>	0.13%	0.06%
<i>many</i>	0.03%	0.04%
<i>almost</i>	0.01%	0.01%
<i>approximately</i>	0.00%	0.03%
summary		
modal auxiliaries	0.89%	0.34%
epistemic lexical verbs	0.28%	0.15%
epistemic lexical adverbs	0.10%	0.03%
numerical data	0.25%	0.15%
total	1.52%	0.67%

Table 3: Frequencies of lexical hedges in specialised and popular academic texts

Fig. 2 clearly shows that hedge expressions were used more frequently in popular than in specialised medical articles. The following Fig. 3 presents the frequencies according to hedge type and, again, all types occur relatively more often in popular texts than in specialised texts.

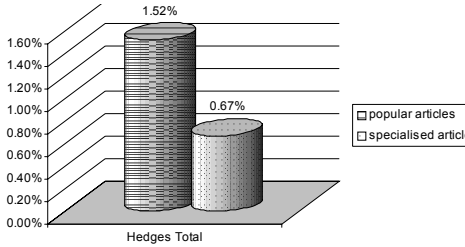


Fig. 2: Hedges in popular and specialised articles

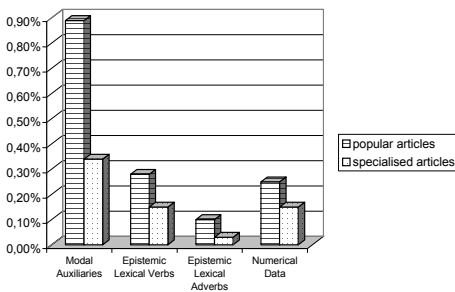


Fig. 3: Hedge types in popular and specialised articles

3.2 Qualitative analysis of lexical hedges in popular vs. specialised academic texts

Although the quantitative analysis above shows quite consistent results, it is worth looking at some qualitative detail in academic usage of the hedge types and text types distinguished and discussing the most interesting lexemes more closely.

Authors of the *New Scientist* articles commonly employed auxiliary verbs to express possible consequences for the health of their readers in the future (obviously since they should be interested in what ‘could be dangerous’). Emphasised statements and ethic and rhetorical questions completed this emotional commitment. In order to be convincing, *could* was used most often to make suggestions, utter possible causes and effects, and give medical advice. In contrast to the focus in popular writing, which

is often on future trends, scientists in research papers often refer to circumstances during the experiment or study in the past. Therefore, auxiliaries helped them avoid full responsibility for their findings and criticism of other colleagues' work. Despite the emphasis on clear and falsifiable hypotheses, statements were mostly mitigated in order to justify new research results. Since *may* is an auxiliary with very different meanings, it was used most frequently in the research papers of the study, especially to guarantee politeness towards other researchers.

Epistemic lexical verbs were used as face-saving strategies in both types of academic writing. On the one hand, authors of the non-specialist articles drew their own conclusions from numerous studies in order to give a broad overview of current research. On the other hand, scientists wanted to protect themselves and the faces of colleagues in specialised writing. The mitigated statements were commonly introduced by epistemic verbs and therefore let them appear like possibilities to be judged by the reader. Moreover, authors could be subjective without being open to attack, for example to refer to other scientists or to the content of their own work. In both writings *suggest* and *appear* were employed most frequently, because authors were able to communicate ideas without stating them too bluntly and having to take full responsibility for them.

Statements and frequencies were emphasised or mitigated for different reasons in popular writing and specialised writing by the help of epistemic adverbs. In the *New Scientist* articles, the readers should be convinced by strong statements and own conclusions of medical findings of the writer. Authors of scientific research articles tried to convince their colleagues of their results by quantified claims and weighed evidence. Although they emphasised the importance of their findings, they left space for other scientists to judge for themselves. The study revealed that adverbs of frequency like *usually* and *often* were used more commonly than adverbs of possibility. Therefore, it appears that numbers and amounts have to be more mitigated or emphasised than claims and statements.

As well as adverbs of frequency, hedging numerical data avoids exact numbers and emphasises or mitigates certain amounts. In popular writing the authors often use it to report the findings of medical researchers, whereas in specialised writing the scientists mostly quantified their own results. Figurativeness in non-specialist articles and abstractness in specialist articles is very visual in the use of *approximately*, since it is exclusively employed in formal specialised writing. Generally, one could say that in contrast to the other forms of hedges, only two numerals and approximators (*some* and *about*) were used more frequently in popular writing, which leads to the conclusion that the importance of hedging numerical data is almost higher for the authors of research articles, because they are responsible for the figures of their study and want to protect themselves against possible mistakes.

The different reasons for hedging in popular writing and specialised writing are summarized in the following table:

specialized writing	popular writing
quantify own results	report findings of many studies
refer to circumstances in the past	warn of consequences in the future
avoid criticism	criticise to provoke
formal presentation of results	evaluation and medical advice
convince colleagues	convince readers of magazine
be justified and accepted	be noticed

Table 4: Reasons for hedging in popular and specialised academic writing

Although hedging is an important stylistic means in specialised academic writing, there are various reasons for its more frequent use in popular academic articles. One major cause is ‘second level’ hedging. Since the *New Scientist* authors often collect research results from different studies, they draw their own conclusions. This second process of generalisation also requires hedging by the science journalist. Since the layperson does not need to know every detail like the expert, the journalists only give an overview instead of precise results about a specific topic and consequently have to add their own hedging in addition to the original hedging. Therefore, hedges help the author communicate vaguely, but still utter enough useful information. Furthermore, it is possible to make more provocative statements in order to attract the attention of the reader under the protective shield of hedge expressions. These challenging questions and utterances increase the readers’ interest, which is important for selling a journal. Another effect of hedges is the increased reader-friendliness, considered necessary in popular articles. Comprehensibility is obviously less important for the subject-oriented scientist than for the reader-oriented popular science writer. The more common linguistic features are used, the less formal and abstract a text appears. The most elementary reason for the high frequency of hedges in popular writing is the relation between the content and the number of words. The *New Scientist* articles only contain relatively few words and they are the most ‘dangerous’ or ‘arguable’, whereas specialised writing is much more clearly structured in (heavily hedged) subjective and (little hedged) objective parts: the former include the introduction, discussion, and conclusion, the latter methods, results, and acknowledgements. Maybe the quantitative study would have had different results, if only specific parts of the research papers had been compared with popular writing. An interesting further investigation therefore would be

to compare one of the more subjective parts of research papers with their *New Scientist* equivalents.

Generally, it can be said that despite the increase of hedges in popular-scientific writing, the order of frequency of most hedges remains constant in most cases. Is this congruent form due to the same content of both types of articles or generally valid in all types of academic writing? This question could be examined in a further study of analysing popular and specialised texts that do not deal with the same topic.

4 Conclusions

This investigation of academic writing style has revealed that in contrast to public opinion, academic English is not only characterised by specific, seemingly incomprehensible terminology but also by important discourse features such as hedging expressions. A functional approach shows that these rhetorical subtleties help to create a persuasive interaction between writer and reader, which is the precondition for effective communication with colleagues and patients alike. Our quantitative and qualitative analysis confirms that due to their frequent use in popular as well as specialised articles, hedges constitute a central element of successful communication in medical scientific writing and have different functions in different pragmatic contexts.

It is therefore surprising that the teaching of hedges to scientists does not seem to be prominent in current EMP courses and textbooks. Yet, in order to be noticed and accepted by colleagues and patients, medical scientists and doctors need to be able to use hedges effectively. This is an important part of constructing author identity in academic discourse (cf. Ivanič 1998). Thus the teaching of EMP and EAP in general should not only focus on its complex terminology and grammar, but also raise the awareness for discourse conventions and for the interactive nature of medical or academic discourse (cf. Coffin & Hewings 2005).

Endnote

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