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Editorial

A good variety of core academic subjects involving LSP are addressed in this issue. They are all cases illustrating how the development, exchange and acceptance of new ideas and products in scientific domains as well as in trade and public services would hardly be possible without a permanent parallel development of the LSPs and an increased understanding of the pivotal role of LSP.

Five important domains of the physical world are in fact under scrutiny. The medical domain is represented by "Traducción de textos biomédicos: creación de recursos a partir de un corpus sobre enfermedades neuromusculares pediátricas" (English-Spanish translation of texts on rare diseases, in this case neuromuscular diseases in paediatrics, by Elena Sánchez Trigo and María Magdalena Vila Barbosa). Almost as important as medical science is the linguistic challenge of dealing with accounting terminology, when different accounting systems and principles meet but must be tackled and kept apart in one and the same language, e.g. global English (Cathrine Norberg and Jeaneth Johansson). Unambiguous communication in the aviation sub-language may be a question of life and death (Carsten Breul), and a diachronic study of a corpus of financial texts by Khurshid Ahmad addresses the relation between moral hazards and financial systems. Finally, the use of English as an international language in the military is reported in a national-based survey of perceptions and attitudes towards the use of English in the Spanish armed forces by Concepción Orna-Montesinos.

Summer is here and I hope that the more relaxed schedule will give you time and space to enjoy reading these articles and find inspiration for new projects.

I encourage you to invite your colleagues and contacts to register as subscribers to the LSP Journal and to submit papers at <http://lsp.cbs.dk>. The next issue will be published in December 2014.

Henrik Selsøe Sørensen
Editor in chief

Moral hazard and financial systems: A diachronic study of a corpus of financial texts

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Keywords: moral hazard, economic cycles, financial corpora, change in stock market indices, financial crisis.

Abstract

For many thinkers, language is a communications system used to represent reality without interfering with the message. For others, contrarily, language shapes the message and becomes part of the message; language constitutes the message rather merely representing it. If language is constitutive then changes in the use of certain linguistic artefacts, like the frequency of some single and compound words, will correlate with *real world* data expressed in other modalities of communication – numbers for instance. We have looked at an iconic term, used frequently during the 2008-financial crisis, *moral hazard*, in a corpus of newspaper texts comprising 718926 tokens published between 1999-2009. A similar study was conducted on a corpus of papers drawn from four journals of economics and finance. The changes in the use of certain keywords correlate with the changes major stock market indices.

1 Introduction

Complex physical systems exhibit repetitive behaviour or cycles. For example, a robust and elastic material when viewed under an electron microscope reveals a repetitive or periodic arrangement of atoms comprising the materials; a lack of periodicity is regarded as a *defect*. We have weather changes – spring in May, snowfall in December in the Northern hemisphere, but the ‘early’ onset of spring/summer/winter, the more/less than average rainfall/snowfall, or the more/less frequent floods, is variously attributed to the disastrous global warming/cooling. Any deviation from a repetitive behaviour is described through terms of negative affect – *defects, disasters, spikes, and crash*.

This paper discusses how terms come to be regarded as a representative symbol of a movement – an icon that keeps recurring in times of change and recedes when the change subsides. Terms sometimes are used as icons to evoke memories, emotions, and traditions based on notions pertaining to ideology and history amongst others. *Free markets* evoke notion of voluntary exchange of goods and services, and *collective bargaining* refers to the power of (oppressed/underprivileged) communities in seeking economic and workplace

salvation. Galbraith (1958/1998:38) suggested that over the last 400 years successive downturns, or ‘deep trouble’, in the financial markets, have been described by terms that help to ‘soften the connotation of deep trouble’; 17th century *financial mania* was replaced by the softer *financial/market bubble* (18th century), which, in turn, was replaced by *market panics* (19th century, see Rothbard 1960). The 20th century begat *market crash* and, and then we have had the borrowing from the physics of wave-like behaviour terms including *economic depression* and *economic recession*. The 21st century downturn (c. 2008) was so severe that the softer terms like *credit squeeze/freeze* gave way to *credit crunch*. It does not mean that the older, ‘harsher’ terms disappear – ‘banking panic’, a technical term used in the 1960’s, has resurfaced in the research literature (Chari and Jagnathan 1988).

I would like to look at an iconic term – *moral hazard*– that has been frequently used during the 2008 global meltdown: its lexicogenesis from denoting the hazards associated with fire insurance in the 19th century to its use in economic and social policy speeches and documents is quite remarkable. The term is currently used not only for its original purpose, to discuss risk seeking behaviour due to protection provided by the fire insurance company, but has been used to discuss other forms of insurance: papers in the leading journal in finance studies, *The Journal of Finance*, shows that the term is used in diverse contexts:

disability insurance (Dickerson Jr., 1958);
‘risk aversion’ amongst wealthy individuals (Smith and Litzenberger 1975);
informational asymmetry in financial transactions (Lee, Thakor and Vora 1983);
incentives for not working because of social security (Spear and Srivastava 1987)
risk aversion amongst higher paid chief executive officers (Becker 2006); and
policy of rotating loans-officer in a bank (Hertzberg, Maria and Paravisini 2010).

1.1. Spikes in economic cycles and moral hazard

Prices and traded volumes of shares, bonds and commodities, show a cyclical behaviour over a period of time – Jugular (1862) noted a 10 year cycle, then there are 20 year Kuznet *swings* and 50 year Kondratieff *cycle* (Solomou 1998); and for the chaos theorist Benoit Mandelbrot there are 5 year cycles. However, the unexpected surges and devastating downturns in prices remain largely unexplained; we will look at one of the causes – the excessive risk taking of large institutions due to the **moral hazard** created by the existence of a lender of last resort (banks like the Federal Reserve in the USA and the European Central Bank). Speculative lending on the part of banks that might create morally hazardous situations has been a subject of research in banking and finance – a recent paper cites 10 other papers published over the last years that deal with ‘moral hazard in banking’ (Niinimäki 2009) Recently, it has been observed that *moral hazard* can also be created by complex financial instruments created for hedging against non-payment of mortgages – the so-called collateralised debt obligations (Duffie and Gârleanu 2001, Singh and Hossain 2009). There have been arguments to the effect that major international financial institutions like the International Monetary Fund and others cause moral hazard and political business cycles (Dreher and Vaubel 2004).

It has been argued recently that the aperiodic behaviour of financial systems can be caused by ‘excessive’ risk taking behaviour and that this behaviour can, in part, be attributed to the fact that the larger risk takers have the foreknowledge that there is a lender-of-last-resort (LOLR): the LOLR has been known to compensate for the losses of the excessive risk-takers – the typical LOLR being the *central banks* of nation states and trans-national entities like the EU. The moral hazard is that risk takers are encouraged to take risks. LOLR started its life as

buyer of last resort in 1837. Walter Bagehot, the British essayist, journalist, business person and constitutional expert, suggested that central banks, in the last resort, should buy off debts incurred by commercial banks. By appearing to lend ‘quickly, freely and readily’ the central bank will assuage the fears of lenders and thus hold back the panic stricken lenders (*The Economist* 2007), The buyer-of-last-resort doctrine was at the time (1837) called his ‘mischievous doctrine’. Central banks have lent ‘quickly, freely, and readily’ during the 2008 crisis – this practice has been adorned with the term *quantitative easing* – which is yet another term used partially to, what Galbraith has said in other context, ‘soften the connotation of deep trouble’.

The cyclical behaviour of prices suggests that when an object is underpriced by its seller, buyers will compete encouraging the seller to discover the correct price; similarly for an overpriced object, buyers shy away and the seller is forced to sell the object at its true value. Prices move towards an *equilibrium* value, much like the physical systems where forces of nature (atomic, molecular, gravitational and so on) help the systems to move towards an equilibrium. The analogy of the physical forces has led some to talk about *market forces* and this has led to the so-called *rational market theories*, especially the efficient market hypothesis, which dominated the pre-2007/08 credit crunch. Market forces, it has been argued, will discount irrationality and the lender-of-last-resort will be there only to discourage criminal manipulation of prices. However, this (constructivist) Cartesian world of rationally behaved trinity of buyers/sellers/regulators discounted three well documented observations:

- (a) *framing – presentation format of a proposition effects the perception of what is being proposed (Kahnemann and Tversky 2000);*
- (b) *human herd behaviour in financial markets (Cipriani and Guarino 2009);*
- (c) *areas of human brain dedicated to seeking risk unnecessarily and avoiding plausible risk (Porcelli and Delgado 2009).*

1.2 Lexicogenesis of *moral hazard*

According to the *Oxford English Dictionary*, the compound term *moral hazard* has had a complex lexicogenesis. The headword *hazard*, rooted in the Arabic *al hazr* (danger) and Old French *hazard*, was first reported in the English language at the beginning of the 14th century where it referred to games of chance that had a confounding number of rules; the modern sense of the word, *risk of loss or harm; peril, jeopardy*, was first used in the 16th century. The word *moral*, rooted in Old French and its notable uses were *vertu morale* (moral virtue) and *philosophie morele* (moral philosophy), was first used in the late 14th century. The word was subsequently used in philosophy in the 16th century; the modern sense of the word moral has not changed much from the original meaning: of or relating to human character or behaviour considered as good or bad; or of actions having the property of being right or wrong.

The compound moral hazard entered the English language in 1875 denoting: ‘the effect of insurance on the likelihood of the insured event occurring; the lack of incentive to avoid risk where there is protection against its consequences, e.g. by insurance’ (OED 2010¹). Moral hazard appears to have roots in games of chance (*hazard*) and in being righteous (*moral*) and

¹ *Oxford English Dictionary – Online Edition* (<http://dictionary.oed.com.elib.tcd.ie/about/> - site visited 25th April 2010)

is used currently used both to describe risk seeking behaviour, for example as in casino banking, or in risk averse behaviour related to social security or its corporate equivalent.

1.3 Post Mortem of a disaster and the *ultimate moral hazard*

Financial and economic news over the last two years appears to have been dominated by a negative feeling: financial reports and the associated commentaries and opinions talk about contagion and ultimate collapse. To paraphrase this discourse appears to suggest that the financial contagion which led to the collapse of financial institutions has been caused, in part, by the moral hazard of the state being always available to underwrite risks, large and small. Even when the financial systems have been partially rescued, the term moral hazard still dominates discussions amongst policy makers and executives. Consider, for example, the exchange in the UK House of Commons' Select (Oversight) Committee on Finance, between the then Chair of the Committee (Mr John McFall, 2005-2010) and the chief executive of the UK LOLR, Governor of the Bank of England, Mr Mervyn King (2003- to date):

Q[uestion] [.] [by] Rt. Hon. John MacFall: [...] How have you avoided moral hazard in the design of the liquidity scheme [in which the UK Government took over 3 major banks and underwrote the liabilities of a few others]?

[Answer] Mr. Mervyn King, [...] the way we have protected against moral hazard is by ensuring that the credit risks stayed with the banks, [...] (Uncorrected Transcripts ⁱ of witnesses and politicians and cited in the House of Commons Report HC-524i, 2010 ⁱⁱ.)

Despite the fact that the potential credit risks 'stayed with the banks', public and party-political reaction to the post-2008 operations of the banks remained skeptical. Indeed, King's suggested elimination of moral hazard appeared to have become the *ultimate moral hazard*:

We do not hear about moral hazard any more; moral hazard was fashionable about six months ago and seems to have disappeared under the weight of billions of taxpayers' money. Is this not the ultimate moral hazard? (Forsyth 2009 ⁱⁱⁱ.)

The law makers in the above exchange do appear to subscribe to the conventional theory of moral hazard – that excessive risk taking is facilitated by the existence of a lender of last resort: central banks are not the only LOLRs, it turns out that exotic financial products – like derivatives and collateralised debt obligations, are used to defray the risk associated with investments or loans – were also in the frame. The size of a financial institution appears to determine the magnitude of risk the institution takes – the bigger the institution, the bigger the risk (Ekholm and Pasternack 2007). A concordance of the use of the *term* shows this small shift that is only apparent we have a diachronic organisation of documents (Table 1).

1999	Acting as lender of last resort, central banks	<i>create</i>	moral hazard
1999	big public bailouts may	<i>create</i>	moral hazard
2000	Fed(eral Reserve Bank of the USA) [has been criticized] for	<i>creating</i> a	“moral hazard”
2000	Fed’s success in steering the economy may have	<i>created</i> a	moral hazard
2007	credit derivatives	<i>create</i> a	moral hazard
2007	[Central banks] Pumping in liquidity too eagerly may	<i>create</i>	moral hazard
2008	[announcing rescue] terms beforehand can	<i>create</i>	moral hazard
2009	[Fed’s rescue of] Bear Stearns [...] drew criticism in congress [...]for	<i>creating</i>	moral hazard

Table 1: Selected concordances of the term moral hazard from *The Economist*, covering two periods 1999-2000 and 2007-2009; both periods comprise a financial crisis. (Bear Stearns was a bank that collapsed in September 2008.)

The question for us is this: are there signals for the onset of the *aperiodic* behaviour of the markets other than the purely numerical ones related to prices and volumes? How do economic actors communicate their intent? How are the key components described by Vernon Smith, home grown principles of actions and ‘morality’, articulated?

1.4 Key results of a genre-varied and diachronic corpus

Our corpus-based analysis shows that the usage of the term *moral hazard* in a genre varied corpus, including texts from newspapers, financial magazines, and economics and finance journals, does show signs of fluctuations over a 10-year period (1999-2009). These fluctuations have been confirmed by an analysis of the distribution of *moral hazard* in a representative corpus of American English. The fluctuation and appears to anti-correlated with the movements of a major index of US markets – *Standard & Poor’s 500*.

Our method may be of use to explore changes in a specialist subject domain by looking at the diachronic behaviour of key terms.

2 Method and Data Sets

2.1 Method

The basic method of analysis is based on a heuristic that the lexicon of a language is the result of a consensus amongst the users. Such a consensus may be found in a set of texts or speech excerpts, written and spoken by the users: this set, if systematically collected and shown to represent what language users do, can be used to find evidence of preferential or censorious attitude towards vocabulary items, syntactic and morphological patterns, and, perhaps towards key semantic units (Halliday 2004, Sinclair 2004). In times of change, words are re-lexicalised and assigned newer senses of meaning, and sometimes new words are coined. Evidence of such changes, especially during the changes, can only be found in a text corpus – the claim here is that only a detailed examination of texts can lead us to the inherent causality underlying the changes, a hermeneutic approach of sorts (Teubert 2003).

My approach to the ebb and flow in scientific matters has been to focus on (a) creating a corpus of texts that is as representative of a domain as is possible; and (b) on ensuring that the corpus is diachronic (Ahmad 2008a, 2008b). The question of representative corpora is a vexed one and invariably involves the opinions of the corpus makers and nebulous concepts of copyright (Ahmad 2007).

I will look at the frequencies of number of texts and number of tokens within a text.

2.2 A note on the lexicogenesis of compound terms

Compound terms have an interesting genesis – the manner in which two different linguistic tokens, different etymologies, different usage patterns, different meanings, are used together to form a semantically coherent linguistic token (McMohan 1994) and has been termed *lexicogenesis* by Picone (1996). The lexicogenesis appears to hallmark major changes in science and technology (Ahmad 2000). The meaning and the genesis of words are recorded in historical dictionaries where entries in the dictionary are dealt according to ‘various groupings of senses [...] in chronological order according to the quotation evidence words’ (OED 2010).

Lexicogenesis shows a carrier word in a domain, referring to a key concept, object, or event in a specialist domain, which is used to make an ontological commitment within the domain. Ontological commitment suggests that certain members of a domain have decided on the importance of a concept, an object or an event, and then will pursue investigations committed to elaborate on the concept, object or event. Single words like *atom* and *nucleus*, *acid* or *base*, *wealth* or *poverty*, *freedom* or *liberty*, and *kinship*, and *grammar*, are some of the keywords in domains as diverse as physics, molecular biology/bio-chemistry, economics, politics and anthropology, and linguistics respectively. These words become *carriers of meaning*: In physical sciences, this has led to physical atoms (antiquity-18th century), chemical atoms (early 19th century), atomic structure (late 19th-20 century), nuclear atom (20th century), (unstable and artificially produced) pionic/muonic atoms (late 20th century²). The observation that the atom was divisible and that it comprised *elementary particles* (electrons, protons, neutrons) was a major ontological commitment by some of the early 20th century physicists; the stable nucleus of the mid-20th century was stable because the neutrons and protons exchanged short-lived pions – initially called the Japanese electron as the particle was postulated by the Japanese born Heide Yukawa! The commitment has now changed and the *new elementary particles* are the quarks. The genesis of all these terms is recorded in the journal papers, notebooks, monographs and ultimately in textbooks before being consigned to history books (see Ahmad 2007, for an example of this genesis in four different subjects).

Lexicogenesis now can be better observed in the accessible corpora of digital texts in all their confounding varieties – online learned papers, popular science literature, and blogs for instance.

2.3 Data Sets used – A *dialled-up*’ corpus of newspapers, magazines, journal papers and Google Trends

The advent of the Internet and digital publishing has allowed us to access, for example, newspaper texts over literally tens of years, and the entirety of all the volumes of many a journal. Advanced search engines, like LexisNexis®, allow complex combinations of keywords to be used to search the digital content of a given library. The advanced search engines also have a facility to deliver the texts to bona fide users of the search engines. So now one can dial-in a corpus; a notion propounded by the late John Sinclair - one of the founders of the corpus linguistics (Sinclair 2005).

² In a muonic/pionic atom instead of an electron orbiting a nucleus we have *unstable* particles orbit a nucleus in laboratory conditions

I will focus on the reporting of financial markets in the Northern Hemisphere between 1999 and 2009. The period is demarcated by two major downturns in the market – the failure of mortgage markets in the USA and sovereign defaults in Russia around 1999, and the *credit crunch* of 2007-2009. The texts were selected by a simple criterion: if the term, *moral hazard*, occurred in the text: our measure of usage is the yearly count of the number of distinct texts within the collection that comprise one or more instances of the term.

The digital collections we have sampled include the LexisNexis News Online Information Service that provides access to over 1500 newspapers and magazines published in English, and the digital collections of journal publishers and their agents in order to access four journals in economics and finance. The sampled texts form our *moral hazard* corpus – the corpus was analysed and subsequently deleted in conformation with the terms and conditions of the agreements between the subscribers and the information providers.

2.3.1 Newspaper Corpus

We selected two newspapers (*The New York Times* and the London *Guardian*), two business news magazines (*The Economist* and *Business Wire*), and transcripts of political news shows of one TV station (*Fox News*) and trawled through texts over a 10 year period. The newspapers represent liberal/left point of view, the news magazines are pro-business and free enterprise oriented, and *Fox News* is generally regarded as a right-wing broadcaster. The details of each of the sources are given below (Table 2).

News Source	Mission Statement/Objectives
<i>New York Times</i>	' <i>Conservative</i> , in all cases where [...] conservatism is essential to the public good; [...] <i>Radical</i> in everything [...] that requires] radical treatment & [...] reform. [...]'
<i>The Guardian</i>	Founded as "an organ of the middle class", and generally on the mainstream left of British political opinion
<i>Fox News</i>	Delivery of "fair and balanced coverage of the day's news events" – accused sometimes of right-wing/conservative bias
<i>The Economist</i>	Free trade and globalisation, [...] for health and education [...], of banks & financial enterprises against bankruptcy.
<i>Business Wire</i>	disseminates full-text news releases from [...enterprises....] worldwide to financial markets and news organisations

Table 2. News Sources that comprise our newspaper sub-corpus and their mission statements. Texts selected between 1999 and 2009

The LexisNexis systems retrieves newspaper/magazine etc sources for given time frames and exports all the text retrieved as one single file: the annual number of stories containing at least one instance of the term *moral hazard* in each of the five publications during 1999-2009. The total number of stories we extracted for the 11 year period is 650 – an average of 59.1 stories containing *moral hazard* within the collection (with a standard deviation of 50.1). We have noted, however, that the average for the period 2005-2009, comprising the world-wide financial crisis, is 85 which is just over twice for the period 1999-2004: the maximum yearly total was in the year 2008 (Table 3).

Year	News source					Total
	<i>The Guardian</i>	<i>New York Times</i>	<i>The Economist</i>	<i>Business Wire</i>	<i>Fox News</i>	
1999	14	23	24	0	0	61
2000	2	10	13	0	0	25
2001	0	12	10	1	0	23
2002	2	16	14	8	1	41
2003	5	9	30	6	1	51
2004	1	7	10	1	3	22
2005	0	20	14	7	2	43
2006	1	0	5	3	1	10
2007	39	22	15	4	6	86
2008	45	83	29	13	13	183
2009	18	43	16	7	21	105
Total	127	245	180	50	48	650
Average	11.5	22.3	16.4	4.5	4.4	59.1
Std Dev	16.2	23.1	8.0	4.1	6.7	50.1

Table 3. The diachronic composition of our newspaper corpus comprising articles published between 1999 and 2009. The number of stories per year was below the mean for each of the news sources for most of the 11 years in some cases by as much as one standard deviation of the mean in the year 2006, except for the years 2008 & 2009 when the number of stories across the five publications were one standard deviation of the mean and in the case of *The Guardian*, *The New York Times*(*NYT*) and *Business News Wire*(*BNW*). During 1999 the number of stories was above the 11 year mean for *The Guardian*, *NHT* and *BNW*. The same was the case in 2003 for *NYT* and *BNW*.

2.3.2 Journal Corpus

The specialist texts were looked at using the following searchable archives: (a) JSTOR archives include over 1,000 humanities, social sciences, and sciences journals. The archive can be searched using keyword(s); (b) Business Source Complete database that comprises searchable cited references provided for more than 1,300 journals; and (c) Science Direct which comprises 2,500 journals that can be searched; the system also provides yearly summary of articles containing user-specified keywords.

I have looked at four journals – two in the area of banking and finance (*Journal of Banking and Finance* and *The Journal of Finance*), one in economic behaviour (*Journal of Economic Behavior and Organisation*) and one in development economics (*J. of Development Economics*). These four represent different view points about the efficacy of the markets and the objectives of economics and finance (Table 4).



Title	Publishes research into
<i>Journal of Banking & Finance</i>	Financial institutions and money & capital markets
<i>The Journal of Finance</i>	Financial economics
<i>Journal of Economic Behavior & Organization</i>	Economic decision, organization and behavior, and change.
<i>Journal of Development Economics</i>	Economic development, growth, intl. trade and finance, labor economics, [...] social choice and political economics

Table 4. The composition of our journal paper sub-corpus together with a brief remark on the research the journal publishes. We have selected papers that contained the term *moral hazard* anywhere in the paper during the period of 1999 and 2009.

Over 600 papers comprising the term *moral hazard* were published during the decade 1999-2009. The average number of papers per year is about 55 with a standard deviation of 15. Now if we look at the average number of papers containing the term *moral hazard* between 1999 and 2004, the average is 44 but in the period containing the financial collapse, 2005-2009, the average is 67: a ratio of 1.5 before and after the crisis. This ratio remains valid for individual journals and indeed the *J of Finance* shows a four fold increase during 2005-2009 when compared with 1999-2004. The diachronic variation in the number of papers that appeared in these journals containing the term *moral hazard* is shown in (Table 5).

Year	Journal of				Total
	<i>Banking & Finance</i>	<i>Finance</i>	<i>Economic Behavior Organization</i>	<i>& Development Economics</i>	
1999	20	1	7	13	41
2000	12	2	12	10	36
2001	11	2	12	4	29
2002	19	1	5	11	36
2003	15	6	8	17	46
2004	16	7	10	8	41
2005	22	15	11	9	57
2006	21	15	12	11	59
2007	19	17	14	12	62
2008	26	11	23	6	66
2009	28	5	28	20	81
Total	209	82	142	121	554
Average	19	7.5	12.9	11	50.4
Std Dev	5.3	6.1	6.8	4.6	5.31

Table 5. Diachronic details of the contents of our journal sub-corpus comprising journal papers that have at least one instance of the term *moral hazard*. Papers selected were published during 1999 and 2009. In the period 1999-2004, the number of papers in almost all the journals is below the 11 year mean; *J. of Development Economics* (JDE) is an exception in that in 1999 and 2003 the number was above the mean. During the 2005-2009, the mean number of articles in the *J. of Banking & Finance* (JBF) is above one standard deviation of the 11 year-mean, and number of papers in the *J. of Finance* (JoF) is above the 11 year mean and during between 2005-2007 and dropping below the mean in 2009. The numbers of papers published in *J. of Economic Behavior and Organisation* is above the mean rather later between 2007-2009. There is no discernible difference in *JDE*.

2.3.4 Confirmatory Analysis

I will use the movements of a major index of market movements to see whether the diachronic distribution of *moral hazard* reflects the changes in the index. I have used the US-based *Standards & Poor 500 (S&P500)* – a composite of the movements of the major US stocks and regarded as a bell weather for booms and busts in the USA (Table 6).

Date	Index	Volume Traded
01 December 1999	1469	9.1
01 December 2000	1320	12.3
03 December 2001	1148	13.0
02 December 2002	880	12.9
01 December 2003	1112	13.1
01 December 2004	1212	14.5
01 December 2005	1248	20.6
01 December 2006	1418	24.6
03 December 2007	1468	33.6
01 December 2008	903	53.2
01 December 2009	1115	41.6

Table 6: Variations in the value of the S&P 500 Index; a benchmark of the US economy comprising 500 major US corporations, each with a capitalization of more than 4 Billion US Dollars. Index value is given for the end of each year.

3 Lexicogenesis of *moral hazard* : Three Case Studies

In this section we look at frequency distribution in our three corpora or archives. First, we look at the term *moral hazard* in a contemporary corpus of English language and then go on to with a similar study with the newspaper and journal papers. We look at the total number of texts comprising the term published annually together with the distribution of single and compound words that occur in our corpora. The frequency distribution of the term over a ten year period (1999-2009) is then compared with one of the benchmarks of US economy, the S&P 500 index.

3.1. Moral hazard in ‘contemporary language’

Language learning literature, and latterly corpus linguistics literature, comprises discussion of what should the learner learn about a language – language used in high literature or language used in detective fiction, language used in science and technology or language used in popular science literature? The notion of representative corpus was developed – where the corpus curator will select a broad range of texts, fiction, serious and popular newspapers and then focusing of reportage and editorials, science and technology, law and government and so on (see Ahmad 2007). I have chosen a contemporary corpus of English comprising diverse genres of texts published between 1990-2013, and used an influential magazine of wide circulation and some repute, to see how the usage of the term *moral hazard* changes over time..

The Corpus of Contemporary American English (COCA) comprises over 450 million words and is available for browsing on the World-Wide Web.

The use of the term appears cyclic both in specialist literature on economics and finance. We have looked at the frequency of this compound using the COCA web interface. The peak usage of the term in COCA was in 1999, 2002, 2006 and 2008; more than half of the usage

was in academic publications. Contrast this with the use of the term in *The Economist* magazine over the same period: the peaks of usage of the term were in 1999, 2003 and 2008. It appears that after 2004, the distribution of *moral hazard* is anti-correlated in COCA and *The Economist* – peaks in one of the two corpora will correspond to troughs in the other (Figure 1).

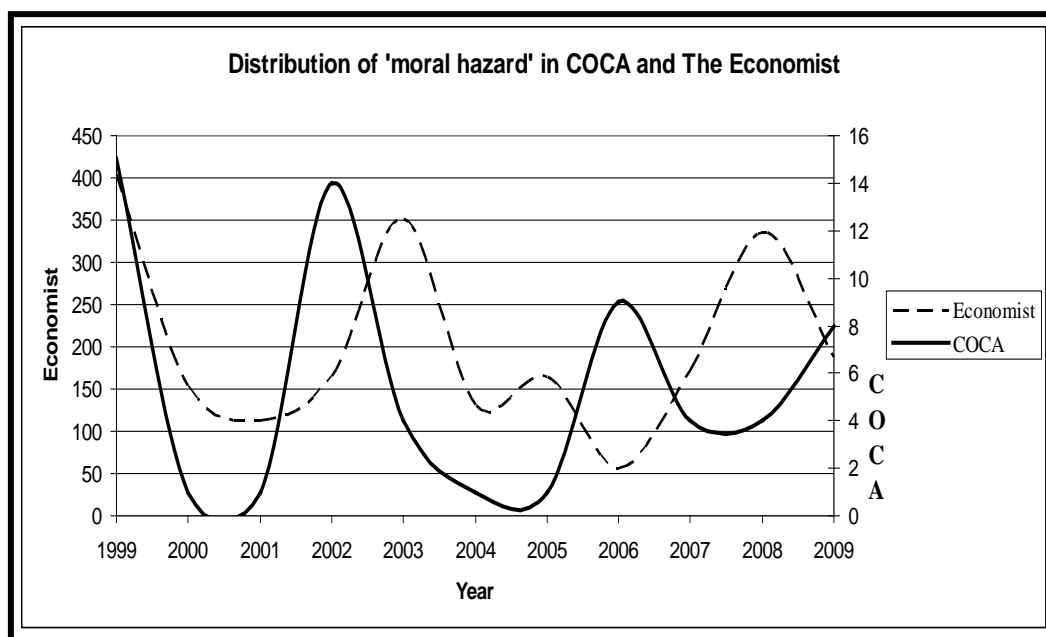


Figure 1. The variation in the absolute frequency of the term *moral hazard* in Contemporary Corpus of American English (404 Million token, right vertical axis), and in our selection of texts from *The Economist* (140 articles comprising 176062 tokens, left vertical axis).

The variation in the use of the term in *The Economist* goes through similar cycles as is the case in COCA – if one shifts the COCA curve in Figure 1 by one year the reader will see that the diachronic distribution is not much difference – except that the use in general language lags by ‘one’ year. Note that the relative frequency of usage of *moral hazard* in COCA is very low (between one and two occurrences per million words) as compared to *The Economist* – where the term occurs between 300-2000 per million words.

3.2 A business and political news corpus

To explore the ebb and flow of this term we dialled LexisNexis and explored the use of the term in five different publications: two broad sheets the UK *Guardian* and the US *New York Times*, two economic, business and financial news outlets, the mid-Atlantic *Economist* and the US-based *Business News Wire*, and the highly political excerpts of transcripts of *Fox News*. We used LexisNexis to search for the total number of articles comprising the term *moral hazard* published between 1st January 1999 and end of February 2010. The search engine retrieved over 500 news stories comprising 718926 tokens; the ‘corpus’ was retrieved in a few minutes from the LexisNexis site. The texts were deleted soon after the analysis was completed. On average there were 10 stories per publication per year: the *Economist*, NYT being three biggest ‘users’ of this term (Table 7).



Publication	Total no. of Stories	No. of Tokens
Business Wire	48	50140
Economist	140	185385
Fox News	42	152192
Guardian	103	96758
New York Times	171	234451
Total	504	718926
Average	101	143785
Standard Deviation	56	72461

Table 7: Composition of our ‘moral hazard’ corpus. Texts in the corpus were published between 1999 and 2009. The total number of stories and the associated total number of tokens comprising the stories is generally within 1 standard deviation of the mean. The *New York Times* texts dominate our collection both in terms of number of stories and tokens (1.3 standard deviation above the mean), however, we have had fewer number of stories from *Fox News*, one standard deviation below the mean, as the agency was only formed in 2006, the number of tokens made up for the smaller number of stories and the mean is just below one standard deviation. *Business Wire* texts are below the mean both for the number of stories and the number of tokens (one standard deviation below the mean). The variance perhaps is an indication in the bias in our analysis.

The total number of stories across all the five publications comprising the term moral hazard shows a cyclical behaviour and the cycle lasts between four and five years – peaks occur in 1999 (61 stories), 2003 (51 stories) and 2008 (183 stories). These cycles are present in all the publications individually (Figure 2).

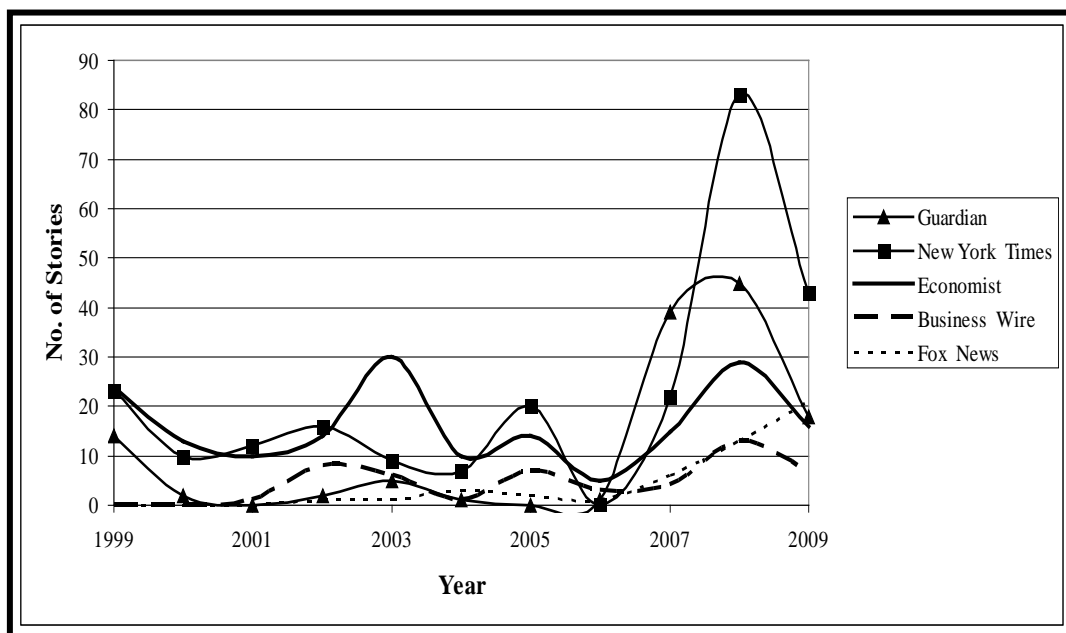


Figure 2. Variation in the number of stories comprising the term moral hazard across 5 publications

An analysis of the single and compound word frequency in the five sub-corpora also throws some light on the association between the use of the term *moral hazard* and the contents of the news stories in our corpora. The first ten most frequent open class tokens, that is words that do not belong to the closed classes including determiners, prepositions, pronouns, conjunctions and verbs-to-be, give some indication of the topics that may be under consideration in a text (sub-) corpus: All the 5 sub-corpora, except Fox News transcripts (FNt), include tokens like *market* and *financial* amongst the ten most frequent words. The business publications (*Business Wire* and *The Economist*) frequently use *risk* and *capital* and in the two newspapers (*Guardian* and the *NYT*) we see frequent use of *crisis* in their ten most frequent words. *Fox News*' fixation with (Presidential candidate and then President) Obama shows itself in our corpus as the 2nd most frequent token; *The Guardian* mentions Mr. King, the Governor of the Bank of England (Table 8).

Rank	News Source (1999-2009)				
	<i>Business Wire</i>	<i>Economist</i>	<i>Fox News</i>	<i>Guardian</i>	<i>New York Times</i>
1	business	bank	people	bank	bank
2	market	market	Obama	financial	financial
3	financial	financial	government	government	market
4	insurance	capital	president	market	government
5	risk	risk	money	rock, money	company
6	credit	America	time	King	money
7	capital	economist	bill	Northern	Fed
8	company	credit, money	house	crisis	federal
9	Fitch	countries	year	economy	people
10	report	prices	America	system	crisis

Table 8. The rank order of ten most frequent single words in our five sub-corpora comprising news reports containing at least one instance of the term *moral hazard*.

The frequency of compound words shows similar focus on certain key terms, organizations and people involved in creating and regulating the *moral hazard*: we discuss the first 10 most frequent compound terms to surmise the possible topics under discussion: *central banks* as generic term and its instances like the *US Federal Reserve* and the *European Central Bank* are amongst the most 10 cited compound terms. Similarly, *banking* and *financial institutions* are referred to generically and through instances largely of the failed institutions (*Bear Sterns*, *Lehmann Brothers*, *Fannie Mae* and *Freddie Mac* in the USA and *Northern Rock* in the UK). *Business Wire* uses specialist terms (*capital markets*, *credit derivatives*, *housing correction* and so on) and *The Economist* focuses its discussions on *asset prices*, *share prices* and *monetary policy*. The two newspapers focus their discussion on *credit crunch* (*The Guardian*) and *financial crisis* together with a list of failed US financial institutions (NYT); *Fox News* appears keen on the current US President, Barrack Obama who has three variants of in the 10 most frequent: *President Obama* and *Obama Administration* together *Hillary Clinton*, Obama's Secretary of State are amongst the top 10 compound words. The compound *moral hazard* appears in all – but this is an artifact of our search – the only moralistic term used is *corporate social responsibility*, it is used frequently in *Business Wire* (Table 9).



R an k	<i>Business Wire</i>	<i>Economist</i>	<i>Fox</i>	<i>Guardian</i>	<i>NYT</i>
1	corporate social responsibility	moral hazard	Barack Obama	Northern Rock	moral hazard
2	moral hazard	central banks	White House	moral hazard	Federal Reserve
3	financial institutions	financial system	moral hazard	financial system	Wall Street
4	capital markets	Asset prices, central bank	President Obama	credit crunch	Bear Stearns
5	financial markets, Geneva association, systemic risk	World Bank	Hillary Clinton	Wall Street	central bank
6	Fannie Mae, financial system	monetary policy	American people, health care, Wall Street	Federal Reserve	financial system
7	credit derivatives, holding company, re-insurance industry/subsidiary	Federal Reserve	Federal Reserve, Freddie Mac, stimulus package	central bank, financial markets, money markets	financial markets
8	financial crisis, housing correction, IFS ratings, missile defense, Secretary Paulson	share prices	Barney Frank, Fannie Mae, Federal government, John McCain	banking system	Mr. Bernanke
9	American people, analyst blog, financial stability	financial markets	North Korea, Obama administration	financial services authority, housing market	financial crisis
10	Bear Stearns, capital model, credit derivative market, credit protection, financial guarantors, Freddie Mac	Wall Street, banking system	beltway boys, Paul Gigot, President-elect Obama	European Central Bank	Lehman Brothers, <i>financial institutions</i>

Table 9. The rank order of ten most frequent compound words in our five sub-corpora comprising news reports containing at least one instance of the term *moral hazard*.

In all the different texts, except *Fox News* perhaps, moral hazard is associated with financial institutions – I say this on the basis of the proximity of rank order of the two terms; *Fox News* focuses on the White House and Obama.

3.3 A finance, banking and economics corpus

We used Science Direct, a vendor of over 2500 scientific journals which has powerful search facilities like LexisNexis. The system allows its bonafide users to download PDF and HTML versions of the papers. We chose *Science Direct* to search for the term *moral hazard* in papers published between 1st January 1999 and end of February 2010 in four major journals in economics, banking and finance: journals entitled *Banking and Finance*, *Development Economics*, *Economic Behaviour & Organisation*, and (*The Journal of*) *Finance*. These four journals have different foci: The *Journal of Economic Behaviour and Organisation* which publishes papers that emphasises the role of human behaviour in financial markets; *The Journal of Finance* focuses on efficient market hypothesis that perhaps discounts human behaviour in financial markets. *Development Economics*, focuses away from wealth creation to poverty alleviation. *Journal of Banking and Finance* is empirically oriented and concentrates on current practice in the two subject areas. The search engine retrieved 58 papers in four journals comprising 659161 tokens.

In a journal paper the term *moral hazard*, and for that matter any term, may appear in the main body of the paper, as a footnote, or (in the titles of articles) in the bibliography which typically accompanies the paper. I have counted the occurrence of the term *moral hazard* in the three components of the journal papers in the journals' corpus used in this paper. The term appears most frequently in the *J. Banking & Finance* (0.095%), followed by *J. Dev. Economics* (0.048%), *J. Banking & Finance* (0.024%), and lastly *J. Finance* (0.011%) on the whole, the term occurs once for every 2478 tokens in the journal papers in our corpus (Table 10).

Title	Number of Articles	In Text	Foot notes	Refs.	Total	N	f/N (%)
<i>J. Econ. Behavior & Organization</i>	28	50	8	15	73	301905	0.024
<i>J. Dev. Economics</i>	12	53	6	17	76	159697	0.048
<i>J. Banking & Finance</i>	8	80	18	10	108	113408	0.095
<i>J. Finance</i>	5	5	2	2	9	84151	0.011
Total	53	188	34	44	266	659161	0.0404
Average	13.3	47	8.5	11	66.5	164790	0.045
Standard Deviation	10.2	31.1	6.8	6.7	41.5	96556	0.037

Table 10. The occurrence of the term *moral hazard* in our journal sub-corpus comprising journal papers published between 1999-2009. Different numbers of papers were retrieved from each of the four sources: a computation of the mean and standard deviation across the number of articles suggest that number of articles in the JEBO and the other two journals are within a standard deviation of the mean, whilst the number in JoF were more than one standard deviation of the mean. The same is true of the frequency distribution of the term *moral hazard* in the journals as well. The distribution of the frequency across different segments of a paper – the term occurring in the main body of the text of the paper, in the footnotes, and in the titles of the papers/books cited in a paper's bibliography, show similar results. The proportion of the number of times the term occurs in the main body of the text, and the footnotes and cited titles, is 70:30 except in the case of the JoF where this ratio is 56:44. The one minor conclusion perhaps is that *moral hazard* is not used as frequently as a key word in *The Journal of Finance* when compared to the other three.

The single word distribution shows that except for the *J. of Economic Behavior & Organisation*, the journals have the terms *bank* and *risk* amongst the first 10 most frequent terms; the term *firm* is amongst the top 10 most frequent terms in all journals except for the *J. of Development Economics* (Table 11).

Rank	J. Banking & Finance	J. Development Economics	J. Economic Behavior & Organisation	J. Finance
moral hazard	0.095%	0.048%	0.024%	0.011%
1	Bank	loan	agent	<i>firm</i>
2	Loan	country	<i>firm</i>	<i>risk</i>
3	Value	agent	team	agent
4	<i>Firm</i>	<i>risk</i>	effort	loan
5	Finance	bank	investment	finance
6	Collateral	information	economic	agent
7	Banking	group	equilibrium	bank
8	Growth	contract	principal	rights
9	Insurance	development	capital	debt
10	<i>risk</i> , ratio	model	behavior	value

Table 11. Single word frequency distribution in our journal sub-corpus. The frequency has been computed by analyzing 266 journal papers, comprising 659161 tokens, published between 1999 and 2009. Each journal paper has at least one occurrence of the term *moral hazard*. (The relative frequency, given as a percentage, of the term *moral hazard* is given in the 2nd row of this table).

The compound word frequency distribution throws further light on the orientation of the journals. The reader should note that that ours is a small corpus and the collection of texts was based on that stipulation that each text in our sub-corpus should comprise at least one instance of the term *moral hazard*. The *J Banking and Finance* focuses on issues related to banks as in *state owned banks* and *joint equity banks* and one key issue related to banks world-wide: *deposit insurance* – an American English term that refers to the insurance provisions for protecting the deposits of the individual customers in a (US) bank. The most frequent compound terms in *The Journal of Finance* deal with an issue related to deposit insurance that is *debt capacity* – the capacity of an organisation to borrow without jeopardizing its financial well being; the most frequent term is *creditor rights*. The *J of Development Economics* deals with *World Bank*, *foreign assets*, and *medical effort*. The *J of Economics Behavior and Organisation* comprises frequent compound terms that deal with the rather negative aspect of modern day finance and governance: *preemptive collusion* and *preemptive bribe* for details of the distribution of the compound terms in our journal sub-corpus (Table 12).

Rank	J. Banking & Finance	J. Dev. Economics	J. Econ. Behavior & Organisation	The J. Finance
$f_{\text{moral hazard}}$	0.095%	0.048%	0.024%	0.011%
1	state-owned banks	world bank	team members	creditor rights
2	deposit insurance	credit bureau	preemptive collusion	mature firms, property rights
3	joint-equity banks	precautionary savings	preemptive bribe, team output	young firms
4	financing rounds	foreign assets	public signal	stock returns
5	ceo stock option grants	medical effort	estimated mean thresholds	debt capacity

Table 12. Distribution of 5 most frequent compound terms in our journal sub-corpus extracted from papers published during 1999-2009 and containing at least one occurrence of the term *moral hazard*. (The relative frequency of the term *moral hazard* is given in the 2nd row of this table).

3.4 Summing up: What does a word count have to do with the ‘real world’?

The appearance and disappearance of terms in scientific, technical, commercial and other specialisms indicate changes in the specialisms. Causal links can be discerned but this is all there is to it – a discernment. Recent developments in the study of finance, marketing and politics, under the umbrella term *sentiment* or more accurately *affect analysis* appear to create a causal link between the appearance of negative affect terms to the decline the value of stock markets, consumer goods, and political parties or individuals respectively (see Ahmad 2011). The textual turn in *finance* has come about quite recently perhaps after questions appeared related to the so-called efficient market hypothesis (EMH), which has influenced the free-market oriented minimal-regulatory approach to all matters financial. The EMH is based on the idea that there is a process of price discovery that is driven by the so-called market forces: an over-priced item will be shunned by buyers and eventually the seller will move towards what the buyers perception of the true value. Vice-versa, for an under-priced equity there will be a rush to buy and the seller will be motivated to raise the prices until it reaches its true value. Price is discovered through information being relayed about an equity’s value and here any other source of information will be discounted altogether by price related exclusively about prices. The ontological position of the proponents of the EMH was even more profound: the actions of the buyers and sellers will regulate the market and all we need is soft-touch regulation. However, many a clear thinker has suggested that the fears and ambitions of traders in a market place do influence their behavior (Kahnemann and Tversky 2000, Mandelbrot 2005) and there is a need for closer and tougher regulation.

There are a number of publications in the mainstream journals of finance, for example *The Journal of Finance*, now carries papers on the influence of news on the movement of equity prices. These papers focus on comment columns – often referring as *agenda setting* columns that appear in financial newspapers like the *Financial Times* and the *Wall Street Journal* -- contain speculation and humour about companies and individuals. Researchers have found that the negative affect found in these columns does account for the downward movement of indices measuring the performance of financial markets (Tetlock 2007); more refined versions of this approach suggest that a negatively-minded commentator of these comment columns can exercise downward pressure on financial indices and positively-minded commentator has the converse effect (Dougal et al 2012). In this spirit we will look at the S&P 500 index and

see whether the appearance and disappearance of the key word *moral hazard* has any relation to the changes in the value of S&P 500.

The S&P 500 is an aggregate value of the value (market capitalization or the value of the share price or equity price on a given day multiplied by the total number of shares) of 500 US companies – each selected by a committee employed by the US-based consultancy Standard & Poor’s; each company in the S&P 500 should have a market capitalization of 4 Billion US dollars amongst other requirements. The consultancy provides ‘market intelligence’ and provides consultancy to investors amongst other activities.

S&P 500 has been increasing year-on-year since 2003. This growth is remarkable in that the index fell from its peak value of 1518 in August 2000 – at the height of dotcom boom – to half its value of 841 in February 2003; ostensibly the reason was the dotcom boom/bust during 1999-2003. The index *recovered* eventually four years later to 1531 in May 2007 only to fall a new low of 735 in February 2009. The traded volume, the number of times the index was bought or sold and a sign of market activity increased during two periods of downturn, 2003 and 2008 as compared to a period of upturn 2000 and 2007 respectively: During the dotcom boom (c.2000), the 9.3 billion indices were traded at S&P500’s peak value of 1531, but in the downturn 14 billion indices were traded when S&P500 was nearly half its 2000 value of 735 in 2003. Similarly, the index reached a value of 1549 in the 2007 property/mortgage boom, when 14 billion indices were traded, and when the index halved (again) in 2009 to 735.09. The traded volume appears to be another bellweather of ups and downs in the markets (Figure 3).

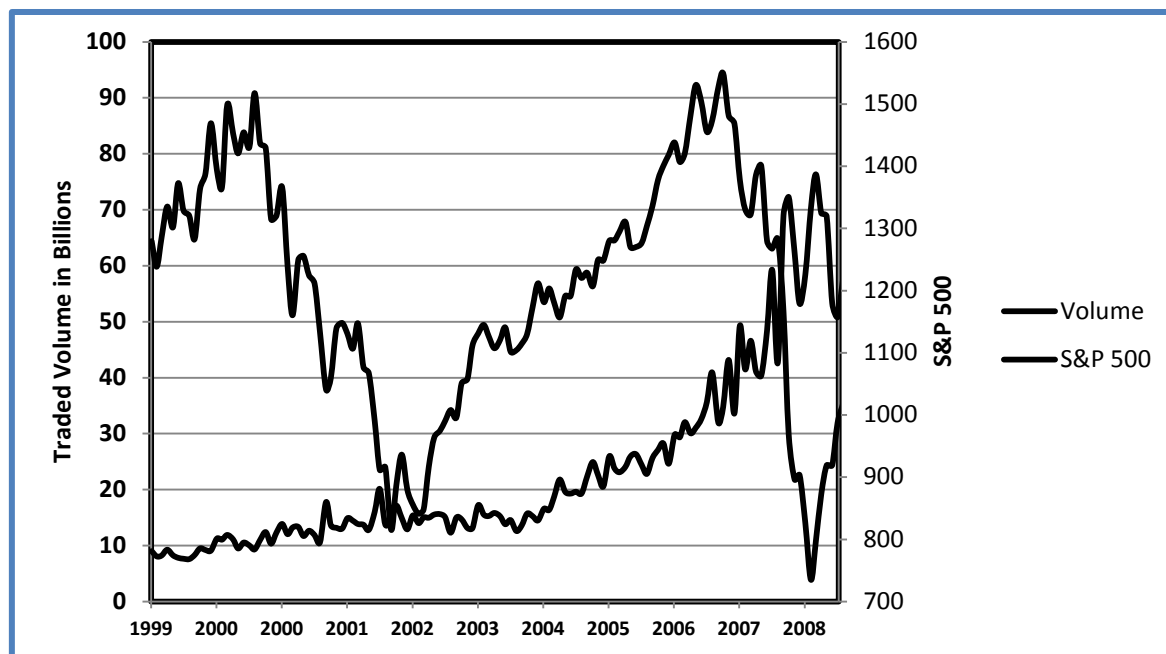


Figure 3. The movement of the S&P 500 index during the 11 years 1999-2009 together with the traded volume (index bought and sold).

The correlation of the frequency of articles containing *moral hazard* in our newspaper corpus and the journal are anti-correlated with the movements in the S&P 500 index : -15% and -7%



respectively, whilst the correlation between the frequency of articles in the two corpora is positively correlated (66%). In a limited sense the increased appearance of the term *moral hazard* appears to be a harbinger of the downturn of the equity markets and vice versa. It also appears that the appearance of this term in journals is also related to its appearance in newspaper articles (Figure 4).

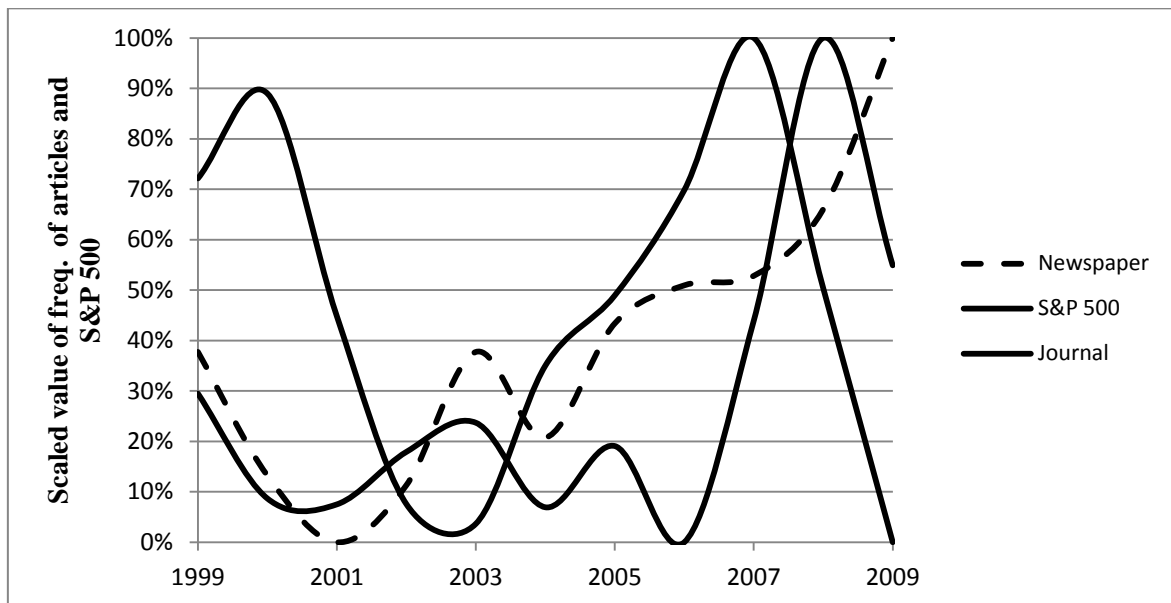


Figure 4. The variation of the S&P scaled values, the average value for the year less the minimum value then normalized by the difference between maximum and minimum value: this means the maximum value is represented as 100% and the minimum is 0%. Similarly for the scaled values of the frequency of articles comprising our two corpora – newspaper and journals.

4 Afterword

We started by observing one well established pattern of trading in financial markets – the cyclical change in prices of equities. There is auto-correlation in prices: today's prices are mildly different to yesterday's or this month's to the next month, and this perhaps engenders stability in the markets. It is assumed that uninformed speculators (termed *noise traders* in finance literature) lack the information that is possessed by informed traders – and the erroneous bets made by noise traders can be discounted by the informed folks – traders, financial institutions and others. The idea is that through auto-correlation and information markets can become self-regulated. Not so, it turns out to be the case: the informed traders panic and tend to follow the uninformed and the stability of the market is threatened by this herd behavior. So we not only have cycles but super cycles of boom and even longer periods of deflation and bust. There are apparently signs in journals, financial news papers and news casts signaling the onset of a boom or a bust: affect words related to the economy at large or affect words associated with individuals, do appear to have an impact of prices. This impact is not accounted for by many of the theories of the financial markets.

We have focused in this paper on a keyword – *moral hazard* – used as a proxy for the existence and operations of lenders of last resort – whether such lenders are national

governments, federations like the European Union, international institutions like the IMF, or super-rich individuals like Warren Buffet in the USA or oligarchs in post Soviet Union states. Moral hazard was used in economics and finance on the introduction of *fire insurance* – the fear was that people will not be careful with fire appliances if they knew that there in the *last resort* an insurance company will pick up the tab for their erroneous behavior. The term was used in recent times on a range of key topics – disability insurance, investment protection and a host of others.

If signals do exist then how can these signals be discerned? More specifically, can we learn something if we follow the use of an iconic proxy like *moral hazard*. The answer is mildly positive as we have shown through the analysis of a general language corpus, a corpus of financial/political newspapers and telecasts, and the analysis of learned papers in economics and finance. The focus was not a detailed analysis of the use of the keyword – in that we were content with the fact that the keyword occurred at least once somewhere in a newspaper article or a learned paper. The diachronic changes in the frequency of occurrence were plotted and correlated with a major index of the 21st century equity market (S&P 500). There was an anti-correlation between the frequency of the keyword and the S&P 500, whilst there was a positive correlation in frequency of the keywords in the newspaper corpus and the learned paper or journal corpus.

We looked at the other frequently co-occurring words in our two corpora and found that the newspaper corpus had a high frequency of terms like *financial crisis* and *financial systems*. The journal corpus comprised frequently used text related to *deposit insurance* and *debt capacity*. The newspaper corpus had key terms referring generally to a *crisis* in a *system* caused by lapses in *insuring* debts and in overextending the capacity of financial institutions in lending money. This insight, although with considerable hindsight, was achieved not by using an economic or financial theory but by looking at the genesis of the use of lexical tokens in a variety of texts. Sinclair (2004) suggested that we should trust the text – and that is what has been done in this paper.

More can indeed be achieved by examining random samples of papers in financial newspapers and learned papers in finance and economics to systematically investigate the use of language by the key stakeholders. We should not forget one key source of information – prices and traded volumes of equities and commodities – in that there is a significant amount of information about the behavior of the markets and many of its traders in these numbers. The task of folks interested in *language for special purposes* is now to bring forth the accumulated wisdom of the last 100 years in the studies of *fachsprache* to bring to bear upon pressing concerns in one important specialist area of human life – wealth or the lack of it. There is a need for systems to be in place to automatically sample texts for creating and analysing balanced and representative corpora of texts written in special language of a given domain. These corpora should contain texts that comprise a range of genres -- from the newspaper texts, journal texts, speeches and blogs. Such a system will *dial-a-corpus*: this term was coined by the late John Sinclair for a joint project proposal initially proposed by myself and then finessed by John and Yorick Wilks. Alas, John's untimely death has only left a trace of this ambitious project in the form of his tongue-in-cheek phrase *dial-a-corpus*. This paper was written with the intention of informing the reader on a variety of topics. My apologies if I have confused or mis-informed the reader.

Acknowledgments

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ⁱ <http://www.publications.parliament.uk/pa/cm200708/cmselect/cmtreasy/uc524-i/uc52402.htm>. (Site visited 5 April 2010; The transcript is subject to correction and is not yet an approved formal record of these proceedings.)

ⁱⁱ HC-524i-Re-appointment of Mervyn King as Governor of the Bank of England, Tenth Report of Session 2007–08, Report of the Treasury Committee, House of Commons, UK, London, HM Stationery Office, London, pp Ev 2;]

ⁱⁱⁱ Forsyth, Lord of Drumlean. (2009) House of Lords Economic Affairs Committee (2009) Banking Supervision and Regulation, Second Report. Question/Answer session on 10 March 2009. (<http://www.publications.parliament.uk/pa/ld200809/ldselect/ldeconaf/101/9031008.htm>, site visited 5 April 2010).

Accounting terminology and translation – a linguistic challenge

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Abstract

This article focuses on linguistic comparability and the understanding of accounting terms between languages in the context of international standardization of accounting principles. By analyzing the translations of the American English term *income* in bilingual dictionaries (English/Swedish and Swedish/English), the complexity of translating accounting terms, and the risk of miscommunication involved in the process, is highlighted.

The study shows that non-technical uses of terms are commonly confused with technical uses, and that the information presented in bilingual technical dictionaries may be both incorrect and misleading. The research demonstrates the fuzzy nature of language, and shows that linguistic and cultural aspects in accounting communication cannot be ignored in the on-going work of standardizing accounting world-wide.

1 Introduction

The aim of this paper is to explore the comparability and understanding of accounting terms in two related languages – English and Swedish. By analyzing the translations of the accounting term *income* in bilingual business dictionaries the difficulty in translating accounting terms correctly, and the danger of miscommunication, is highlighted. Our aim is to make producers and users of accounting information aware of linguistic aspects in financial reporting, and show that uniformity of principles and terminology is needed to promote transparency in international accounting communication.

In accordance with accounting theory, companies' disclosure of timely and relevant information in financial reports reduces information asymmetries (see, for instance, Frankel & Li, 2004). There is, however, as pointed out by Soderstrom and Sun "considerable variation in accounting quality and economic efficiency across countries" (2007: 676). Therefore, convergence to unifying standards has been regarded as necessary, and constitutes a current topic in financial reporting (Chua & Taylor, 2008; Zeghal & Mhedhbi, 2006). Chua and Taylor (2008) argue that the complexity of international capital markets and their interconnection are critical rationales for the adoption of a unifying standard. According to Barth (2008), one global standard would not only reduce the costs international companies pay for preparing financial statements, it would also help them interpret financial statements prepared in other countries. His view is that one single language of business is a prerequisite for ensuring comparability of international accounting information. Quite similarly, Jacob and Madu (2009) emphasize that the development of one global standard would have the potential to contribute to more comparable and solid reports.

Until today, much of the work on standardizing international accounting has focused on norms and regulation. Work focusing on how companies actually interpret and do their accounts in practice has been wanting, although pointed out as a necessary complement to harmonization work on a *de jure* level (Beuren *et al.*, 2008; Baker & Barbu, 2007). One important aspect of harmonization on a *de facto* level which has been receiving increased attention during the last few decades is language (Beuren *et al.*, 2008; Evans 2004; Evans *et al.*, 2010). Our aim is to contribute with knowledge concerning the centrality of language in accounting communication, and thereby contribute to the work on converging accounting to international standards.

Prior studies focusing on the relationship between language and accounting in cross-national settings have primarily focused on connotative differences in accounting practitioners' understanding of expressions and phrases (Doupnik & Richter, 2004; Evans, 2004; Evans & Nobes, 1996; Archer & McLeay, 1991). This study adds to previous research on accounting terminology by focusing on the understanding of a term part of the financial statement and by showing that even denotative meanings of terms may give rise to confusion. The article examines the translation of *income* in dictionaries by employing the idea of fuzzy meaning as an analytical framework.

2 Background to the study

2.1 Theoretical framework

It is common practice to discuss word meaning in terms of denotative and connotative meanings. A strict division into these two sense-components of word meaning builds on componential analysis or core theory. In line with Aristotle's theory of word meaning, proponents of core theory hold that the denotative or essential meaning of every word can be extracted and specified (Aitchison, 2012:53-54). The difficulty of applying the theory to a number of words has been observed, however, and today most linguists argue that few words have a fixed meaning (Aitchison, 2012: 54ff; Kövecses, 2006; Persson, 1995: 11). To illustrate the difficulty of applying core theory to word meaning, the definitions of the concepts 'tiger' and 'bird' have commonly been used. Most people would say that they know what a bird or a tiger is, but when asked for exact definitions of the concepts which separate them from other entities and which hold true for all tigers and birds, the complexity of defining the exact meaning of words is highlighted (Aitchison, 2012: 59ff).

The antithesis of componential analysis is that word meaning is fuzzy and that exact or discrete meanings of terms are seldom, if ever, found (Aitchison, 2012: 58ff.; Rosch, 1975). Many words have such complex meanings that not even speakers within the same profession within the same country share the same conceptual understanding of them (for examples of different understandings of terms in interprofessional accounting communication see, for example, Libby (1979), Oliver (1974) and Jain (1973).

Proponents of the theory of fuzzy meaning argue that words should not be studied in isolation (Aitchison, 2012: 80ff). To acquire the full understanding of a word, knowledge of the whole setting or frame in which it occurs is required. For instance, to understand what 'Monday' is, an understanding of the whole concept 'week' is needed, which in Western culture is divided into a sequence of five working days and two days off (Aitchison, 2012: 86; Fillmore, 1985). In a similar way, it could be argued that when an individual talks and refers to the term *income*, the whole frame 'accounting' is activated.

In the analysis and classification of words, discrepancies in lay and scientific understandings of concepts are frequently referred to and discussed. Scientific definitions of terms often differ in many significant ways from the lay understanding of the same terms (Ungerer & Schmid, 2006: 55ff; Wardhaugh, 2006: 232; see also Aitchison, 2012: 59; Janicki, 2002). Ungerer and Schmid (2006: 55 ff) give a number of examples of such discrepancies and demonstrate that although many lay models of concepts have shown not only to clash with scientific ones, but to be incorrect, they nevertheless influence people's understanding of the world. Examples of misconceptions and confusion as a result of failures to distinguish between scientific and everyday meanings of terms have, for instance, been provided from the legal realm by Cao (2002). It is thus reasonable to assume that the everyday understanding of *income* differs from the technical definition of the term, and that the former may affect the understanding of the latter (see 5.1.1 below).

2.2. Language and culture

Various theories have been launched about the nature of the relationship between language, culture and world-view. In the context of language relativity, for example, the degree of language's impact on thought has been explored, resulting in stronger and weaker versions of language relativism (Saeed, 2003: 41). The way people cut up the color spectrum is frequently used to demonstrate this relationship. We all know that the color spectrum is a continuum where different colors merge into each other without clear-cut boundaries. In spite of this, names are assigned to the color shades of the spectrum as if they were perceived as distinct entities that could be separated from one another. How people categorize colors and assign names to them is, however, as is well known, quite different world-wide. Most Western cultures employ about eleven basic color terms, whereas other cultures make use of considerably fewer categories. It has also been shown that despite an equal or almost equal number of color terms in some cultures people may nevertheless conceptualize colors differently in these cultures (Taylor, 2003: 1-17).

The relationship between color terminology and human categorization has been studied extensively within a variety of fields and supplied us with valuable clues to human cognition (Taylor, 2003; Heider (Rosch), 1971; Berlin & Kay, 1969). For the purpose of this study, however, it seems enough to state that the link between language, culture and world-view

exists, and as a consequence accounting terms and expressions used in one language do not necessarily mean the same thing in another. One may thus conclude that translating a text from one language into another requires knowledge of the target language which goes far beyond knowing its linguistic structure, and that misunderstandings of terms and underlying concepts are likely to occur, particularly in international communication.

The degree of inconvenience caused by the discrepancy between terms and what they refer to and how they are understood in various languages is, of course, highly context-dependent. If people with different cultural backgrounds meet and realize that they understand color terms differently, the harm may perhaps not be equally severe – at least not in informal contexts – as if people engaged in accounting discussions misunderstand each other. Misinterpretations of accounting terms may, for instance, lead to research flaws or incorrect investment decisions (Beuren *et al.*, 2008; Evans, 2004). Misunderstandings with serious consequences are also likely to arise in accounting classes if the underlying principles of accounting as described in the course literature do not correspond to the accounting practice of the country where the course is taught. International students in such classes may at worst be doubly confused if both the course literature and the system to which it is applied are foreign to them. Similar problems may arise in situations where people speaking different languages meet to discuss business and use a lingua franca to make communication possible (for a discussion on the role of English as a business lingua franca see, for instance, Kankaaranta & Planken (2010) and Ehrenreich (2010).

The relationship between language and culture in mind, it is thus important to remember that full semantic equivalence between terms in various languages is rarely found (Riemer, 2010; Ungerer & Schmid, 2006; Bassnett, 2002: 22; Janicki, 2002), implying that even if one global financial accounting standard would improve international accounting communication, a single set of accounting standards can never guarantee comparability between terms in different languages. Comparability is not achieved, as pointed out by Dahlgren & Nilsson (2009), simply by obliging international companies to prepare their statements in accordance with the IFRS.¹ As mentioned above (section 2.1), true comparability requires understanding of the whole frame where a particular word occurs.

2.3. US and Swedish Accounting traditions and international accounting communication

Together with Great Britain, Ireland, Holland, Canada, New Zealand, Australia and the former British colonies the US adheres to the Anglo-American (also referred to as Anglo-Saxon) accounting tradition. Sweden has traditionally been influenced by the continental tradition together with Japan and the main part of the west European countries (Alexander & Archer, 2000; Smith, 2000: 73). An important difference between the American and Swedish accounting systems is that while US accounting regulation focuses on protecting external shareholders, the Swedish system, like that of other continental accounting countries, focuses on taxation and the protection of creditors (Aisbitt, 2008; Smith, 2000: 76-77). Whereas the US law system shows similarities with British practices, Swedish accounting theory has primarily been influenced by German regulation and theory (Aisbitt, 2008; Alexander & Archer, 2000). Some time in the mid twentieth century, a move from the continental to the common law tradition began to take place in Sweden, however. German textbooks in

¹ Since 2005 all European Union member states must adopt the International Financial Reporting Standards (IFRS).

Swedish accounting education were, for instance, replaced by many Anglo-American books, and English became more important than German in a number of social and political instances (Artsberg, 2010: 192, 198- 200). This change was caused by an increased number of multinational companies listed on the New York and London stock exchanges. Another important factor was that accounting was becoming increasingly international and international accounting standards developed primarily in accordance with Anglo-American traditions (Smith, 2000: 76).

Anglo-American accounting legislation includes supplementary requirements issued by sector bodies, commonly made up of accountants. In the continental countries, by contrast, accounting practice is typically dominated by tax law leaving little room for the influence of professional accounting bodies, such as the Financial Accounting Standards Board (FASB) in the US and the International Accounting Standards Board (IASB) in the UK (Blake *et al.*, 1997). This is, for example, the case in France and Germany (Degos & Mattessich, 2006). Sweden serves as an exception to continental practice in this respect, because, like professional accounting boards in the US and the UK, Swedish accounting bodies have traditionally had a great influence on accounting regulation, although it is true that the Swedish legal accounting system is based on a binding tax-accounting link (Blake *et al.*, 1997). Sweden's position between these two approaches, and the debate concerning the effects of a strong link between tax rules and accounting regulation in an international context appear to illustrate both difficulties in and demands on standardizing global accounting information and practices.

All European Union companies are today required to adopt the International Financial Reporting Standards (IFRS). These standards have been adopted by a number of countries in the world, but not by the US, whose financial reporting system follows GAAP (Generally Accepted Accounting Principles). A convergence program between the international accounting organizations FASB and IASB was started in 2002, however, and a Memorandum of Understanding between them was issued in 2006.² In 2009 they reaffirmed their commitment to the memorandum, and in line with this, the Securities and Exchange Commission (SEC) proposed a work plan with several milestones to achieve global harmonization.³

² See: <http://www.ifrs.com/updates/fasb/memorandum.html>

³ See: <http://www.ifrs.org/>

2.4. Language and accounting

Along with an increased need of communicating accounting internationally, and the demands on standardizing accounting, the last few decades have witnessed a growing amount of research focusing on how accounting information is communicated cross-nationally and on the problems of translating accounting terms into other languages. Archer and McLeay (1991), for example, have examined the extent to which the accounting registers of different languages may be regarded as translinguistic, that is, translated rather unproblematically from one language into others. Their study shows that even if there is some evidence of semantic overlap between different national accounting registers, which would make transnational financial reporting possible, cultural differences in the way information is presented in a given context, for example, in terms of courtesy and choice of wording are more difficult to overcome in translation.

A number of studies have focused on how the concept of ‘true and fair view’ is understood in accounting communication (Evans, 2004; Nobes, 1993; Walton, 1991), all of them suggesting that there is great variation in how the concept is perceived both on a single and a cross-national level. Walton (1997) points out that not even in the UK where the concept originates is it understood unambiguously among accountants.

Another accounting term which has attracted attention among researchers with respect to translation is *prudence*. Evans and Nobes (1996) studied the prudence principle in European languages in relation to the Forth Directive⁴ and concluded that there is a difference in emphasis between different language versions of the directive as to the meaning of the principle. In a more recent article by Evans focusing on the same concept (2004), the author explains that differences in the understanding of the prudence principle most likely depend on the fact that language users interpret the word in accordance with what they are familiar with in their respective economic and legal systems. In the same article, the translation of the German expression *Grundsätze, ordnungsmässiger Buchführung* (GoB) (‘principles of orderly accounting’) into English is discussed, as the meaning of it, as pointed out by the author, “persistently give[s] rise to problems and misunderstandings” (Evans, 2004: 212).

The problems entailed in interpreting technical vocabulary have also been addressed by Evans, Baskerville and Nara (2010). Their study, written in the context of the convergence of the IFRS, contains a review of literature focusing on translation from other disciplines than accounting to enable comparison and practical solutions. The Swedish translation of the IFRS has been studied by Dahlgren and Nilsson (2009). A number of translation errors concerning accounting terms are presented in their study, there among, the translations of *income*, *profit* and *recognition*. This study adds to previous research on the complexity involved in translating accounting terms, but, unlike prior studies, it points more explicitly to “problems” inherent in language as a cause for misunderstanding, and demonstrates that misconceptions occur on both connotative and denotative levels. To illustrate the complexity in interpreting word meaning, this study primarily focuses on the English term *income* in its relation to the Swedish term *inkomst* – two terms which historically meant the same thing but have developed to mean different things. The problems entailed in translating specialized

⁴ The directive includes “general valuation principles to be applied in the preparation of financial statements” (Evans & Nobes, 1996: 361).

vocabulary, and the danger involved in it, are highlighted by analyzing the possible interference of the everyday understanding of ‘income’ on the technical understanding of the concept.

3 Research aims

The aim of this study is to analyze the suggested translations of the accounting term *income* in eight two-way business dictionaries (English-Swedish/Swedish-English). Based on the information found in the dictionaries, the study addresses the following questions:

- Are there any inconsistencies or incorrect translations of the term in the dictionaries? If so, what are the possible reasons for the mistakes?
- In what way may the errors be attributed to the fact that Swedish and English are related languages?
- Does the lay definition of *income* affect the understanding of the technical sense of the term?
- Is it possible to achieve full comparability and transparency in international accounting communication?

4 Method and material

Since American English is the most commonly used language of account in international contexts today (Parker, 1994), the focus on the term *income* in this study is on how it is used and understood in American English. For this reason, only dictionaries which mark when a term is used specifically in American English were selected. *Income* was chosen as a term of investigation, because it constitutes a key term in accounting which is commonly misunderstood in international accounting communication (see, for instance, Dahlgren & Nilsson, 2009).

All the dictionaries (see Tables 1 and 2) chosen for the study are bilingual business dictionaries, except *Google Translate*, which is a web-based general dictionary. It was included in the material as it constitutes one of the most frequently consulted dictionaries among Swedish accounting practitioners. The first step was to look up *income* in the English-Swedish dictionaries. The suggested translations of the English term are presented in Table 1. They are listed in the same order as they occur in the dictionaries. The terms listed as Swedish equivalents of *income* were then looked up in the same dictionaries to see what their English translation rendered (Table 2). This method was chosen not to demonstrate possible inconsistencies in the dictionaries’ presentations of the terms, but as a means of highlighting the complexity involved in transferring the meaning of terms from one language to another and the risk of miscommunication entailed in it. The business dictionary *FARs engelska ordbok (FAR)* (2000), which is recognized as an authorized accounting dictionary in Sweden, was used as a point of departure for the analysis. This dictionary lists five different Swedish terms to cover the meaning of the English term: *inkomst*, *intäkt*, *vinst*, *resultat* and *avkastning*.

Each translation presented in the dictionaries is analyzed and discussed semantically and compared to other suggested translations. Since the Swedish term *inkomst* is frequently understood as the equivalent term of *income*, the focus is primarily on the concept of ‘income’ in its relation to ‘inkomst’.

5 Analysis and discussion

5.1. *Income* – a term of confusion

It is generally argued that absolute equivalence between languages is unusual (Harkins & Wierzbicka, 2001; Joseph, 1998; Gibbs, 1994; Nida, 1996). Even if one may come across terms whose equivalents in another language refer to exactly the same concepts, connotative differences may create differences in people's conceptualization of them (Aitchison, 2012: 54; Bassnett, 2002: 22). The fact that not all concepts are lexicalized in all languages constitutes another complexity in international communication (Zeff, 2007: 296; Wardhaugh, 2006: 223). English, for example, makes no linguistic distinction between the brother of someone's mother and the brother of the father of this person. They are both *uncles*. Such a distinction is made in Swedish where the former is called *morbror* and the latter *farbror*. Numerous examples of similar mismatches between terms in different languages could be listed, in particular in the terminology of cultural and social artifacts (see, for instance, Kocbeck, 2008; Wardhaugh, 2006: 232), as such concepts, more than perhaps others, are culturally defined. The risk of confusion is moreover likely to increase if a term in the source language resembles a term in the target language whose underlying concept differs from that of the source language (false friends). A related phenomenon with a similar effect on perception is the so-called "Einstellung effect" which implies that once a word for a specific concept has been understood as the "correct" term for it, this term will cause its users to over-generalize its meaning and make him or her see only what he or she expects to see (Evans, 2004; Jain, 1973; Luchins, 1942).

A semantic analysis of the term *income* and Swedish translations of it should provide valuable information in the contexts of international accounting communication. To demonstrate the social and cultural impact on the semantic development of terms and to underscore the fact that the meanings of terms are not static, but change over time (Kleparski, 1996: 4ff; Hughes, 1988), a short etymological background to the development of *income* and the Swedish term *inkomst*, followed by a presentation of the understanding of *income* on a national level, precedes the analysis.

As noted above, the term which is commonly understood as the nearest equivalent of the English term *income* in Swedish is *inkomst*. Originally, *income* meant 'entrance' or 'coming in' (Oxford English Dictionary (OED)), formed from *in* + *come* (Old English *incuman*). According to the OED, the verb form occurred for the first time in English about 1000. The Swedish term *inkomst* was formed from the same collocation. The first recorded example of *income* as a noun is in 1300 (OED). The first instances of "periodical produce of one's work, business, lands or investments" (OED) were recorded in both languages around 1600 (OED; *Svenska Akademiens Ordbok*). Since the seventeenth century legal and social changes have caused the original concept designated by the two terms to develop differently in their respective languages, however. Swedish accounting principles, including the *income* concept, received a more uniform meaning in commercial accounting through the implementation of the so-called M-chart (Mekanförbundets Normalkontoplan) in 1945 (Fagerström & Lundh, 2009). The US term, on the other hand, appears to have developed as a rather generic term including many different kinds of *income*, for example *revenue* "the income generated from sale of goods or services, or any other use of capital or assets, associated with the main operations of an organization before any costs or expenses are deducted," *net income* "the total revenue in an accounting period minus all the expenses during the same period," *other income* "income derived from transactions not involved in daily operations of business. For

example, rent received from other business properties” and *gross income* “the amount by which sales revenue exceeds production costs” (*BusinessDictionary*).

Regardless of how the two terms have developed the meanings of income and the Swedish term *inkomst* are, as shown more in detail in the analysis below, not clear-cut. As for the English term, Schroeder, Clark and Cathey (2009: 137) emphasize that “there is a general lack of agreement as to the proper definition of [it].” It is used with reference to both economic and accounting income, and “means different things to different people,” to use Dyckman et al.’s words (1992: 135). In economic terms, for example, it refers to a change in wealth between two periods (Dyckman et al., 1992: 135), but in accounting, it denotes “specific events that give rise to recognizable elements of revenue and expense during a reporting period” (Epstein & Mirza, 2000: 65). Unlike economic income, which does not necessarily need to be realized, accounting income is normally “recognized only when it is fully realized” (Epstein & Mirza, 2000: 65). Investors and shareholders also understand the term differently. To the investor, it represents “earnings before any payments.” To the common shareholder, on the other hand, it means “earnings after payments to other investors” (Epstein & Mirza, 2000: 65). That the term income covers many different concepts is also illustrated in the on-line *BusinessDictionary* which presents five different meanings of the term: one general, two in accounting, one in economics and one in law.

5.1.1 Income in Bilingual Business Dictionaries

Against the information presented above, this section provides an analysis of the American English accounting term *income* and the Swedish translations of it in eight bilingual business dictionaries (see Tables 1 and 2).

Dictionaries	Swedish translations
<i>Accounting Bilingual dictionaries</i>	<i>inkomst, vinst</i>
<i>Business dictionary : English-Swedish, Swedish-English</i>	<i>inkomst ‘revenue’, intäkt, vinst</i>
<i>Ekonomiordbok: svensk-engelsk, engelsk-svensk</i>	<i>intäkt, resultat, vinst</i>
<i>Elsevier’s dictionary of commercial terms and phrases</i>	<i>inkomst, intäkter, vinst</i>
<i>English-Swedish Business Dictionary</i>	<i>inkomst, avkastning</i>
<i>FARs engelska ordbok</i>	<i>inkomst, intäkt, vinst, resultat, avkastning</i>
<i>Natur och kulturs ordböcker, engelsk-svensk-affärsordbok</i>	<i>inkomst, avkastning</i>
<i>Google translate</i>	<i>intäkter, inkomst, avkastning, inkomster</i>

Table 1. Swedish translations of the US term *income*

As shown in the above table, seven of the eight dictionaries list *inkomst* as a possible translation of the English term *income*, and all of these except one (*Google Translate*) present it as the first meaning, indicating that it is the most typical sense. Indeed these two terms have a lot in common. As shown above, they derive from the same Germanic source and originally they meant the same thing. Today, they are both frequently used business terms in their respective languages, and on a general level they both refer “to the money that a person, a region, a country etc. earns from work, from investing money from business etc.” (*Oxford Advanced Learner’s Dictionary*). Similar general definitions of the two terms are presented in the Swedish terminology bank *Rikstermbanken* and in the *BusinessDictionary*. At first glance, *inkomst* thus appears as the most “natural” translation of the English term. *Income* is the term that most Swedish people associate with *inkomst*, and also the term which most dictionaries present as the equivalent term of the Swedish term in question. They moreover look very similar. A closer look at the contexts where the two terms occur, however, reveals that they are far from the equivalents of one another. In accounting, in particular, they are shown to refer to entirely different concepts.

The difference between the two terms is mainly a matter of divergent accounting practices in Sweden and the US and may be explained by reference to how the inflow and outflow of resources are accounted for in the respective systems. The US accounting system makes use of two pairs of terms to describe the inflow and outflow of resources; the Swedish system uses three. In the US system, one pair describes the recognition of the components of income (*revenues* and *expenses*) and the other refers to the realization of the resources (*receipts* and *disbursements*). The latter pair is similar in the Swedish system, where *inbetalning* corresponds to *receipt* and *utbetalning* to *disbursement*. The first pair is not equally straightforward in its application within the two systems, however. Swedish accounting practices make a distinction between the compensation for products and services which have not yet been accrued for (*inkomster* and *utgifter*) and resources which have been accrued for and recognized in the financial statement (*intäkter* and *kostnader*). In US accounting, the Swedish concepts of ‘*inkomst*’ and ‘*utgift*’ do not exist.

Surprisingly, none of the English-Swedish dictionaries explains the difference between the two terms by referring to and explaining differences in the accounting practices of the two countries. Instead between two and five different terms (*inkomst*, *intäkt*, *vinst*, *resultat* and *avkastning*) with entirely or slightly different meanings are listed as possible equivalents of the English term. Two of them are included in the Swedish income statement in the senses of ‘revenue’ and ‘net income’ (*intäkt* and *resultat*), whereas the other three are not. *Vinst* and *avkastning* (‘gain’ and ‘return’ on, for instance, investments) are more general business terms also used among lay people in everyday speech. All the dictionaries except *Norstedts juridik* present *inkomst* as an equivalent term of *income*. *Norstedts juridik* nevertheless contributes to the confusion concerning the meaning of the two terms by listing *income and expenditure* under a separate entry and translating the expression as *inkomster* (the plural of *inkomst*) och (‘and’) *utgifter* (the plural of *utgift*, that is, *expenditure*).

If the information concerning the understanding of *income* and *inkomst* appears limited and misleading, the confusion is even greater when the meanings of the other terms suggested as possible translations of *income* are taken into consideration (see Table 1). The information

about *intäkt* is of particular interest since it is a term which is commonly mixed up with *inkomst* on a single-language level, and which, according to the dictionaries, is a common meaning of *income*. Like the information about *inkomst*, the presented meanings of *intäkt* are far from clear-cut. For instance, none of the dictionaries explains that *income* and *intäkt* converge semantically in the sense of ‘revenue’, but are used on different semantic levels in other contexts. The main difference between the terms, which appears to cause problems in translation, is that *income*, as used in US accounting, covers a much larger area of use than the Swedish term *intäkt*. As stated above, the English term functions both as a superordinate term including many different kinds of income and as a term for a specific kind of income. *Intäkt* is only used in the sense of ‘revenue’ (Gröjer, 1983: 208-209).

Compared to *inkomst*, *intäkt* thus appears to be semantically closer to *income*. This is not shown in the dictionary information, as three of them do not list *intäkt* as a possible meaning of *income*. *Norstedts juridik* gives *intäkt* and also *resultat*, that is, ‘net income’ as translations of *income*. The *Business dictionary: English-Swedish, Swedish-English* explains that *income* could coincide with the meaning of *intäkt*, but emphasizes that *inkomst* corresponds to its meaning in most contexts. Only two dictionaries list *intäkt* as the first meaning of *income* (*Google Translate* and *Ekonomiordbok*).

Resultat is found in two of the dictionaries, although not listed as the first meaning in either of them. It corresponds to the English term *net income*, that is, revenues minus expenses, and may therefore, like *intäkt*, be viewed as one of the meanings included in the concept of ‘income’. Against this, the limited occurrence of the term in the dictionaries is surprising. The Swedish term *vinst*, on the other hand, which is a term for ‘gain’ in general discussions concerning financial issues occurs in five dictionaries. Curiously, only the result of a positive net income is mentioned (*vinst*). Analogously, *förlust*, that is, a negative net income (*loss*) could have been listed. Finally, four dictionaries suggest *avkastning* as a translation of *income*.

The complexity of translating technical terms into other languages and the confusion which may arise when doing so is perhaps most clearly demonstrated in how the suggested terms for ‘income’ are translated back into English again in the same dictionaries (See Table 2).

Dictionaries	<i>inkomst</i>	<i>intäkt</i>	<i>vinst</i>	<i>resultat</i>	<i>avkastning</i>
Accounting Bilingual dictionaries	<i>income, gross, revenue, receipts receipts</i>	----	<i>gain, profit, net income, net profit, lucre, profits, earnings</i>	----	----
Business dictionary: English-Swedish, Swedish-English	<i>earning, income 'revenue', revenue 'proceeds'</i>	<i>income, proceeds, return 'gain', revenue 'income', takings</i>	<i>earnings, income 'profit', gain, return 'profit'</i>	<i>profit and loss</i>	<i>return 'yield', yield 'return'</i>
Ekonomiordbok: svensk-engelsk, engelsk-svensk (Norstedts juridik)	<i>revenue primarily 'incomes of takings', proceeds 'of sales', gains, yield, receipts</i>	<i>accrued revenue 'income', receipts, yield, proceeds</i>	<i>gain(s), profit(s), margin, income, earnings, yield, return, proceeds</i>	<i>Income, net income</i>	<i>yield, return, profit, proceeds, interests</i>
Elsevier's dictionary of commercial terms and phrases	<i>income, revenue</i>	<i>income, revenue, proceeds, avails, receipts, takings, incomings</i>	<i>profit, income</i>	<i>result</i>	<i>yield</i>
FARs engelska ordbok	<i>income</i>	<i>revenue, income, earnings</i>	<i>profit, gain, results, income, earnings</i>	<i>earnings, income, result</i>	<i>earnings, income, return, yield</i>
Natur och kulturs ordböcker, svensk. engelsk affärsordbok	<i>income, earnings, revenue 'intäkt', receipts, takings, proceeds</i>	<i>Income, revenue 'intäkter', earnings, receipts, proceeds</i>	<i>gain, profit, earning, margin, proceeds, yield, return</i>	<i>income 'net', profit, loss, proceeds, earning</i>	<i>return, yield, profit, income</i>
Swedish- English Business Dictionary	<i>profit, yield, proceed(s)</i>	<i>income 'inkomst', receipts, proceeds, revenue, takings, profit, yield</i>	<i>profit, gain, income, yield, return(s), earnings, proceeds</i>	<i>result, profit, income, net income, loss, proceeds, return, yield</i>	<i>yield, return, proceeds, revenue, profit</i>
Google translate 2012-11-16	<i>revenue, income, earnings</i>	<i>earnings</i>	<i>profit, win, gain, yield</i>	<i>results, result</i>	<i>revenue, return, income, yield, proceeds</i>

Table 2. English translations of *inkomst*, *intäkt*, *vinst*, *resultat* and *avkastning*

As shown in Table 2, six of the eight dictionaries present *income* as an equivalent term of *inkomst*. Four of them list *income* as the first meaning of *inkomst*. In two of the dictionaries *income* is shown to be the second most common sense of the Swedish term in question. *FAR* suggests *income* as the only translation of the Swedish term. No fewer than six dictionaries (two of them as the first listed meaning) give *revenue* as a term to cover the Swedish concept of 'inkomst', one of them emphasizing *revenue* in the sense of 'intäkt', and another one in the sense of 'incomes of takings'. Three dictionaries give *receipts*. Other terms included as possible meanings of the Swedish term in the dictionaries are *profit*, *yield*, *proceeds*, *takings* and *earnings*.

That *intäkt* converges with *income* in the sense of 'revenue' comes forth more clearly in the Swedish-English versions of the dictionaries. Four of the dictionaries list *income* as the first meaning of *intäkt*, and one dictionary lists it as the second most common sense. Altogether six of the dictionaries present *revenue* as a translation of the Swedish term, but only one of them as the first meaning, one with the additional explanation *accrued revenue*. Other terms

shown to cover the meaning of *intäkt* in the dictionaries are *proceeds*, *return*, *takings*, *yield*, *earnings* and *receipts*.

Like the information about *vinst* in its relation to *income* in the English-Swedish dictionaries, *income* is presented as a possible equivalent term of *vinst* in five of the Swedish-English dictionaries, most of them without further explanations. One dictionary gives *net income*. Seven of the dictionaries list *profit* and *gain* as translations of *vinst* and six *earnings*. A variety of other terms are also suggested: *lucre*, *return*, *yield*, *proceeds*, *results* and *margin*.

That *resultat* and *income* have more in common than *income* and *vinst* is not shown clearly in the suggested meanings of the Swedish term *resultat* in the dictionaries. Four of them present *income* as an equivalent term of the Swedish term (cf. five occurrences of *income* as a translation of *vinst*). Two dictionaries present both *net income* and *income* without further explanation. One dictionary (*Natur och kulturs ordböcker*) gives *income* with the additional explanation *net*. Four dictionaries give the general term *result* as a term for *resultat*. Other terms presented in the dictionaries are *earnings*, *proceeds*, *profit*, *loss*, *return* and *yield*. As for the translation of *avkastning*, a variety of terms with quite different meanings are suggested: *yield*, *return*, *proceeds*, *income*, *profit*, *interests*, *takings*, *receipts* and *revenue*. Among these, *yield* appears in all the dictionaries and *return* in all but one.

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The present study shows that the understanding of the American English term *income* is far from clear among users of accounting information. The dictionaries analyzed suggest a number of different meanings of the English term. The most conspicuous finding is that the Swedish term *inkomst* is presented as the first meaning of the English term in the majority of the dictionaries, despite the fact that the two concepts differ considerably in accounting. In line with the “Einstellung effect,” it may be concluded that the mistaken idea of *income* and the Swedish term *inkomst* as equivalent terms has resulted in an over-generalization of the meaning of the Swedish term in its relation to *income*.

On a specific level, the study shows that terms which resemble each other linguistically, but differ semantically, are likely to cause confusion, and that semantic developments of terms are not always observed by language users (cf. Parker, 1994). The findings demonstrate that non-technical uses of terms are commonly confused with technical uses (cf. Cao, 2002), and that misunderstandings concerning the meaning of terms on a national level are likely to be exacerbated in translation. It is also shown that some terms are difficult to translate simply because there are no terms for the concepts in question in the target language (Khuwaileh, 2011; Zeff, 2007: 296; Bassnett, 2002: 37ff; Crystal, 1987). The concept of ‘*inkomst*’ serves a purpose in Swedish accounting, but not in American. Consequently, no equivalent technical term exists in American English. To translate meaning concepts which do not exist in other languages is of course possible, but requires great linguistic expertise (cf. Bassnett, 2002: 42), and in this case, also expert knowledge of accounting (cf. Khuwaileh, 2011; Shen, 2009; Kocbek, 2008; Cao, 2002).

On a more general level, the present study points to the fuzzy nature of language when it comes to the definition of words. The many different translations of the English term *income*

and the confusion as to the “real” meaning of the term – both in national and international contexts – show that exact meanings of terms in the Aristotelian sense of the word are unusual, even when it comes to the definition of technical terms whose meanings are generally expected to be more exact than non-technical ones (Aitchison, 2012: 59; Ungerer & Schmid, 2006: 42). The confusion as to the exact meaning of *income* (and also *inkomst*) on an intra-cultural level (Schroeder *et al.*, 2009: 137) demonstrates that not even people sharing the same cultural and social background understand terms in the same way (Aitchison, 2012: 60; Labov, 1973: 354).

Finally, even if many of the misleading translations of *income* in the dictionaries seem to be related both to “problems” inherent in language and divergent accounting principles in two countries, the effect of poor translation cannot be ignored. Many of the terms presented in the dictionaries investigated are listed without a context explaining when and how the terms are used in their respective systems. Like David and Brierley’s study (1985) of the translation of legal terms in dictionaries (French/English), this study shows that the information presented in technical dictionaries may be both misleading and incorrect. Khuwaileh (2011) reports similar dictionary inefficiencies in his study of the translation of IT terminology from English into Arabic.

6 Conclusion

Based on the translation of a key term in accounting the present study demonstrates that linguistic aspects in accounting communication cannot be ignored in the on-going work of standardizing accounting principles world-wide. Although the study is limited to the understanding of one single accounting term, the findings are indicative and show that misinterpretations of accounting terms occur both on national and cross-national levels. The confusion as to the understanding of accounting terms and the difficulty in transferring the exact meaning of them between languages have been highlighted and pointed out as aspects in international accounting communication that users and producers of business information need to be acquainted with.

In line with proponents of accounting standardization and harmonization (Jeanjean *et al.*, 2010; Ball, 2006), the study shows that terminological uniformity is needed to promote transparency and comparability in accounting communication. It is true that the nature of language makes complete understanding of terms between speakers more or less impossible (Taylor, 2003; Janicki, 2002; Bassnett, 2002). It is, however, the present writers’ contention that misconceptions would be reduced considerably, if as many countries as possible active in international accounting used one unifying system (the same semantic frame), instead of, as is the practice today, a number of different principles and languages, sometimes overlapping in practice and terminology, but other times completely different both in application and terminology.

In conclusion, it is important to emphasize that everything is possible to communicate in any language of the world. The purpose of this article is not to show that translation is an impossible thing (Evans, 2004: 239; Joseph, 1998), but to demonstrate the complexity involved in it, and show that special consideration needs to be taken when technical terms are translated into other languages (Evans, 2004). Further research highlighting linguistic aspects in translating technical terms is therefore encouraged. A fruitful way of studying business words, for example, would be to retrieve information about the representation of them in large



electronic language corpora. As a result of an increasing number of international classes at all universities of the world, the educational domain should also constitute a potential research field – particularly in the context of international accounting communication.

Orthographic conventions

- Terms and expressions referred to or discussed are italicized
- Concepts or meanings are enclosed by single inverted commas.

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Traducción de textos biomédicos: creación de recursos a partir de un corpus sobre enfermedades neuromusculares pediátricas (francés-español)

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Abstract

This paper deals with the creation of terminology resources to assist in the translation of biomedical texts. First of all, we describe the criteria used to design and compile the ENEUPECOR corpus, a French-Spanish bilingual specialised corpus constituted by scientific papers on neuromuscular diseases in paediatrics. Afterwards, we describe the methodology and steps involved in corpus exploitation in order to create a French-Spanish bilingual glossary including the main concepts of the sub-domain selected.

This study is part of our current research on text translation within the field of rare diseases, domain to which belong neuromuscular diseases in paediatrics. Both the thematic sub-domain selected as well as the choice of languages constitute a novel line of research. Furthermore, the fact that rare diseases are now beginning to be seen as a priority in European Public Health Policies confers more relevance to our work from a social point of view. Thus, academic-scientific interests and social interests go hand-in-hand.

1 Introducción¹

La pericia o conocimiento experto (Sirén & Hakkrarainen, 2002; Shreve, 2002) de un traductor de textos del ámbito de la biomedicina debe incluir, entre otros aspectos, un buen conocimiento de la terminología propia del subdominio en el que se inscriben los textos que

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traduce. La gran diversidad de especialidades que componen este ámbito, la rápida evolución de las mismas y la constante creación de nuevas microáreas hacen que la disponibilidad de recursos terminográficos constituya una herramienta fundamental para realizar su trabajo.

La investigación sobre corpus aplicada a la traducción, denominada en inglés *Corpus Translations Studies* (CTS), se remonta a principios de los años noventa del siglo XX. En 1993 Mona Baker sostenía que las técnicas estadísticas y la metodología puestas en funcionamiento por Sinclair (1991) podían contribuir al paso de estudios prescriptivos a descriptivos. Apuntaba, asimismo, que el cambio de orientación desde una perspectiva conceptual a un enfoque situacional y del significado al uso ponía las bases del desarrollo de una nueva manera de trabajar que tomaba el texto como centro de estudio. Más recientemente, Bernardini, Stewart y Zanettin (2003) denominan *Applied Corpus-Based Translation Studies* a la rama resultante de la convergencia de CTS y *Applied Translation Studies*.

La aplicación del trabajo con córpora a la traducción especializada permite obtener información fundamental y de diverso tipo sobre los textos:

A corpus can be a useful resource for learning about the linguistic features of an LSP, such as knowledge about terms, collocations, grammar and style. It can also provide conceptual information, such as knowledge about the characteristics of the concepts behind the terms and about the relationships concepts have with one another (Bowker & Pearson, 2002: 39).

En la misma medida en que existe un cierto convencionalismo en la lengua común, que caracteriza la forma peculiar de expresión de una comunidad lingüística, en los lenguajes de especialidad se reconocen diversos convencionalismos que caracterizan la forma de decir las cosas y de organizar la información en una determinada área del conocimiento (Tagnin, 2005). El acceso a esta información permitirá al traductor producir textos de calidad que no resulten extraños a los lectores profesionales y que encajen perfectamente con los textos originales producidos en esa área.

El estudio de extensas colecciones de textos, gracias al importante volumen de textos accesibles en la red, se ha revelado como un procedimiento útil para la creación de recursos terminográficos multilingües. La extracción de conocimiento mediante corpus multilingües permite estudiar las lenguas de especialidad en el uso que de ellas hacen sus productores naturales o quienes las emplean para comunicarse (Pérez, 2002).

De acuerdo con estos planteamientos, el objetivo de este artículo es presentar un ejemplo de las posibilidades que la explotación de un corpus de especialidad ofrece a la práctica terminográfica y a los estudios de traducción. En primer lugar abordamos los pasos seguidos para la creación del corpus ENEUPECOR. Un corpus bilingüe (francés y español) especializado en un subdominio de la biomedicina (enfermedades neuromusculares (ENM) pediátricas) y en un género textual específico (artículo científico). A continuación describimos la metodología y herramientas utilizadas para llevar a cabo su explotación con la finalidad de elaborar un glosario en francés y español sobre el ámbito indicado. Se explora, por ejemplo, el interés de algunas herramientas específicas como el extractor de contextos definitorios ECODE. El artículo se cierra con las principales conclusiones obtenidas tras el estudio realizado.

En estos momentos las enfermedades raras (ER), ámbito en el que se integran las ENM pediátricas que conforman ENEUPECOR, empiezan a constituir una prioridad en las políticas de salud pública europeas. Así, el 2013 ha sido declarado en el año español de las ER. La escasez de recursos de utilidad para traductores centrados en estas enfermedades nos ha llevado a desarrollar una línea de investigación para contribuir a su creación (Miquel & Sánchez, 2010; Varela & Sánchez, 2012).

Tanto la actualidad social del subdominio temático, que no ha sido abordado, como la metodología y las lenguas en la que nos centramos confieren elementos novedosos al trabajo que presentamos.

2 El corpus ENEUPECOR: subdominio temático, criterios de diseño y datos estadísticos

Como hemos indicado, las ENM pediátricas se integran en el ámbito de las denominadas ER, también conocidas como ‘minoritarias’, ‘huérfanas’ o ‘poco frecuentes’. Esta denominación engloba a un amplio número de formas de expresión, aproximadamente unas 200, consideradas de baja prevalencia, pero que incluyen a un importante número global de personas afectadas (de 24 a 36 millones de personas en la UE).

La selección temática de nuestro corpus y de esta línea de investigación se justifica inicialmente por nuestra experiencia en la traducción de textos de este ámbito. De este modo hemos podido conocer la existencia de una demanda de traducciones que se deriva de la actual búsqueda de visibilización de las ER. Esta actividad nos ha permitido, asimismo, profundizar en las características de este conjunto de afecciones y en la producción textual sobre las mismas.

El hecho de centrarnos en esta ocasión en el segmento específico de las ENM pediátricas se justifica porque la mayoría de las ENM se manifiestan en el período neonatal y en los primeros años de vida. Un diagnóstico temprano de las ENM va a ser, por lo tanto, clave. La importancia de detectar estas afecciones en estas etapas iniciales ha determinado la orientación de la investigación en este ámbito y ha dado lugar a un buen número de artículos científicos sobre ENM pediátricas.

Esta producción textual es de especial interés para la investigación basada en corpus tanto por su carácter multidisciplinar, ya que en él confluyen numerosas especialidades del ámbito médico y sanitario, como por la variedad, actualidad y rigor de dichos textos.

2.1 Criterios de diseño

ENEUPECOR es un corpus bilingüe (francés-español), comparable, constituido por un subcorpus en cada lengua, y monogénico, ya que está compuesto por artículos científicos.

Para su compilación hemos seguido los criterios que habitualmente se suelen tomar como base (Biber, 1993; Bowker, 1996; Meyer & Mackintosh, 1996; Sinclair, 1996; Pearson, 1998), si bien adaptándolos y primando algunos de ellos para adecuar la selección textual a nuestros intereses investigadores.

En esta ocasión la finalidad de nuestro estudio nos ha llevado a seleccionar textos redactados originalmente en francés o español. Este criterio que nos impusimos como restricción hace

que el corpus no incluya traducciones. De este modo se pueden analizar las características de textos producidos en situaciones comunicativas similares sin las posibles distorsiones originadas por las traducciones de un corpus paralelo.

En este punto debemos indicar que uno de los problemas para la creación del corpus ha sido que la producción textual original en francés sobre ENM es mucho más amplia que en español. Buena parte de los volúmenes de neuropediatría o de neurología pediátrica disponibles en castellano son traducciones del inglés. Sin embargo, a pesar de estas dificultades iniciales, conseguimos compilar una muestra textual representativa y de tamaño similar en ambas lenguas.

Para asegurar la comparabilidad y equilibrio la selección textual se ha llevado a cabo utilizando los mismos criterios en los dos subcorpus que conforman ENEUPECOR: número de muestras, temas abordados, cronología y extensión.

Los textos proceden de revistas especializadas de referencia, como *Archives de pédiatrie* (JCR, FI: 0.298) y *Anales de Pediatría* (JCR, FI: 0.770), lo que apoya el criterio de calidad. Son accesibles online y desde el punto de vista cronológico, si bien se incluyen en una franja temporal de 14 años, el 80% se sitúa entre los años 2000-2009. Se ha aplicado el criterio de representatividad en relación con la actualidad científica, aunque las características del subdominio temático nos han llevado a ampliar la cronología para incluir algunos textos de especial interés.

Los artículos seleccionados se caracterizan por tratar los temas abordados en profundidad. Entre otros aspectos, estos artículos hacen referencia a la evolución y desarrollo de las investigaciones en ENM, la aparición de nuevos criterios de clasificación, los resultados de nuevas pruebas de laboratorio que permiten diagnósticos más fiables y precisos, o la aplicación de posibles tratamientos.

2.2 Datos estadísticos del corpus

De acuerdo con los criterios indicados hemos elaborado un corpus cuyas características generales son las siguientes:

CRITERIOS	DESCRIPCIÓN DEL CORPUS
Canal	Textos escritos (formato electrónico)
Número de palabras	<i>Tokens</i> : 72 316 (fr) y 102 312 (es) <i>Types</i> : 9228 (fr) y 10 087 (es)
Contenido	Especializado tanto por el tema (textos con contenido específico ENM en pediatría) como por el tipo de género concreto (artículos científicos)
Tamaño de las muestras	Textos íntegros
Anotación	Corpus no anotado, muestras analizadas en formato .txt.
Límites cronológicos	Entre 1995 y 2009
Finalidad	Fin específico, recopilación de textos con fines léxicos y terminológicos
Lenguas	Bilingüe (francés y español)

Tabla 1. Datos generales del corpus

Como se puede apreciar, el número total de palabras (174 628) se corresponde con el límite superior de un corpus de tamaño mediano-pequeño (Vargas, 2006). Este número de palabras se ha contabilizado excluyendo tanto los resúmenes en otras lenguas como las referencias bibliográficas que figuraban en los textos. El objetivo buscado era poder establecer de este modo una cierta homogeneidad en la extensión de los textos que forman parte del corpus.

Si bien el debate sobre el tamaño que debe tener un corpus no está cerrado, son numerosos los autores que consideran que un elevado número de textos no es forzosamente sinónimo de calidad y representatividad (Kennedy, 1988; Leech, 1991). De modo más específico, encontramos autores, como por ejemplo Wright & Budin (1997) o Kock (1997), que destacan la utilidad y representatividad de los corpórea de en torno a 100 000 palabras en ámbitos especializados, dado que el vocabulario utilizado es más restringido en estos casos.

De acuerdo con estas afirmaciones, el tamaño de ENEUPECOR es, por lo tanto, suficiente para conferirle el carácter de equilibrio y representatividad del ámbito temático seleccionado y del género textual en el que se centra.

El corpus compilado está constituido por un subcorpus en francés y otro en español, cada uno de los cuales cuenta con 25 muestras textuales respectivamente.

Los datos estadísticos del subcorpus en francés se resumen como sigue:

Tokens	72 316
Types	9228
Ratio Type/Token	12,76
Ratio Type/Token	12,76
Media (Tokens)	2763,40
Desviación estándar (Tokens)	1885,36

Tabla 2. Datos estadísticos del subcorpus en francés

En relación con el número de palabras de cada muestra textual, el intervalo general del subcorpus se sitúa entre 1236 y 9892 palabras. El 72% de los textos presenta entre 1800 y 6000 palabras y son mayoría en este grupo los textos en torno a las 3000 palabras. De los textos restantes un 24% incluye menos de 1800 palabras y solo el 4% más de 6000.

Podemos representar el número de palabras /texto en el subcorpus en francés como sigue:

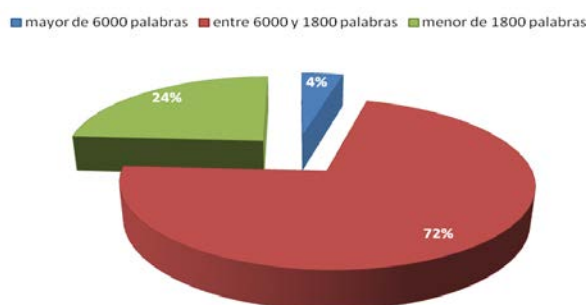


Figura 1. Intervalo número de palabras subcorpus en francés

Los datos estadísticos del subcorpus en español figuran en la siguiente tabla:

Tokens	102 312
Types	10 087
Ratio Type/Token	9,87
Estandarizado Type/Token	41,68
Media (Tokens)	4092,48
Desviación estándar (Tokens)	2029,43

Tabla 3. Datos estadísticos del subcorpus en español

En relación con el número de palabras de cada muestra textual, el intervalo se sitúa entre un mínimo de 1948 y un máximo de 10 160. El 88% de los textos presenta entre 1800 y 6000 palabras y solo el 12% supera esta cifra. Asimismo, la mayor parte de las muestras textuales de este subcorpus se sitúa en torno a los 4000 palabras (extensión media: 4092,48).

La distribución palabras/texto se presenta en el siguiente gráfico:



Figura 2. Intervalo número de palabras subcorpus en español

Como se puede observar, ambos subcorpus presentan un tamaño suficiente para asegurar su representatividad.

3 Metodología de explotación del corpus y resultados

Una vez creado el corpus procedimos a su explotación para elaborar un glosario terminológico bilingüe (francés-español) que incluyese los principales conceptos del subdominio de las ENM pediátricas.

En las páginas que siguen resumimos las cuestiones más relevantes en relación con la metodología seguida y las principales etapas del trabajo realizado. Estas etapas, si bien se presentan de manera secuencial, tienen generalmente, con excepción de la primera, un carácter recursivo.

3.1 Análisis de la formas más frecuentes

El primer paso en la explotación del corpus consistió en la extracción y análisis de las cincuenta formas de aparición más frecuentes. De este modo se pueden conocer los términos propios del subdominio objeto de estudio (Cabré, 1993; Dubuc, 1992; Rondeau, 1984) e identificar aquellas palabras que, por su frecuencia de aparición, podrían considerarse posibles candidatos a términos.

Para ello, utilizamos el conocido paquete informático *WordSmith Tools* diseñado por Michael Scott. Una vez realizada la exclusión de las palabras de contenido gramatical, con el fin de evitar el ruido de palabras vacías de contenido, obtuvimos dos listas, una por cada lengua de trabajo, que se recogen parcialmente en la tabla que sigue:



N	FR	Freq.	ES	Freq.
1	Maladie	270	Enfermedad	312
2	Musculaire	261	Muscular	534
4	Type	180	Tipo	129
6	Gène	175	Gen	123
7	Diagnostic	161	Diagnóstico	356
8	Clinique	151	Clínica	121
9	Patients	144	Pacientes	497
10	Ans	141	Años	181
11	Musculaires	139	Musculares	221
12	Myopathie	128	Miopatía	125
13	Maladies	125	Enfermedades	206
14	Enfants	123	Niños	122
15	Troubles	119	Trastornos	109
17	Étude	114	Estudio	251
18	Signes ²	113		
19	Forme	112	Forma	153
21	Génétique	101	Genético	83
22	Mois	101	Mes	126
23	Âge	97	Edad	131
25	Muscles	94	Músculos	93
27	Syndrome	83	Síndrome	182
31	Tableau	81	Tabla	88
32	Dystrophie	79	Distrofia	221
34	Biopsie	73	Biopsia	169
36	Analyse	72	Análisis	83
39	Hypotonie	65	Hipotonía	292
40	Respiratoire	65	Respiratoria	112
46	Neuromusculaires	62	Neuromusculares	99
50	Duchenne	59	Duchenne	85

Tabla 4. Palabras de mayor frecuencia de los subcorpus en francés y español. Datos extraídos con *Wordlist*

Los resultados de este primer análisis nos permitieron, tras llevar a cabo una selección, obtener una relación inicial de posibles candidatos a términos monoléxicos. Como veremos más adelante (apartado 3.4) tomamos estas listas como punto de partida para realizar búsquedas más precisas y llevar a cabo el análisis exploratorio de cada una de estas formas en

² La celda en español está vacía porque la forma 'signos', equivalente de *signes*, es la única de todas las recogidas que no se encuentra entre las 50 palabras más frecuentes también en el subcorpus en español.

su respectivo contexto de aparición. Esto nos permitió observar cómo funcionan los posibles candidatos en el interior del discurso, sus combinaciones y derivados.

La obtención de estas dos primeras listas muestra, asimismo, la existencia de un importante grado de coincidencia entre las formas más frecuentes en ambos subcorpus. De este modo se pone de manifiesto la homogeneidad de los mismos.

3.2 Extracción de contextos definatorios

Los contextos proporcionan pistas para saber cuándo estamos ante una unidad terminológica, dado que, en determinados casos, dichos contextos aportan información conceptual mediante la incorporación de definiciones.

El proceso seguido en esta fase fue diferente para el subcorpus en español y para el subcorpus en francés por la no disponibilidad de las mismas herramientas en ambas lenguas.

3.2.1 Extracción de contextos definatorios en el subcorpus en español con ECODE

Para extraer los contextos definatorios (CDs) en español hemos utilizado una herramienta de extracción automática del grupo de investigación del área de Ingeniería Lingüística de la Universidad Nacional Autónoma de México (UNAM), encabezado por Gerardo Sierra y Rodrigo Alarcón (Sierra *et al.*, 2003 y 2008; Sierra, 2009). Estos investigadores han desarrollado un extractor automático de CDs basado en reglas lingüísticas (ECODE) y el sistema Describe® para la búsqueda, clasificación y agrupamiento de definiciones en la web.

La extracción de candidatos a términos con el ECODE necesita una gramática de patrones verbales definatorios (PVD) que contiene una serie de parámetros: verbos definatorios y los nexos que los acompañan; restricciones verbales referentes al tiempo y a la persona gramatical; patrones contextuales y restricciones de distancia entre el verbo y su nexo (Sierra, 2009).

Tras la extracción de los candidatos a partir de los PVD y el empleo de la gramática el análisis de los CDs requiere dos procesos principales: el primero consiste en eliminar los contextos irrelevantes mediante reglas de filtrado y el segundo en el reconocimiento de sus componentes.

Por último, el ECODE evalúa los CDs resultantes después de la etapa de filtrado, y en concreto los elementos constitutivos, para ponderar los mejores CDs según la estructura del contexto recuperado automáticamente. Se utilizan reglas heurísticas que contrastan las estructuras sintácticas de los elementos etiquetados como término y definición con sus estructuras prototípicas. Se designa un valor a cada elemento y un valor global a partir de las combinaciones localizadas. Los contextos que sobrepasen un umbral determinado serán los que el ECODE considere como buenos CDs.

Si bien el ECODE aún no está disponible en línea, tuvimos la oportunidad de que nuestro corpus en español fuese analizado con esta herramienta gracias a la disponibilidad, que agradecemos, de los investigadores de la UAM. Nos facilitaron información sobre las bases teóricas y el funcionamiento de su programa y trataron los textos. Los contextos obtenidos del análisis de ENEUPECOR, que servirán para aumentar el bagaje de experimentación de ECODE, nos permitieron obtener informaciones conceptuales importantes para localizar

posibles candidatos a términos, redactar las definiciones del glosario que queríamos elaborar y diseñar el árbol conceptual de nuestro subdominio.

A continuación presentamos algunos de los contextos definatorios en español obtenidos al final del tratamiento realizado. Hemos limpiado las etiquetas del ECODE, pero en cursiva se destacan los verbos y nexos que permitieron identificar los contextos definatorios (CDs):

Los trastornos neuromusculares <i>constituyen</i> un grupo de enfermedades que afectan cualquiera de los componentes de la unidad motora, <i>es decir</i> , la unidad funcional constituida por el cuerpo de la motoneurona del asta anterior de la médula espinal, su axón (nervio periférico) y todas las fibras musculares inervadas por esta motoneurona.
Las enfermedades neuromusculares hereditarias <i>son</i> trastornos heterogéneos en edad de inicio, clínica y gravedad.
Las distrofinopatías <i>son</i> trastornos causados por una anomalía en el gen que codifica la proteína muscular distrofina.
La distrofia miotónica de Steinert <i>se caracteriza por</i> miotonía (dificultad o retardo en la relajación del músculo luego de su contracción), y debilidad muscular generalizada muy predominantemente facial.
La hipotonía neonatal generalizada <i>se define como</i> la disminución patológica del tono postural en las cuatro extremidades, el tronco y el cuello durante el primer mes de vida extrauterina
El síndrome de Walker-Warburg <i>consiste en</i> distrofia muscular congénita con anomalías de las circunvoluciones cerebrales y cerebelosas, hipodensidad de la sustancia blanca en la TAC y alteraciones oculares (glaucoma congénito, hipoplasia retiniana y del nervio óptico, y cataratas).
<i>Como</i> amiotrofias musculares proximales <i>se conoce</i> a un grupo de enfermedades neuromusculares hereditarias de transmisión autosómica recesiva, ocasionadas por una degeneración de las motoneuronas del asta anterior de la médula espinal y posteriormente de los núcleos motores bulbares.
La terapia transgénica alternativa <i>utiliza</i> otros genes <i>para</i> restablecer la proteína deficitaria.

Tabla 5. Contextos definatorios en español extraídos por el ECODE

3.2.2 Extracción de contextos definatorios en el subcorpus en francés

Para la extracción de los contextos definatorios de los textos en francés no pudimos contar con el auxilio del ECODE, ya que esta herramienta, como indicamos, solo está disponible para español. Combinando el uso de *WordSmith Tools* con los fundamentos teóricos sobre los CDs, seleccionamos fragmentos de los textos en los que se nos daba información conceptual útil para también ahora identificar posibles candidatos a términos, redactar las definiciones del glosario en francés y realizar la estructuración del árbol en francés. He aquí algunos de los ejemplos más significativos:

La mutation du T521 <i>correspond</i> à une délétion d'une thymidine entraînant un décalage du cadre de lecture dans la partie du gène codant pour la portion extracellulaire de la protéine.
Le γ -sarcoglycane <i>est</i> une des protéines constituant le complexe de la dystrophine [5].
La thérapie génique <i>consiste</i> à apporter un vecteur contenant le gène d'intérêt et a pour objectif de corriger le déficit génétique par transfert du gène d'intérêt.
Les dystrophies musculaires et les myopathies métaboliques <i>représentent</i> les principaux groupes étiologiques.
La dermatomyosite juvénile <i>se manifeste par</i> un déficit musculaire et par des signes cutanés caractéristiques
Le terme « phénotype comportemental », qui <i>désigne</i> l'ensemble des comportements, mais aussi des troubles émotionnels et affectifs d'un sujet, peut paraître flou ou réducteur et ne doit être confondu avec « symptôme comportemental », il n'en reste pas moins le terme consacré en clinique
Les dystrophies musculaires des ceintures (LGMD) <i>forment</i> un groupe hétérogène de maladies, d'origine génétique, de gravité et de transmission variables et pouvant être divisé en deux groupes selon le mode d'hérédité : autosomique dominant (LGMD1, A-E) ou autosomique récessif (LGMD2, A-I).
Le complexe sarcoglycane <i>constitue</i> un premier sous-ensemble constitué de quatre protéines alpha, bêta, gamma, delta

Tabla 6. Contextos definitorios en francés

3.3. Elaboración de una organización conceptual bilingüe sobre ENM pediátricas

La organización conceptual es el esqueleto sobre el que se redactan las definiciones y que refleja el modo en que se estructura el área del conocimiento. Se trata de una de las fases más importantes, que, sin embargo, no ha estado exenta de problemas. Hemos tenido que plantearnos y tomar decisiones sobre cuestiones de diverso tipo para elaborar el árbol conceptual.

Por un lado el subdominio de las ENM pediátricas está en continuo cambio como resultado de las investigaciones y de los avances en la genética. Así, por ejemplo, hace años la clasificación de estas enfermedades se establecía a partir de la topografía, es decir, del componente de la unidad motora primariamente comprometido (enfermedades de la motoneurona, enfermedades del nervio periférico o neuropatías, enfermedades del músculo o miopatías y enfermedades de la unión neuromuscular). Sin embargo, en la actualidad se prefiere una clasificación basada en la biología molecular, que ha permitido la creación de nuevos subtipos dentro de un mismo conjunto de síntomas. Por este motivo hemos seguido esta última orientación para la clasificación de las enfermedades. Somos conscientes de que esta clasificación es susceptible de cambios en un corto período de tiempo, conforme vayan saliendo a la luz los nuevos hallazgos sobre las causas de cada una de ellas.

Por otro lado nuestra clasificación se ha visto condicionada por el hecho de que debería incluir únicamente las enfermedades que se manifiestan en la edad pediátrica. Por lo tanto enfermedades como la *polimiositis*, *miositis por cuerpos de inclusión* o *distrofia muscular oculofaríngea* se excluyen, ya que éstas solo se manifiestan en la edad adulta.

Asimismo, nuestro objetivo era incluir no solo la denominación de las enfermedades, sino también los conceptos relacionados con la patología, diagnóstico y tratamiento. Por lo tanto, el árbol conceptual tenía que abarcar todas estas áreas, además de la nosología (clasificación de las enfermedades), como se recoge en el siguiente esquema:

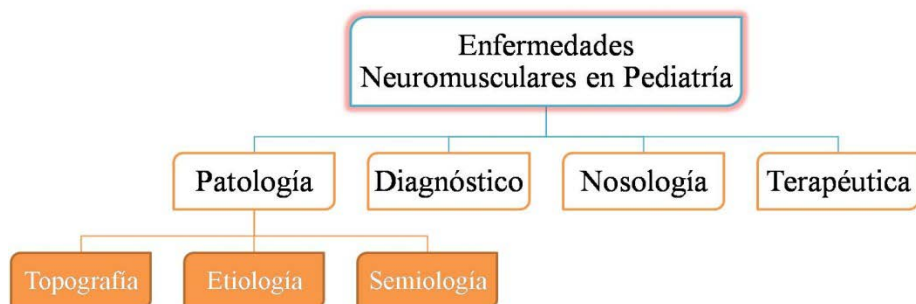


Figura 3. Esquema de las áreas de conocimiento incluidas

La elaboración del árbol conceptual conllevó un amplio proceso de documentación con fuentes especializadas (informes, monografías, artículos) y especialistas, que nos permitió conocer más a fondo el subdominio de las ENM pediátricas. El carácter multidisciplinar de este ámbito nos obligó además a trabajar con conceptos que estas afectaciones comparten con otras áreas como la genética o la anatomía.

A partir de las cuestiones indicadas, las lecturas de referencia y del análisis automático de los textos del corpus, validado en última instancia por los expertos en el tema, hemos elaborado el árbol conceptual y una estructura jerárquica bilingüe:

Enfermedades Neuromusculares en Pediatría	Maladies Neuromusculaires en Pédiatrie
1. Patología	1. Pathologie
1.1 Topografía	1.1 Topographie
1.1.1 Neuropatías	1.1.1 Neuropathies
1.1.1.1 Nervio periférico	1.1.1.1 Nerf périphérique
1.1.2 Enfermedades de la motoneurona	1.1.2 Maladies du motoneurone
1.1.2.1 Motoneurona	1.1.2.1 Motoneurone
1.1.3 Enfermedades de la unión neuromuscular	1.1.3 Maladies de la jonction neuromusculaire
1.1.3.1 Unión neuromuscular	1.1.3.1 Jonction neuromusculaire
1.1.4 Miopatías	1.1.4 Myopathies
1.1.4.1 Músculo	1.1.4.1 Muscle
1.2 Etiología	1.2 Étiologie
1.2.1 Enfermedades neuromusculares hereditarias	1.2.1 Maladies neuromusculaires héréditaires

Figura 4. Muestra estructura jerárquica bilingüe

3.4 Establecimiento de las denominaciones del glosario

Al empezar a trabajar más específicamente sobre los términos que íbamos a incluir en el glosario nos encontramos con dos aspectos que requirieron un tratamiento especial: las unidades sintagmáticas y la variación.

3.4.1 Identificación de las unidades sintagmáticas

La delimitación de lo que constituye una unidad terminológica, sobre todo en aquellos casos en los que especialistas han creado estructuras sintagmáticas para dar nombre a un concepto, no es fácil.

En primer lugar realizamos con la herramienta *Concord* de *WordSmith* una extracción de los *clusters* y los analizamos siguiendo las propuestas de Cabré (1993: 302). Esta autora ofrece una serie de pruebas que pueden ayudar a decidir si un segmento léxico corresponde a un término o si se trata de una combinación de términos.

Para ello tomamos como base el listado de posibles candidatos a términos simples que habíamos realizado (supra apartado 3.1), ya que el análisis de los *clusters* se lleva a cabo a

partir de un fichero de concordancias de una determinada palabra. Tomando como referencia el horizonte colocacional fijado, obtuvimos secuencias de palabras repetidas con una determinada extensión, *clusters* de dos, tres o cuatro palabras. Estos son los *clusters* de tamaño 2, 3 y 4 más frecuentes en francés y en español:

N	Word – Francés	Freq.	N	Word- Español	Freq.
1	Dystrophie musculaire	55	1	Distrofia muscular	132
2	Biopsie musculaire	48	2	Debilidad muscular	83
3	Gène SMN	47	3	Distrofias musculares	79
4	Maladies neuromusculaires	45	4	Biopsia muscular	74

Tabla 7. Los 4 *clusters* que más se repiten de tamaño 2

N	Word – Francés	Freq.	N	Word- Español	Freq.
1	Prise en charge	55	1	Muscular de Duchenne	56
2	Amyotrophie Spinale Infantile	23	2	Atrofia Muscular Espinal	30
3	Système nerveux central	21	3	Distrofia muscular congénita	26
4	Du système nerveux	20	4	Enfermedad de Werdnig	25

Tabla 8. Los 4 *clusters* que más se repiten de tamaño 3

N	Word – Francés	Freq.	N	Word- Español	Freq.
1	Gène de la dystrophine	17	1	Distrofia Muscular de Duchenne	55
2	Dystrophie Myotonique de Steinert	14	2	Enfermedad de Werdnig-Hoffmann	22
3	Maladies neuromusculaires de l'enfant	14	3	Síndrome de Walker-Warburg	19
4	ASI de type II	12	4	Mayoría de los casos	16

Tabla 9. Los 4 *clusters* que más se repiten de tamaño 4

Junto con este primer análisis aplicamos a ENEUPECOR las propuestas de Montero & Faber (2008: 81-87), que proponen una clasificación de las unidades de significación especializada (USE) atendiendo a diversos criterios y establecen una tipología de términos compuestos o unidades sintagmáticas presentes en los discursos especializados.

Así, en el corpus identificamos unidades lexicalizadas del dominio especializado (*distrofia facioescapulohumeral*, *Western blot*,...) y unidades fraseológicas usadas para parafrasear términos especializados o para cambiar de un registro formal a uno informal (*dolores musculares generalizados* y *mialgias*, *dolor de cabeza* y *cefalea*,...). Encontramos, asimismo, unidades fraseológicas de tipo metafórico, como las metáforas empleadas para caracterizar a las distintas afecciones o malformaciones de los pies (*pie de trinchera*, *pie de elefante*, *pie de atleta*) o las utilizadas para caracterizar los tipos de marcha (*marcha equina*, *marcha de pato*, *marcha laberíntica*, *marcha de gallo*). Obtuvimos también casos de unidades fraseológicas transmisoras de un solo concepto, equivalentes a términos compuestos, pero cuyos componentes carecen de fijación, admitiendo cambio de orden y variación, como *biopsia muscular* y *biopsia del músculo* o *cintura pelviana* y *cintura pélvica*.

Otro fenómeno analizado en esta fase fue el de la *truncación*, muy presente en sus diferentes posibilidades también en ENEUPECOR. Así identificamos la presencia de:

1. Siglas: *DMD (Distrofia muscular de Duchenne)*, *DMB (Distrofia muscular de Becker)*, *RM (resonancia magnética)*, *MG (miastenia gravis)*, *VCN (velocidad de conducción nerviosa)*, *AME (atrofia muscular espinal)*, *TC o TAC (tomografía computarizada o tomografía axial computarizada)*,... Tanto en español como en francés se usan también habitualmente siglas en inglés, como *LGMD (Limb Girdle Muscular Dystrophy)*.
2. Formas abreviadas: *quimio (quimioterapia)*, *fisio (fisioterapia)*, *maladie de Becker (dystrophie musculaire de Becker)*,...
3. Acrónimos: *Agrimed (agricultura mediterránea)*, *Insalud (Instituto Nacional de Salud)*,...
4. Abreviaturas: *b.i.d. (bis in die o dos veces al día)*, *q.h. (cuando hora o cada hora)*, *s.op.s. (si opus sit o si es necesario)*,...

Las unidades polilexemáticas o sintagmáticas se han identificado en el glosario como sintagmas nominales (S. nom.), ya que se trata de caracterizarlas desde el punto de vista gramatical. Muchas de estas estructuras se correspondían con denominaciones eponímicas de las enfermedades, como, por ejemplo, *distrofia muscular de Duchenne*, *distrofia muscular de Becker*, *enfermedades de Charcot-Marie-Tooth* o *distrofia muscular de Emery Dreifuss*. Nos encontramos también con casos de sustantivos seguidos de un adjetivo o de un sintagma preposicional que precisa su significado (*biopsia muscular*, *biopsia de nervio*). En algunos casos, cuando era pertinente, en la fase de elaboración del glosario se ha consignado una ficha a parte para el sustantivo que constituye el núcleo de ese sintagma y otra para el sintagma en cuestión (*miopatías* y *miopatías metabólicas*, *miopatías inflamatorias*,...).

Es interesante subrayar que, en nombre de la economía del lenguaje, se suele abreviar un determinado sintagma utilizando solamente su primer componente, como es el caso de *distrofia muscular*, *atrofia muscular* (sustituible por *amiotrofia* con la forma del griego *myós* o *mio-* referido al músculo), *hipotrofia muscular*, *debilidad muscular*, que se truncan y aparecen sin el modificador *muscular*, aunque se sobreentiende por el ámbito de conocimiento al que pertenecen los textos que estos hacen referencia a todo lo relacionado con los músculos y no con otros órganos.

Hemos encontrado algunos casos, los menos frecuentes, en los que la combinación léxica solo tiene sentido en sí misma y su significado no es igual a la suma de significados de sus partes (*Western Blot*).

3.4.2 Tratamiento de la variación

El fenómeno de variación y/o sinonimia en terminología ha sido estudiado a partir de diferentes perspectivas con criterios y parámetros distintos, lo que se traduce en una pluralidad de tipologías y en divergencias en su definición.

Para analizar la variación en ENEUPECOR aplicamos la clasificación de Faulstich (2002). Esto nos permitió identificar variantes lingüísticas de tipo fonológico y gráfico (*kinesiterapia* y *cinesiterapia*; *creatincinasa* y *creatinkinasa*), morfológico (*cintura pelviana* y *cintura pélvica*) y léxico (*distrofia muscular de Duchenne* y *distrofia de Duchenne*), variantes de

registro geográfico (*tomografía axial computada y tomografía axial computadorizada*), o bien variantes coocurrentes (*afección y enfermedad; sujeto e individuo*) y variantes competitivas (*LGMD y DMC; testing manuel musculaire y MMT*).

Junto a todos estos casos que nos han planteado problemas debemos destacar de modo especial algunos otros, como por ejemplo, la existencia de varias denominaciones para un mismo concepto. En el caso de la denominación de las enfermedades es frecuente el uso de una denominación eponímica y de otra no eponímica (*amiotrofia espinal tipo I o Werdnig-Hoffmann*), además del uso de siglas (*AME o amiotrofia espinal*).

Para resolver estas cuestiones tuvimos que determinar la pertinencia de esas designaciones para la elaboración del glosario, así como para decidir qué término usar como principal y cuáles como variantes.

El criterio seguido para determinar cuál era el término principal fue el de la frecuencia de aparición en las obras, así como la jerarquización propuesta por aquellos autores que mencionaban más de una denominación para un mismo concepto. Nuestras decisiones fueron revisadas por expertos.

4 Elaboración de un glosario en francés y español sobre ENM pediátricas

La información extraída de los diferentes análisis del corpus se organizó y sintetizó en fichas terminológicas que recogen los datos de nuestro interés para elaborar el glosario. El fichero terminológico está compuesto por un total de 246 fichas (123 en español y 123 en francés):

F-75	FR	25/04/2010	12/05/2010
Calpainopathie		n. f.	
Dystrophies des ceintures en formes récessives par déficit de calpaïne.		PETIOT, P. y URTIZBEREA, J. A. (2004): «Diagnostic des maladies musculaires», en <i>EMC – Neurologie</i> , 1 (2), pp. 137-155. Artículo disponible en: < http://www.emc-consulte.com/article/25517/diagnostic-des-maladies-musculaires >. [Fecha de consulta: 29-04-2010]	
La forme la plus fréquente des ceintures correspond à l'entité clinique qui avait été décrite par Erb, et qui est appelée aujourd'hui «calpainopathie», en raison de l'identification d'un déficit d'une protéase de la famille des calpaïnes.		BEHIN, A., y PRADAT, P. F. (2002): <i>Neurologie</i> . Rueil-Malmaison: Groupe Liaisons.	

Figura 5. Muestra de ficha en francés

E-04	ES	26/04/2010	12/05/2010
Calpainopatía		n. f.	
Miopatía de cinturas debida a la alteración o ausencia de la calpaína muscular.		<p>ERAZO-TORRICELLI, R. (2004): «Actualización en distrofias musculares», en <i>Revista de Neurología</i>, 39 (9), pp. 860-871. Artículo disponible en: <http://www.neurologia.com/pdf/Web/3909/r090860.pdf>. [Fecha de consulta: 25-04-2010]</p> <p>KLEINSTEUBER, K. y AVARIA, M. DE LOS ÁNGELES (2005): «Enfermedades Neuromusculares en Pediatría». [En línea]. <i>Revista Pediatría Electrónica</i>, 2 (1), pp. 52-61, <http://www.revistapediatria.cl/vol2num1/pdf/9_enfermedades_neuromusculares.pdf>. [Fecha de consulta: 25-04-2010]</p>	
Las <i>calpainopatías</i> (LGMD2A) se deben a la alteración o a la ausencia de una enzima específica del músculo esquelético: la calpaína muscular (gen CAPN3 en el cromosoma 15). Una proteasa calcio dependiente.		ZARRANZ, J. J. (2003): <i>Neurología</i> . Madrid: Elsevier Science.	

Figura 6. Muestra de ficha en español

A partir de estas fichas hemos elaborado el glosario bilingüe que reúne los principales conceptos del subdominio de las ENM pediátricas cuya publicación estamos preparando:

<p><u>D</u></p> <p>dermatomyosite. <i>n. f.</i> maladie inflammatoire du muscle, de caractère auto-immun, qui se manifeste par une inflammation au niveau de petits vaisseaux dans les muscles (myosite) et de la peau (dermatite), entraînant des manifestations caractéristiques comme la faiblesse musculaire et la douleur, surtout au niveau des muscles situés au niveau des hanches et des épaules et des éruptions cutanées sur le visage, les paupières, les articulations des doigts, les genoux et les coudes.</p> <p>dermatomyosites juvenile. <i>s. nom.</i> forme de dermatomyosites dont les signes commencent à l'âge de 16 ans.</p> <p>DMB. voir dystrophie musculaire de Becker</p> <p>DMC. voir Dystrophies musculaires congénitales</p> <p>DMC avec déficit primaire en mérosine. <i>s. nom.</i> maladie génétique qui se manifeste par une atteinte musculaire s'accompagnant, au moins au début, d'une élévation des enzymes musculaires CPK ; on observe, par ailleurs, des anomalies de la substance blanche au niveau du cerveau, visibles dès l'âge de un an, sans retard mental, ni malformations oculaires associés.</p> <p>DMD. voir dystrophie musculaire de Duchenne</p> <p>DMJ. voir Dermatomyosites juvenile</p>

Figura 7. Muestra del glosario en francés

G

gastrostomía. *n. f.* intervención quirúrgica que consiste en la creación de una abertura permanente que comunica el estómago con la pared abdominal a la que se recurre en caso de obstrucción de las vías digestivas superiores.

glucogenosis. *n. f.* miopatías metabólicas que pueden aparecer en cualquier edad y que cursan con fatiga muscular, calambres y dolores al realizar esfuerzo.

glucogenosis tipo II. *s. nom.* véase enfermedad de Pompe.

glucogenosis tipo V. *s. nom.* véase enfermedad de McArdle.

Figura 8. Muestra del glosario en español

Como se puede apreciar en estas figuras de muestra, en el glosario se han incluido las siglas presentes en el corpus. Esta inclusión se deriva de la importancia de estas formas en el ámbito de la biomedicina y que, por lo tanto, se manifiesta asimismo en el subdominio objeto de estudio.

En el glosario se ha recogido asimismo el fenómeno de variación, que abordamos en el apartado precedente. Así, en la entrada del término considerado principal se incluye la indicación *Var.*, enumerando a continuación los términos o variantes considerados secundarios. A su vez, en el apartado de remisiones de cada una de esas variantes secundarias, se indica *Véase*, para que se consulte el término principal.

5 Conclusiones

En este trabajo hemos presentado las fases seguidas para la elaboración del corpus bilingüe comparable ENEUPECOR y su posterior explotación con la finalidad de crear un glosario terminológico de utilidad para la traducción de textos del ámbito de la biomedicina en francés y español.

En las páginas precedentes hemos mostrado la utilidad del trabajo con corpus para la creación de recursos terminológicos. Presentamos cómo el corpus sobre ENM pediátricas que hemos creado —compuesto por artículos científicos, con un total de 174 628 palabras y organizado en dos subcorpus en función de las lenguas indicadas— nos ha permitido reconstruir el esqueleto conceptual de este subdominio en torno a cuatro conjuntos principales: patología, diagnóstico, nosología y terapéutica. Esta organización conceptual elaborada nos proporcionó una visión clara de las características del campo abordado. Por otra parte, la importante densidad de información conceptual y terminológica de los textos del corpus hizo posible el reconocimiento de las unidades especializadas complejas, de las variantes para un mismo concepto y de los criterios adoptados por los especialistas para la clasificación de las ENM.

Hemos mostrado asimismo la utilidad para la explotación del corpus de una metodología sistemática y de algunas herramientas informáticas que facilitan las diferentes fases de trabajo seguidas. En especial por su novedad destacamos el programa ECODE, que demostró ser una herramienta útil para el desarrollo de diccionarios especializados y glosarios. Pudimos comprobar que esta herramienta, con la que obtuvimos de forma automática la información necesaria para elaborar la definición de aproximadamente el 60% de las entradas en nuestro glosario en español, agiliza el proceso de elaboración de recursos terminológicos.

Para finalizar, queremos destacar que tanto el subdominio temático abordado (ENM pediátricas) como la selección de las lenguas confieren a este estudio otro rasgo de interés. Por un lado, nos hemos centrado en un ámbito temático novedoso, multidisciplinar y en el que existe una demanda social de difusión de la información. Como hemos indicado, las ER, en el que se integran ENM pediátricas, constituyen en estos momentos una prioridad en las políticas de salud pública. Por otra parte, frente al predominio del inglés en la comunicación científica, hemos identificado una producción textual de calidad tanto en francés como en español.

Este trabajo constituye una nueva aportación dentro de la línea de investigación que estamos desarrollando sobre traducción de textos médicos, en concreto ER y que toma como base la elaboración de corpus multilingües para la creación de recursos para traductores.

Como señala Malmkjaer (2003: 119), el uso de corpus ha cambiado definitivamente el paradigma de investigación en traducción. Ha marcado un hito solo comparable a la formulación hecha por Gideon Toury de las normas y la redefinición del concepto de equivalencia,

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Language in aviation: The relevance of linguistics and relevance theory

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Abstract

English and a semi-artificial sublanguage based on English play the dominant role as the means of communication in aviation, especially in the communication between pilots and air traffic controllers and in international contexts. The first part of the paper surveys this state of affairs from the viewpoint of (English) linguistics. In its course, attention is drawn to aviation incidents and accidents, some of which with extremely severe consequences, where the role of language, or of English in particular, was critical. The second part of the paper argues that insights provided by relevance theory can be effectively used in the analysis and explanation of some of the communication problems. Given that relevance theory has not figured as a conceptual tool box with which to approach such problems so far, it is argued that it ought to be employed, especially as it emphasises that linguistic expressions are semantically underdetermined in principle. This means that the utterance of virtually any linguistic expression, including those of the semi-artificial aviation sublanguage, is dependent on pragmatic inferencing for the recovery of what was intended to be conveyed, an important aspect in the evaluation of the role that such a sublanguage may play in principle.

1 Introduction*

Problems of communication have been found to be an important or even the decisive causal factor for many critical incidents as well as near and actual accidents in aviation (see, among others, Cushing, 1994; Helmreich & Merritt, 1998: 202ff.; Isaac, 1999: 131ff.; Jones, 2003; Krifka, Martens & Schwarz, 2003; Maschke, 1994: 57f.; Silberstein & Dietrich, 2003: 10; Tajima, 2004; Turner & Nübold, 1981). This holds for both the communication among members of the crew in the cockpit and the communication between pilots and air traffic controllers. Among the languages used as the means of communication in aviation, English plays the dominant role. A substantial share of flights are and have been set within a national context where English is the official language; English serves most often as a *lingua franca* among the members of an international cockpit crew; a semi-artificial sublanguage based on English

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serves as the standard means of verbal communication between pilots and air traffic controllers both in English-speaking countries and where international airports are involved. This suggests a significant relevance of the linguistic study of English as well as of communication conducted in English for safety issues in aviation. Surprisingly, however, there has been comparatively little work done by linguists – in the sense that includes linguistic pragmatists – or in collaboration with linguists in this area. As pointed out by Sexton & Helmreich (2003: 71): "Cockpit communication is a rich area of study for language investigators, and it has been relatively underresearched given the critical role it plays in flight safety."¹

The ultimate aim of the present paper is to draw attention to a basic and central insight from linguistic pragmatics, namely that utterance interpretation is crucially based on non-demonstrative inferences in addition to the decoding of the narrowly linguistic (grammatical and lexical) aspects of the utterance, and to questions that this insight raises for communication in aviation. As far as I can see, this issue of utterance interpretation being essentially inferential in nature, a point that has been emphasised especially within relevance theory, has not so far been prominently addressed in discussions of safety-relevant aspects of communication in aviation. In order to prepare for the points to be made about the relevance of this pragmatic insight in the aviation context, the paper will first provide an introduction into more general aspects of communication in aviation and its key role in safety issues, and it will refer to some of the pertinent research that has been carried out. That is, the paper demonstrates the relevance of general linguistics and English linguistics in this domain of communication both by drawing on work that has already been done and by raising new questions and opening up new perspectives for research.

2 Some examples of the causal role of language in aviation incidents and accidents

In this section, the statement from the beginning of this paper about the causal role of communication problems in incidents and accidents in aviation is exemplified.

The following problem, which involves homophony, led to the crash of an aircraft on its approach to Kuala Lumpur, Malaysia, in 1989 (see Cushing, 1994: 14; Helmreich & Merritt, 1998: 202f.).

- (1) *The controller clears the aircraft to descend "two four zero zero". The pilot reads the clearance back as "OK. Four zero zero". "The controller did not catch the readback error, perhaps because he was not a native English speaker" (Helmreich & Merritt, 1998: 202f.). The aircraft descends to 400 feet rather than the appropriate altitude of 2,400 feet and crashes into a mountain peak at 481 feet.*

In the next example the controller, as communicator, and the pilot, as addressee, associated different referents with the word *things*. This prevented the pilot from becoming aware of the problem the controller was referring to (see Cushing, 1994: 18f.).

- (2) *On approach to Miami International Airport, the crew is having a problem with a light on the plane's nose gear. At the same time the aircraft inappropriately declines in eleva-*

¹ Referring to official accident reports issued by the US National Transportation Board, Jones (2003: 247) writes: "No linguist is required to sign as approving these reports, hence no formal attention is paid to the degree to which miscommunication contributes to accidents." Tajima (2004: 468) concludes that "linguistics and language educators can greatly contribute to this yet-to-be-extensively-researched area".



tion. The crew is unaware of this second problem. The controller, who is aware of the second problem, wants to check on the crew's actions about it. He asks "how are **things** comin' along out there?". The pilot, believing that the controller refers to the nose gear problem, replies "**OK**, we'd like to turn around and come, come back in." The controller takes the 'OK' to mean that the elevation problem is under control. The crew, however, is still unaware of the elevation problem. The aircraft crashes into the Everglades about 30 seconds later.

The next example involves an erroneous inference on the pilot's side (see Cushing, 1994: 28). Fortunately, this did not have serious consequences. But the dangerous potential of the type of problem is obvious.

- (3) *The pilot, cruising at flight level 230 (i. e. 23,000 feet), requests permission to ascend to flight level 310. Controller: "310 is the wrong altitude for your direction of flight; **I can give you 290** but you will have to negotiate for higher." Pilot: "Roger, **cleared to 290**, leaving 230." This erroneous readback is not challenged by the controller. Later realising that the aircraft is at a wrong altitude, the controller states: "I did not clear you to climb; descend immediately to FL [flight level] 230".*

In the fourth and last example for the moment a conversational behaviour which is appropriate in many everyday communicative situations, namely behaviour that exhibits linguistic politeness, contributed to an accident (see Linde, 1988: 379), which, fortunately, did not cause any casualties.

- (4) *At landing, the copilot realises that the aircraft is considerably faster than appropriate. The captain is apparently not aware of this. Linde (1988: 379) comments on the ensuing communicative problem in the following way:*

[t]he interesting point is that the copilot mentioned in his interview that he 'tried to warn the captain in subtle ways, like mentioning the possibility of a tailwind and the slowness of the flap extension.' [...] The copilot said that he thought that the captain understood the meaning of these remarks and would take the appropriate action. The captain said that he didn't interpret the copilot's remarks to mean that they were going too fast [...]. This example should serve to demonstrate some of the real-world dangers of excessive mitigation.

Many more examples of safety-critical communication problems in aviation have been reported on in the literature.² Some more will be supplied in the course of the paper. Still many more could be identified, for instance, by following the example of Cushing (1994), who studied the reports in the newsletter *Callback*, where aviation personnel anonymously describe their observations concerning critical incidents, or by investigating internet sources such as those mentioned by Jones (2003: 245) in his "References and Annotated Bibliography". Another source of data may become increasingly available through the recordings and transcripts obtained from simulated flights. This has been the sort of data used by the linguists involved in a research project on cockpit communication reported on in Dietrich (ed.), 2003.

² For a list of "[c]rashes with ties to language" from 1971 to 2002, see Jones (2003: 237ff.).

3 Scripted aviation language and ATC-English

As already mentioned, a conspicuous feature of the communication between pilots and air traffic controllers in an international context is the use of a semi-artificial English-based sub-language which is employed as a standardised code for the exchange of information via radio-telephony. Following Philps (1991), I call this sublanguage ATC-English (*ATC* being the common abbreviation for *air traffic control*). Authorities and aviation companies very often require scripted wordings to be used also for the communication between crew members within the cockpit (see e. g. Arminen, Auvinen & Palukka, 2010: 448); in the majority of cases the underlying language for these scripts is English too. In the following I will concentrate on ATC-English, but will occasionally refer to (examples of) scripted language use between pilots in the cockpit as well.

There are several varieties of ATC-English in existence, most prominently the one recommended by the International Civil Aviation Organization (ICAO) and the one prescribed by the US Federal Aviation Administration (FAA) (see Jones, 2003). The study of ATC-English and its use clearly belongs in the domain of research into languages for specific purposes (LSP) and English for specific purposes (ESP). And some linguists with interests in this domain have indeed been concerned with it (e. g. Sullivan & Girginer, 2002; Turner & Nübold, 1981; Varantola, 1989; Vatnsdal, 1987). On the whole, however, as with the study of language in aviation in general, ATC-English has only played a very modest role in LSP and ESP research. This is also reflected by the fact that there is not a single reference to ATC-English in the subject index for the more than 2500 pages of the two volumes of the international *Fachsprachen/Languages for special purposes* handbook (Hoffmann, Kalverkämper & Wiegand (eds.), 1998-1999).

ATC-English is characterised by the following main features (see Philps, 1991; cf. also Vatnsdal, 1987):

- 1) rules about the order of priority between different types of messages;
- 2) a spelling code for letters and numbers;
- 3) rules for the expressions of callsigns (by which aircraft and ground stations are identified);
- 4) rules about the message structure;
- 5) rules about which messages to send in cases of emergency;
- 6) a list of conventional expressions and their meanings;
- 7) a set of skeleton messages, i. e. a phraseology.

There are differences between natural English and ATC-English on every linguistic level. I will give some examples:

• **Phonology:** e. g. the pronunciation of the digits *three*, *five* and *nine* is [tri:], [faɪf], [naɪnə]; ; this is in order to prevent phonetic confusion and to facilitate pronunciation for many non-native speakers of English (note that especially in radiotelephony [faɪv] and [naɪn] are difficult to distinguish and that the pronunciation of dental fricatives, [θ, ð], is often difficult for non-native speakers of English).

- **Lexis:** the use of specific expressions to convey meanings which are expressed differently in natural English: e. g. *affirm* ('yes', 'of course', etc.), *negative* ('no', 'of course not', etc.), *request* ('I'd like to', 'could I', etc.), *say again* ('repeat', 'sorry?', 'What?', etc.).
- **Syntax:** some items in the phraseology of ATC-English are syntactically identical to their natural English counterparts, most can be described in terms of a systematic modification of their natural English counterpart, such as determiner deletion (e. g. *resume own navigation*; cf. *resume **your** own navigation*), deletion of prepositions of direction, place, purpose, time (e. g. *climb 150*; cf. *climb **to** (flight level) 150*), pronoun deletion (when referring to pilot or air traffic controller) (*will shortly lose radar contact*; cf. ***you** will shortly lose radar contact*).

Actually, almost all of the syntactic modifications of natural English which characterise ATC-English can be described as deletions or ellipsis. This leads Philips (1991: 123) to the following conclusion:

Paradoxically, the brachylogical search for clarity, precision and lack of ambiguity in the phraseology [...] results in a pronounced tendency towards ellipsis (in the widest sense of the term), rather than, as might have been expected, towards forms of linguistic redundancy (cf. Lyons 1968: 85ff.). This observation may better be formulated as a question: how is it that a codified language such as the phraseology, which sets out to be explicit, can be so elliptical?

The answer to this question has already been hinted at: the fundamental mechanism that allows the phraseology to function effectively as a communication tool is surely to be found in the interaction between its intra- and extralinguistic levels. The phraseology in fact interweaves two systems: the structural system of an English subgrammar and a system of referential values common to its domain (air traffic control) and to the speech community within this domain. If it were not for this interwoven complex, communication would be jeopardised and linguistic security put at risk.

While Philips appears to imply that ATC-English functions rather well, Jones (2003) argues that it is riddled with defects. In the FAA-version of ATC-English, the latter identifies "[t]wo sorts of ambiguities [that] need purging. The first sort is due to synonyms, where a meaning has more than one expression. The second sort is the reverse, where a given expression has more than one meaning" (Jones, 2003: 239). In addition, he deplores the differences between the ICAO and FAA varieties of ATC-English, which are said to create "opportunities for disastrous confusion" (*ib.*: 240). However, Jones's criticism is not directed only against ATC-English; for him, English as such is the problem:

*Without benefit of a scientifically comprehensive plan for aviation phraseology, English, in any of its dialects, was recommended for international aviation in 1951 by the ICAO. Aviation has since been plagued with pilot errors, many of them due to ambiguity in English words and phrases. Non-native English-speaking pilots, about half of the pilots of the world, find it very difficult to deal with the massive irregularities of English. (*Ib.*: 243)*

In 2002 it is clearly time for the 'adoption of a more suitable form of speech for universal use in aeronautical radiotelephony communications' as foreseen by the ICAO in 1951. That standard form of speech for aviation must be characterized by formal rules for its grammar and structure. It must be superior to any given variety of English in the clarity of its spoken form. Its root word acquisition must be subject to the discipline of

an Academy whose members are drawn from many nations. Perhaps here there is a practical solution in Esperanto, which might, with standardized terminology and phraseology, become the language for permanent use in international aeronautical communication. The inability of English to express specific instructions to pilots without confusion would seem to disqualify it as a language for permanent use by aviation. (Ib.: 243f.)

Although Jones (*ib.*: 243) also recommends that "foreign aviation personnel should receive more training in English", his more general position seems to be that natural English is thoroughly unsuitable as a language to be used in aviation, both as the basis for a standardised, more or less artificial, sublanguage and as a medium for communication in those cases where the use of the sublanguage is suspended.³ His reference to Esperanto can be taken to implicate a suspicion that other natural languages may not be much more suitable in these respects.

Other researchers as well as pilots and controllers share Jones's view that ATC-English needs to be improved but do not share his scepticism as to whether such improvements can lead to a satisfactory result in principle, a scepticism due to the fact that ATC-English is derived from natural English. They emphasise that a very high proficiency in natural English, in addition to mastery of ATC-English, is a key factor in optimising safety in the domain of communication. The interviews with Turkish pilots and controllers carried out by Sullivan & Girginer (2002), for instance, revealed that

pilots and ATCs both stated that they needed to improve their conversational English, not just Airspeak, since they are called upon to communicate in situations in which Airspeak is insufficient. This correlates to the findings of Chatham and Thomas (2000) as well as of Morrow et al. (1994) who found that nonroutine transactions between pilots and ATCs contained more conversational English, more complex syntax, and more vague terminology than routine transactions. This use of English in nonroutine transactions can be particularly problematic if one or both of the interlocutors are not native English speakers since they may differ in their use of vocabulary and conversational discourse conventions. (Ib.: 402)

Modifications of the standards of ATC-English and the use of natural language between pilot and controller have frequently been observed to occur (see e. g. Beneke, 1993: 13; Morrow, Rodvold & Lee, 1994: *pass.*; Mell, 1994; Nevile, 2004: 195, 200ff., *pass.*; Philps, 1992: *pass.*; Sullivan & Girginer, 2002: 400ff.; Thomas, 1989: *pass.*; Turner & Nübold, 1981: 13). Morrow, Rodvold & Lee's (1994) empirical study shows that controllers and pilots actually tend to use natural language in emergencies (see also Dumazeau, 2008: 56f.; Mell, 1994). The gist of Nevile's (2004) studies and conclusions is that the occurrence of deviations from a prescribed, coded script in aviation communication is inevitable and that these deviations are often beneficial for the maintenance of safety and sometimes necessary in the prevention of disasters (see e. g. *ib.*: 202f.).

³ "Can you make the runway?" asked a Seattle controller to a Russian pilot. His answer might have been, 'Making a runway requires construction equipment and material.' As it was, he was merely confused and tried to land on a Seattle street – an illustration of the fact that when a controller's working language and native language are the same he is apt to lapse into puzzling idioms and to make assumptions about the pilot's command of English" (Jones, 2003: 243). "This short review of miscommunication in aviation can offer some recommendations for improving safety until English is replaced by a more suitable language" (*ib.*).

The problem of how many and which meanings that might become relevant in aviation one should attempt to code by a lexical item (word or phrase) of a (semi-)artificial (sub)language can be illustrated by referring to a communicative situation mentioned by Arminen, Auvinen & Palukka (2010: 453ff.). The example does not involve communication between pilot and air traffic controller, but between two pilots – commander (CDR) and co-pilot (COP) –, whose verbal interaction also involves regulated language use in certain situations.

The pilots are discussing the transfer of control and navigation duties. The COP, who is in control, is giving these to the CDR [...] [saying 'Your controls']. The CDR first accepts the duties [...] [saying 'My controls'], but then allocates them back to the COP [...] with a repair activity. (Ib.: 453)⁴
[...]

The standardized response to 'Your controls' is 'My controls', exactly as the CDR said. The scripted wordings do not include a callout that would enable the airline pilot to formally refuse to take on the control and navigation duties. The standard operating procedures also aim to standardize the pilots' actions by restricting responses to callouts. When standardized responses to standard callouts are inappropriate, pilots may need to remedy the scripted wordings with practices from ordinary talk, such as repairs or pre-sequences. (Ib.: 455f.)

This example suggests that it may neither be intended nor possible to provide standardised utterances drawn from a (semi-)artificial (sub)language for every foreseeable and safety-relevant communicative situation in aviation – nor for any unforeseeable one, of course, a trivial but nevertheless important point in view of the fact that semi-artificial sublanguages like ATC-English differ from natural languages in that they are deliberately designed so as to be capable of expressing only a limited set of meanings.

The observations made in most of the works mentioned above point in the direction that Helmreich & Merritt (1998: 205) are right in claiming "[t]he simple reality is that a very high level of linguistic proficiency is needed before one can communicate effectively at the level that a time-critical, non-standard or emergency situation may dictate". This raises what Varantola (1989: 182) calls "one of the eternal questions in all LSP teaching programmes", namely, "How much general language is needed then?". The answer to this question that most researchers give amounts to saying: as much as possible, plus knowledge of varieties of English.⁵

4 The relevance of some fields and theories of linguistics

We have already seen that phonological, lexical, semantic and syntactic knowledge is needed, for example, in the analysis and potentially the improvement of ATC-English. Basic knowledge in disciplines such as these, which belong to what Aitchison (1972/1999: *pass.*) calls the "inner circles" of linguistics, also help in becoming aware and describing certain types of problems which may occur in aviation communication. In the following I will con-

⁴ The reason for this repair is that the CDR needed to make sure first that another task was completed.

⁵ As concerns national varieties of English and the relevance of their existence for communication in aviation, see Seiler, 2009 among others.

concentrate on some aspects which rather belong to the "outer rings" (Aitchison 1972/1999: *pass.*) of linguistics.

Hopkin (1995: 268) makes an observation which is very familiar from sociolinguistics. "There is extensive anecdotal evidence, though relatively little experimental evidence, that controllers and pilots base judgements about each other and about their colleagues on speech". A few paragraphs later he states that "[t]he soundness of the judgements themselves has not been tested" (*ib.*: 269). A linguist trained in sociolinguistic theory and methodology will be able to provide experimental evidence for correlations between features of speech and judgements concerning speakers who display them. Subsequent tests of the soundness of such judgements may turn out to be very revealing for the practitioners and may thus advance their understanding of the linguistic aspects of their profession.

Linde (1988) applies concepts from politeness theory in an investigation of aircraft crew communication. She found out "that crews classified as high in safety performance have a higher rate of mitigation than poor crews. This finding is both surprising and important because many suggestions have been made that crews should be trained in linguistic directness" (Linde, 1988: 395). As an answer to the question of why this may be so she mentions that mitigation "can help to prevent the development of interpersonal or relational misunderstandings or animosities" (*ib.*: 396). For communication training in aviation she draws the conclusion that crew members should be prepared for situations in which directness might be interpreted as a challenge of the hierarchical relationship of crew members. And she proposes to offer training "in forms of communication that can challenge a superior's assessment of a situation, while indicating respect for the superior's position" (*ib.*). In the same vein, Morrow, Rodvold & Lee (1994: 255) recommend that "training in ATC communication should emphasize collaborative principles rather than focusing on terminology or isolated practices ('speak slowly', 'enunciate clearly')".

Concepts, categories and methodologies from speech act theory, politeness theory, discourse analysis and conversation analysis are applied in the studies documented by the various articles in Dietrich (ed.), 2003. The main focus of the researchers involved here is the relation between workload in high risk environments on the one hand and communicative behaviour and success on the other hand, primarily in the cockpit. The data in these studies were obtained by recording the cockpit communication during simulated flights. Krifka, Martens & Schwarz (2003: 99), for instance, conclude that "[t]here is evidence that linguistic features of communication correlate with the performance of crews and with the level of task load". An example of a more specific finding by these researchers, which supports the one by Linde just mentioned, is that "[p]oliteness elements occur slightly more often in good crews. Interestingly, good crews have fewer politeness elements in segments of high task load, just the opposite to poor crews" (Krifka, Martens & Schwarz, 2003: 90). Another interesting point, which is made by Silberstein & Dietrich (2003: 36), concerns differences in the communicative behaviour between crews of different cultural backgrounds. According to these authors, crews consisting of members from a western cultural background tend to use more informal language, whereas the register employed among crew members from Far East and Muslim cultures is pervasively formal.

To dwell on the issue of interculturality in aviation for a little longer: It has actually been known for some time that the communicative encounter of interlocutors from different cultural backgrounds may be a source of danger in aviation. Consider, for instance, the example given by Beneke (1993: 13) of Japanese pilots approaching San Francisco airport.

The pilots were sometimes not quite certain as to the exact meaning of the ATC [...] instructions. When they were asked, however, whether they had understood the instructions, they would always say, Yes. It was found that many of the American controllers did not stick closely enough to standard phraseology, but tended to use idiomatic American English. The Japanese pilots, on the other hand, neither complained nor did they ask back. Rather, they would give the impression that they had perfectly understood the message.

These Japanese pilots can be said to be culturally primed not to complain in a geographical context in which they considered themselves as guests, nor to reveal what they felt to be a linguistic weakness by admitting that they had not properly understood. Observations such as these made researchers aware of the necessity to investigate the intercultural aspects of the communication between pilots and air traffic controllers. Some research in this direction has actually been done, less so, however, by linguists, but rather by social and organisational psychologists (see e. g. Helmreich & Merritt, 1998; Isaac, 1999: ch. 4).

This is the appropriate place to point out that a more intensive study of the respective work by social and organisational psychologists on the part of the linguists and vice versa as well as a closer co-operation between these disciplines are certainly fruitful for both sides. Interdisciplinary work in this domain is of course not restricted to the topic of intercultural communication but extends to all topics and questions where models and theories of language and language use are employed in empirical studies. A very important part of the contribution by linguists in this kind of co-operation is their competence in analysing the relation between the form and the function of verbal expressions.

Language variation has turned out to be a source of problems in aviation communication too, so that a good understanding of the phenomena in this field is also important. The following is a real-life example from Helmreich & Merritt (1998: 203):

(Diaboliical dialects.) With the introduction of transponders to aviation, the terms Mode A, Mode C and Mode S arrived with an interesting communicational problem. On approach to Melbourne, one particularly strong-accented Australian was heard to call 'Mayday'. The ATC tower was gripped with excitement as they tried to ascertain the cause of the emergency. Several more calls later from a remarkably calm-sounding crew led to the discovery that he was saying 'Mode A' not 'Mayday' and so the practice of calling 'Mode Alpha' was born. (Graham Braithwaite, British safety researcher working in Australia.)

Helmreich & Merritt (1998: 204f.) also remark on "a Pakistani pilot who spoke with a perfect 'BBC English' accent. Referring to the heavy American accents he encounters at New York Air Traffic Control, he said, 'Forget about us foreign pilots, how about getting those guys in the Tower to speak English?'" If meant seriously, the manner in which the problem was stated by this pilot will appear as a misrepresentation to a linguist. The linguist's assessment will be that the pilot has something important to learn about language in general and English in

particular. If meant more or less as a joke, the remark nevertheless emphasises that there is a problem here which may be attended to by linguists (as more recently done by Seiler, 2009).

5 The relevance of relevance theory

In the final section of this paper the role relevance theory (RT) may play in a linguistic approach to communication in aviation is discussed. In particular, attention is drawn to the tension between, on the one hand, the insight emphasised especially within the RT framework that coded meaning only plays a triggering and partial role in the interpretation of utterances in ordinary communicative situations and, on the other hand, the fact that a rigorously coded (semi-)artificial (sub)language has been considered indispensable in the aviation context by most researchers.⁶

So far, it seems, RT (see Wilson & Sperber, 1981; Sperber & Wilson, 1986/1995; Wilson & Sperber, 2004 among many others) has not been made use of in the aviation context. Just like the Gricean theory of implicature (see Grice, 1989; especially Grice, 1967/1989), RT stresses the importance of pragmatic inferencing in the interpretation of verbal utterances, but differs in some respects from the Gricean approach and from the so-called neo-Gricean school as represented by Levinson (e. g. 2000), for instance. I will now present the basic ideas of RT in a nutshell.

In RT, the linguistic meaning of a sentence used in an utterance, which is decoded on the basis of the hearer's knowledge of the language, "is just one of the inputs to a non-demonstrative inference process which yields an interpretation of the speaker's meaning" (Wilson & Sperber, 2004: 607). Being 'non-demonstrative' means that the inference process does not guarantee the recovery of the speaker's meaning. The other inputs to such an inference process are drawn from the context, that is, the set of assumptions held by the hearer at the time when the utterance is to be interpreted. The set of assumptions drawn from comprises those that the hearer holds about the world in general, about the specific situation of the communicative exchange and about assumptions held by the addressee. It may be mentioned as an aside that there is no incompatibility between approaches pursued in social and intercultural pragmatics on the one hand and RT on the other hand. Quite to the contrary, the linguistic phenomena which are revealed and studied within social and intercultural pragmatics certainly arise from the mental models constructed by interlocutors as contexts used in utterance interpretation.

One basic supposition of RT is that the part of the human cognitive system which is concerned with utterance interpretation strives for the generation of so-called positive cognitive effects. One type of positive cognitive effect is the generation of a new assumption, that is, one which could not have been derived from the input alone, nor from the context alone, but only from both together. Other types of positive cognitive effect "include the strengthening, revision or abandonment of available assumptions" (Wilson & Sperber, 2004: 608). Another basic supposition is that the generation of positive cognitive effects is constrained by the

⁶ Tajima (2004), for instance, who like many others stresses the importance of a very high proficiency in natural English for aviation personnel, also recommends that "we should sincerely and rigorously strive to create an error-resistant and mistake-free language environment" (*ib.*: 467). Recall also the quotation from Jones 2003 in section 3 above where he mentions "Esperanto, which might, with standardized terminology and phraseology, become the language for permanent use in international aeronautical communication".

amount of cognitive effort invested in the interpretation process. The relevance of an utterance for an interpreting individual results from weighing processing effort and positive cognitive effects against one another along the following lines (*ib.*: 609):

- a. *Other things being equal, the greater the positive cognitive effects achieved by processing an input, the greater the relevance of the input to the individual at that time.*
- b. *Other things being equal, the greater the processing effort expended, the lower the relevance of the input to the individual at that time.*

Now, the essential claim made by relevance theory is that the specific inferences that are made in the interpretation of an utterance in addition to the decoding of its linguistic meaning are guided by two principles. The "Cognitive Principle of Relevance" states that "[h]uman cognition tends to be geared to the maximisation of relevance (Wilson & Sperber, 2004: 608). The "Communicative Principle of Relevance" states that "[e]very ostensive stimulus [i. e. an utterance in verbal communication] conveys a presumption of its own optimal relevance" (*ib.*: 612). These two principles together imply a certain strategy for the process of utterance interpretation on the part of the addressee: It is most rational for the addressee to apply a least effort strategy and to take the first interpretation which satisfies his expectations of relevance as the most plausible hypothesis about the intended meaning on the part of the communicator. However, as pointed out by Wilson & Sperber (2004: 614), "[s]ince comprehension is a non-demonstrative inference process, this hypothesis may well be false; but it is the best a rational hearer can do".

RT highlights the following insights that ought to be taken into consideration in the study of communication in aviation: First, that the linguistic expressions as such that are used in order to convey meaning in natural verbal communication constitute only a part, if an important one, of the resources that are employed in the effort of recovering meaning. Whereas the code model of verbal communication suggests that human communicators are decoders, perhaps with an inbuilt noise-eliminator, RT suggests that linguistic expressions *per se* are semantically underdetermined in principle and that human communicators are constructors of meaning who take the denotation of linguistic expressions into account as one of the sources of information for constructing an interpretation alongside information provided by the context assumptions. The code model insinuates a robustness in the conveyance of information which may be deceptive. RT makes us aware of the fact that the success of communication is, although often achieved, a very subtle affair. Linguistic and communicative training in the aviation context may thus consider dispensing with any variety of the code model of communication, in which the linguistic expression – i. e. words, phrases, sentences – is conceived as the carrier of the information content from sender to receiver.

While this view of RT applies to natural communication by means of natural languages, it nevertheless raises the question whether a (semi-)artificial sublanguage that allegedly consists of an unambiguous lexicon and an unambiguous syntax does and can in principle really supply what it is intended to. The answer to this question is a clear 'no' for all those indeterminacies of meaning in verbal communication that are not due to natural language lexical or syntactic indeterminacies. For all a (semi-)artificial sublanguage can optimally do is provide a (semi-)artificial lexicon (potentially including a phraseology) and a (semi-)artificial syntax whose items (lexicon) and structures (syntax) are mapped in a one-to-one fashion onto senses of lexical items and disambiguated syntactic structures of a natural language. The point here is

that the meaning of the items and structures of the (semi-)artificial language are necessarily coded by making reference to items and structures of a natural language. That is, the addressee of an utterance transmitted in a (semi-)artificial language necessarily translates its coded meaning into a natural language equivalent. The interpretation of this equivalent is, in principle, subject to all those kinds of indeterminacies that an utterance directly transmitted in a natural language is subject to, except for indeterminacies due to ambiguous or vague senses of lexical items and ambiguous syntactic structures. It is true, the determination of the relevant senses of lexical items (given that this is possible in a technical context) and the disambiguation of syntactic structures that may be achieved by this detour via a (semi-)artificial language is important for communication in aviation and may have been able to prevent a large number of misunderstandings. However, they cannot in principle forestall misinterpretations due to inferences that do not serve the determination of communicator-intended senses of lexical items and syntactic structures, but are rather triggered by aspects of meaning interpreted adequately at this level.

The following is a simple example where the pragmatic inferences performed by a controller in order to determine the referent of the pronoun *we* leads to an interpretation that was not intended by the speaker and consequently to a dangerous situation.

One of two fighters on instrument route developed mechanical problems and stated ([5]a), after which the controller then issued an IFR [i. e. Instrument Flight Rules] clearance, to which the aircraft replied ([5]b).

([5]a)We need a clearance back to base.

([5]b)We are in a left turn and we are climbing to 17,000.

The controller interpreted we as meaning that both aircraft were returning to home station, when in fact only the lead aircraft wanted to return [...]. 'The wing man continued on the original IFR clearance and completed out the military route through the airspace of two centers.' (Cushing, 1994: 18)

The conceptual meaning (see, among others, Ariel, 2010: 149ff.) that is encoded by the item *we* sanctions both the interpretation intended to be conveyed by the pilot and the interpretation arrived at by the controller. In this situation, where, for certain assessments, the two planes have to be conceived of as a pair, the interpretation of *we* as referring to both planes is the first interpretation imbued with sufficient relevance generated by the controller and is consequently the one attributed to the speaker. From Neville's (2004: 45ff.) discussion of the use of *we* in cockpit communication, it can be inferred that its use in this example is non-prescribed by the regulations for talk in aviation; and this would be in agreement with what I pointed out in section 4 about the deletion of pronouns in the code provided by ATC-English.⁷ The important point in the present context is that a deletion of the pronoun as possibly prescribed would not have changed anything about the potential for misinterpretation. It would of course be possible in principle to construct a code which avoids problems of this

⁷ Neville (2004: 77), for instance, writes: "By saying 'we've captured flight level X', rather than the prescribed 'captured flight level X' the pilot is able to represent the altitude as something achieved by the crew in their conduct of flight".

specific type. However, the limits of the effectiveness of a generalised procedure in which one tries to find a coded solution for the prevention of every type of conceivable misinterpretation are obvious. It is likewise obvious that communication in aviation generally cannot dispense with the flexibility afforded by natural language for conveying information about situations that may evolve but have not been foreseen by the designers of a coded sublanguage.

Another important point highlighted by RT is the possibility that human beings in general cannot help interpreting certain utterances in a certain way under certain conditions. We cannot in general help reading meaning into and above what the linguistic expressions used by a communicator denote. Example (3) of the communicative problems mentioned in section 2 is an illustrative case in point. In terms of RT, we may argue that the pilot could not help interpreting the controllers utterance of *I can give you 290* as a clearance for ascending to flight level 290. This is certainly the first interpretation which achieves sufficient relevance for the pilot who has just asked for permission to ascend to flight level 310 and was additionally told "but you will have to negotiate for higher". It is true, in terms of ATC-English the controller's utterance was no clearance, and the pilot should have reacted accordingly. But the fact that he interpreted the utterance as he did in spite of his familiarity with ATC-English seems only to emphasise the cognitive pressure towards optimisation of relevance as stated by the cognitive principle of relevance.

The final link in the causal chain that led to the disastrous collision of a passenger plane and a cargo plane over Lake Constance in 2002 may perhaps also be accounted for by a relevance theoretic consideration. Here the pilot of the passenger plane received contradictory instructions by the automatic warning system on the one hand and by the controller on the other hand. The chain of events concerning the passenger plane (TU154M) can be summarised as follows (see BFU 2004).

- (6) *43 seconds before the crash, the controller instructs the crew to immediately descend. 7 seconds later the crew initiates a descent, but receives simultaneously an instruction to climb by the plane's automatic collision warning system. Another 7 seconds later the controller repeats his instruction to descend, which is verbally confirmed by the crew. 21 seconds later the automatic warning system issues the command to "increase climb". 8 seconds later the passenger plane, which is still descending, collides with the cargo jet, which followed the instruction of its own automatic collision warning system and has been descending as well.*

The investigation report identifies the following circumstance as one of the immediate causes of the collision: "The TU154M crew followed the ATC instruction to descend and continued to do so even after TCAS [i. e. Traffic Alert and Collision Avoidance System] advised them to climb. This manoeuvre was performed contrary to the generated TCAS RA [i. e. Resolution Advisory]" (BFU 2004: 5). The crucial point here seems to be that the pilot of the passenger plane trusted the instruction issued by the human being, the controller, more than that issued by the machine.

Pilots are subject to the regulation that in cases of contradicting instructions by the automatic warning system on the one hand and by controllers on the other to follow the former. However, it seems to be difficult for humans to actually comply with this regulation. Human factor research has revealed that there is a "greater compliance rate that pilots have in following ad-

visories given by a human controller, than those given by an automated algorithm with a synthetic voice" (Wickens et al. (eds.), 1998: 146). An explanation in terms of relevance theory may proceed along the following lines: A verbal utterance made by a human communicator is what Sperber & Wilson (e. g. 1986/1995: 153ff.) call an ostensive stimulus. Such a stimulus makes it manifest to the addressee that the communicator has an informative intention and that the communicator wants the addressee to recognise that she has this intention. To consider an utterance as relevant presupposes that it is treated as ostensive (Sperber & Wilson, 1986/1995: 154). A machine as such is not attributed intention at all by an addressee; a machine may serve as a mediator of human intentions, so that human intention is communicated only indirectly where a machine as mediator is involved. Moreover, the human intention indirectly communicated in this case is associated with anonymous communicators who are not aware of the specific situation in which their communicative intention was made manifest to the addressee by the machine. This anonymity and the separation of the communicative intention from the actual communicative situation reduces the relevance of the communicative intention compared to where a human communicator is directly involved in the actual communicative situation.

6 Conclusion

The potential for problems in communication in aviation that linguists will be able to anticipate in the abstract, i. e. without having looked at the pertinent literature or done pertinent research, does not seem to deviate much from what is actually there. Due to the extremely severe consequences that these problems may have and have had, the topic is, though interesting, also a sombre one. It will not be possible to avoid all of these problems. Quite apart from the disadvantages – and advantages in certain situations – that an unregulated use of language would engender, every piece of regulation that one may want to introduce in order to prevent an identified type of problem may turn out to have disadvantages under unforeseen circumstances. However, conducting research on communication in aviation from the point of view of a linguist certainly contributes to a deeper understanding of the issues involved. Finally, the investigation of language in the context of aviation, where very much depends on communicative success, may make the linguist and the communicative practitioner most sharply aware of and sensitive to the processes and problems involved in linguistic behaviour in *any* field of social interaction.



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English as an International Language in the Military: A Study of Attitudes

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Abstract

This paper reports on the findings of a national-based survey of perceptions and attitudes towards the use of English in the Spanish armed forces. Drawing on the theoretical assumption that knowledge of the social, textual and generic motives of professional communication is only available to expert members of a discourse community, the survey inquires into the discourse practices and procedures of the military community in Spain, their established ways of transmitting information in texts in English, the genre sets that they use and the communicative events they are involved in. Survey findings show that the growing internalization process undergone by the Spanish armed forces has been paired with the use of English as the lingua franca of international communication in this professional context. The important implications of the predominance of English as the workplace language for the personal and professional development of these professionals are discussed in the light of the results.

1 English as a Lingua Franca in International Contexts

The openness in international communication, in information exchange and knowledge dissemination has made English a shared language favoring the internationalization of professional activities. As such, it is also the language of international communication practices (Dewey, 2007; Giddens, 1999; House, 2003; Seidelhofer, 2001, 2004, 2005), particularly in academia (Belcher, 2007; Curry & Lillis, 2004; Ferguson, Pérez-Llantada & Plo, 2011; Pérez-Llantada, 2012). Yet, the dominance of English has raised controversy and debate whether viewed as a “lingua frankensteinia” (Phillipson, 2008), as a “Tyranosaurus rex” (Swales, 1997), as an “epistemicide” (Bennett, 2007), that is, as a threat to multilingualism and thus to the survival of local languages, or as “simply work” (Kankaanranta & Louhiala-Salminen, 2010). Whatever their stance, these studies acknowledge that, in this global era defined by the growing interconnection of individuals and institutions, of local and global contexts, English has become the language for communication in international professional settings, as well as in academic and research exchange.

Not surprisingly, English also stands as the vehicular language for the Military, in an international geo-political scenario marked by the globalization of conflicts beyond national borders and consequently by the integration of armies in multinational and multicultural

coalition forces (Febbraro, McKee & Riedel, 2008; Stewart et al., 2004). For the Spanish armed forces this new international arena has meant their increasing participation in international military operations (since 1989 more than 100,000 military personnel have participated in international missions in four continents¹), which has involved the deployment of an unprecedented number of troops and equipment and their integration in multinational structures (cf. *Fuerzas Armadas Españolas: Mejorando la eficacia operativa*, 2008). The present and, very likely, the envisioned future military scenarios are clearly ones of complexity: beyond traditional warfare, the military scene has gradually been taken, as Pierce and Dixon (2006) claim, by peace enforcement, peacekeeping and humanitarian missions. Yet, winning the peace has shown to be more challenging than winning the war and it requires, Chiarelli and Michaelis (2005, July-August) argue, the implementation of full-spectrum operations:

if there is nothing else done other than kill bad guys and train others to kill bad guys, the only thing accomplished is moving more people from the fence to the insurgent category—there remains no opportunity to grow the support base (p. 6).

In this open scenario, the latest international conflicts of Afghanistan or Iraq have confronted armies around the world with the strategic importance of managing information and therefore of transmitting the right message. To a large extent, military effectiveness seems to depend on successful communication with the local population and on the effective transmission of information. For the purpose of fighting not only insurgency, but also the battle of influencing public opinion, the new media can be seen as “weapons of mass communication”, as the cover of the February 2008 issue of *NATO Review*, a well-known military magazine, very intelligently puts it. If, as the vision statement of the Spanish Army claims, “leading an army requires communicating and thus understanding that public information creates public opinion” (*Visión del JEME 2025*, 2010), modern warfare might have found a new answer to the question of whether the pen is truly mightier than the sword:

Whether one chooses pen or sword may depend on whether one believes knowledge is power. That belief, in turn, may hinge on how knowledge is defined and power understood. Can the expression of ideas move others as swiftly, as effectively, as permanently as the use of force or the lure of riches? Does truth—or simply the command of ideas—provide leverage over others? Are ideas weapons? Conversely, can force inspire and persuade or only coerce? (Foster, 1996)

As the lingua franca of military communication, English can help facilitate the necessary interconnection between individuals and organizations, between the national and the international, between the local and the global. Essential for the understanding of the role of English as an international language are those studies (Poteet et al., 2008; Rasmussen & Sieck, 2012; Rasmussen, Sieck, & Smart, 2009; Sieck & Patel, 2007) which have interpreted the all-encompassing role of English as causing problems and barriers to adaptability, mainly because of the differences individuals bring together into coalitions: differences in natural and doctrinal languages, in technological capabilities, or in core competencies, and very specially, in cultural backgrounds, in their culture, values and norms. Even more complex and challenging is the strategic effort of communicating with the local population, frequently mediated by intercultural relations. The issue brings to the fore the close interrelation of language and cross-cultural competences, particularly significant for the military (Abbe, Gulik, & Herman, 2007; Hummel & Siska, 2011; Lunt, 2008; Stier, 2006; Watson, 2010).

¹ <http://www.defensa.gob.es/areasTematicas/misiones/>

Of particular concern for military communication have also been claims about international security and about the vital consequences of the miscommunication problems caused by the lack of English proficiency in related professional domains, for example, international merchant marine (Bocanegra-Valle, 2010, 2011; de la Campa-Portela, 2005, 2006; Johnson, 1994; Vangehuchten, van Parys, & Noble, 2011) or civil aviation (Connell, 1996; Cushing, 1994; Kim & Elder, 2009; Orasanu, Fisher, & Davidson, 1997; Ragan, 2002; Rantanen & Kokayeff, 2002; Tajima, 2004; Verhaegen, 2001). This has led to the adoption of standardized languages such as the *Standard Marine Communication Phrases*² or the *Standardized Radio-Telephony Communication Terminology*³, to regulate and thus to facilitate communication procedures.

The influential role of English as the lingua franca in the military workplace, in allied coalitions, in international security and in public communication, has meant the increasing pressure for professional internationalization in the Spanish armed forces. It has also made knowledge of English an essential professional competence, materialized in the requirement of having their level of English assessed and certified according to NATO STANAG 6001 in the Standard Language Profile (SLP) test (Vadász, 2011) thus greatly enhancing, or damaging, their chances for professional promotion. It finally means pressure for the academic training program of cadets, future practitioners of the discipline. The pressure for learning the language is not only a personal one, a matter of academic success, personal development or professional promotion and advancement; it is also essential for the growth of the organization: an officer can be seen as representing the whole army and the difficulties to participate in professional interaction in English would badly affect the institution.

Yet, despite the international relevance of the military institution, their discourse has been, to my knowledge, underresearched in applied linguistics, ESP or communication studies. The urge to research military discourse is more justified than ever after the creation of the Common European Higher Education Area, which seeks to make quality assurance standards more comparable and compatible throughout Europe, and has recently led to the creation of the new *Centro Universitario de la Defensa* (the Defense University), CUD henceforth, at the Spanish Military Academy of Zaragoza, a public institution of higher education. Standardization initiatives have been increasingly implemented by allied armies across Europe and North America, where similar systems of higher education have been implemented for decades, which should result in better mobility and higher operability among allied countries (see, for example, *Los estudios de posgrado en las Fuerzas Armadas*, 2008; Romero Arrianza, 2006). The new educational system of the Spanish armed forces has also been adapted to the European standards, and the Class of 2015 will be the first Class in the Spanish armed forces history to receive a university degree, whose mission is to provide future officers with a dual civilian and military training, that is, academic training and scholarly/academic literacy background as well as military-specific professional competence.

The general goal of the new system of military training has been defined as to enable future officers to acquire the management and leadership skills to work in multidisciplinary groups and in multinational structures in a multilingual context⁴. In this scenario it seems essential that the role of English as an international language in the Military is fully understood.

² <http://www.imo.org/>

³ <http://www.icao.int/>

⁴ <http://titulaciones.unizar.es/ing-org-industrial-cud/>

Contributing towards this purpose, this paper uses a survey and interview-based study to examine the Spanish officers' perceptions and attitudes towards the English language together with the contextual factors of professional communication and the intercultural demands of the military profession.

2 A Nation-based Survey of Attitudes towards English

Survey- and interview-based studies have been employed to elicit attitudes, views or interpretations on the role of English lingua franca in academia (Hymes, 1972; Curry & Lillis, 2004; Pérez-Llantada, Ferguson & Plo, 2011), and in some professional contexts such as business (Holliday, 1995; Kankaanranta & Louhiala-Salminen, 2010; Rogerson-Revell, 2007, 2008), the law (Bhatia, Garzone & Degano, 2012) or aviation (Kim & Elder, 2009). Underlying these studies is the common view that understanding communication cannot be separated from understanding the people who create it, that is, the communities or disciplines where communicative practices are embedded.

Drawing inspiration from these premises, the survey described below sought to provide a multi-perspective insight into the communicative practices of this professional community, assumed to be constructed from textual, generic and social perspectives (Bhatia, 2004). In this line, the survey was meant to provide text-internal information on the genres and communicative events in which this discipline engages (second set of questions) complemented with very valuable information on text-external features, that is, information into the disciplinary identity of this community, their attitudes, beliefs, values and motives (first set of questions). For this purpose the specific goal is to shed light into the perceived attitudes and views, into reasons and motives of language use, into the personal and professional motivation for learning English, ultimately trying to determine the relevance of English in their academic, professional or personal lives. It is finally expected that the analysis could eventually inform both future educational decisions and potential areas of research.

Because a holistic interpretation of the data was to be achieved, the survey was designed to integrate two stages of data gathering, a questionnaire complemented with follow-up semi-structured interviews and observations. The first question of the questionnaire was meant to elicit views on the importance of language competence for their professional and academic development or promotion. The next question sought to estimate the awareness of respondents of the relevance of English for their professional practice, and very specifically for the success of their participation in national and international missions (Question 2). The following questions asked the respondents about their level of English (Question 3), further exploring the difficulties they had experienced in contexts in which the language is used in the follow-up stage. As for their language learning experience, Question 4 inquired into the formal and informal language learning activities in which they have been involved. The second set of questions was intended to generate a catalogue of professional written and oral genres (Questions 5 and 6). The goal was to determine in which communication events, both written and oral (Questions 7 and 8), the Military most frequently resort to English for professional, academic or personal use, as well as to explore their audience, that is, both who they write or speak to, what they read and what or who they listen to.

Although the many advantages of other types of questionnaires and scales of measurement need to be acknowledged, for the first stage of this survey a structured questionnaire with two different scales was chosen. Likert-scaled questions with a four point scale (*very important /*

important / not very important / not important at all) were preferred for the question aimed at ascertaining attitudes towards the importance of English for the profession or with a five point scale, including a ‘*non applicable*’ option, for the question on the success of military missions. For those questions which sought to measure perceptions regarding their level of English or the use of English in the profession, multiple option questions were used to reflect the four skills (reading, writing, listening and speaking) also with a Likert scale (*excellent / good / intermediate / low / none* for the first one and *very important / important / not very important / not important at all* for the second one). On the other hand, for the questions on the genres and audiences of writing and oral communicative events most frequently employed and targeted, the use of non-scaled multiple-choice open-ended questions was expected to allow respondents to provide additional comments.

The nation-based questionnaire administered to the Spanish Army officers via their intranet, was answered by 421 officers. The use of a purposefully simple questionnaire, with a reduced number of questions written in Spanish, was meant to maximize easiness and thus to reach the largest number of respondents. The questions were specifically designed to enquire into the opinions compiled in the open-ended questions. The wealth of thought-provoking data obtained in the questionnaires was further extended in the follow-up interviews, answered by email or personally by 15 officers who had shown their willingness to participate.

The collection of information both in the surveys and the interviews was, however, affected by factors such as the uneven distribution of information in the army, mainly dependant on their fully hierarchical order, which not only meant the availability (or lack of it) of some high rank officers to respond the questionnaire, but also to encourage their subordinates to participate (or not to). Furthermore, the transition from a purely military training institution into an academically-oriented one, still in progress, has meant an undeniable challenge for this profession, for which an academic survey like this might not have caused some resistance. The singular nature of the military institution also emerged during the survey, particularly in the follow-up stage. Comments on some of the more controversial issues of deficiencies or communication misunderstandings understandably proved to be challenging for participants, whose code of honor demands not only discretion, but also acceptance and obedience of hierarchical discipline. The possible resentment provoked by the demand for English proficiency certification cannot be ignored either.

Although cognizant of the limitations of using a questionnaire for an attitudes survey, also of the potential problems of question choice or of desirability bias, the advantage of reaching a large number of people, particularly in the case of this nation-based investigation with the target population dispersed all over the country (some even in international posts), made a direct approach a quick, easy and efficient way of accessing the military discipline. However, the number of respondents, which can be viewed as representative of the target population, together with the large amount of information provided both in open-ended questions of the surveys and in the interviews, was considered satisfactory.

3 Towards an Understanding of English in the Military

With the aim of clarifying the opinions and attitudes expressed in the questionnaires and interviews, some basic biographical information about their rank was asked. Of the 413 respondents who answered this first question 82 were lieutenants, 128 captains, 93 majors, 78 lieutenant colonels, 27 colonels and 5 generals) and the 15 interviewees were 1 lieutenant, 2 captains, 4 majors, 5 lieutenant colonels and 3 colonels. A higher rank is associated with years

in service as well as with more demanding responsibilities. It also means a privileged position to reflect on military practices, experiences and views.

3.1 About the Importance of English

In response to Question 1 (*How important is English for the military profession?*), the data showed that current officers appear to be fully aware of the importance of English in their context:

	Total	%	Cumulative total
very important	197	47.40%	89.50%
important	175	42.10%	
not very important	26	6.30%	10.60%
not important	18	4.30%	
<i>answered question</i>	416		

Table 1. About the importance of English for the military profession.

References to English as essential, as a basic skill in the present world, compared with the acquisition of basic computing skills for example, abound among the informants' responses to open-ended questions and in the interviews. Despite the general perception, a cumulative 10.6% of the officers participating in the survey still considered English as not very important or not important at all. When asked about this percentage of officers who did not seem to find English important, one of the informants reflected on what he called a dichotomy between two clear-cut groups in the Army, those members of the Spanish armed forces involved exclusively in tasks carried out in Spain, without any multinational perspective, who do not seem to experience the need to speak any languages, and those who do. Although for some the secondary role of English in the profession could be associated with variables such as age, current job or a certain feeling of rejection caused by their lack of skills, the military community clearly links language competence to professional promotion, higher ranks, better jobs or more possibilities for professional development. This might correspond to the requirements for assessment and certification of linguistic competence in the Military in order to access certain ranks and positions, with the countless social, professional, economic or personal implications for the hierarchical Army rank system. The harm to professional future was clearly perceived by the informants, who seemed to feel the urge to enter the "*dynamics of the profession*", or else "*you have very little to expect from this profession*".

The need to use English was also felt to be associated with rank, since lower rank officers explained they were not so likely to use English—they restrict their activity to the command of their units—whereas higher rank officers most frequently tend to occupy higher responsibility posts of command which involve coordination of their work with other armies. It is also these higher ranks which are expected to transform the decisions made by superiors into commands to subordinates. Younger officers appeared to be aware of these future needs. As an example, the claim of one young captain who acknowledged that he does not need English at all in his present job, although he knows English will be "*essential, crucial*" once he starts taking part in international missions.

When asked about cadets' attitudes, as future professionals in this envisioned 21st century scenario, interviewees agreed that, like the large majority of future professionals, full awareness only comes with professional practice. Simply put: *they are still not aware of the*

professional challenges they are facing but as soon as they are given an operation command in English or they are ordered to make a presentation, they “wake up” (respondent #In3). Ratifying this claim, an internal survey showed that a cumulative percentage of 96.6% of cadets are aware of the importance of English (68.30% consider English as very important and 28.30% of them consider it important). The percentages are clearly higher than those of current officers: 47.40% think English is very important and 42.10% think it is important and the percentage of those who think it is not important is almost negligible. This seems to respond not only to the tendency of Spanish university students, as well as those in most countries around the globe, towards internationalization, but also to the growing awareness of the new role of the Spanish armed forces in the international geopolitical sphere.

The next set of questions concerned the use of English in their professional practice. The answers to Question 2 (*How important is English for the success of international missions?*), ratified by the interview responses, showed that language competence is related to their professional practice, particularly to whether that takes place in Spain or abroad. The growing importance of English in the military context cannot be separated from the participation of the Spanish armed forces in international operations. This requires their integration in multinational teams in which the vehicular language is mostly English, a fundamental factor for the consideration of the role of English:

	Total	%	Cumulative total
very important	247	59.10%	95.50%
important	152	36.40%	
not very important	16	3.80%	4.30%
not important	2	0.50%	
not applicable	1	0.20%	
<i>answered question</i>	418		

Table 2. About the importance of English for the success of international missions.

It is when referring to their participation in international missions that the decisiveness of English emerged in responses, not only for their possible personal or professional benefit (*if you can't speak English, you are lost*), but because those are very frequently life-threatening situations in which there is no time for a translator. A striking testimony came from an officer who reported his own experience when deployed in Iraq in 2004 where three American soldiers bled to death in their hands, while the Spanish control tower was struggling to communicate with the rescue helicopter. *“The lives of many soldiers are at stake”*, he claimed (respondent # In8).

The challenge of communication in English in a multinational working environment was not only mentioned by Spanish officers. American officers with whom I had the opportunity of sharing the preliminary data obtained in this study corroborated those difficulties. Very tactfully they tried to be understanding (*American HQs can be very intimidating to an American officer. It must be even more so to foreign officers* – respondent # Am1) and willing to help foreign officers to integrate their workplace community. They, nonetheless, acknowledged the communicative challenge.

Another interesting issue arose in the follow-up opinions regarding the difficulties faced in the profession. However essential English is regarded as, lack of skills and the problems

experienced when using English in professional practice seem to be equally clear. Not unexpectedly, language competence deficiencies were referred to with a subtle tone of frustration, particularly when the issue of higher level certification requirements was mentioned. Officers, particularly older ones who did not have the chance of being trained in English in high school or in college, openly complained about feeling punished and having lack of motivation: the economic costs of courses, the burden for family life or professional damage are mentioned. Opinions thus seem to correlate the biographical data provided by respondents, most of them older officers with years in service. A comment very openly, perhaps bitterly, exemplifies this view:

Although it is true that in the last 30 years the level of English among officers has improved a lot; it is also true that trying (unsuccessfully in most cases) to reach the bloody Level 3 has made people's lives a misery to a greater or lesser extent. The way things are going with the new Level 3 (Professional) and if things don't change, it seems that in the next 30 years the English level of officers will continue improving, which at the same time will make the lives of 100% of them a misery. IN SHORT, it is essential that common sense and realism regarding languages return to the Ministry of Defense, that they understand that "WHAT CANNOT BE, CANNOT BE AND IT IS ALSO IMPOSSIBLE" and no matter how miserable they make peoples' lives, impossible will continue being impossible. AMEN. (respondent # respondent Qu62)⁵

3.2 About their Level of English and the Learning Experience

A shared perception seems to pervade from the above comments, many officers did not seem to consider their level of English satisfactory. This self-perceived language lack of proficiency was only partially corroborated by the answers to question 3 (*How would you rate your level of English?*):

	excellent	good	intermediate	low	none
reading	14.85%	38.37%	34.65%	8.66%	3.47%
writing	5.24%	30.67%	46.63%	11.72%	5.74%
speaking	6.98%	32.42%	38.65%	15.71%	6.23%
understanding	10.97%	32.42%	36.66%	14.71%	5.24%
means	9.51%	33.47%	39.15%	12.70%	5.17%

Table 3. About their level of English.

The questionnaires showed that an average 42.98% view their level of English as excellent (9.51%) or good (33.47%), whereas 17.87% consider it to be low (12.70%) or non-existent (5.17%). When individual skills were considered, speaking and writing, that is, the production skills, were seen as comparatively weaker than reading and understanding, the reception skills. However, these perceptions did not totally match the data obtained in the interviews, where speaking, rather than writing, was reported as posing the greatest difficulties. Although

⁵ As mentioned the survey was administered in Spanish but the quotes have been glossed in English. The original quote in Spanish is the following:

Si bien es cierto que durante los últimos 30 años ha mejorado mucho el nivel de inglés de los Oficiales; no es menos cierto que el intentar (sin éxito en la mayoría de los casos) obtener el maldito Nivel 3 le ha amargado la vida en mayor o menor medida al 50% de ellos. Tal y como se pone la cosa ahora con el nuevo Nivel 3 (Profesional), y si la cosa no cambia, todo apunta a que en los próximos 30 años seguirá mejorando mucho el nivel de inglés de los Oficiales, al mismo tiempo que se le amargarán la vida, en mayor o menor medida, al 100% de ellos. EN DEFINITIVA, es imprescindible que el sentido común y el realismo en materia de idiomas vuelvan al Ministerio de Defensa; que comprendan que "LO QUE NO PUEDE SER, NO PUEDE SER, Y ADEMÁS, ES IMPOSIBLE" y que, por mucho que le amarguen la vida al personal, lo imposible no dejará de serlo. AMÉN. .

some unexpected references to difficulties with reading, felt as the most necessary and widely used skill, arose, it is with speaking and understanding that they seem to struggle most, because of their lack of fluency, which might even cause some embarrassing situations. Difficulties were attributed to the use of English in stressful situations or to the limitations to understand English speakers (native pronunciation and accents seem to be particularly problematic).

Interviewees acknowledged that many people might feel uncomfortable in these situations and it is precisely the awareness of the possible consequences of misunderstanding that leads them to employ a number of strategies. When asked in the follow-up questions about these strategies, some attempts about trying to write directly in English were incidentally mentioned. However, the practice of writing in Spanish first (*"I cannot think in English"* respondent # In15) and then translating into English was openly admitted. The help of electronic translators, dictionaries or, most frequently, of a native speaker with expertise in their area were encouraged if, as one of the respondents suggested, you want to avoid what he called *"grammatical disasters"*. Some testimonies referred to those cases in which colleagues, even themselves, have tried to be accompanied by somebody who speaks English (an extra burden for those fluent in the language, one officer complains), or by an interpreter. This practice appears to be frequent in the military context, in which, because they have decision-making power, consequences can be serious as has been reported in other areas such as seafaring (Bocanegra-Valle, 2010, 2011; de la Campa-Portela, 2005, 2006; Johnson, 1994; Vangehuchten, van Parys, & Noble, 2011) and civil aviation (Connell, 1996; Cushing, 1994; Kim & Elder, 2009; Orasanu, Fisher, & Davidson, 1997; Ragan, 2002; Rantanen & Kokayeff, 2002; Tajima, 2004; Verhaegen, 2001).

In oral communication, difficulties in expressing one's thoughts were mentioned and with them the need to resort to shortcuts or to long and winding explanations. Occasionally, they admitted having even tried to avoid situations in which English needs to be used, whether in presentations, briefings or meetings. Speaking in public, and the frequent uncertainties and hesitations it implies, can damage some people's self-esteem, a clear handicap faced because of language deficiencies. They further acknowledged that the content of their presentation and even their professional image can be badly affected by poor oral skills (*"because you can't say what you know, it seems you do not know it"* respondent # In15).

Their awareness of perceived language deficiencies also extended to their perception of the audience's, either native or non-native speakers, reaction to their oral speech. Although felt as an understanding audience, the pressure to compensate lack of oral competence with better contents, or more attractive presentations seems to be, nevertheless, experienced. To remain on the safe side, avoiding sarcasm, irony or even humor (*"Do not try to tell jokes!"* respondent # In14) were strongly recommended by some of the interviewed officers.

When asked about their learning experience, to how and where they learnt English (Question 4: *In what formal and informal learning activities have you participated?*), respondents seem to be skeptical, even critical, with the language teaching/learning activities in which they had taken part: more frequently language courses in Spain (67.50%) than courses abroad (29.30%), together with private lessons (55.30%) and, considerably less frequently, professional courses in English (19.90%). This was one of the open-ended questions, which explains the general perception of dissatisfaction with standard language learning activities underlying those responses which mentioned immersion courses or stays abroad, most

frequently designed for younger students with totally different skills and motivations. As professionals, and thus as adult, more mature, learners, causes might respond, they claimed, to cultural aspects, to the lack of a social perception of the need to speak English, or to the Spanish educational system itself, as compared to those of other countries, such as Germany or Scandinavia.

Improvement was seen as ideal, but not realistic by interviewees, who also tried to provide solutions. These might come from sustainable lifelong learning; efforts should, they suggested, target younger generations of learners rather than professional adults, thus starting in childhood and moving away from short courses or isolated activities. When referring to training the pressure to improve their level of English, frequently felt as tedious or demotivating, appeared as a challenge, particularly because of the personal implications it involves, and certainly not economically or professionally rewarded.

3.3 About Communicative Events in the Military

Responses to the final set of questions, addressing genres and communicative events in which the members of the Spanish armed forces engage (Question 5: *In your professional practice you use English for reading ...* / Question 6: *In your professional practice you use English for writing ...*), contributed to explore the rich repertoire of genres employed by the members of the military community in their everyday communication, which reflect their very diverse fields of interest and the large array of communicative motives behind them:

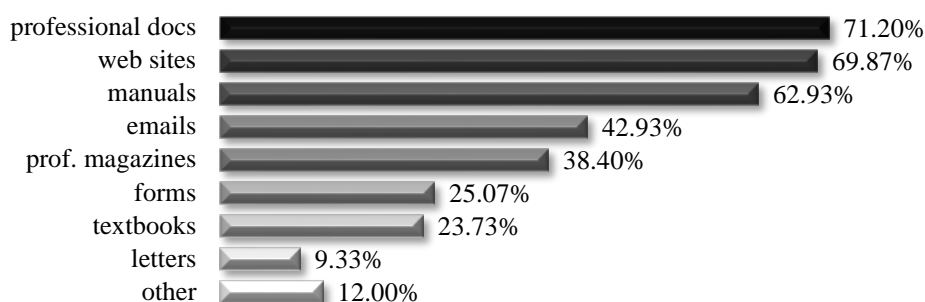


Figure 1. About reading genres.

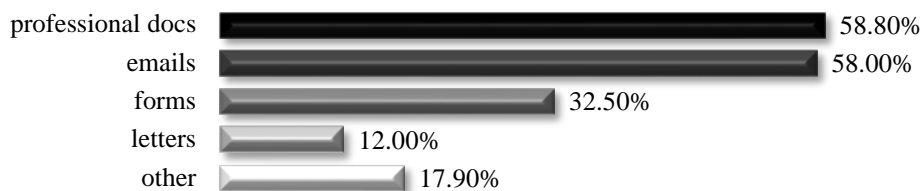


Figure 2. About writing genres.

As mentioned above, derived from their integration in multinational structures and organizations English emerges from the data as the lingua franca of allied forces. For the military community it is the language of the workplace, the language of the documents these professionals read and write in their working practice, a large array of professional documents (71.20% for writing/58.80% for reading) and forms (25.07%/32.50%), such as STANAGs, doctrine publications, norms or operational procedures, commonly used by allied countries. Connected with this growing international character of the Army could also be the use these professionals make of Internet resources for professional purposes, either for electronic purchases and transactions or for electronic communication, with team members or with suppliers. Hence, responses also showed the preference of reading and writing emails (42.93%/58.00%) over traditional letters (9.33%/12.00%) as a means of commercial and professional communication. Manuals, both traditional paper and electronic ones (62.93%) or textbooks (23.73%) were other frequently mentioned sources of information.

The high rate of consultation of web sites (69.87%) can be explained because these professionals are bound to work in an international environment requiring frequent contact with other armies or to be actually deployed to different parts of the world, which leads them to turn to online papers, TV stations (e.g., *BBC*, *CNN*, *Al Jazeera*), military journals (e.g., *Military Review*) or the websites of some international organizations like NATO or UN for information about the country or about the conflict in which they are or will very soon be involved. Also relevant for these professionals, particularly for those working in areas related to the ever-changing technological and scientific knowledge, is the need to update or enhance this knowledge on a variety of topics, such as defense, security, geopolitics, military history, international information, terrorism, other armies, etc.. This seems to lead them to search for information on the many fields of expertise in the Army, an institution comprising many different professional fields. For this reason, when asked to provide specific examples about the texts they write, a large number of topics were mentioned: whereas those assigned to engineering corps will look for information on recently developed equipment, materials, software or vehicles; those in the Artillery will read about newer weapons or about the weapons used by other armies, helicopter pilots will mention consulting flight protocols and the Medical Corps will search for information on, for example, rare diseases.

In response to the question of communicative events in which these professionals participate (Question 7: *In your professional practice you use written English in ...* / Question 8: *In your professional practice you use oral English in ...*), a number of written and oral activities were mentioned, involving different types of audiences and settings:

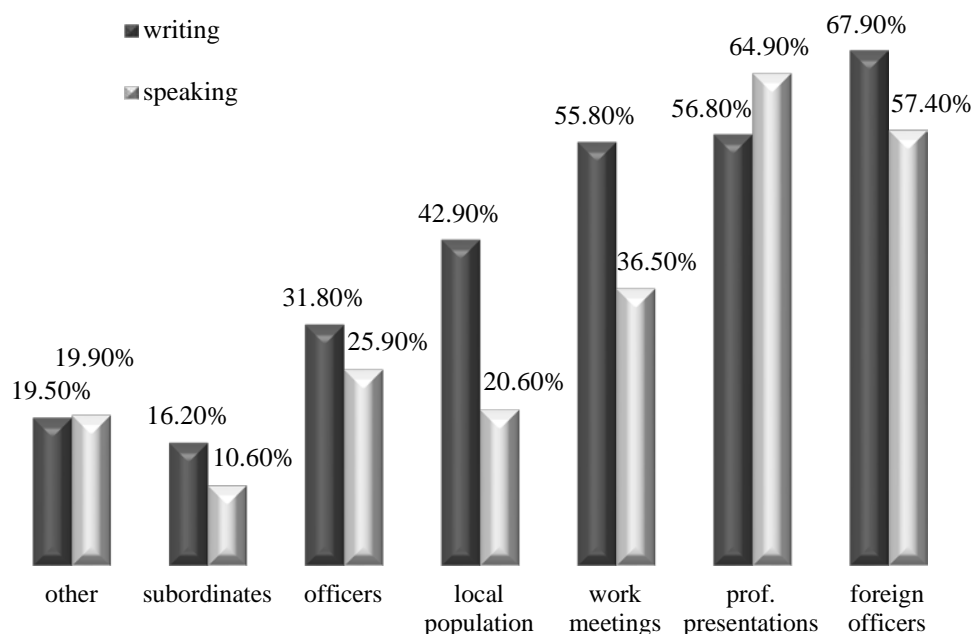


Figure 3. About their target audiences

The use of oral presentations (56.80%/64.90%) seems to correspond to the requirements of working in multinational teams, which, they claimed, certainly involves their participation in a large number of work meetings (55.80%/36.50%), frequently involving a large number of different intercours with a myriad of readers and listeners, national and international, native and non native speakers. In their professional practice they engage in more or less formal interaction with foreign (67.90%/57.40%) and national (31.80%/25.90%) officers and subordinates (10.60% / 16.20%)—transmitting or translating orders down the command line was frequently reported. Depending on their area of specialization, they report the use of written or oral communication with control towers, radio instructions, telephone or email conversations or contact with local suppliers, workers or contractors. Highly decisive for the success of the army mission is, in the respondents' view, also the communication with the local population (25.90%/42.90%), particularly oral interaction with civilians in conflict areas.

Despite the primarily professional character of language use in the military context, the interviews also brought to the fore a clearly social dimension of language use. English was reported as the language of social contact both in formal and informal contexts. This is again a particularly specific disciplinary feature of this community, accustomed to frequent deployments and transfers, a routine in the military world, both for personnel and their families. Positions or courses abroad are highly encouraged, and rewarded, by the Army promotion system and therefore the high frequency of questionnaire references to oral and written communication with present or former international colleagues, with whom very frequently they have shared not only work in Headquarters, but also barracks, clubs and even

their leisure time. Some of the informants even claimed that because workplace communication seems to have fixed, more easily learnt sets of rule and conventions, they tend to have more difficulty when dealing with the social use of the language during their off-duty time, for booking hotels or restaurants, for shopping or for sight-seeing; in short, when involved in small talk.

4 English as an International language in the Military

The goal of this survey was to explore the attitudes of the Spanish military community towards communication in English. Interesting perspectives have emerged from the study, which have ratified the essential role of English as the lingua franca of the international missions in which the Spanish armed forces participate as members of coalitions. As a vehicular tool, it is the language of the workplace as well as the language of everyday, ordinary life while in missions. The survey has brought to the fore the officers' awareness of the importance of English, seen as an opportunity for more successful participation in international activities, whether military missions, work at international headquarters and coalition meetings, or for the advancement of their careers. Acknowledging their lacks and deficiencies, they clearly showed their concern for the professional and personal consequences of the need to improve their level of English or for the pressing urge for certification. English is, understandably, felt as a challenge, even a burden, involving a lot of professional and personal effort.

However, the reported difficulties (even the reluctance) involved in those communicative situations in which English needs to be employed were referred to in this study. As has been reported for the business context (Ferguson, 2011; Holliday, 1995; Kankaanranta & Louhiala-Salminen, 2010; Rogerson-Revell, 2007, 2008), the lack of linguistic confidence or the discomfort with language use might lead to evaluation and judgment, to apparent misconceptions of intellectual competency and (un)cooperation or to combative or defensive attitudes. This is also true of the Military, particularly if viewed, in line with the mentioned studies, as a high status elite decision-making organization of institutional relevance at the international level. Collaborative work in multinational and multidisciplinary teams is necessarily challenging since the language is primarily used to fulfill a task but through that to develop strategies and to build professional networks. It is the complexity of multilingualism in multinational companies that has been claimed by Ferguson (2011), as the cause, of language barriers which might lead to situations of marginalization and disempowerment, because, in Rogerson-Revell's words (2007: 118), "while people may well need to 'speak the same language' in such multilingual contexts, they may not necessarily 'speak the same way'". The army can be seen, if I may borrow Ferguson's image, a large multinational and multilingual company in which a diversity of ages, races and cultures, of motives, values and norms are involved. For the Military, at the global and at the local levels, that is, internationally as well as in nationally, the workplace appears to be not only the place for individual professional interaction, but also for institutional advancement and achievement; not only for personal promotion but, very importantly, also for showing and exerting national and as international power.

Added to the possible negative institutional consequences of poor command of English, as some of the testimonies about miscommunication problems showed, are the consequences for international safety, also reported in fields closely related to military activities, such as seafaring (Bocanegra-Valle, 2010, 2011; de la Campa-Portela, 2005, 2006; Johnson, 1994; Vangehuchten, van Parys, & Noble, 2011) and civil aviation (Connell, 1996; Cushing, 1994;

Kim & Elder, 2009; Orasanu, Fisher, & Davidson, 1997; Ragan, 2002; Rantanen & Kokayeff, 2002; Tajima, 2004; Verhaegen, 2001). A further (mis)communication difficulty also referred to in the study is the role of English as the lingua franca of communication with the local populations in conflict areas, whether in patrol missions, for work with interpreters or in daily contact, for example, and with that the concern of armies around the world, also of the Spanish armed forces (*Vision del JEME 2025*, 2010), of showing cultural awareness and sensitivity to local peoples and cultures. This poses a greater challenge for the Military since it is precisely the intercultural component that has been shown (Alptekin, 2002; Dewey, 2007; Seidlhofer, 2001, 2004, 2005; Seidlhofer, Breiteneder, & Pitzl, 2006; Stadler, 2011; Vangehuchten, van Parys, & Noble, 2011, Watson, 2010) to cause most misunderstandings in communication. It is not only poor command of English, but also, as argued in these studies, ethnic, social and cultural factors that are undoubtedly decisive for intercultural communication.

The responses provided by officers themselves constitute a clear example of the link between the text and the discipline in the military community. The approach to the communicative practices of these professionals rendered valuable insights into their perceptions of both the text-internal and text-external features of military communication and thus of the correlation of communicative and professional practices advocated by Bhatia (2004, 2008). Both in the questionnaire open questions and in the follow-up interviews, the reference to their communication practices was intertwined with the reference to professional motives behind them. The study has thus allowed the connection of the single text with the wider picture of disciplinary and professional communication

Survey and interview findings have yielded a wealth of text-internal information about the genres employed by the military discipline in their professional written and oral communication but whose use can only be fully understood when interpreted in the light of disciplinary and socio-cognitive factors. By resorting to the perspective of military practices and procedures, military communication can be understood, as it is the case of many other international organizations, as requiring the participation of a large number of parties, each defined by their own regional and socio-cultural specificities, which would make the use of highly technical, standardized and conventionalized texts a necessity. This certainly must imply a higher level of complexity when writing reports, minutes, forms or oral presentations and thus when complying with the disciplinary conventions of those genres. Military communication involves not only lexico-grammatical, semantic or rhetorical constraints, but also a high socio-cultural component ruled by the need to standardize the procedures of different armies coming from totally different national backgrounds. If, as some informants claimed, standardization facilitates generic literacy once you are familiar with the genres, it also means that writing in the military is even more constrained than in other disciplines. For oral communication the diversity of audiences necessarily poses the challenge of coping with a diversity of socio-linguistic traits, of different accents and multinational multicultural features. The particular character of military life certainly forces their communication to address issues concerning not only adequate discursal or format expectations, but also issues such as the level of formality, using the right tone, expressing beliefs, views and attitudes or dealing with cultural barriers.

This study has meant to be a process of discourse contextualization which has helped to understand why the military community constructs discourse the way they do (Bhatia, 2004, 2008, Swales, 1990). This insight into the situational and social factors that scaffold the

construction of military communication has provided a very helpful framework for interpreting the generic, lexico-grammatical or rhetorical resources of their oral and written communication in English, as well as for the development of pedagogical tools.

5 Some Pedagogical Considerations

Communication appears to be an inseparable part of professional military practice and conversely communicative expertise is an essential part of being a professional; it is also a decisive part of learning to become a professional. In their enculturation process into disciplinary knowledge and practices, cadets, as future officers, need to develop both academic and professional literacies, that is, the acquisition of the disciplinary literacies of the military profession, both of subject content and of the literacy of effectively communicating in English (Bhatia, 2004, 2008; Holliday, 1995; Johns, 1997; Pérez-Llantada, 2009; Swales, 1990). As this survey-based research into the military discipline has highlighted, an important vehicle for their future professional success is the acquisition of communicative competence in English. The enculturation into military communication should thus help these learners to familiarize first of all with the generic, lexico-grammatical and rhetorical resources of military discourse. However, the survey findings have contributed to ratify claims made in the mentioned studies about the fact that successful military communication requires the fulfillment of linguistic as well as socio-linguistic requirements. Thus understood, professional communication competence does not only involve a linguistic dimension but it also has an interpersonal dimension; it is not only meant to produce a linguistically correct message, but also to accomplish professional goals, to transmit a message but through that to transmit disciplinary values and beliefs.

In the military context communicative competence has been shown to go beyond words, which involves the consideration of the social context and social rules of use. The creation of a meaningful learning environment should thus be sensitive to the social implications of communication and of the different sociolinguistic contexts underlying language use and promote the development of adequate communicative strategies. In the case of the military, as the survey findings have shown, educational priorities should be accommodated to raise the learners' awareness of a context of intercultural communication. A successful language training program should be designed to prepare and better equip future officers of the Spanish armed forces to acquire the communicative proficiency which allows them to avoid fatal miscommunication errors, to successfully communicate with the local population and ultimately to adequately represent the military institution in the international arena. To do so, the stress should fall on effective communication, on the acquisition of flexible skills, on familiarity with both native and non-native accents, with different norms and standards rather than on the traditional pressure for lexico-grammatical accuracy and appropriateness. The focus should shift away from the idealized, even utopian, monolithic image of the native speaker's language and culture, which fails to recoil the status of English as a lingua franca, as an international language and thus reflect the cultural, social and linguistic transformations of the international order.

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