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From *Virtual Sex* to *Virtual Dictionaries*: On the Analysis and Description of a De-terminologized Word

Abstract

This paper deals with *de-terminologized* words, i.e. words that originated in a specialized field of expertise (e.g. computing, medicine), but that have migrated into the vocabulary of the general, educated public. A striking example is *virtual*, the focus of this paper. First, we analyze the de-terminologized uses of *virtual* using a framework based on semantic features and influenced by prototype theory. Second, we examine the issues of lexical description that *virtual* raises for general-language dictionaries. We identify some of the weaknesses of current dictionaries with regard to this word, and make suggestions for improvements.

Keywords: Lexicology, terminology, lexicography, lexical semantics, semantic features

1. The de-terminologized lexicon

We live in a world where specialized knowledge has replaced manual labour as the axis around which economic development revolves (Drucker 1993). In this "knowledge society", large amounts of specialized information spill over into our daily lives. Consequently, increasing numbers of lexical items are migrating from specialized to general discourse, acquiring new meanings and new behaviour in the process. Consider, for example, the waste-management sense of *recycling*, compared with its new general-language uses, where software, resources and even ideas can be recycled. Or the computer senses of words and affixes such as *interface*, *bug* and *-friendly*, compared with new, general-language uses such as "to interface with people", "bugs in one's thinking", and "film-friendly politics". Or our recent favourite, *bandwidth*, used colloquially to designate the range of a person's abilities, as in "Do Meyer, Mackintosh and Varantola have the bandwidth to understand the subtleties of the de-terminologized lexicon?"

Virtual is a particularly interesting example of de-terminologization. This word's terminological, 'virtual reality' meaning has recently become "stretched" in general language to refer to concepts that have very little to do with virtual reality *per se*: *virtual sex*, *virtual office*, *virtual travel* – even *virtual corpus* (e.g. Holmes-Higgin *et al.* 1994) and *virtual dictionary* (e.g. Atkins 1996). But it is not just the meaning of *virtual* that has undergone transformation – grammatical behaviour has been affected as well. In its original, general-language sense of 'almost', *virtual* could only be used attributively (e.g. one can say *a virtual prisoner* but not **the prisoner was virtual*). In its de-terminologized meanings, however, *virtual* can be used predicatively, as in "my travels are virtual" (meaning, perhaps, that one visits travel-related sites on the Internet). This grammatical transformation also applies to *virtually*. For example, "He has virtually travelled the world" does not mean the same as "He has travelled the world virtually", just as "virtually having sex" is not the same as "having sex virtually".

Although de-terminologization is clearly a crucial lexical phenomenon of our "knowledge society", it has received surprisingly little attention from lexicologists and lexicographers.[1] Our study aims to make a start at filling this gap. This paper is divided into two main sections. First, we shall examine *virtual* from a pre-lexicographic, lexical-semantic point of view, using a descriptive framework based on semantic features and prototype theory (Hanks 1994). Second, we shall examine the treatment of *virtual* in some recent dictionaries, and make suggestions for how this treatment could be improved.

2. A lexical-semantic portrait of virtual

In another paper (Meyer *et al.* 1997), we have analyzed in detail the various changes that *virtual* has undergone in moving from general-language use to terminological use, and back again. These changes are summarized in Figure 1. *Virtual*'s original, general-language meaning of 'almost' (1 in Figure 1) was first taken up in the domains of optics (e.g. *virtual image*) and physics (e.g. *virtual particle*). More recently, in the 1960s, it was adopted by the computer world to designate the specialized and interrelated concepts of *virtual memory* and *virtual world* (2). Soon thereafter, *virtual* was adopted to designate the technology of *virtual reality* (3). As virtual reality captured the attention of the media and general public, *virtual* was launched on a two-step path of de-terminologization: on the one hand, looser uses of *virtual reality* (4) developed as computer science and other domains tried to "cash in" on the popularity of the concept; on the other hand, new general-language uses bearing only minimal conceptual traces of *virtual reality* were born (5).

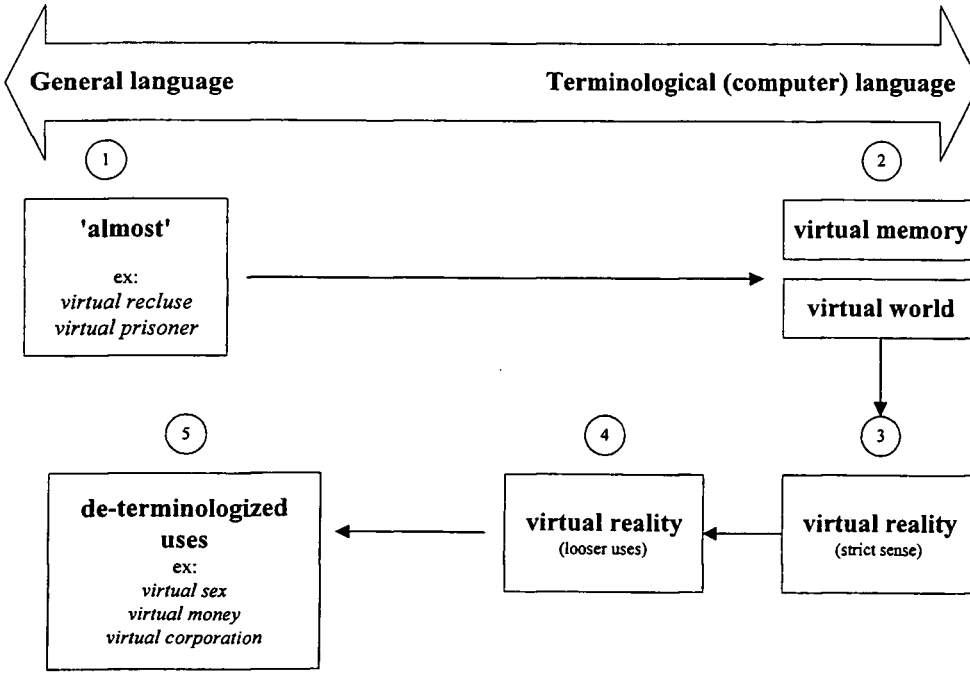

Figure 1: An overview of the lexical-semantic evolution of virtual.

The various meanings of *virtual* illustrated in Figure 1 all interrelate in complex ways, as described in Meyer *et al.* 1997. In this paper, however, we shall deal only with the last category, i.e. the "de-terminologized uses" labelled (5) in Figure 1. This category includes a broad group of rather fuzzy uses, encompassing examples like the following:

(1a)	virtual sex	(2a)	virtual money	(3a)	virtual corporation
(1b)	virtual classroom	(2b)	virtual voting	(3b)	virtual team
(1c)	virtual community	(2c)	virtual travel	(3c)	virtual dictionary
(1d)	virtual meeting	(2d)	virtual application	(3d)	virtual corpus

All these examples are related to *virtual reality* in the sense that they involve the SIMULATION of an entity or activity (SIMULATION is a key semantic feature of *virtual reality*, as we argue in Meyer *et al.* 1997). Despite this common denominator, the above uses of *virtual* appear extremely diverse: it is difficult to imagine what *virtual sex* might have in common with a *virtual dictionary*, for example. Furthermore, the examples illustrate that the de-terminologized *virtual* has become extremely fuzzy: in effect, it has become a buzzword.

For all these reasons, we have not found it useful to attempt an Aristotelian delineation of a fixed set of distinct, de-terminologized "senses". Rather, we propose that the de-terminologized uses be subsumed into one broad category that can be described in terms of four semantic features: SIMULATED CO-PRESENCE, INTERNET, COMPUTING, and DYNAMIC. SIMULATED CO-PRESENCE, illustrated in 1a–d, involves a "bringing together" of various participants in an activity (instead of being linked by physical means, the participants are linked by computer). *Virtual sex* is the most telling example of this feature. The next two features, INTERNET and COMPUTING, illustrated in 2a–d, are normally combined. Obviously, when a concept involves INTERNET, it necessarily implies COMPUTING as well. As we shall see later, however, there are some cases where computing aspects other than the Internet are implied, and therefore, where COMPUTING is used alone. The fourth feature, DYNAMIC, illustrated in 3a–d, refers to the notion of 'created for a specific purpose and for a limited period of time'. A *virtual corporation*, for example, is created for a particular business opportunity, and disbanded when the opportunity is over. Atkins' (1996) *virtual dictionary* is created for a specific user and his/her specific needs at the time of dictionary consultation. Similarly, Holmes-Higgin *et al.*'s (1994) *virtual corpus* refers to a user-configured text corpus.

Our feature analysis has been greatly inspired by Hanks' (1994) prototype approach to lexical description, which aims at showing meaning *potentials* rather than meanings. In Hanks' approach, meaning potentials consist of a number of features, certain combinations of which are activated in a communicative context. Hence, understanding any given de-terminologized use of *virtual* means understanding which combination of the four features are activated. We have found two restrictions on which of the features can be activated together:

1. **Use of one feature.** The only feature that may normally be used independently of the others is INTERNET, as in *virtual application*, i.e. software designed to run on the Internet. We have, however, encountered a very small number of examples where COMPUTING is the only feature. For example, in one case an ordinary CD-ROM dictionary (as opposed to Atkins' more futuristic concept) was called a *virtual*

dictionary. According to our informants (and our own intuition), however, this example is extremely marginal.

2. **Use of two features.** When two features are activated, one of the two must be INTERNET or COMPUTING. For example, Atkins' *virtual dictionary* activates the features COMPUTING and DYNAMIC. *Virtual sex*, on the other hand, activates the features INTERNET along with SIMULATED CO-PRESENCE. We have not encountered any examples involving SIMULATED CO-PRESENCE and DYNAMIC *without* a notion of INTERNET or COMPUTING. Clearly, these features (in particular INTERNET) are *central* to the de-terminologized uses of *virtual.*

Figure 2 illustrates the above combinability restrictions, i.e. those that apply when only one or two features are involved. In a large number of cases, however, three or four features are activated simultaneously. As Figure 2 illustrates, concepts such as *virtual office* involve three features, while others, such as *virtual corporation,* may involve all four. It is also interesting to note that the "strength" of a particular feature will vary from one example to another. In Figure 2, we have indicated our personal impressions of the strengths of various features through different thicknesses of lines. For example, SIMULATED CO-PRESENCE appears to us to be extremely strong in *virtual sex*, and much weaker (hence the dotted line in Figure 2) in *virtual currency.*

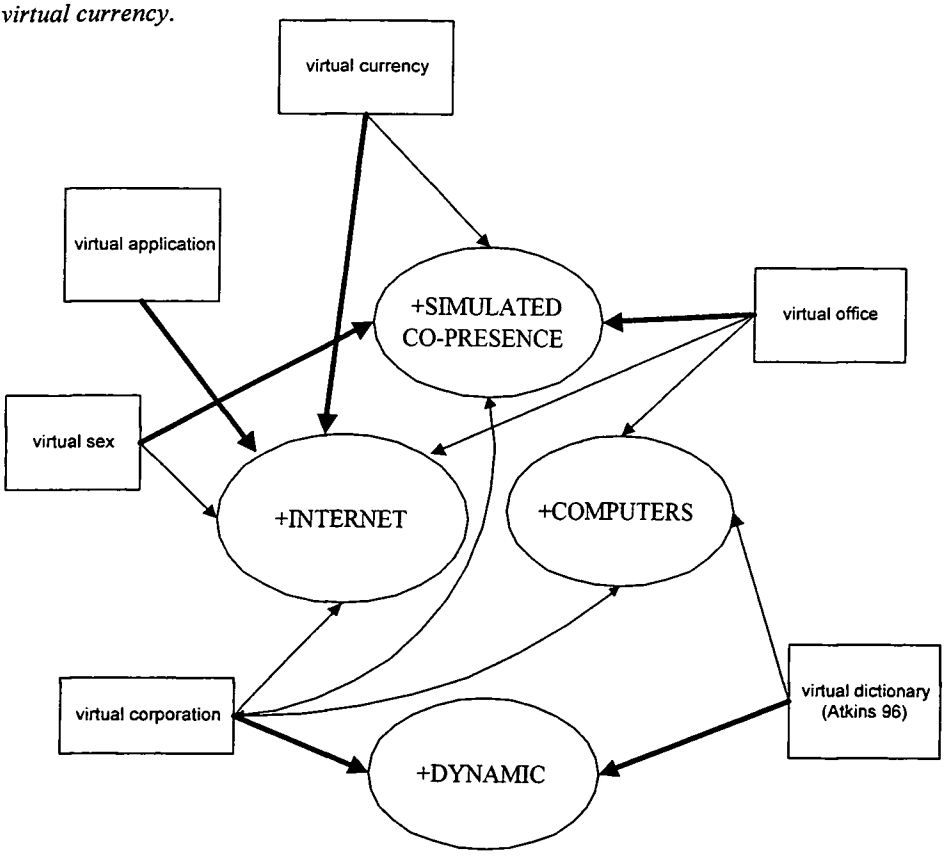

Figure 2: Possible feature combinations for the de-terminologized uses of *virtual.*

The feature analysis illustrated in Figure 2 represents only the standard, current uses of the de-terminologized *virtual*. However, following Hanks' (1994) approach, this type of framework should be able to handle meaning "potentials" as well as meanings. Indeed, we can imagine eventually modifying our analysis in the future to incorporate new uses that *virtual* may acquire if its meaning continues to "stretch". We are already encountering examples where COMPUTING appears to be loosening up to include other forms of technology. For example, a TV cartoon designed to teach morals to young children was referred to as "Virtual Virtue", simply because it involved the technology of television. In another case, a person spoke of intending to watch a TV program "virtually", by which they meant they would tape the program and watch it at a later date on the VCR. While these examples are still marginal – and often intended to be humourous – they can be accommodated in our representational framework should they become standard usage in the future.

3. *Virtual* in general-language dictionaries

As increasing amounts of specialized knowledge spill over into our daily lives, more and more lexical items will migrate from specialized to general texts, as *virtual* has done. This presents new challenges to dictionary-makers, since people will want to know what the new meanings are, and what (if any) changes these meanings bring to grammar. In the following sections, we shall first examine the treatment of the de-terminologized uses of *virtual* (i.e. 5 in Figure 1) in existing general-language dictionaries. Of course, these dictionaries also describe the other meanings of *virtual* (i.e. 1–4 in Figure 1), but we will not deal with these here. We conclude with some suggestions on how current dictionaries could improve their treatment of *virtual*'s de-terminologized uses, in the light of the lexical-semantic analysis presented above.

3.1. De-terminologized uses of *virtual* in general-language dictionaries

We examined 13 English-language dictionaries, all published or revised in 1994 or later. None of these described all the subtleties of the de-terminologized *virtual* that were brought out in the analysis above, though the *Oxford Dictionary of New Words* came impressively close.[2] The following general tendencies were noted:

Absence of de-terminologized uses. Only 2 of the 13 dictionaries made any reference at all to the de-terminologized uses: the *Oxford Dictionary of New Words* (whose entry was by far the best of all those consulted), and *Random House-Webster's College Dictionary*. These 2 entries are reproduced in Figures 3 and 4. The closest the remaining dictionaries came to the de-terminologized uses was a description of the terminological, *virtual reality* sense. *Collins Today's English Dictionary*, for example, states: "Virtual is also used to describe things to do with virtual reality – *Wearing a dataglove you can use hand movements to do things in the virtual world...a virtual kitchen.*"

Since only the *Oxford Dictionary of New Words* (ODNW) and *Random House Webster's* (RHW) handled the de-terminologized uses of *virtual*, the following comments are limited to these two dictionaries:

Definitions. Neither of the two dictionary definitions includes all four semantic features mentioned above. RHW mentions COMPUTING in the definition, and implies INTERNET in its

examples, but does not reflect either SIMULATED CO-PRESENCE or DYNAMIC. The ODNW, on the other hand, fares much better: the notion of SIMULATED CO-PRESENCE is brought out in the descriptions of *virtual community*, *virtual classroom*, and *virtual meeting*; the concepts of COMPUTING and INTERNET are mentioned in several places. The DYNAMIC feature, however, is rather neglected, though it comes out somewhat in the word *temporary*, used in the definition of *virtual corporation*. Regarding *combinations* of features, the RHW neglects this aspect completely. The ODNW does illustrate the possibilities to some degree: the definition for *virtual community*, for example, implies both SIMULATED CO-PRESENCE and INTERNET.

Examples. The RHW provides only one example of the de-terminologized *virtual* ("*virtual discussions on the Internet*"). The ODNW, in contrast, provides numerous examples, both within its definitional section and in the citations at the end of the entry. Furthermore, the examples illustrate almost the full range of combinatory possibilities of the semantic features (with the exception of INTERNET used alone, as in *virtual application*). One source of possible confusion, however, is that the citations intersperse the de-terminologized uses with the terminological, *virtual reality* sense.

Grammar. As mentioned earlier, the de-terminologized uses of *virtual* allow *virtual* to be used predicatively (e.g. *Even though my travels are virtual, I still enjoy them.*) For the original, 'almost' sense of *virtual*, predicative use is non-standard (e.g. he was a virtual dictator; *the dictator was virtual). None of the dictionaries consulted indicated this newer predicative behaviour, not even for the terminological senses where it first originated.

Meaning potential. As mentioned earlier, many people are "stretching" the meaning of *virtual*, often for humourous or creative effect. We noted, in particular, that the features of COMPUTING/INTERNET are sometimes stretched to include other forms of technology as well. None of the dictionaries consulted provided any examples of such "stretched" usage. This is unfortunate since on the one hand, it is widespread, and on the other hand, it may be pointing the way to new standard uses of this word in the future.

virtual / 'vɘ:tju:ɘl/ *adjective*
In computing: not physically existing, but made to appear so from the point of view of the user; involving the replication of a physical object by an electronic equivalent.
The word *virtual* has been employed in computing since the late fifties to describe techniques for simulating memory space, disk storage, and operating environments. However, the current usage stems from the development of the phrase **virtual reality** in the early eighties. It refers to a computer-generated visual environment that a person can move about in and interact with, for example by touching or moving 'objects'. Since such **virtual environments** require large amounts of computer power, a realistic simulation is beyond today's capabilities, but at various levels of verisimilitude, such systems are now used in training, medicine, scientific and technical simulations, military exercises, and entertainment. Some employ a DATAGLOVE; others have helmets containing motion sensors and small television screens, which always show what the user is looking at; yet others employ *body suits* which feed back the user's movements to the system producing the displays. Some use all of these, in a *total-immersion* environment. The surroundings generated by such systems are also referred to as **virtual landscapes, virtual spaces,** or **virtual worlds**. Some psychiatrists have used *virtual reality* techniques to help individuals overcome phobias, such as fear of snakes or heights, using **virtual therapy**. It is suggested that improved quality of simulation may one day permit **virtual sex** between individuals who are physically separated. Research into **virtual shopping** is taking place in the US; this would permit shoppers to traverse a simulated shopping mall, making purchases as they go, with the goods delivered to their homes later. The associated nouns are **virtuality** and **virtualization**; the verb is **virtualize**. The abbreviation **VR** for *virtual reality* has been recorded since the late eighties.
With the growth in computer-based communications in the eighties and nineties, the word *virtual* also took on a weakened sense referring to the replacement of a physical entity by an electronic equivalent using telecommunications. A **virtual community** is one which 'meets' and interacts through the medium of the NET; in a **virtual classroom** students may be linked to each other and to teachers without being physically present; people may communicate in a **virtual meeting** using videoconferencing or similar techniques; a **virtual office** is one which is simulated by communications links between dispersed employees or freelances; the proposed **virtual corporation**

would be a temporary network of independent companies, suppliers and customers, linked by information technology to share skills, costs, and access to one another's markets; the term **virtual company** has been used in the sense of both *virtual office* and *virtual corporation*.

Variations of virtual-reality technology already have been used to help physicians position beams of radiation...and to aid biochemists seeking to attach drugs to protein molecules.

— *Wilson Quarterly* Summer 1991, p. 125

This spring the Open University is to start a course taught entirely on computer networks to explore the possibilities of 'virtual classrooms'.

— *Independent* 20 Jan. 1992, p. 15

Television viewers watching BBC news will soon be watching the newsreader sitting in the middle of a virtual newsroom. From 13 April...everything apart from the announced will have been generated by computer in all news programmes on both BBC channels.

— *New Scientist* 3 Apr. 1993, p. 22

The key to immersive VR is the use of a headset, or 'eyephone', which projects a small image of the virtual world on to each eye.

— Guardian 14 Jun. 1993, Education supplement, p. 14

Computer networks have created thousands of virtual communities that have been the basis for a participatory democracy, creating fast friendships for millions of people around the world.

—*New York Times* 2 Jan. 1994, section 4, p. 5

The virtual corporation begins to emerge: workers who never go to the office, but who fax, phone, and transmit their work back and forth to one another from remote sites.

—*Minnesota Monthly* Feb. 1994, p. 10

Figure 3: Entry for *virtual* in the *Oxford Dictionary of New Words*.

vir·tu·al (vûr 'choo əl), *adj.* **1.** being such in force or effect, though not actually or expressly such: *reduced to virtual poverty.* **2. a.** noting an optical image formed by the apparent convergence of rays geometrically, but not actually, prolonged, as the image formed by a mirror (opposed to *real*). **b.** noting a focus of a system forming virtual images. **3. a.** temporarily simulated or extended by computer software: *virtual memory on a hard disk* **b.** of, existing on, or by means of computers: *virtual discussions on the Internet.* [1350-1400; ME < ML *virtuālis* = L *virtu(s)* VIRTUE + -ālis -AL[1]] — **vir'tu·al 'i·ty**, *n.*

Figure 4: Entry for *virtual* in the *Random House Webster's College Dictionary*.

3.2. How can dictionary treatment of the de-terminologized *virtual* be improved?

In light of the lexical-semantic analysis presented above, and considering our findings in existing dictionaries, we would like to propose some guidelines for improving the treatment of the de-terminologized uses of *virtual* in general-language dictionaries. We have tried to formulate them in as generic a way as possible, so that individual dictionaries can implement them in whatever way is most feasible and useful, given their target audience and practical constraints.

Relation of de-terminologized and the terminological uses. To our mind, the "ideal" dictionary entry would contain an overview of the different senses of *virtual*, both general and terminological, along the lines of what we presented in Figure 1 and described in Meyer *et al.* 1997. Considering the practical constraints of commercial dictionaries, however, a more feasible option would be to at least relate the de-terminologized uses to the terminological uses, somewhat along the lines of the ODNW ("With the growth in computer-based communications in the eighties and nineties, the word *virtual* also took on a weakened sense

referring to the replacement of a physical entity by an electronic equivalent using telecommunications"). By having the de-terminologized and terminological senses explicitly related, users might better appreciate the potential semantic features of the former (e.g. SIMULATED CO-PRESENCE, COMPUTING). They might also find it easier to understand the grammatical changes of *virtual* (and *virtually*), which originated in the terminological senses.

Semantic features and their combinability. *Virtual* can combine with an enormous number of nouns, and in each combination, certain of its semantic features will be "activated". In order to help dictionary users employ the word in combinations that are acceptable, we recommend making explicit the fact that any given use of *virtual* can involve up to four features, and explaining precisely the restrictions on the combinability of these features. We recommend giving examples in which a particular feature is strongest, as well as others where the features have equal strength.

Grammar. The fact that *virtual* can be used predicatively should be explained and illustrated through examples. Dictionaries might even consider making an explicit comparison with the predicative use of the terminological senses, and an explicit contrast with the attributive use of the original general-language sense.

Meaning potential. Using language well means using it creatively, i.e. knowing just how far it can be "stretched". Dictionaries might consider providing examples of creative usage, particularly some of the puns and other humourous usage that abounds. Dictionaries might also consider explaining that the feature of COMPUTING is sometimes being stretched to include other forms of technology as well, and provide supporting examples like the ones we saw above. New corpus evidence, as from the Oxford University Press reader corpus, would be useful to show various aspects of meaning potential.

4. Concluding remarks

In this paper, we have tried to illustrate some of the kinds of changes that can occur in a word's meaning and behaviour when it migrates from terminological to general-language usage. We have seen that the new uses of *virtual* have become extremely fuzzy, in keeping with its buzzword status. Despite this fuzziness, however, we have found that *virtual*'s meaning can be described according to a number of semantic features, certain combinations of which will be activated in a given communicative situation. Unfortunately, the majority of English dictionaries do not describe *virtual*'s meaning potential fully, and we have suggested some ways of improving the lexicographic treatment of this word.

Many fundamental questions about the de-terminologized lexicon, however, remain. On a lexic*ological* level, it is unclear to what degree (if any) our findings for *virtual* can be generalized to other de-terminologized words. On a lexic*ographical* level, it would be interesting to explore how dictionaries could better represent the influences of terminological on general-language usage (and vice versa) within a lexicographic tradition that has always tended to separate the two. These and related questions will make fascinating research subjects as our knowledge society produces increasing amounts of de-terminologization in the words we encounter daily.

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5. Notes

[1] Some notable exceptions, which deal with the issue primarily from a lexicographical viewpoint, are Béjoint 1988, Landau 1974, Mazière 1981, Opitz 1983, Varantola 1993.

[2] Considering that the lexicographer(s) surely had more extreme time and space constraints than we did, we are very impressed with the entry for *virtual* in the *Oxford Dictionary of New Words*!

6. References

Atkins, B.T.S. (1996) Bilingual Dictionaries: Past, Present and Future (plenary paper). In: Gellerstam *et al.* (eds), *Euralex '96 Proceedings*. Papers read at the Seventh EURALEX International Congress, Göteborg, Sweden, 1996. Göteborg: Göteborg University Department of Swedish, 515–546.

Béjoint, Henri (1988) Scientific and Technical Words in General Dictionaries. *International Journal of Lexicography* 1(4), 354–368.

Drucker, Peter (1993) *Post-Capitalist Society*. New York: HarperBusiness.

Hanks, Patrick (1994) Linguistic Norms and Pragmatic Exploitations, or why Lexicographers need Prototype Theory, and Vice Versa. In: Kiefer *et al.* (eds), *Complex '94. Papers in Computational Lexicography*. Budapest: Research Institute for Linguistics, Hungarian Academy of Sciences, 89–113.

Holmes-Higgin, Paul, Khurshid Ahmad and Syed Sibte Raza Abidi (1994) A Description of Texts in a Corpus: 'Virtual' and 'Real' Corpora. In Martin *et al.* (eds), *Euralex '94 Proceedings*. Papers read at the Sixth EURALEX International Congress, Amsterdam, The Netherlands, 1994. Amsterdam: Vrije Universiteit, 390–402.

Landau, Sidney (1974) Of Matters Lexicographical: Scientific and Technical Entries in American Dictionaries. *American Speech* 49(3–4), 241–244.

Mazière, F. (1981) Le dictionnaire et les termes. *Cahiers de lexicologie* 39(2), 79–104.

Meyer, Ingrid, Kristen Mackintosh and Krista Varantola (1997) Exploring the Reality of *Virtual*: On the Lexical Implications of Becoming a Knowledge Society. *Lexicology* 3 (1), 129–163.

Opitz, K. (1983) On Dictionaries for Special Registers: The Segmental Dictionary. In Hartmann (ed.), *Lexicography: Principles and Practice*. London: Academic Press, 53–64.

Varantola, Krista (1993) Technical Vocabulary and Learner's Dictionaries. In Hiltunen *et al.* (eds), *English Far and Wide: A Festschrift for Inna Koskenniemi*. Turku: Annales Universitatis Turkuensis, 249–260.

6.1. Dictionaries Consulted

Cambridge International Dictionary of English (1995) Cambridge: Cambridge University Press.
The Cassell Concise Dictionary (1997) London: Cassell.
Collins-Cobuild English Dictionary (1994) London: HarperCollins.
Collins English Dictionary, 3rd ed., updated, (1994) London: HarperCollins.
Collins Today's English Dictionary (1995) London: HarperCollins.
Concise Oxford Dictionary, 9th ed. (1995) Oxford: Oxford University Press.
Gage Canadian Dictionary (1997) Vancouver: Gage.
ITP Nelson Canadian Dictionary of the English Language (1997) Scarborough, Ontario: ITP Nelson.
Oxford Dictionary of New Words, 2nd ed. (1997) Oxford: Oxford University Press.
Random House Webster's College Dictionary, 2nd ed. (1997) New York: Random House.
Random House Webster's Unabridged Dictionary, 2nd ed. (1997) New York: Random House.
Webster's New World College Dictionary, 3rd ed. (1997) New York: Simon and Schuster.
Webster's Universal College Dictionary (1997) New York: Random House.