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LINGUISTIC RESEARCH ON HEDGING IN SCIENTIFIC DISCOURSE OF THE ENGLISH LANGUAGE

Abstract

The paper is concerned with the nature of hedging used as a communicative strategy in the English scientific communication. Basic classifications of linguistic devices of hedging are considered. The difference in quantity of hedging markers encountered in the humanities and technical sciences is investigated, supported by statistics from numerous research data. Special attention is paid to pragmatic effect of hedging, which can vary across disciplines depending upon communication context.

Keywords: hedging, scientific discourse, academic discourse, metadiscourse markers, politeness, communication strategy, soft sciences, hard sciences, pragmatic effect, epistemic lexical devices

Linguistic means of hedging, defined as "words whose job is to make things more or less fuzzy" are first mentioned by G. Lakoff, who points out that semantics of these predicate modifiers that make a distinction in degree of properties is not independent of pragmatics [10]. Since then a large number of scientists have been investigating the pragmatic nature of hedges used to express author's tentativeness and possibility with respect to the truth of propositions both in spoken and written discourses, and across various disciplines (Biber, Brown and Levinson, Caffi, Carter and McCarthy, Crismore and Vande Kopple, Fraser, Hübler, Hyland, Ilchenko, Lewin, Meyer, Prince et al., Salager-Meyer, Schneider, Skelton, Swales, Yarkho and others).

Being rather broad and multi-functional, the term "hedging" often overlaps with other aspects of communication, such as modality, evidentiality, politeness, indirectness, and vagueness. This is the objective of the present paper to review the framework of theories available at present to deal with linguistic devices of hedging in the English language, especially in the context of academic writing, where authors tend to mitigate the strength of their scientific claims in order to save face and reduce the potential opposition of academic community.

In fact, recent cross-cultural studies have revealed that hedging, being culturally determined, is inherently characteristic of English academic texts [1-4]. Furthermore, the quantitative analysis has shown that hedges dominate among all the metadiscourse markers in Master's and PhD theses written in English, with even slightly more hedging markers in the doctoral texts, where writers are supposed to develop more discursively elaborated arguments [6]. For that reason, hedging is worth studying as it is a strategy that is gaining importance in scientific communication and helps promote understanding of intercultural differences.

One of the first taxonomies of hedges, proposed by F. Salager-Meyer in her study on medical English written discourse, consists of five subcategories:

- "shields", which comprise modal auxiliaries seem, appear and modal verbs (can, could, may, might, will, would), epistemic verbs (believe, speculate, suggest), probability adverbs (likely, possibly, probably), and their related adjectives;
- "approximators", which refer to imprecise quantity, degree, frequency and time (approximately, roughly, quite, usually, generally, somehow, somewhat, occasionally);
- phrases which express author's personal doubt and involvement (I believe, as far as I know, to our knowledge, it is our view that);
- "emotionally charged intensifiers", describing the author's reactions (extremely interesting, particularly encouraging, of particular importance, surprisingly);
- "compound hedges" or "strings of hedges", which could be represented by double hedges (It may suggest that), treble hedges (It would seem likely that), or quadruple hedges (It would seem somewhat unlikely that) [16, p. 154-155].

However, with further linguistic research into hedging, this classification needed some improvement and modification. Crismore and Vande Kopple, for example, stated that hedging can be expressed not only through personal voice (it seems to me, I suppose that), but also by impersonal voice (it seems that, it is supposed that) [11, p. 35].

In terms of pragmatics hedges that reflect the speaker's communicative intent, causing effects of implication rather than change the apparent meaning of the statement, are classified by Prince, Bosk, and Frader into "approximators" and "shields" [15].

Approximators can change the perception of the topics of conversations and the original meaning of discourse structure, depending upon the communicative context. Two subcategories of approximators are identified, namely "adaptors", which are words that make certain amendments to the original meaning of discourse (kind of/ sort of, a little/ a bit, almost, somewhat, might, more or less), and "rounders", or words that signal a certain range of variation in the numerical and temporal domains (about, around, approximately, essentially, roughly, over) [14; 17, p. 154-156].

When used with telic expressions, some adapters can express near-accomplishment, and when used with gradable lexemes they can have a deintensifying effect, several types of "downtoners" being distinguished by the strength of that effect. Among discourse functions of adaptors are description of ad hoc concepts, compensation of memory loss and lexical gaps in case of problems with speech planning, as well as softening of strong opinions and face-threatening orders [14].

Roundrs in their turn are less pragmaticalized, and mostly used to reduce the risk referring to the information that is not available or not required in detail.

Shields, on the other hand, do not change the semantic content of discourse, but convey the manner speakers indirectly moderate their tone; therefore, they have a wider scope of pragmatic potential than approximators. Shields can be further divided into "plausibility shields", expressing doubts or speculation of speaker's attitudes (I think, I guess, I wonder, I suspect, I am afraid), and "attribution shields", which show the speaker's attitude by means of quoting other's perspectives (according to, in one's view, it is said/ believed). Both subcategories of shields operate on an interpersonal level, and help mitigate the speaker's responsibility for their statements. However, it is attribution shields, which represent third personal structures, that imply the absence of the speaker, and thus protect their face at the most [14; 15; 17].

In K. Hyland's taxonomy hedges belong to interactional metadiscourse markers, used to express the author's position and involve the audience. Along with hedges, aimed at softening the author's claims, he distinguishes here between "boosters", which emphasize the degree of author's certainty, "attitude markers", which express the author's perspective or evaluation of the propositional content, "self-mentions", which contribute to revealing the author's stance, for example, by personal pronouns, and "engagement markers", which explicitly address the audience so that to draw it into the discourse [13].

Studying hedges as a means of expressing politeness and etiquette in Anglo-American scientific community, O. Ilchenko suggests that they are employed in the language of science to serve the purposes of mitigating the effect of negative statements, facilitating information decoding, and attracting the reader's attention. Approximators and epistemic verbs are said to be most frequently used hedges, followed by verbal markers of impersonality (impersonal use of pronoun it, indefinite pronouns, passive voice), and volitional modality (I mean, I should say, It occurs to me, etc.) [1].

This fully conforms to the results of research done by P. Martin-Martin, where hedges are grouped based upon the explicit functions they fulfil, namely the strategy of "indetermination", that is expressing uncertainty, vagueness and fuzziness (epistemic modality, approximators), "subjectivisation", including the use of personal pronouns I or we with verbs of cognition (think, believe) and performative verbs (suppose, suggest), and "depersonalisation" through passive and impersonal constructions. It is shown that the strategy of indetermination is preferred by academic writers, especially in the Discussion/ Results section of medical research articles, while that of depersonalisation ranks second, being encountered either in Introduction, or Discussion/ Results. The strategy of subjectivisation could be identified only in the Introduction section, when the writer is making the rhetoric move of highlighting the relevance of the research [12].

Indeed, other studies on how often hedges occur in academic texts indicate the difference in their distribution across sections of a research paper due to communicative purposes to serve. Hedges appear least in Methods, as it is the least discursive section, and are most often found in Discussions, where claims are made and the significance of results argued [6, p. 243]. In qualitative terms the highest frequency of hedges of 84% occurs in the Results and Discussion sections, with only 4% in Methods [9, p. 10].

Numerous frequency analyses have proved that hedges along with boosters are two most common interactional metadiscourse markers used in Results and Discussion sections of academic research articles in both social and natural sciences (soft and hard scientific fields), although the total number of interactional metadiscourse markers in soft fields is somewhat higher than that in hard fields [9, p. 68].

For the sake of comparison academic knowledge can be represented by such categories as hard pure sciences, studying general laws (e.g. physics), soft pure sciences, or humanities, which conduct personal and specific research (e.g. history), hard applied sciences, which are concerned with technologies, product-orientated techniques (e.g. mechanical engineering), and soft applied sciences, directed by non-academic interests (e.g. education, law). Overall, the linguists report that there are some similarities and differences across the various disciplines in terms of using hedges [4; 5; 7]. The similarity between them is that all scientists tend to display their humility and deference by following the Politeness Principle of communication. For example, the findings of research into the language of four different disciplines (English Language Teaching and Economics representing soft sciences, and Biology and Civil Engineering representing hard sciences) have discovered little variation in the number and types of interactional metadiscourse markers. Still, a few differences include a larger quantity of boosters in soft sciences, and the lack of engagement markers and self-mentions in hard sciences [9, p. 72-73]. Another analysis of hedges in the dissertations from six academic disciplines, namely Electronic Engineering, Computer Science, Business Studies, Biology, Applied Linguistics, and Public Administration, indicates a higher percentage of interactional markers in the soft knowledge disciplines, hedges being actually well over twice and self-mentions almost four times more frequent than in the hard fields. This could be explained by a greater role of explicit personal contribution of research in the humanities and social sciences, where interpretations are typically more explicit and the criteria for establishing proof less reliable [7]. What is of particular importance, however, is that computer science, even though being a hard field, differs from the general picture of impersonality of scientific discourse, and displays a relatively high frequency of self-mentions and engagement markers. The thing is that unlike the other two hard fields under consideration, computer science is practical in orientation rather than directed to the development of discipline-internal theories so that it requires a greater amount of interactional metadiscourse to address both academics in the field and practitioners outside it [7, p. 173]. There are all reasons to believe that this must also apply to some other fields of engineering, which are attracting more and more non-academic members to their discourse community (consumers, investors, business people, managers, etc).

The quantitative studies of the scientific research corpus provide the statistics to illustrate some of the statements above. First of all, the language of academic papers in both soft and hard sciences indicate the dominance of lexical means of hedging, with 79% of hedges being verbs, adjectives, adverbs and modals [5; 8]. The most frequently encountered modal verbs are would, may and could; however, there is a considerable difference in the distribution of different modals between disciplines. In particular, will is shown to rank as the least frequent, and may is found to be most common in fields of hard sciences, while must is the predominant modal in spoken academic discourse. Among the epistemic verbs indicate and suggest occur far more often in scientific writing than, say, appear and propose. 20% of hedging devices are epistemic adjectives, such as (un)likely, possible, and consistent with, which are usually used as attributes. The high frequency of epistemic adverbs apparently, probably, essentially, relatively, and generally is explained by their position mobility. On the whole, 43% of all hedges are double hedges, that is combinations of epistemic verbs with adjectives, modal verbs with adverbials, or adjectives with adverbials. Suggest, would, possible and indicate are reported to occur the most often in such clusters [8].

Yet, whatever the focus of the research, linguists still emphasize that the use of hedges varies greatly between genres and disciplines. Thus, it is the objective of further studies to investigate norms and expectations of particular professional communities as to the range, frequency, and pragmatic effect of hedging devices employed to convey author's commitment to propositions, and signal rhetorical respect for the audience.

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