PHRASEOLOGICAL PATTERNS IN MEDICAL DISCOURSE

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Abstract

The notion of collocation has prompted linguists to study word co-occurrence as an important part of the contextual meaning of a word. This paper explores the question of the motivation for the use of phraseological patterns in a specific genre: the medical paper. It describes the patterns of occurrence of the most frequent non-technical adjectives found in medical papers and examines the discourse function of these patterns. The results suggest that the use of these adjectives in specific phraseological patterns contributes to conveying the idea that the research described is objective, reliable and important.

Key-words: *phraseology; collocation; genre; medical discourse; non-technical vocabulary.*

Resumo

As unidades lexicais com as quais uma palavra geralmente figura no discurso (colocações) formam parte do seu significado contextual. Este artigo explora o uso de estruturas frásicas em um gênero específico: o artigo de medicina. Descreve ainda as colocações dos adjetivos não-técnicos mais freqüentes em artigos médicos, além de analisar a função discursiva das estruturas frasais nas quais estes adjetivos ocorrem. Os resultados sugerem que o uso de tais adjetivos em modelos frasais específicos contribuem para a transmissão da idéia de que a pesquisa descrita é objetiva, confiável e importante.

Palavras-chave: *fraseologia; colocação; gênero; discurso médico; vocabulario não- técnico.*

1.   Introduction

The distinction between terms or technical items, characterized by special reference within a discipline, and words, or items of general reference which are not specific to any discipline, is one of the assumptions of most studies of lexis in scientific discourse (Ewer and Latorre, 1967; Roe, 1977). This distinction is related to that made between two categories of lexical items: those that are resistant to semantic changes, and therefore do not admit negotiation of meaning (e.g. technical words like *meningitis, peritonitis*), and those that are not resistant and "lend themselves to negotiation of meaning from a context to another" (Cowie, 1988: 129) (e.g. *top, give, dark*). The interpretation of the sense of a particular occurrence of the latter words is heavily dependent on the context. Part of the non-technical lexis occurring in scientific discourse belongs to what has been called "sub-technical vocabulary" (Cowan, 1974; Baker, 1988). These are items which are not specific to a certain field of knowledge but are used in a distinctive way and for specific functions in specialized texts.

Baker (1988) suggests that sub-technical vocabulary in fact consists of different types of vocabulary, of which she lists six, each defined in terms of different criteria. Most definitions of sub-technical vocabulary are based on formal criteria, like distribution or frequency of occurrence in specialized texts (Yang, 1986), or on purely semantic criteria (i.e. whether the words have a more general or restricted meaning) (King, 1978). However, rhetorical and discursive criteria should also be taken into account. Some studies which have focused on the discursive function analyze the lexis used for the discussion of the research process and the evaluation of data in a discipline (e.g. King, 1989; Martin, 1976). Only one of the six types of sub-technical vocabulary listed by Baker is defined according to function (1988: 93): the *rhetorical/ organizational lexis*, which consists of "items which are used in specialized texts to perform specific rhetorical functions. These are items which signal the writer's intentions or his/her evaluation of the material presented" (e.g. "it has been suggested...").

In this paper we are concerned with the meaning and function of non-technical adjectives in medical papers. Salager-Meyer (1983) analyzed the core lexis of medicine, that is, the items (verbs, nouns, adjectives and function words) with a homogeneous distribution across medical texts, and found that the adjectives occurring in this type of discourse describe illnesses or injuries, as well as the quality and timing of treatment. She makes reference mainly to the ideational component of language. In this paper we want to explore the role of adjectives in relation to the interpersonal component. The semantic sense of this interpersonal component has to do with the writer's stance or orientation towards the ideational content and with the interaction between writer and reader.

The basic assumption of the current study is that the meaning of a word is not a fixed one, but depends on the other words with which it collocates. Thus, the analysis of the collocates of a word in a specific text will reveal the meaning of that word. As Firth (1957: 12) claimed:

> *Statements of meaning at the collocational level may be made for the pivotal or key words of any restricted language being studied. Such collocations will often be found to be characteristic and help justify the restriction of the field. The words under study will be found in "set" company and find their places in the "ordered" collocations.*

This is the notion of meaning adopted in systemic linguistics (Hasan, 1985, 1986; Lemke, 1990). Systemic linguists consider that although lexical items have a wide range of potential meanings their actual use-meanings in a text depend on the relation with the other lexical items which appear in the text.

Within this framework the present study sets out to discover which are the most frequent adjectives in medical research papers, to determine whether they occur in specific patterns, in collocation with specific words, and to examine the function of these

collocations. In order to understand the function of non-technical adjectives in this type of discourse we should first analyze briefly the nature of the medical paper.

2.   Medical discourse

Sociological work (e.g. Bazerman, 1988; Knorr-Cetina, 1981; Latour and Woolgar, 1979) has proved that scientific texts are not the objective report of the experiment and its findings, but the result of a process of social construction. The authors resort to rhetoric to persuade the audience to assent to the claim put forward in the paper. Swales' definition of the research paper reflects clearly the suasive nature of this genre:

> *Research articles are rarely simple narratives of investigation. Instead they are complexly distanced reconstructions of research activities, at least part of this reconstructive process deriving from a need to anticipate and discountenance negative reactions to the knowledge claims being advanced* (1990: 175).

Thus, the main aim of the reconstruction that the research article involves is to persuade the scientific community, including the referees of the paper, that the knowledge claims presented there must be accepted as valid and must be incorporated into the network of consensual knowledge. The authors of the article try to prove that their claim is a true description of reality and to create consensus by means of language so as to show the referees that the current research does not constitute a threat to their own research programs. In addition, the claim must be both new and relevant within existing work in the field. Authors make use of different textual strategies in the writing of the research article in order to create the impression of reality, or as Woolgar (1980) calls it, "the out-there-ness of the phenomenon". They resort to *externalizing devices*, which suggest that the phenomenon exists "out-there" and is not dependent on the authors' action which leads to its discovery, and to *sequencing devices*, which create a sequential order between the events and

actions which are described, producing the effect of logic in scientific papers (i.e. the results derive from the data) (Woolgar, 1980).

Hunston (1993) proposes that evaluation has an important role in the process of persuasion. For her evaluation is a pervasive phenomenon, consisting of three different elements: *status, value* and *relevance*. The *status* of a sentence is "the writer's degree of certainty and commitment towards the proposition" (Hunston, 1993: 60-61). *Value* is a judgement made in terms of quality, of the place on a scale ranging from good to bad. The criteria used to bestow value are different for every element of the research. For instance, a result will be valued positively if it is reasonable, reliable, consistent with other data and results, important, and so on. Finally, *relevance* evaluates the significance of the preceding or following text to the argument of the discourse. The evaluation of the status and value of the different elements of the research is highly important since in order to persuade the audience of the validity of the claim scientists have to present the claim as *certain* (or *highly probable*) and *significant*.

Scientists have clues as to how to persuade the audience (especially the referees) of the validity of their claim in the guidelines for authors and for referees and in the checklists for statisticians which appear in the journals where publication is intended. The articles that are published in prestigious journals are selected by the editorial board who asks for advice from some referees. In the guidelines for referees in the *British Medical Journal* it is stated that the referees should give their opinion about "the originality, scientific reliability, clinical importance, and overall suitability of the paper for publication in the journal" (1990: 39). Several other scientific documents provide information regarding the conditions that a publishable paper must fulfill (Burgos et al., 1994; Polgar and Thomas, 1993; Polit and Hungler, 1991). Some of the most important conditions are originality, scientific reliability and relevance of the research:

(i) *Originality*. The research must be original and have an innovative approach.

(ii) *Scientific reliability*. In the Introduction the problem must be clearly stated and placed within an appropriate theoretical frame. The methods must be appropriate and be adequately described. The results should be relevant to the research question. The interpretation and conclusion should be reasonable, warranted by the data, coherent with the results. Other possible explanations are included. The conclusions should be justified.

(iii)*Importance of the subject matter and implications*.

The committee who decides whether a paper should be published or rejected may send the papers, after revision by the referees, for statistical assessment. The checklist for statistical review in the *British Medical Journal* includes questions like the following (1990: 40): "Was the objective of the study sufficiently described? Was an appropriate study design used to achieve the objective? Was a satisfactory response rate achieved? Was the conclusion drawn from the statistical analysis justified? Is the paper of acceptable statistical standards for publication?"

3.   Method

This research is based on a corpus of 100 medical papers, totalling 287.902 words, drawn from two different medical journals which include papers from different disciplines: *British Medical Journal* and *New England Journal of Medicine*. We used a concordance generator to analyze this corpus. With the help of this program we produced an index which provided the frequency of occurrence of the words in this corpus. From this index we extracted the adjectives which occurred 20 times or more.

From this initial list we excluded technical vocabulary belonging to the lexis of medicine. This included vocabulary used in a specific speciality (e.g. *bacterial, cardiac, intravenous, colonic, choronic, coronary, capillary, topical*) or vocabulary which being

used in general language has a special reference in medical papers (e.g. *abnormal, active, acute, moderate, potent, serious, traumatic*). These technical items are used to describe the object of study (i.e. illnesses or drugs). A concordance (i.e. a list of all occurrences of a given word, or combinations of words, within its immediate context in a corpus of texts) of each of the remaining items was produced in order to examine the words with which each adjective collocates, the structures in which it appears, and the elements that it modifies.

4. Results

Table 1 presents the list of non-technical adjectives occurring in the corpus, with their frequency of occurrence.

high,-er,-est (496)	main (88)	late (48)
low,-er,-est (330)	dependent (88)	worse, worst (47)
significant (312)	short (82)	successful (46)
related (294)	poor,-er,-est (80)	probable (46)
similar (201)	few,-er,-est (79)	particular (44)
specific (198)	recent (77)	difficult (41)
great,-er,-est (190)	effective (75)	true (40)
least (184)	average (74)	current (40)
previous (182)	independent (71)	beneficial (37)
small (166)	last (66)	secondary (36)
present (164)	remaining (64)	local (35)
negative (152)	substantial (62)	consecutive (35)
possible (144)	direct (60)	relevant (34)
second (142)	potential (60)	full (32)
important (142)	consistent (60)	considerable (32)
due (140)	appropriate (59)	useful (31)
different (126)	following (58)	detailed (31)
likely (122)	apparent (57)	prospective (30)
daily (116)	unlikely (56)	wide (28)
available (116)	unknown (54)	necessary (28)
initial (114)	frequent (53)	detectable (27)
large,-est (110)	strong,-er,-est (50)	unrelated (24)
new (100)	good (50)	reliable (20)
statistical (98)	subsequent (48)	equivalent (20)
standard (88)	protective (48)	adequate (20)

Table 1: Most frequent non-technical adjectives

In the remainder of the paper we will examine the function and meaning of these adjectives, by taking into account their collocational contexts. These adjectives are used for the following functions:

(i) to refer to the design of the experiment (methods, data, etc).
(ii) to qualify and evaluate past and future research actions.
(iii) to comment on the results.
(iv) to establish a cause relation.
(v) to express different degrees of possibility.
(vi) to express quantity and frequency.
(vii) to express importance, relevance.
(viii) to situate pieces of research in time.

4.1   To refer to the design of the experiment (qualifying methods, data, etc.), e.g. *appropriate, available, average, detailed, detectable, relevant, unrelated.*

These adjectives, occurring mainly in the section Methods, are used to prove that the methods used are appropriate and that their description is adequate. They bestow a positive value on the methods, which are described as *appropriate* and *unbiased*. Some of these items qualify the data or information on which the research is based (e.g. *available, detailed, relevant, independent*). Presenting a claim as based on the *available data* is a device to maintain face. The author does not impose his/her claim on other researchers, since it is implied that this claim could be challenged with further data.

Other items qualify the sample (e.g. *unrelated, average*), the instruments, treatment or planning (e.g. *appropriate*), or the method of study (e.g. *different, similar*). Stating that the method is different from previous ones focuses on its originality, while stating that it is similar to others emphasizes the fact that the research is placed within a theoretical framework and that methods which have proved valid are used here. A frequent adjective used to describe the

design of the method is *independent*, applied to nouns like *assessors, centres, consultants* or *reviewers*. It draws attention to the objectivity of the research, which is also achieved with the use of the technical adjectives *blind, blinded, randomized*.

4.2.   To qualify and evaluate past and future research actions, e.g. *appropriate, necessary, difficult*.

These adjectives are used to qualify the experimental process, to explain why certain research actions have (not) been performed and to recommend further research. They occur in two different syntactic structures:

> *-it+ be+ adjective+ extraposed to-infinitive clause* (e.g. "It is difficult to compare the effectiveness of hospital units").
> *-adjective+ purpose clause* (e.g. "Prospective studies will be necessary to determine...").

These adjectives tend to collocate with modal verbs (e.g. "It *may* not be appropriate to compare our results with...") and with verbs which refer to research actions, such as *compare, assess, determine, see, estimate* and so on.

4.3.   To comment on the results, e.g. *consistent, different, significant, similar, strong, poor*.

There is a frequent occurrence of adjectives that qualify the statistical analysis (e.g. *significant, strong, poor*). They modify nouns like *difference, correlation, association, relation*. The reliability of the statistical results is one of the most important aspects to assess the quality of a research. Adjectives like *significant* bestow a positive value on the results, which are presented as statistically sound, and thus reliable.

Other adjectives like *consistent* or *similar* also bestow a positive value on the results by emphasizing their consistency and supportiveness. They indicate that the author's research is related to

others (e.g. "our results are similar to those of previous research"), which in a way validates it. Thus, previous research is used to provide a positive evaluation on the current results.

4.4.   To establish a cause relation, e.g. *associated, due, related.*

These items are used to establish an external causal relationship (i.e. happening a is *the cause of* happening b) (Halliday,1988). The frequent occurrence of these items is consistent with the proposal that medical reports are constructed as explanations of little understood or unexplained phenomena (Adams-Smith, 1987). These adjectives are part of the sequencing devices used by the authors of research papers (Woolgar, 1980). They reveal that there is a logical connection between the data and the conclusions.

4.5.   To express different degrees of possibility, e.g. *apparent, likely, possible, probable, unknown, unlikely.*

The function of these adjectives is to express the writer's degree of confidence in the truth of the propositions expressed. An important aspect in the writing of research papers is to distinguish interpretations from facts and to signal the writer's assessment of the likelihood that the statements presented are true. These adjectives are useful devices to express the status of statements and signal the degree of interpretation and evidence.

The adjectives *likely, unlikely, probable, possible* occur in the structure *it is+ adjective+ that*, functioning as hedges of a claim; that is, they express the writer's opinion about the claim. *Likely* and *unlikely* also occur in the structure *be likely/unlikely to*. In this structure *likely* is very frequently preceded by *more*. *Likely* and *possible* modify nouns like *cause, reason* and *explanation*. The author presents an explanation tentatively, but does not risk asserting it with confidence.

The adjective *unknown* is frequently followed by the conjunction *but*, which introduces a clause where a possible explanation is given. The following example illustrates this point:

> *The mechanisms underlying the abnormal vasomotion in these patients are unknown,* but *they may relate to defective endothelial function, inappropriate vasoconstriction, or both.*

Thus, it is used by the authors to indicate that they will speculate about an unresolved question.

Finally, the adjective *apparent* collocates with items like *effect, benefit, concern, deterioration, rate of, relation*, expressing that the author does not want to commit himself/herself to the assertion that this is the actual effect, relation, etc.

The frequent use of these adjectives in scientific discourse is due to the fact that authors are aware that knowledge is correctable and therefore they try to protect themselves from possible refutations and contradictions. They don't risk making assertions that can be proved to be false.

4.6   To express degree, quantity and frequency, e.g. *considerable, few, fewer, fewest, frequent, great, greater, greatest, high, higher, highest, large, larger, largest, least, low, lower, lowest, small, substantial, wide.*

These items are used to convey vagueness in the expression of degree, quantity or frequency. For Myers (1996: 6) vagueness is intended as "a means of communicating in a situation, not as a failure of some ideal explicitness". Channel (1990) considers that vagueness is used for pragmatic reasons, such as persuading the audience, giving only the needed information, expressing politeness and deference, protecting oneself against making mistakes or coping with the lack of specific information. Since these adjectives are inherently vague their meaning depends on the context in which they

are used (Channel, 1990). This kind of items are used for specific communicative purposes. A look at the nouns with which the adjectives collocate reveals why they are used.

The adjectives *high* and *low* collocate with items like *rates, doses, levels, concentrations*. The adjectives *small* and *large* collocate with items like *proportion of, number of*. Channell (1990) argues that the second part of the maxim of quantity (i.e. "Do not be over-informative") is regarded by speakers as having an important role in communication. Thus, the authors use vague expressions to provide only the amount of information that they think that the reader will need to know. The reader does not need to know the exact rate, level, etc. but only to know whether this rate or level is regarded by the researcher as high or low.

The adjective *considerable* collocates with items like *consequences, benefits, morbidity, importance, advantages, risks*. And the adjective *substantial* collocates with *differences* and *proportion of*. *Considerable* is defined as "worth consideration, significant; large in extent or degree", and *substantial* is defined as "considerable in quantity; significantly large". Thus, these adjectives share the semantics of *significant* and of *large*.

The adjective *few* collocates with nouns used to describe the method of the research (e.g. *few autopsies, few subjects*) and with the noun *studies*. With nouns used to describe the method of the research the authors may use *few* to withold information and not tell the exact number. With *studies* the authors use *few* to justify their own research. The collocation *few studies* occurs in the Introduction to indicate a gap in existing knowledge, and thus justify the authors' research, which is intended to fill this gap.

We can say that the adjectives that express degree or quantity are used to justify the conclusions. By stating the degree or quantity of specific elements the authors intend to show that their conclusions are sound, drawn from data, and warranted by the results.

4.7.   To express importance, relevance, *e.g. important, main, major, relevant, useful.*

One of the conditions that a research must fulfill in order to be publishable is the importance and relevance of the subject matter and of the implications. The claim must be relevant within the existing knowledge in the field (Kaufer and Geisler, 1989). These adjectives contribute to bestowing a positive value on the research, since they emphasize that it has come up with important findings and results. They collocate with the following nouns: *important* (*effect, aspect, finding, issue, factor, cause*), *main/ major* (*cause, reason, finding*), *relevant* (*information, description, history, report*), *useful* (*approach, findings*). Thus, they draw attention to and highlight the information which is presented.

4.8.   To situate pieces of research in time, e.g. *current, present, previous, recent*.

The purpose of the scientific article is to integrate a new piece of knowledge into existing knowledge. The scientists use these adjectives to situate their research within a theoretical framework and to establish a contrast between previous studies and the present study in order to show that something new is introduced.

5.   Conclusion

Among the aspects of language which have been practically ignored by genre analysis is the contextual meaning of words. Most studies on lexis in technical and scientific discourse have focused on technical vocabulary, or on the criteria to distinguish between technical and sub-technical vocabulary. In this paper we have examined the discursive function of non-technical adjectives in medical papers.

There is a set of adjectives which occur with high frequency across medical papers. These adjectives are part of phraseological patterns. They tend to co-occur with specific words, and each of them is used in this genre to modify a restricted set of nouns. The typical meaning of these adjectives in medical papers can be

determined by looking at the words which co-occur with them. Their co-occurrence with specific nouns is motivated by the rhetorical aims of the genre. This study has shown that non-technical adjectives which are part of phraseological patterns have specific discursive functions in the genre of the medical paper: to refer to the design of the experiment (methods, data, etc), to qualify and evaluate past and future research actions, to comment on the results, to establish a cause relation, to express different degrees of possibility, to express quantity and frequency, to express importance or relevance, to situate pieces of research in time. By serving these functions non-technical adjectives convey the idea that the research reported is objective, reliable and relevant, which contributes to the persuasive purpose of the research paper. Thus, we can conclude that mastery of the phraseological patterns which are part of the linguistic expression of the research paper is essential for the writers of this genre.

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