Sub-Technical Vocabulary and the ESP Teacher: An Analysis of Some Rhetorical Items in Medical Journal Articles[1]

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This paper discusses the various definitions of "sub-technical" vocabulary and suggests that more emphasis should be placed on one type of sub-technical lexis, namely items used for rhetorical/organisational purposes in specialised genres. A method is offered for categorising the vocabulary used in medical journal articles into three bands: General Lexis, Specialised Lexis, and Sub-technical/Rhetorical items. General Lexis is identified on the basis of its even distribution across medical and general English. Specialised lexis is identified on the basis of (a) its uneven distribution among medical texts, i.e. text specificity, and/or (b) a significant difference between its frequency of occurrence in medical and in general English. Items not identified as Specialised or General are assumed to have a potentially significant role in structuring the writer's argument. A detailed analysis of a selected number of these items is presented. The paper argues that rhetorical/organisational items are provided in the text as clues by which the reader can interpret the writer's intentions and evaluations. Their acquisition is therefore essential to successful interpretation. Some pedagogical applications are discussed.

INTRODUCTION

It has often been pointed out by ESP teachers and applied linguists that the division of vocabulary in technical registers into specialised and general items is both simplistic and inadequate for the purposes of teaching English as a foreign language. Many have argued that the real difficulty with understanding scientific/technical text, as far as the foreign specialist or learner is concerned, lies in the area of vocabulary generally referred to as "subtechnical". The term "subtechnical" covers a whole range of items which are neither highly technical and specific to a certain field of knowledge nor obviously general in the sense of being everyday words which are not used in a distinctive way in specialised texts.

The notion of subtechnical vocabulary has been useful in drawing the attention of the teacher/linguist to the fact that understanding specialised texts is not simply a matter of understanding or acquiring the relevant terminology. Nevertheless, "subtechnical" as a category has proved to be elusive and confusing for many teachers, the reason being that the term has neither been clearly nor consistently defined in the literature. Moreover, it is as simplistic as the specialised/general

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[1]This is a version of a longer paper entitled 'A method of identifying stylistically significant lexis in medical journal articles'. For reasons of space, a considerable amount of detail, including references to previous academic work in the field, has had to be omitted from the present paper. Anyone wishing to read the original version should apply to the author.

division in that it attempts to classify anything that is neither specialised nor general under the same heading. Common sense and experience indicate that this middle area between specialised and general is itself made up of several different types of vocabulary which require different teaching techniques. To illustrate, let us look at some types of items which have been referred to as "subtechnical" by various linguists:

1.   Items which express notions general to all or several specialised disciplines, e.g. *factor, method* and *function.*

2.   Items which have a specialised meaning in one or more disciplines, in addition to a different meaning in general language. *Bug* in computer science, for instance, is different from *bug* as we know it in everyday use. *Solution* has different specialised meanings in mathematics and chemistry, in addition to its general language meaning.

3.   Items which are not used in general language but which have different meanings in several specialised disciplines. *Morphological,* for instance, means different things to linguists and botanists.

4.   Items which are traditionally viewed as general language vocabulary but which have restricted meanings in certain specialised disciplines. In botany, *effective* simply means "take effect"; it carries no evaluative meaning. In the same discipline, genes which are *expressed* have observable effects i.e. are more apparent physically, as opposed to being *masked. Expressed* in botany is therefore not associated with emotional or verbal behaviour as is the case in general language.

5.   General language items which are used, in preference to other semantically equivalent items, to describe or comment on technical processes and functions. For example, a recent examination of a corpus of biology textbooks (Holes and Baker, forthcoming) revealed that "photosynthesis, and other processes such as digestion, do not, apparently, ever 'happen': they overwhelmingly 'take place' and occasionally 'occur'". *Take place* and *occur* can therefore be regarded as subtechnical vocabulary.

6.   Items which are used in specialised texts to perform specific rhetorical functions. These are items which signal the writer's intentions or his evaluation of the material presented. Johns and Dudley-Evans (1980) give the following examples of expressions used in Plant Biology lectures: "One *explanation* is . . .", "*Others* have *said* . . ." and "It has been *pointed out* by . . .".

RHETORICAL/ORGANISATIONAL LEXIS AND THE ESP TEACHER

I would like to suggest that, of the above types of "subtechnical" vocabulary, the last type is the most difficult to teach and acquire. The first type of subtechnical

vocabulary described above may be considered somewhat difficult to explain since it relates to abstract notions. Nevertheless, it has a specific, stable meaning and pattern of use, and is therefore not likely to pose a major problem for the learners once the teacher has explained it. Types two and three should cause little or no difficulty for the learners once they are made aware of the fact that certain items have different meanings from the ones they are or may be familiar with. It is simply a matter of learning to assign different meanings to items which share the same form. Types four and five require a fairly simple explanation from the teacher, especially for comprehension rather than production purposes. They are items which are used in a somewhat restricted way in the discipline concerned. The teacher will obviously need to show how they are used in context, but we might assume that their meanings, once defined, will remain stable, and that they are not likely to vary from one genre to another within the same discipline. The same restrictions which apply to the item *expressed* in a journal of botany are likely to apply to it in a textbook on botany. Furthermore, failure to understand an item from either of these two categories will mainly affect the student's understanding of the piece of information contained in the sentence or sentences concerned. By contrast, failure to interpret correctly an item which signals the writer's evaluation or intentions will affect the student's understanding and appreciation of the whole text, or at least substantial parts of it. Johns and Dudley-Evans (1980) point out that, in ESP, as indeed in so many other areas of language teaching, understanding a text "is not simply a matter of knowing the information it contains, but also – and crucially – of being able to evaluate and use that information".

What the ESP teacher would ideally hope to achieve by teaching rhetorical/organisational lexis is to develop in his foreign students a sense of style relevant to the various text-types used in their specific discipline and an ability to interpret, evaluate and later make use of an argument or piece of specialist information. This necessitates the study of real texts in order to identify the relevant items, the patterns in which they occur and the restrictions applying to their use in any particular genre.

THE PRESENT STUDY

In view of the importance of rhetorical/organisational lexis, the present study set out to explore the possibility of achieving the above aims by means of objective criteria rather than intuition. The genre of medical journal articles was selected for several reasons. Scientific journal articles in general are among the most obvious examples of the role of English as an international language. They are written and read by an increasingly large number of non-native speakers of English. Moreover, Swales (1985) points out that they are under-researched as a genre, in spite of their considerable importance to foreign scientists who either need access to the up-to-date information contained in them or wish to further their career opportunities by

publishing their own articles. More important from the point of view of this study, which was carried out as a small MA project with modest facilities and limited research time, was the highly conventionalised nature of medical journal articles in particular. This is illustrated by the fact that they follow a set layout (Abstract, Introduction, Methods/Case Report, Results and Discussion/Comment) and are therefore already divided into rhetorical sections, thus making it easier to draw pedagogically useful conclusions from a small scale study.

To arrive at objective and reliable conclusions in a short space of time, I decided to use the computer to analyse a number of medical articles (altogether 18 articles from 8 different journals – a total of 21,087 words). I will refer to this collection of texts as the **Large Medical Corpus**. The computer produced a frequency word list of this corpus, from which I extracted the top most frequent 218 items, with a cut-off point of 14 occurrences. The easiest way of uncovering items which may be used for rhetorical reasons seemed to be through a process of eliminating specialised and general lexis, in the hope of narrowing down the number of possible candidates for this category.

Several recent studies have been successful in identifying specialised lexis on the basis of its frequency (i.e. the number of times it occurs in a homogeneous corpus) and distribution (i.e. the range of texts in which it occurs within the same corpus). This method of identifying specialised items is based on two assumptions: (a) that specialised items occur fairly frequently in their relevant disciplines but infrequently or not at all in general language, and (b) specialised items tend to be text- as well as subject-specific. In other words, an item such as *myocardium* is subject-specific in the sense that it is a medical word, and text-specific in the sense that it is not likely to occur in any or even a large number of medical texts but only in those medical texts which deal with heart ailments or related topics. By contrast, we may assume that general lexis items are likely to show a stable pattern of frequency and distribution across registers. This is largely because items such as *the, of, there* and *had* carry little meaning on their own. There is therefore no reason why their frequencies should peak in some texts and fall in others.

In order to measure the frequency and distribution of my 218 items, I needed to refer to two corpora other than the **Large Medical Corpus** already mentioned. The first was a sub-section of the Medical Corpus – a total of 7 of the 18 articles, which I merged into a separate file on the computer. I will refer to this as the **Small Medical Corpus**. The second was the COBUILD Corpus of General English held at the University of Birmingham, which amounts to 7.3 million words of general English. This will be referred to as the **General English Corpus**. The differences in the size of corpora were evened out by converting the raw frequencies of items into percentages of the total number of words in each corpus. For example, the item *the* occurred 1176 times in the **Large Medical Corpus** (21087 words). Its percentage

frequency in that corpus is $(1176 \times 100) \div 21087 = 5.57\%$.

The next step was to obtain the ratio of frequency percentages between each two corpora. This is calculated as follows:

Item: *the*

Frequency Percentage in Large Medical Corpus: 5.57.

Frequency Percentage in General English Corpus: 4.23.

Ratio of Frequency Percentage (LMC/GEC): $5.57 \div 4.23 = 1$ (rounded figure)

The computer was then instructed to select all general language items, which were identified on the basis of a low Ratio of Frequency Percentage for Large Medical/General English Corpora (RFP value of 5 or less). This produced the list of 92 general items shown in Figure 1.

Fig. 1 General Lexis

No.	WORD	RATIO:L/G	No.	WORD	RATIO:L/G	No.	WORD	RATIO:L/G
1	the	1	42	are	0	112	time	0
2	of	1	43	but	0	117	such	1
3	and	1	46	which	0	118	their	0
4	in	2	47	it	0	121	could	0
5	a	1	49	both	4	125	however	4
6	with	3	50	also	2	126	most	1
7	was	1	53	these	1	127	over	0
8	to	0	54	three	3	131	four	3
9	were	4	55	two	1	137	when	0
10	for	1	57	day	3	140	seen	3
12	by	2	58	right	2	141	about	0
13	is	0	60	may	2	142	although	4
14	that	0	62	left	4	144	each	1
17	had	1	67	only	1	163	well	0
18	at	1	70	out	1	167	five	3
19	been	2	74	before	2	168	into	0
20	on	0	78	used	4	175	system	3
21	be	1	81	found	4	176	those	1
22	as	0	86	first	1	179	women	2
24	this	1	87	more	0	180	year	1
25	from	1	88	one	0	189	home	1
27	an	1	90	than	1	195	six	4
29	not	0	94	between	2	196	they	0
30	or	1	95	other	1	197	among	3
32	no	1	97	she	0	199	can	0
33	we	1	99	her	0	203	given	3
36	have	0	104	years	1	205	out	0
37	has	1	105	against	2	206	possible	3
38	who	1	106	because	0	208	second	2
40	there	0	110	he	0	217	woman	2
41	all	0	111	some	0			

The criteria for selecting specialised items were: (a) an RFP value for Large Medical/General English Corpora of more than 300, and/or (b) an RFP value for Large Medical/Small Medical Corpora of more than 10. The first criterion identifies specialised items on the basis of their subject-specificity. This produced the list of 61 highly technical items shown in Figure 2.

Fig. 2: Specialised Lexis

NO.	WORD	RATIO:L/S	RATIO:L/G	NO.	WORD	RATIO:L/S	RATIO:L/G
11	patients	0	382	139	regimen	1.70141E+38	3288
23	serum	1	3154	145	pain	1.70141E+38	20
34	RBC	0	1.70141E+38	150	acromegaly	0	1.70141E+38
48	TNF	1.7014E+38	2307	153	cyclosporin	1.70141E+38	1.70141E+38
51	hormone	0	626	154	degeneration	0	1471
52	pregnancy	1.70141E+38	158	156	exercise	1.70141E+38	23
56	antibodies	0	12808	159	myocardium	1.70141E+38	1.70141E+38
61	fig	2	1009	161	placenta	1.70141E+38	535
66	botulinum	1.70141E+38	3808	164	angina	1.70141E+38	5538
68	sinusoids	1.7014E+38	5712	165	donors	0	615
71	parenteral	1.70141E+38	1.70141E+38	169	myocardial	1.70141E+38	1107
72	samples	0	426	170	organisms	1.70141E+38	131
75	nutrition	1.70141E+38	1192	171	plasma	0	1.70141E+38
77	toxin	1.70141E+38	5365	172	praevia	1.70141E+38	1.70141E+38
79	botulism	1.70141E+38	10385	174	spinal	0	791
80	concentrations	0	384	177	tract	0	395
83	poliomyelitis	0	5192	178	virus	0	346
85	diabetes	0	1254	181	bone	1.70141E+38	44
113	transfusion	0	2654	182	bowel	1.70141E+38	519
115	coronary	1.70141E+38	585	184	CST	0	1.70141E+38
116	insulin	0	7616	187	heart	1.70141E+38	7
119	cl	1.70141E+38	403	189	home	1.70141E+38	1
120	clinical	1	454	190	intermittent	5	324
123	glucose	0	3634	194	RIAT	0	1.70141E+38
124	HLA	0	1.70141E+38	198	birth	1.70141E+38	16
128	penicillamine	1.70141E+38	1.70141E+38	201	continuous	1.70141E+38	62
129	antibody	0	1.70141E+38	209	skin	1.70141E+38	12
132	hepatitis	0	6923	210	spaces	1.70141E+38	100
134	pagets	1.70141E+38	1.70141E+38	213	systemic	1.70141E+38	1615
135	tumour	0	629	214	term	1.70141E+38	10
136	ventricular	1.70141E+38	1730				

Thus, of the 218 items selected originally, 153 items were excluded and the following 65 remained to be considered.

Fig. 3: Sub-technical/Organizational Lexis

NO.	WORD	RATIO:L/S	RATIO:L/G	NO.	WORD	RATIO:L/S	RATIO:L/G
15	after	0	6	63	showed	0	26
16	patient	0	173	64	results	1	39
26	disease	3	160	65	severe	0	82
28	normal	0	54	69	survival	0	51
31	treatment	1	72	73	study	1	18
35	during	2	11	76	reported	2	40
39	case	1	9	82	human	0	5
44	growth	0	30	84	days	0	5
45	table	0	16	89	test	0	33
59	cases	2	24	91	months	0	9

NO.	WORD	RATIO:L/S	RATIO:L/G	NO.	WORD	RATIO:L/S	RATIO:L/G
92	positive	0	43	155	described	1	15
93	weeks	2	11	157	figure	0	8
96	concentration	0	62	158	hospital	1	11
98	cell	1	48	160	observed	0	34
100	levels	1	38	162	present	1	5
101	motor	0	50	166	findings	1	128
102	report	1	15	173	reduced	1	22
103	type	8	16	183	changes	1	8
107	daily	1	16	185	detected	1	152
108	developed	1	16	186	examination	0	30
109	evidence	0	13	188	history	1	5
114	blood	0	14	191	loss	0	17
122	diagnosis	3	213	192	methods	0	18
130	cells	0	40	193	negative	0	35
133	increased	0	22	200	compared	0	20
138	low	1	9	202	cord	0	142
143	associated	1	34	204	lateral	0	28
146	period	3	7	207	presence	0	15
147	shown	0	16	211	symptoms	0	59
148	studies	0	24	212	syndrome	1	127
149	tube	6	59	215	tests	1	32
151	active	2	19	216	treated	1	19
152	caused	0	19				

As stated earlier, the hope was to narrow down the number of candidates for the category of sub-technical items, not to isolate the required items totally. It is clear that while Fig. 3 contains a number of items which are likely, in context, to belong to Category 6 items, eg. *showed, results, study, reported,* it is also clear that many of the items on the list do not belong to the category, eg. *after, patient, growth* etc.

To achieve better results, one would have to supplement the above exercise with a collocational/phraseological study. Sinclair (1987) maintains that "There is a close correlation between the different senses of a word and the structures in which it occurs. 'Structure' includes lexical structure in terms of collocations and similar patterns. 'The sense of a word' includes the contribution that a word may make to a multi-word lexical item". According to this view, a collocational/phraseological check should ensure the following:

(a) that homographs are isolated and treated differently according to their different senses. Items such as *motor, cell, tube* and *cord,* which appear in Fig. 3 are used differently in Medicine and General English. A collocational check would clearly place them in the Specialised Lexis Band.

(b) that the nominal compounds and specialised multi-word units are identified as such. Yang (1986) identified single-word terms by their frequency and distribution, and multi-word terms by their collocational behaviour. Because the present exercise was carried out on single items only, items like *disease, growth, loss, survival, syndrome, test* and *type* are included in Fig. 3 (Organisational Lexis). A

quick look at the concordances of these items revealed that they are mostly used in nominal compounds. *Disease,* for instance, occurs 78 times of which 20 occurrences are in the form *Paget's Disease* and 7 in the form *Wilson's Disease.* Other compounds are *Chrohn's Disease, coronary artery disease, meningococcal disease* and *polycystic kidney disease.* The following is a brief summary of the profiles of some other items in Fig. 3.

> *Growth,* 47 occurrences, 37 as *growth hormone*
> *Loss,* 15 occurrences, 6 as *motor neuron loss,* 3 as *fiber loss*
> *Survival,* 33 occurrences, 16 as *rbc survival,* 7 as *cell survival,* 2 as *motor neuron survival*
> *Syndrome,* 14 occurrences, 6 as *guillain-barre syndrome,* 2 as *idiopathic respiratory distress syndrome,* 1 as *Cushing's Syndrome*
> *Test,* 20 occurrences, 9 as *lymphocytotoxicity test,* 2 as *anti-IgG test,* 2 as *antiglobulin test*
> *Type,* 24 occurrences, 16 as *type F* – mostly followed by *botulism, toxin* or *organism.*

Clearly, if these items were identified as compounds by means of a collocational check, their RPF values would be quite different.

The substitution of lexemes may further improve the results rendered by the above exercise. However, it would have to be selective substitution. I suggest that only singular and plural forms of some nouns such as *patient/patients* and *case/cases* should be combined, and only where they occur in different bands. Any attempt to substitute other forms, such as verbs, with lexemes would have a blurring effect on the way this genre of medical writing seems to use certain forms of certain verbs for instance and not others, or use certain forms in certain rhetorical sections of the article.

ANALYSIS OF SELECTED ITEMS

KWIC concordances of 43 of the above 65 items were next produced by the computer. A KWIC concordance consists of one line of text, with the keyword in central position (Key Word In Context). The computer was also instructed to print on the left-hand side of each concordance a code indicating the journal article and the rhetorical section in which it occurred. This served two purposes: (a) It gave an indication of whether a pattern was typical of the genre (because it was repeated in different articles from different journals) or untypical (because it only occurred in one article or journal); and (b) it gave an indication of whether an item was used in the same way in all sections, or used for specific rhetorical purposes in specific rhetorical sections. As we might expect, the Discussion section proved to be the richest in rhetorical items, followed by the Introduction section.

Five items were eventually selected for a close analysis: *findings, report, reported, diagnosis* and *evidence.* The one-line concordances were expanded by the writer to illustrate the rhetorical role played by these items. Due to lack of space, only sample concordances of three of the above items (*findings, report* and *evidence*) are presented below.

Findings

Total Occurrences: 16, of which 7 (43.7%) are from the Discussion Section.

Selected Concordances from the Discussion Section are:

> 1.   Our *findings* suggest that the results of MacGillivray et al were due to chance. Moreover, they provide strong evidence against the hypothesis that late conception is linked to placenta praevia.

> 2.   Our *findings*, in conjunction with the previous work by Bernstein, Hall and Gostelow, describing development of a morphoea-like reaction after penicillamine therapy, raise a question about the suitability of this drug for the treatment of scleroderma.

> 3.   Our *findings* extend this assumption to RBC-HLA incompatibilities;

> 4.   Our *findings* are important for patients with haematological diseases with potentially long-term survival.

Findings is typically preceded by the pronoun *our* in the Discussion Section, unlike in other sections where the same item tends to be preceded by descriptive modifiers such as *clinical, physical, operative* and *routine laboratory.* This close association with *our* suggests that *findings* is used by medical writers in the final section of an article to emphasise their claim to the research outlined in previous sections.

Findings seems to be largely presented as an active agent in the clause. *Findings* in the Discussion Section *extend, raise a question, suggest* and *provide strong evidence.* Concordances from other sections simply present *findings* as *normal, did not change* or *were observed.* This pattern, together with the writers' description of their findings as *important* in Concordance 4, suggest that the use of *findings* in the Discussion Section is highly evaluative.

Report

Total Occurrences: 23, of which 12 (52%) are from the Introduction Section.

Selected Concordances from the Introduction Section are:

> 1.   We *report* a patient with Wilson's disease who developed systemic sclerosis-like lesions while being treated with penicillamine.

2.   We *report* the case of a young woman who developed insulin dependent diabetes after renal transplantation for non-diabetic renal disease.

3.   We *report* on a patient who developed peritonitis after the latex in a Celestin tube inserted for benign mid-oesophageal stricture broke up.

4.   Long acting nitrates are widely used to treat angina with the objective of providing continuous antianginal prophylaxis, but there is growing evidence that sustained raised nitrate concentrations may lead to tolerance. We *report* an investigation that assessed the extent of tolerance during continuous and intermittent treatment with glyceryl trinitrate patches.

5.   We *report* on a patient with acromegaly and hyperprolactinaemia, in whom treatment with the dopamine agonist bromocriptine caused a rapid progression of the growth hormone producing tumour.

6.   The persistence of myocardial sinusoids in both ventricles as an isolated anomaly has not been described before. We *report* the first case in which the diagnosis was made by two-dimensional echocardiography, documented by angiocardiography and proved by autopsy.

7.   The persistence of toxin or organisms in the gut of some patients with food-borne botulism indicates that enteric C1 botulinum infection may not be restricted to infants. We *report* here our observations in a patient with a rare type F botulism, classification undetermined, who had two episodes of botulinum toxaemia, associated with severe illness, while in hospital.

Report is used almost exclusively as a simple present verb in the Introduction Section. In other sections, namely Discussion and Case Report, the same item is used exclusively as a noun.

Report collocates very strongly (almost 100%) with the pronoun *we* in the Introduction section. This pattern does not occur in other sections.

We report occurs in sentence-initial position in all but one of the Introduction concordances. Moreover, it occurs in the last sentence in Introduction in 8 out of 12 concordances, in the sentence before last in 2 concordances, and as the only sentence in a merged Abstract/Introduction Section in one concordance. We may therefore regard it as a fixed expression used to "wrap up" the Introduction and prepare the reader for the next rhetorical section.

We report is often preceded by a direct or indirect statement of a gap in medical knowledge, e.g. "has not been described before" (Concordance 6), "may lead to" (Concordance 4) and "may not be restricted to infants" (Concordance 7). This serves to emphasise the contribution of the research about to be outlined and encourages the specialist to continue reading.

We report may also be described as a lexical signal of an element similar to Problem or Response in a Problem-Solution pattern or a variant of it (Hoey, 1979, 1983). In other words, it signals to the reader that there is a Problem, e.g. an area of medicine which has not been adequately researched or a possible danger arising from a drug, etc., and introduces what the writers view as their Response, i.e. their contribution to filling part of the gap or providing part of the answer to a problem or uncertainty.

The whole sentence introduced by *We report* may also be said to represent the Preview element in a Preview-Detail relation (Hoey, 1983), where the Detail element is provided by the whole of the Patients and Methods, Case Report or Results sections or any combination of these. In other words, the sentence introduced by *We report* may be seen as a summary of the whole article.

Evidence

Total Occurrences: 23, of which 13 (56%) are from the Discussion Section.

Expanded concordances from the Discussion Section are given below. Single line concordances from the other sections are also given to illustrate that some of the patterns are typical of all or several sections. Moreover, the use of *evidence* in this corpus was compared with its use in another corpus of technical English to see whether the patterning and use of rhetorical items are likely to be similar or different across genres. The other corpus referred to is drawn from the area of Transportation and Plant Biology (Johns 1987).

Selected Concordances from the Discussion Section are:

1. There was no *evidence* of exacerbation of anginal symptons overnight, when no nitrate was being supplied.

2. Moreover, they provide strong *evidence* against the hypotheses that late conception is linked to placenta praevia.

3. We found no *evidence* of CST degeneration in these seven patients who had survived many years after a severe attack of paralytic poliomyelitis.

4. There is *evidence* for occasional corticospinal involvement in acute poliomyelitis, but this involvement is far less in frequency and extent than the CST degeneration seen in ALS.

5. The present study also provides *evidence* against the hypothesis that adult upper motor neurons are dependent on a substance derived from spinal motor neurons.

6. We found no *evidence* of transsynaptic retrograde degeneration of the CST.

7/8.   One of our patients went into premature labour at 30 weeks gestation. Although the use of lipid emulsions in pregnant animals has been associated with premature labour (Heller 1977), there has not, so far, been any *evidence* that the same occurs in man. Our second patient had had two previous spontaneous abortions and we do not feel that her premature labour was related to the infusion of lipid emulsion. Histological examination did not show any *evidence* of lipid deposition or lipid thrombi in any of the three placentas. Until an association between lipid infusion and premature labour is conclusively demonstrated in women, the regimen described in this report appears quite suitable for pregnant patients on home parenteral nutrition.

Concordances from Other Sections include:

(Abstract).... was examined for *evidence* of CST degeneration.
(Introduction).... but there is growing *evidence* that sustained....
(Case Report).... to his records, there was no *evidence* of renal....
(Case Report).... There was no *evidence* of Raynaud's phenomenon....
(Case Report).... There was no *evidence* of intestinal obstruction.
(Patients and Methods).... There was no *evidence* of exacerbation of....
(Patients and Methods).... there was no *evidence* of lipid....
(Patients and Methods).... no clinical *evidence* of any other....
(Patients and Methods).... initial disease without *evidence* of....
(Patients and Methods).... No *evidence* of active inflammation was....

Evidence collocates very strongly with particles of negation in all sections. This pattern contrasts very sharply with the concordances of *evidence* drawn from the corpus of Plant Biology and Transportation and Highway Engineering (Johns 1987) where, out of 56 concordances, there are only two instances of *evidence* collocating with a negative particle.

Although *evidence* collocates with *no* in most sections, the larger patterns in which the two items occur are different. In Case Report and Patients and Methods, for instance, by far the most prevalent pattern is "There was no evidence", mostly in sentence initial position. A variety of other patterns occur in the Discussion section.

There is a strong tendency to qualify *evidence* by an *of* phrase in the above concordances. This pattern is strongest in Case Report, Patients and Methods and Results, where every occurrence of *evidence* without exception is qualified by an *of* phrase. The same pattern recurs in 7 out of the original 13 concordances from Discussion. Altogether, 16 out of 23 instances of *evidence* repeat this pattern in the Medical Corpus. By contrast, Johns' concordances show only 2 out of 56 occurrences of *evidence* being qualified by an *of* phrase.

In most instances where *evidence* is presented as "positive" or "existing" it is not qualified by an *of* phrase.

The pattern "provide evidence against the hypothesis that" may prove characteristic of the Discussion Section (see Concordances 2 and 5, taken from different texts). It is surprising to see a long chunk of language such as this occurring in two different texts from two different journals. This suggests that the genre of medical journal articles is highly conventionalised and restricted in its patterning.

Concordances from this corpus do not show a significant tendency for *evidence* to be modified. There are only four modifiers preceding *evidence* in the medical corpus: *strong, direct, growing* and *clinical*. This suggests that the main concern of writers in this genre is to state whether or not evidence exists. When it is modified, the emphasis seems to be more on "how much of it there is", i.e. its "quality/reliability" rather than what sort of evidence it is, hence the lack of descriptive modifiers, with the exception of *clinical*. Again, this contrasts sharply with Johns' concordances where a variety of descriptive modifiers are used, e.g. *archaelogical, collective, experimental, genetic, linguistic, physical,* etc.

Only concordances from the Discussion and Introduction sections present *evidence* as existing. This suggests that the more "objective", less rhetorical sections of medical journal articles, namely Case Report, Patients and Methods and Results, are merely concerned with eliminating unsubstantiated interpretations of a symptom or disease in order to narrow down the potential number of causes and end up with some diagnosis or explanation. Once a diagnosis is offered, the writers turn their attention to supporting it by indicating that evidence does exist to justify their interpretation or to disprove other hypotheses which conflict with theirs (see Concordances 2 and 5 in particular). The "no evidence" pattern is also used for the purpose of argumentation in this section, rather than for eliminating potential causes. The most obvious example of this is Concordances 7/8, taken from the same text, where the writers are obviously engaged in justifying their "regimen" by saying that there is no evidence to prove that the complications in their two patients were caused by that regimen or elements in it.

PEDAGOGICAL IMPLICATIONS

The above data suggests that certain lexical items may be used in set patterns in certain specialised genres to perform specific rhetorical functions (e.g. evaluating, summarising, highlighting gaps in a field of knowledge) and to structure and organise the writers' argument. The obvious pedagogical implication is that rhetorical items should be identified and that learners should be given a great deal of exposure to these items in order to appreciate and make use of the information in a text. The other obvious implication is that these items should not be taught in isolation but in context and as central elements in typical collocations. In teaching a rhetorical item, the ESP teacher should attempt to draw the learner's attention to

the following:

1.   The type of text in which the learner can expect to encounter it.

2.   The rhetorical section in which the item is used.

3.   The typical patterns in which it occurs, e.g. the learner can expect to see *We report* rather than simply *report* in the Introduction Section. He should also be made aware that different restrictions can apply to the same item in different genres and registers. It would be misleading, for instance, to say that *report* in a medical journal article has a different meaning from *report* in general, everyday language. It is the same item, with the same meaning simply operating under different restrictions. According to the data presented in this study, the following patterns are unlikely to be used in a medical journal article, although they are grammatically correct and appropriate to use in general language:

We report that....

This paper reports....

Instead of having to teach all or a random selection of the syntactic structures in which *report* may enter, the teacher can concentrate on the following typical ones for this genre:

We report on (+ noun phrase)

We report(+ noun phrase)

This process of identifying typical structures and exposing the students to them should simplify the reading process, since the learner will become familiar with and learn to interpret whole stretches of language at a time instead of individual lexical items.

4.   What the item signals, i.e. gap in previous research, summary to follow, etc.

5.   How to use these signals to interpret the writer's attitude towards the information offered in a text.

One advantage of teaching rhetorical items is that it should encourage learners to see relations in a text which extend beyond the sentence, and to look for and use clues which link sentences, paragraphs and rhetorical sections together. The foreign learner/specialist should ideally be able to respond to textual clues and linguistic signals in the same way that a native specialist does, albeit subconsciously. He would be aided in achieving this aim by learning to use rhetorical items as signposts to interpret the writer's intentions.

One interesting way of carrying out the above exercise, once the teacher has done the preliminary work and extracted some data, would be to invite students to find

and analyse similar texts. If the students' findings coincide with those of the teacher, the exercise will serve to reinforce what has been learnt in the classroom, and will provide students with more exposure to the relevant items and more confidence in their ability to interpret an argument. It will also provide the teacher with fresh data which can be used in future courses. Data gathered from the teacher's and student's research can therefore be used as input to ESP teaching materials designed to cover specific genres.

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