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A question of terminology

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24 November 2009 A framework for analysing sub/semi-technical words is presented which reconciles the two senses of these terms. Additional practical ideas for teaching them are provided.

0. Introduction

The terminology for describing the language of science is in a state of confusion. There are several words, with differing definitions. There is even confusion over exactly what should be defined and labelled. In other words, there is a problem of classification. This paper attempts to sort out some of the confusion.

1. Differing understandings of what is meant by “general” English and “specialised” English (see also www.scientificlanguage.com/esp/audience.pdf)

Table to show the different senses of ‘general’ and ‘specialised’		
	Popular senses	Technical senses
“general” English	1. a wide range of general interest topics of general knowledge, such as sport, hobbies etc Suggested term: general topics English	2. Basic English, of all kinds, from pronunciation, through vocabulary, to discourse patterns such as those used in a newspaper. Suggested terms: foundational English basic English
“specialised” English	3. a wide range of topics within the speciality of the student. Suggested term: specialised topics English	4. Advanced English, the fine points, and the vocabulary and discourse patterns specific to the discipline. Suggested term: technical English advanced English

When I think of 'general English' I am usually thinking of box 2. I have been in meetings where I noticed that most people were using the term in the popular sense of box 1. In order to maintain the needed distinctions, I have therefore provided alternatives above.

There is also a problem of logic. Most people assume the following:

basic English (always and only) = general interest English

specialised English (always and only) = advanced English

In other words, foundational English is always and only expressed in general English texts. Foundational English can never be used for specialised subjects. Similarly, Advanced English is used only for specialised subjects, and is never used for general interest subjects.

I submit, this is to commit an error known as a category error. Language and topics are completely distinct and largely unrelated. Thus topics can be general interest or specialised. Language can be basic or advanced.

General interest topics can be expressed in basic or advanced English.

Specialised topics can be expressed in basic or advanced English

Or to put it another way:

Basic English can be used for general interest topics

Basic English can be used for specialised topics

Technical English can be used for general interest topics

Technical English can be used for specialised topics

2. “Sub-technical” and “semi-technical” words

There is also another element - the phenomenon of sub-technical or semi-technical words. The table below shows the difference, and adds the nuance that non-scientific language is composed of both the common words and the common senses of semi-technical words.

Table to compare the terminology for words in English

Term	Meaning	Examples	language
Non Specialised Words which although they are used in science, do not have a meaning specific to science. <i>mot usuel</i>	Common Everyone knows these meanings	water	non-scientific
“Mixed” . [sub-technical, semi-technical] Words which have both a common usage in ordinary situations and a different and precise usage in science, eg ‘cell’ <i>mot technique déguisé</i>	Common AND ----- Specific ie two meanings in one word.	cell force pragmatic =practical linguist = knows many languages ----- cell force pragmatics (a subject in linguistics) linguist = knows about languages	----- scientific
Specialised. Technical words used only in science. <i>mot technique</i>	One meaning (ideally) Science only. Tend to be known by subject specialists, and by ordinary people when there is no other alternative	bacterium	

In addition, some people wish to distinguish between:

- *** specialised words used in **many** sciences with no meaning outside science, eg “bacterium”,
- *** specialised words used only in **one** science with no meaning outside science, eg “T-cells” [immunology]. You could call these ‘**ultraspecialised**’ words.

3. Independent confirmation of my terminology by two French authors

The French authors Vinay & Darbelnet (1977:65) have used terms which are close to the terms I have chosen to use. These are "*mot usuel*" (lit: usual word) for what I have called 'non-specialised'; "*mot technique déguisé*" (lit: disguised technical word) for what I have called 'mixed'; and "*mot technique*" (lit: technical word) for what I have referred to as 'specialised'.

4. Various meanings of 'sub-technical'/'semi-technical'

Note, there are various meanings of these terms, therefore to avoid confusion, Lowe 1992 used the term "mixed". But be aware that this is not a commonly used term.

- a. Cassels & Johnson 1985 use '**sub-technical**'/'**semi-technical**' for what I have called 'mixed'. This terminology is commonly used by science teachers.
- b. Trimble 1985:128, Robinson 1991:28 use '**sub-technical**'/'**semi-technical**' for scientific words in many sciences. Therefore researchers in the ESP profession may well use these terms in a different way to that widely used in science.

Therefore, ironically, the terms "sub-technical" and "semi-technical" are in themselves sub/semi-technical words: they have two distinct meanings! To put it another way, the terms "sub-technical" and "semi-technical" are also "mixed" words.

5. Newmark's (1988:153) varieties of technical language

Variety	Example	Link with my analysis
1) Academic	phlegmasia alba dolens	Ultraspecialised
2) Professional	varicella, tetanus	General specialised
3) Popular	chickenpox, lockjaw	Mixed and Popular

a. Newmark's own criticisms of his scale are:

- 1) these are general categories to which a word is often arbitrarily assigned;
- 2) nomenclature is often clouded by obsolete, obsolescent or regional terms;
- 3) there is a frequent tendency to use a trademark as the name of a product eg 'bic' for 'biro',
- 4) there is the problem of eponyms which are not recognised by another country and language. [An eponym is a word formed from a person's name. Examples include "pasteurization" from Louis Pasteur; "sandwich" from the Earl of Sandwich; "guillotine" from Dr. Guillotin.
www.state.tn.us/education/ci/cistandards2001/la/cilaglossary.htm accessed 2 Nov 2007].

b. My criticisms are:

- 1) the distinction between 'academic' and 'professional', at least viewed from a school perspective, is a very fine one: both are technical levels.
- 2) Newmark fails to distinguish between common words with no special meaning at all in science, and 'mixed' words which have both a common meaning and a science specific meaning.

- 3) It is often difficult to apply the classification to particular examples, as Newmark acknowledges in 1) above. It is particularly difficult to distinguish between the two levels of Academic and Professional.

c. Technical versus descriptive terms

As a translator Newmark is also interested in another distinction, that between 'technical' and 'descriptive' terms. He gives the following sentence in English with a possible French translation:

The submarine's surface is perfectly smooth , with the forward diving planes, rear rudder and radio and sonar bubbles as the only protrusions.	On a donné au sous-marin une forme parfaitement hydrodynamique ; seuls les ailerons de plongée, le gouvernail et les dômes longeant la radio et le sonar font saillie. (Newmark 1988 p153-4, Newmark's translation).
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In the example given, 'smooth surface' is a descriptive term and Newmark argues it ought to be translated by the descriptive term '*surface lisse*' instead of the technical term '*forme hydrodynamique*'. I now suggest the reader critiques this suggestion. **My critique is given at the end of this paper.**

6. Forming science specific terms from common words

Note that a common word can often be made science specific by adding qualification, for instance 'heavy water' (French eau lourde) refers to water containing atoms of deuterium. This whole subject merits further research.

7. Questions for reflection

- a. Compare and contrast the different meanings of 'semi-technical'
- b. Which language is the most difficult for
 - 1) you
 - 2) your students
 - 3) native speakers learning science
- c. Where there is a choice of word, which words are likely to be preferred in English
 - 1) at school level
 - 2) in undergraduate textbooks
 - 3) in journals for teachers
 - 4) in journals for researchers

8. 'Scientific' versus 'non-scientific' terms in two languages

- a. Sometimes in technical texts, the same author can use a word in its common sense, and in another sentence use a word in its technical sense. The reader is expected to know both meanings, and to know which meaning is intended by their understanding of the context. One day I will re-find the references and examples for this point.

b. English is a rich language. Part of this richness is due to words imported from other languages. It means that in science a choice of words that refer to the same thing is often available. The choice can be between a word of Latin or Greek origin, and a word of Anglo-Saxon origin. The former are sometimes called 'scientific' and the latter 'non-scientific'. For instance, 'erythrocytes' (a scientific word) are commonly called 'red blood cells' (a non-scientific word).

c. **Cassels & Johnstone** (1985) *Words that matter in science*.

These authors have studied this phenomena at school level. In their opinion,

- 1) The problem lay, not so much in the technical language of science but in the vocabulary and usage of normal English in a science context (p1),
- 2) Things are at their most dangerous stage when both learner and teacher know the meaning of a word and each assumes that the other shares the same meaning. (p15).

Children repeatedly used the normal general sense of a word in science, and found it hard to learn another, more technical meaning.

There is a trend in Britain in schools to avoid scientific words. This trend can only exacerbate the problem with mixed words. Thus in 'Biological Nomenclature' it is stated that "Whenever possible, English terms [such as Red blood cell] should be used in preference to Latin and Greek Terms [such as erythrocyte]". (IOB 1989 p29 cp Barras 1979). Even Savory can make the remark that though science has a many Greek and Latin words, which is apparently a distinguishing feature of scientific prose, there is in English the "well established belief that such words are to be avoided where possible". (1953 p23).

Even for the Native Speaker, **It is the 'mixed' words which are problems**, those having both a common and a science specific meaning that are most likely to be words where the teacher assumes the science specific meaning is understood, and the student understands the word only in its common sense. If learning a new sense for a known word is hard for a native speaker, how much more so for non native speakers.

9. **Trimble**(1985 p128-9)

Trimble reports that students who had few problems with neither technical vocabularies nor 'general English' still had weaknesses in three areas: memorising, less technical noun compounds, and sub-technical vocabulary (words in common to several scientific disciplines and common words having a special meaning in science). Once again it is the 'sub-technical' (Trimble) or 'mixed' words that give problems.

10. **Combining the two senses of “semi/sub-technical”**

A possible format is provided by van Roey , Granger & Swallow (1988). They analyse the words in several ways. Firstly they present the meanings where both languages agree. Secondly, senses where a different word is needed in English are provided. Thirdly, senses where a different word is needed in French are given. In addition, where there are several senses, the most frequently used sense is given first. The easiest way to see this is to take an example from business English. (p342-3).

Global	
<p>I. 1. Il est parvenu à avoir une vision globale de la situation alors que tous les autres s’embourdaient dans des détails (= d’ensemble, complet)</p> <p>Ceci est une étude globale du sujet</p>	<p>He was able to take a global view of the situation when everyone else was bogged down in details (<i>plus souvent: overall, all-embracing</i>)</p> <p>This is a global study of the subject ^a (<i>plus souvent: all-embracing, comprehensive</i>) ⇨ 2</p>
<p>II. 2. Quel est votre revenu global annuel? (= pris en bloc, total)</p> <p>On a payé une somme globale de 1 000 dollars</p>	<p>What is your total annual income?</p> <p>We paid a total amount of 1,000 dollars</p>
<p>III.2. The spread of Aids is a global problem demanding drastic measures</p> <p>Global warfare was unknown until the twentieth century</p>	<p>La propagation du Sida est un problème mondial/planétaire qui nécessite des mesures draconiennes</p> <p>La guerre mondiale est un phénomène qui n’existait pas avant le XX^e siècle</p>
<p>a. Mais : résultat global (d’une action, d’une enquête...) : overall result (of a campaign, survey...) General note: (Pédag) Méthode globale (de lecture) : word recognition method, look-and-say method.</p>	

This format can easily be adapted for teaching mixed/sub-technical/semi-technical vocabulary.

Common senses	General Academic senses	Specialised Academic senses
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10. Conclusions and implications for teaching

- a. I think the ESP teacher should concentrate on what the general public, and the students, understand by the disputed terms such as semi-technical and sub-technical. We as teachers must adapt to our audience where possible unless there is compelling reason to do otherwise. Let the translators make their fine differences for their purposes, and let Trimble and others find another term for scientific words in many sciences. In fact, such a term already exists - or something like it. Paul Nation and others have compiled the 'academic list' or 'university word list' of word families most commonly used in the academic world, commonly called 'academic vocabulary'. Tobb & Horst (2001) seem to merge the two concepts when they talk about 'sub-technical academic vocabulary'. This is a mouthful, but seems to be the most complete description. The problem is that it is a researcher/teacher classification, and not that which students are likely to instinctively relate to.
- b. However the distinctions are made, it is widely agreed that the sub-technical words present problems, and they are vital words which must be learned. In fact, the minimum vocabulary people (see above reference for more references) argue strongly for the learning of a core vocabulary of 2000 word families, plus the academic list.
- c. There are not enough precisely defined terms to express all the distinctions needed to describe the language used in science in relation to the language used outside science. The terminology used depends on the point of view.
- d. Probably, it is the faux amis and the misunderstandings that come from not appreciating the two or more meanings of mixed words that are a bigger problem to learners than the specialised words.

There are clear teaching implications. It is the duty of the teacher to sensitise students to polysemy. It is a truism in science that people only see what they are looking for; scientists are more likely to observe something if they are looking for it. Now this implication suffers from a question of validity. I am assuming that your students are like most of the students I have taught: they seem to think that one word has one, and only one, meaning. If your students are aware that this is not always valid, then you are fortunate. Therefore, I will put it another way: it is the duty of the teacher to check that students are aware of polysemy, and to take corrective action if they lack this awareness.

It is time to turn a problem into an opportunity. I am assuming that the teacher of English is not a subject specialist and find texts with specialised topics difficult to understand. I am also assuming that specialised students easily learn the specialised meanings of a mixed word and are sometimes unaware of the general senses. Therefore the teacher can take the mixed words in a text, and make sure that both meanings are known. The class can provide and explain the specialised sense - so getting excellent language practice in the act of explaining, and the teacher can provide the common senses.

- e. In addition, (unfortunately I do not have examples to hand). I read somewhere that even in technical texts, the common meaning and the technical meaning of a word can be used interchangeably, and the reader is expected to know and make the difference. Similarly, both common word terms and specialised word terms can co-exist in the same text.

- e. Clearly if the science specific words can give problems within one language to native speakers, the situation is bound to get more complicated with two languages as is the case in Tunisia.
 - 1) There is the problem that a person may not be a native speaker in at least one of the languages. Diglossia is common, and frequently ignored by Western linguists.
 - 2) The distinctions between both scientific versus non-scientific words, and the common versus science specific meaning of mixed words, exist in both languages. And it is by no means automatic that each language will make the distinctions in the same place: varicella in French is both a non-specialised and a specialised name, whereas in English it is specialised only, the non-specialised name being 'chicken pox'.
 - 3) Ideally both sets of distinctions must be learnt, with this additional complication that French and English may not make the same distinctions in the same way.
 - 4) There is the distinct possibility in the Tunisian system where sciences are taught through a foreign language that a pupil will learn the scientific meaning of a mixed word and not know the common meaning.

- f. It is also an open question as to whether or not the French prefer scientific vocabulary to non-scientific when a choice exists. Therefore, as a minimum, it would be a good idea to sensitise students to the situation.

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Critique of 3c. Newmark's example of technical and descriptive terms.

But even this so called technical term '*forme hydrodynamique*' to a scientist is a descriptive term. Both components '*forme*' and '*hydrodynamique*' have a scientific meaning in their own right, (depending on the context and discipline, for a scientific word can have more than one precise meaning), and together they form a descriptive technical term. Therefore this terminology of 'technical' and 'descriptive' is not helpful in determining appropriate levels of language used in science.