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EDITORIAL:

Les ”Salons” organisés par notre Association DSFF en 2001, 2003 et 2005 à l'occasion de la « journée européenne des langues », ont eu un tel succès qu'il a été décidé de les répéter à l'avenir tous les ans. Le 4ième Salon « Langues et Communication », organisé cette année par la Fédération danoise des metiers de la communication et des langues, un des membres fondateurs de DSFF, s'est donc déroulé à Copenhague le 26 septembre dernier.

Le but de la journée européenne des langues est de sensibiliser les populations européennes à l'importance d'apprendre les langues étrangères.

Il semblerait que l'initiative n'est pas resté sans effet : selon la Commission Européenne, le nombre d'événements organisés à l'occasion de cette « journée » a constamment augmenté depuis son lancement en 2001. Par ailleurs, beaucoup de choses ont évolué durant cette même periode et ceci, en partie, grace aux initiatives du Conseil de l'Europe et de l'Union Européenne : recommandation de Barcelone (2002)[1], Plan d'action pour la promotion de l'apprentissage des langues (2003)[2], sans oublier les initiatives concrètes relatives à la formation, à la mobilité des étudiants, au financement d'échanges des classes, de jumelages etc. par l'intermédiaire des programmes Socrates et Lingua. C'est durant cette période aussi que les gouvernements commencent à réaliser qu'une politique des langues pourrait être nécessaire. On publie des rapports, on lance des études et on vote des déclarations. La dernière déclaration en date, votée par le Conseil des Ministres Scandinaves le 1er septembre 2006[3], est particulièrement intéressante pour plusieurs raisons. Elle recommande une politique des langues pour une région qui comprend 5 nations plus 3 régions autonomes et au moins 8 langues dont les 6 sont des langues « complètes ».

La politique des langues suggérée pour la Scandinavie et qui repose sur le principe des langues parallèles devrait assurer que tous les citoyens des pays nordiques sachent lire et écrire la langue ou les langues d'usage dans la région où ils résident, qu'ils soient capables de communiquer avec les habitants des autres pays nordiques dans une langue scandinave, et qu'ils aient une très bonne maîtrise d'une langue « internationale » ainsi qu'une bonne connaissance d'une 2ième langue étrangère.

La déclaration décrit les moyens à mettre en œuvre (renforcement de l'enseignement des langues etc.) et se veut un modèle à suivre pour d'autres nations ou régions européennes.

Bien qu'on puisse déplorer que ce genre de recommandations ne sont que des déclarations d'intention sans force de loi, il est permis de supposer que certaines

[1] Voir editorial nr.10 (LSP & Professional Communication Volume 5, Number 2, October 2005).
[2] Journée Européene des langues 2006. Entretien avec M. Figel´.
http://europa.eu/languages/fr/document/90
[3] Deklaration om nordisk språkpolitik. Ministerrådsforslag vedtaget af Ministerrådet for Uddannelse og Forskning på MR-U 2/06 mødet, afholdt den 1. september 2006.

mesures ont été prises ces cinq dernières années dans les différents pays pour favoriser l'apprentissage des langues étrangères.

Dans les statistiques disponibles on trouve certaines indications.

De l'enquête Eurobaromètre 2005[4] il ressort qur le pourcentage des citoyen européens ayant une bonne maitrise d'au moins une langue étrangère, serait passé de 42% en 2001 à 56% en 2005. Mais comme le dis M. Ján Figel´, Commissaire européen en charge de l'Education, de la Formation, de la Culture et du Multilinguisme, dans un recent entretien, cette enquête ne se fonde que sur une autoévaluation et « nous avons besoin de données objectives sur l'efficacité des systèmes scolaires en matière d'enseignement des langues étrangères aux citoyens européens de demain ». Il souligne que l'UE a entrepris de mettre au point un indicateur européen de compétence linguistique et que d'ici deux ans nous disposerons des premières données fiables sur la compétence linguistique des élèves européens au sortir de l'enseignement obligatoire.

En attendant, d'autres statistiques nous montrent les progrès depuis la fin du siècle dernier. Notamment il ressort de l'étude « Eurydice »[5] (financée par la Commission) que l'apprentissage d'une langue étrangère est imposé aujourd'hui aux élèves dès le niveau primaire dans presque tous les pays, que tous les élèves doivent poursuivre cet enseignement jusqu'à la fin de la scolarité obligatoire et que l'enseignement d'une deuxième langue étrangère devient généralement obligatoire au niveau du secondaire.

Si l'enseignement durant la scolarité obligatoire semble ainsi en bonne voie, d'autres niveaux méritent par contre notre attention : une étude Eurostat de 2005[6], portant sur 28 pays européens, montre le nombre de langues étudiées par élève dans le secondaire. Or si depuis l'an 2000 les chiffres sont pratiquement inchangés au niveau du collège (1,5 langue en moyenne), il y a une baisse d'environ 20% pendant la même période dans le second cycle (de 1,38 à 1,13 langue par élève).

Si cette évolution continue elle risque de déclencher une réaction en chaine. Déjà le nombre d'étudiants dans les facultés de langues accuse une forte baisse et, à terme, l'Europe plurilingue pourra se trouver en manque de spécialistes de langues (enseignants, traducteurs, chercheurs etc.) à tous les niveaux et dans tous les domaines d'une société moderne.

Le comité de rédaction

[4] Special EUROBAROMETER 243 "Europeans and their Languages" (Summary). http://www.eu.nl/public_opinion/archives/ebs/ebs_243_sum_da.pdf

[5] Chiffres clés de l'enseignement des langues à l'école en Europe – Édition 2005. http://www.eurydice.org/portal/page/portal/Eurydice/showPresentation?pubid=049FR

[6] Langues étrangères étudiées par élève. Enseignement secondaire (moyenne). Statistiques générales et régionales. Eurostat 2005. http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=CCA13072

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EDITORIAL:

The three language fairs that our society, the DSFF, organized in 2001, 2003 and 2005 on the occasion of the European Day of Languages, proved to be so successful that the decision has been taken to arrange them every year from now on. The fourth fair, "Communication and Language Forum", was arranged this year by a co-founder of the DSFF, the Association for Professional Communication and Languages, and held in Copenhagen on 26 September.

The whole point of the European Day of Languages is to raise public awareness about the importance of learning foreign languages.

It appears that this particular initiative has not been without effect: according to the European Commission, the number of events organised in connection with the European Day of Language has risen constantly since its launch in 2001. Much else besides has evolved over the past five years thanks, in part and not least, to the initiatives taken by the European Council and the EU: the Barcelona recommendations of 2002[1], the EU plan of action for language teaching in 2003[2] and, not least, the concrete measures in areas such as education, student mobility, financing of class exchanges, twinning arrangements with practical language outcomes and the like. All of this carried out by means of the Lingua and Socrates programs. It seems that, during this period, it has also dawned on governments that it just might be necessary to set up a language policy. Reports are published, studies are launched and resolutions passed. The latest of the latter, the "Declaration on Nordic Language Policy" was adopted by the Nordic Council of Ministers on 1 September this year[3], is of particular interest for a variety of reasons. It recommends a single policy for an entire region comprising five nations and three self-governing areas with at least eight languages, of which six are "complete". The language policy recommended for Scandinavia, that rests on the principle of parallel languages, should ensure that all the citizens of a given Nordic country can read and write the language or languages current in the area where they live and that everyone is able to communicate with the inhabitants of other Nordic countries in one Scandinavian language. Furthermore, everyone should acquire a high level of proficiency in one internationally oriented language and a reasonable level in a further foreign language.

The Declaration describes the means that will have to be deployed in order to reach the goals outlined above. These mainly concern the reinforcement of language teaching at school. It is also clear that, based on the model drawn up above, the Nordic area is seen as a leading area in terms of language policy.

One can deplore the fact that this type of declaration is only one of intent and that it is not legally binding, however, it does reflect the fact that, over the past five years, the

[1] Cf. editorial no.10 (LSP & Professional Communication Volume 5, Number 2, October 2005).
[2] European Day of Languages 2006. Interview with Commissioner Ján Figel'.
http://europa.eu/languages/en/document/90
[3] Deklaration om nordisk språkpolitik. Ministerrådsforslag vedtaget af Ministerrådet for Uddannelse og Forskning på MR-U 2/06 mødet, afholdt den 1. september 2006.

various signatory countries have done much to tighten up and improve their foreign language teaching.

The available statistics do provide some indication of this.

The 2005 Eurobarometer Report on "Europeans and their languages"[4] shows that the percentage of EU citizens reporting high skill levels in at least one foreign language has risen from 41 per cent in 2001 to 56 per cent in 2005. Ján Figel of the European Commission says in a recent interview, however, that this particular study was based on peoples' own evaluation of their language proficiency. He goes on to say "What we really need is hard data on the efficiency of school systems in teaching languages to the European citizens of tomorrow." Mr Figel underlined the fact that the EU had made a substantial effort to introduce a European scale to measure linguistic competence. In about two years from now, the first set of reliable data concerning the language proficiency levels of pupils leaving compulsory school should just have become available.

In the meantime, other statistics show the progress made since the start of the new millennium. The 2005 Eurydice study[5] indicates that the teaching of one foreign language at primary level has been made compulsory in almost all member states.

The teaching of this foreign language continues throughout primary school and, normally, a second foreign language is taught from the seventh form onwards.

Whereas language teaching at primary level thus seems to be on the right track, other levels within education should be looked at. A 2005 Eurostat study[6], carried out in 28 European countries, shows the number of languages that each pupil is taught from the sixth form to the Advanced Levels. The study shows that the number of languages taught to each pupil from the sixth to ninth forms is unchanged at an average of 1.5 languages per pupil since 2000. There is, however, a drop of about 20 per cent at the Advanced Levels over the same time span from about 1.38 languages per pupil to about 1.13.

Should this trend continue, there is a real risk of it starting a chain reaction. There has, already at the time of writing, been a sharp drop in the number of language students enrolled at the universities. This means that, in the fullness of time, multilingual Europe will experience a serious shortage of language specialists, teachers, translators and researchers at all levels and in all areas of modern society.

The Editorial Board

[4] Special EUROBAROMETER 243 "Europeans and their Languages" (Summary). http://ec.europa.eu/public_opinion/archives/ebs/ebs_243_sum_en.pdf

[5] Key data on teaching languages at school in Europe - 2005 Edition. http://www.eurydice.org/portal/page/portal/Eurydice/showPresentation?pubid=049EN

[6] Foreign languages learnt per pupil. Secondary education (average). Eurostat 2005. General and regional statistics. http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=CCA13072

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ARTICLES:

"A clear magnetic light" - can metaphors help with scientific models in ESP? The case of gadolinium

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1. Introduction

Although metaphor has been identified and used as a figure of speech since the time of Aristotle at least, its cognitive importance has only recently been fully recognized with the cognitive theory of conceptual metaphors pioneered by Lakoff and Johnson:"The essence of metaphor is understanding and experiencing one kind of thing in terms of another" (1980: 5). Conceptual metaphors are reflected in set phrases and idioms at a linguistic level. Lakoff and Johnson conceive them as primarily rooted in embodied experience (1999: 44-59). For convenience sake, conceptual metaphors will be written in capital letters in this article and their linguistic counterparts in italics. HAPPY IS UP/SAD IS DOWN, for example, with instantiations such as *cheer up*, *ups and downs*, *to feel down*, *to be downhearted*, etc..., derives from the fact that lying down is often caused by tiredness or sickness, whereas the upright position is characterised by energy and movement. But Lakoff and Johnson also acknowledge that conceptual metaphors may also be influenced by culture. Examples such as *it's a waste of time*, *a time saving device*, *try to gain time*, etc..., can be related to TIME IS MONEY, and seem typical of our western civilization, but might not make much sense among traditional societies in Oceania or Africa. All conceptual metaphors operate by creating "a cross-domain mapping in the conceptual system" (Lakoff, 1973:203), i.e. by transferring the logic of a metaphorical source domain onto a target domain that is to be characterised.

The cognitive view of metaphors has been adopted for this study because it is based on a mapping process which is particularly coherent with the analogical transfer method often used in scientific theory (Hesse, 1966, King, 1991, Cowan et al., 1994, Montuschi, 2000, Gentner et al., 2001). Models in science can be broadly

defined as "simplified representations" (Crease, 1999) consisting in a transfer of shapes or structures from one domain to another (Black, 1962). Niels Bohr's representation of the atom as a miniature solar system is a typical historical example of how a better known domain (Newtonian mechanics) may be used to understand a less well-known one (sub-atomic particles).[1] The use of models dates back to the astronomical maps of the Greeks, but the development of computer calculating power has opened up a host of new possibilities for modelling and simulation, so that the important role played by models in scientific discoveries is now commonly acknowledged (Magnani et al, 1998).

Models and metaphors are relevant to the field of English for Specific Purposes (ESP) in a number of different ways. Most English teachers in science and technology departments are quite comfortable with metaphors, but find dealing with scientific models a daunting prospect, especially if they are fraught with equations. However, as models are becoming an essential channel of professional communication in modern experimental sciences as well as in information technology, they cannot be overlooked altogether. One solution may require resorting to an "expert informant" , i.e. a specialist of the domain who can provide explanations. If no such person is available, however, the similar mechanisms underlying models and metaphors prompt the question: can our knowledge of metaphor help us to understand scientific models, or at least to make sense of them in such a way that we can grasp the role they play in scientific communication? Given the exploratory character of the questions asked, a case study approach seems appropriate in order to explore their relevance in one scientific field before generalising to experimental sciences as a whole .

2. Materials and methods

The metaphors and models analysed in this study are taken from a review article on the use of gadolinium ions in Magnetic Resonance Imaging (MRI) published in *Chemical Reviews*, entitled: "Gadolinium chelates as MRI contrast agents: Structure, Dynamics, and Applications" (Caravan et al., 1999), and hereafter referred to as CR. This article summarizes the state of the art in MRI research for medical diagnostic applications at the end of the 1990s. MRI scans are now widely applied as a help for medical diagnosis because, unlike conventional radiography and computed tomographic imaging (CT) which use potentially harmful X-rays, it is a non-invasive procedure. The principle of the scans consists in using the magnetic properties of stable (non-radioactive) nuclei. Patients are placed in a tunnel-like tube generating a very strong magnetic field. Suitable pulses of radio-waves are then broadcast, which disturbs the magnetic properties of the hydrogen protons contained in the water molecules of our body. The time they take to return to equilibrium (the so-called relaxation rate) is monitored, and transformed into images via a computer. In order to enhance the pictures obtained, contrast agents may be used, the most popular being gadolinium, a “clear magnetic light” (CR:

[1]It is worth noting that Bohr's model is still being used in undergraduate classes for pedagogical purposes, although it has been outdated ever since Schrödinger's equations replaced Newtonian mechanics at a sub-atomic scale.

2293). Gadolinium ions have the property of enabling neighbouring hydrogen protons to relax faster, therefore enhancing the relaxation rate contrast between the tissues absorbing gadolinium, and the rest. Gadolinium ions are potentially toxic, but can be easily and safely trapped by chemical molecules called ligands to form gadolinium complexes.

The field of MRI studies was chosen for two reasons. First of all the complexity of the issue at stake, i.e. characterising through simple images and theories the effects of gadolinium ions in the macro-environment of billions of interacting molecules, implies an intensive use of models. Secondly, it has the advantage of being more inclusive, in as much as, besides its main grounding in physical chemistry, it makes use of different scientific fields: crystallography to determine the structure of molecules, coordination chemistry to synthesize new gadolinium complexes, mathematics to solve differential equations for relaxation theory, pharmacology to test *in vivo* compatibility and medicine to develop new applications for clinical diagnosis. This interdisciplinary scope offsets one of the limits of the case study approach, implying that the tentative conclusions reached may be generalised to a wider range of scientific fields.

Now that the field of MRI scans and contrast agents has been introduced, we can come back to the initial question asked: can conceptual metaphors help us make sense of scientific models? In order to answer it, we must first identify the types of models used in CR and their functions, then the conceptual metaphors found and the parts they play, before looking for interactions between models and metaphors.

3. Models: typology and functions

Let us first look at the types of models found in the CR article. Black[2] (1962) distinguishes between scale models (three dimensional miniatures or magnified versions of some material object), and theoretical models which are based on an identity of structure between two different fields and make an intensive use of mathematics. This typology is still relevant today, and comprehensive enough to include visual and mathematical as well as verbal models, which fits in well with the CR article.

Scale models are the easiest to recognize. They appear either with a tri-dimensional shape, or as a two-dimensional developed chemical formula. Let us take the example of gadolinium-DTPA, a chemical complex commonly used in medical MRI (see appendix n°1). In the developed chemical formula the atoms are represented by their acronym in the periodic table, and the chemical bonds by dashes (see appendix n°1 again). On the other hand, the three-dimensional model features each atom as a roughly spherical ball and each chemical bond as a link (in the displayed compact model links are embedded in atoms). On the whole, 147 developed chemical formulae appear in the CR article and 43 three-dimensional

[2] His influence was acknowledged by Johnson (1987) and Lakoff (1993), along with that of other philosophers of science such as Hesse and Boyd.

models, using up 13 pages out of 59, almost one quarter of the space. The distribution of scale models is not homogeneous throughout the article, however. On the one hand they are widely used to illustrate molecular special geometry in the parts entitled “Solution and Solid State Structure” and “Physical Properties of Small Molecule Gadolinium Complexes”. On the other, they are almost completely absent from the mathematical part, which sums up relaxation theory, and the clinical applications at the end (see appendix n°2). The origin of the three-dimensional models dates back to the beginning of quantum mechanics and to one of its basic postulates, the Pauli principle, which restricts the number of electrons occupying the same region in space. One of the consequences of this principle is that interpenetration is prevented in the regions occupied by the electrons around two atoms, except in case of a chemical bond (i.e. two atoms sharing a couple of electrons) where these regions can have a slight overlap defining the bonding zone. This accounts for the representation of atoms as impenetrable hard balls.

How can such a model help us to understand the theory of MRI relaxation contrast agents? We must remember that contrast agents work by helping water protons to revert to equilibrium more rapidly. The relaxing power of gadolinium in a given chemical complex depends, among other things, on the rotation movement of the complex, as well as the movements of the surrounding water molecules. This emphasizes the importance of being able to describe molecular movements. For that purpose a common (and sometimes rough) approximation consists in representing all contrast agents as spheres, whatever their actual shapes: “Water molecules and the Gd(III) complex are often treated as hard spheres” (CR: 2325). The molecular rotation movements are then much more easily set into equations. This is the case in figure 45 (cf. appendix 2), where the gadolinium-based contrast agent MS325 is represented as a small ball binding to an albumin cell in the shape of a bigger sphere: "The agent is shown schematically as consisting of two parts: a circular gadolinium chelate and a bullet-shaped protein-binding moiety." (C p. 2341) The example of figure 45 thus illustrates clearly how scale models aim at reproducing an original schematically, suppressing certain features, and emphasizing others.

While a scale model (of a molecule, for example) always has an important visual component, theoretical models are much more general and seek to reproduce a structure. In theoretical models, the intuition of an analogy between a real field and a mathematical structure is quantified through applicable mathematical formulae, although the price paid is some degree of simplification. The importance of mathematics in the CR article is directly expressed through 28 equations, two thirds of which being contained in the five pages summing up relaxation theory, and indirectly shown throughout the article by the use of 27 numerical tables which take up one sixth of the space (10 pages out of 59, see appendix n°2).

After this brief description of the range of models found, the question of their function can now be addressed. The models used in the CR article play a dual role: they enable us to visualise on the one hand, to explain and predict on the other. The

tri-dimensional scale model provides the best visual aid through its magnified version of the geometrical structure of the molecule: the links created by the chemical bonds, and their angles, the relative positions of the different atoms in the molecule.

While three-dimensional scaled molecules alone can function as a visual help, all models can be used to explain and predict (Hesse 1966: 157-177). In fact, explanation and prediction can be viewed as mirror images of the same process. On the one hand biological behaviour can be deduced from chemical properties through prediction, but on the other hand chemical properties can also be induced from biological observations, and this provides an explanation. The tri-dimensional model of DTPA, for example, can provide a visual account of how a gadolinium ion can be trapped (see appendix 1). A DTPA molecule can take different shapes, according to the way the different atoms move around their chemical bonds. The negatively charged nitrogen and oxygen atoms of a DTPA molecule are attracted by a positively charged gadolinium ion (coloured in red in the middle), and tend to move around their chemical bonds so as to trap, or complex, this metallic ion.

In the case of theoretical models, predictive ability is an essential element of validity, so that they develop in a continual exchange between experiments and mathematical formalism. For example this is shown quite clearly with the in vivo stability problem (cf appendix n°4). As free gadolinium is a potentially toxic metal ion, contrast agents can only be inoculated in vivo if the complexing molecules can trap gadolinium efficiently. One of the ways of solving this problem is to start from the fundamental thermodynamic properties of a molecule, and predict its in vivo behaviour. The simplest model consists in using the thermodynamic stability constant KGdL, defined by equation 7 (cf. appendix n°4). This model can be refined by taking the acidity of the liquid into account, and defining a new conditional stability constant K*ML, calculated according to equation 8. Then, in order to check experimentally if the thermodynamic stability predictions still apply in vivo, the contrast agent studied is injected into mice, and the quantity of free gadolinium ions found in the skeletons is measured seven days later. If neighbouring values for the conditional stability constant match neighbouring doses of gadolinium found in the skeletons, the prediction is verified, and the model validated. This is in fact not the case here, as the authors' provisional conclusion acknowledges: "Thus it is clear that thermodynamics, i.e. the gadolinium stability constant alone, is not sufficient to explain in vivo stability trends." (C. p 1315). The model must be further extended, taking into account the affinity of the complexing molecule for other metallic ions, as well as for gadolinium. This in turn leads to new equations, new tests, etc, until experimental results are in good agreement with predictions based on thermodynamic properties.

This brief overview of some of the models used in the field of MRI is an illustration of how widely they are used, a popularity which can be explained both by the need to visualize molecular interaction, and the time gained in projecting

successfully the structure of a well-known domain onto a less well-known one. Let us now turn to the metaphors contained in the CR article.

4. Metaphors: typology and functions

The metaphors contained in the CR article were identified by the present author, which made it possible to use conceptual metaphor theory in that task, and also to match the identification criteria with the purpose of this article (see Low 1999: 49). If we remember that the point of view adopted is that of a layperson trying to grasp MRI models through the metaphor she selects, it does not really matter if some of the metaphors are overlooked: if they are opaque to her, they would not be of any use in order to help understand models. The metaphors selected were then checked with an expert informant to offset the subjective character of unilateral identification, and make sure that all the phrases selected were indeed metaphorical (see Low 1999:49 again).

184 metaphors were found in the 59 pages and 24,689 words of the CR article, which amounts to an average of a metaphor every 134 words, and a little over three metaphors per page. Globally, metaphors are only slightly outnumbered by visual models (184 versus 190), and share with them an uneven distribution throughout the article (see appendix n°2). Predictably, the parts using most metaphors are the least technical ones: the introduction (one metaphor in every 48 words), and the clinical applications at the end (one metaphor in every 83 words). On the other hand, the parts containing the fewest metaphors focus either on mathematics ("Relaxation Theory", with a rate of one metaphor out of every 575 words) or on physics ("Physical properties of Small Molecule Gadolinium Complexes", featuring only one metaphor in every 668 words). Other results, however, are more surprising at first sight. The part describing the physical structure of chemical molecules ("Solution and Solid State Structure") is above average for its content of metaphors (one in every 95 words) as well as scale models (two-thirds of the visual models in half of the pages). On second thoughts, though, this fits in well with a strong need for visualisation in a part describing molecular geometry.

After this brief quantitative overview, let us now turn to the conceptual metaphors found, and how the analogical mapping they are based on functions, projecting characteristics of a concrete domain (the source, in cognitive semantics terms) onto a more abstract one (the target). In the CR article, metaphorical targets are mostly either chemical molecules or on scientific theory, in a direct link with the contents (see appendix n°6). Source domains for molecules are borrowed either from the construction industry, or from personification. The source domain of civil engineering allows one to conceive intramolecular connections over atoms or groups of atoms as bridges: *bridging ligand* (CR: 2311*), bridged trimer* (CR: 2303), *ethelene bridges* (CR: 2311). The most frequent source by far, however, is the human body. It has the same origin as visual models, which represent molecules as balls: gadolinium is portrayed as *a little hydrophylic ball* (CR: 2295). Through metonymy (a ball has the same shape as a human head) and synecdoche (the head stands for the whole person), we come to the end result A MOLECULE IS A

PERSON. This personification is nowhere openly acknowledged but functions throughout the article as an overarching subconscious conceptual metaphor leaving clues at the linguistic level of metaphorical expressions. This is reminiscent to the way Turner and Fauconnier (1995: 188) analyse the desk-top metaphor as an interface between human users and home computers: "The user is not manipulating this computer interface by means of an elaborate conscious analogy, but as an integrated form with its own coherent uses and properties". A mapping of the metaphor links different parts of the body with various parts of a molecule: the "*face"* represents the front of a molecule: *the phosphinate oxygen face of the molecule* (CR: 2304), *the twist angles between the faces* (CR: 2306). "*Arms"* project onto peripheral moving parts*: acetate arms* (CR: 2302, 2312, 2313*), hydroxypropyl arm* (CR: 2313). "B*ackbones"* are likened to central parts (*backbone of the ligand* (CR: 2300), *terminal backbone nitrogens* (CR: 2311)). These metaphorical uses of *arm* and *backbone* seem to be conventional rather than creative, which can be checked easily in *Chemical Abstracts*, a database containing the article abstracts of the most well-known chemical journals. The phrase *pendant arm* appears 406 times in *Chemical Abstracts* and *lysine backbone* 101 times. This conventional character has even led to lexicalisation, since *arm* has become the established way of referring to "linear chains attached to a central unit" in a molecule, and *backbone* to "the main chain of atoms", according to the American Heritage Dictionaries.

These words do not seem to have any non-figurative synonym (just as there is no non-figurative way of referring to the leg of a table), but, beyond filling a gap in the lexis, they also play an important role as "theory constitutive" metaphors, as argued by Boyd:

> There exists an important class of metaphors which play a role in the development and articulation of theories in relatively mature sciences. Their function is a sort of catachresis - that is, they are used to introduce theoretical terminology where none previously existed. (1993: 482)

The official adoption of "*arm"* and "*backbone"* by the discipline of physical chemistry, rather than, say, "lungs" or "kidneys", is constrained by the subject of the article: understanding the use of gadolinium involves primarily making sense of molecular interactions, which map onto body movements, and the body parts being able to move, i.e. limbs and backbone. This can be shown as follows. From the premises that persons have arms and backbones (including elbows, wrists, knuckles and vertebrae), we can infer that joints allow us to take special positions and to move. This non-metaphorical entailment related to the human body is projected onto a metaphorical one in the target domain of coordination chemistry: molecular arms and backbones help to account for special atom positions within the complexing molecule (i.e. molecular geometry), as well as for molecular movements (e.g. trapping a gadolinium ion to form a chemical complex). Selected fixed geometries are described according to different criteria: they can take into account either the global geometrical structure of the molecule ("*wrapping*

isomers" CR: 2310,11,12,13), as from a distant view, or only part of it ("*capped plane*" CR: 2303, "*capping position*" CR: 2301, 4, 7) as in a close-up. This duality of a partial versus a global geometry is also relevant in a dynamic approach, separate limb movements mapping onto specific local changes of positions of the atoms, and global body motion onto full intra-molecular dynamics (cf. table 1 below[3]).

PERSON	MOLECULE
premises:	parallel premises:
1) Persons have faces, arms and backbones	1') Molecules have"*faces*","*arms*", and "*backbones*" "*phosphinate oxygen face*" (CR: 2304) "*twist angles between the faces*" (CR: 2306) "*acetate arms*"(CR: 2312),"*hydroxypropyl arm*" (CR: 2313),"*phosphonate arm*"(CR: 2313),"*pendant arm*" (CR: 2314) "*lysine backbone*" (CR: 2336), "*diclohexyltriamine backbone*" (CR: 2297), "*backbone of the ligand*" (CR: 2300), "*terminal backbone nitrogens* " (CR: 2301)
non metaphorical entailments:	metaphorical entailments:
2) our limbs and backbone allow us to take special positions	2') molecular arms and backbones form peculiar atomic geometries "capping positions" (CR: 2301), "capped planes" (CR: 2303), wrapping isomers (CR: 2310)
3) our limbs and backbone allow us to move	3') molecular "*arms*" and "*backbones"* help to account for molecular movements "*shuffling* of coordinated acetates" (CR: 2310), "*flip* of the backbone ethylenes"(CR: 2310, 11), "*tickling* "(CR: 2293), "*intricate danse*" (CR: 2295)
4) our limbs and backbones allow us to perform actions with our whole bodies	4') molecular *"arms"* and *"backbones"* help to account for organised intermolecular movement, i.e. actions "small iron particles can *function as T1 agents*" (CR: 2295), "The texaphyrin ring… *acts as* a monoanion" (CR: 2308), "donor atom" (CR: 2300)

Table 1

[3] In this article, metaphorical inferences have been represented in tables rather than with arrows, following Rohrer (1995, 1997) so that entailments can be clearly highlighted.

This first entailment could be summed up as MOLECULAR POSITIONS ARE BODILY POSITIONS. It can be extended to: MOLECULAR MOVEMENTS ARE BODILY MOVEMENTS. This is already exemplified in the introduction to the article, in which a global view on gadolinium is adopted. It is introduced as "this potentially toxic metal ion which floats among the water molecules, *tickling* them magnetically" (CR: 2293)

This tickling corresponds to the crucial interaction of the gadolinium electrons with the nuclear magnets of the water protons. Their coupling is minute in comparison with the violent direct collisions of a gadolinium complex with a water molecule, which justifies the use of "*tickling*". In the case of dysprosium Dy (III), a neighbouring lanthanide ion, the coupling becomes so fast that it has no effect on the nuclear magnets, as expressed by this aesthetic, even exotic appraisal: "In the *intricate danse* that gives rise to relaxivity, water protons hardly *feel* the effect of ions such as Dy(III), *much like a leaf near the incredibly rapid wings of a humming-bird*." (CR: 2295)[4]. In other words the stimulus becomes too rapid to be felt. After the introduction, in the description of molecular structures, the target domain focuses on what happens inside molecular complexes, with either disorderly movements: "the *shuffling* of coordinated acetates" (CR: 2310), or rapid to-ing and fro-ing: "a *flip* of the backbone ethylenes ..."(CR: 2310-11). Molecules are then tackled more globally in the rest of the article. They are pictured as able to perform actions (thanks to movements), and the first two entailments are subsumed under a more general third one: MOLECULAR ACTIONS ARE BODILY ACTIONS, with instantiations such as: “small iron particles can *function as T1 agents*” (CR: 2295), “The texaphyrin ring… *acts as* a monoanion” (CR: 2308), or “*donor atom*” (CR: 2300). In the part dealing with clinical applications, molecules are even endowed with human-like perception, and even judgment:
“MRI agents which *sense* their biochemical environment“ (CR: 2348)
“MRI enzymes which *sense* the presence of particular enzymes” (CR: 2348).
“Lanthanides tend to favour high coordination numbers in aqueous media” (CR: 2296)

The conceptual metaphor A MOLECULE IS A PERSON therefore seems to be the most consistent way of conceptualising molecules in the CR article. This seems paradoxical at first sight, since scientific writing is widely considered as being impersonal, as acknowledged for instance in *A Grammar of Contemporary English* (Quirk et al., 1972: 808): “The passive is generally more commonly used in informative than in imaginative writing, notably in the objective non-personal style of scientific articles and news items.” This frequent use of passives is correlated in scientific discourse with a strong tendency to nominalize processes into objects, in order to measure them more easily. The first sentence in the second paragraph of the CR article exemplifies both trends: “The successful *penetration* of gadolinium chelates into radiologic practice and medicine as a whole *can be measured* in many

[4]This simile can be considered as a figurative extension of the MOLECULAR MOVEMENTS ARE BODILY MOVEMENTS entailment, as interacting bodies are not human persons, but instead leaves and hummingbirds.

ways." (CR: 2293) This gives the overall picture of an impersonal world populated with objects.

It would be unfair, however, to stop there. As experimental scientists choose to disappear behind passives in the research articles they write, they also endow objects and abstract notions alike with human-like skills (see Banks 1994: 90-103, Fries 2005: 235-236). In the CR article, figures, data and studies are capable of ostention: "table 11 *shows*…" (CR: 2318), "this result *highlights* a key-point" (CR: 2316). They can also produce descriptions: "These equations *describe* relaxation as a function of magnetic field" (CR: 2321), and even make demonstrations on their own: "Neutron diffraction studies… *demonstrate* that this angle can be quite varied…" (CR: 2322). These personifications can therefore pragmatically be considered as a sort of hedges (see Lakoff 1972), one of the many ways used by scientists to disguise their presence in scientific research articles and avoid potential controversy with their peers. This clearly shows that personification has a part to play in modern scientific prose, and that the conceptual metaphor A MOLECULE IS A PERSON is by no means as incongruous as it seems at first sight.

Let us now come back to the cognitive function of this metaphor. According to Lakoff and Johnson, personifications:

> "allow us to make sense of phenomena in the world in human terms - terms that we can understand on the basis of our own motivations, goals, actions, and characteristics." (1980:34).

When gadolinium is presented as "*tickling*" water molecules(CR: 2393), the humorous personification contained in "*tickling*" enables the reader to picture the incredibly rapid movements (nanoseconds, or even less) of minute molecules (a few angströms wide) by transferring them to a human scale. It also implies that the interaction between gadolinium and water is superficial, fast, and does not produce any lasting change.

Another dimension of personification according to cognitive semantics is embodiment, with the claim that the experience we have of our bodies in space can be mapped onto more abstract domains (see in particular Johnson, 1987), especially thanks to conceptual metaphor. Rohrer (2005) surveys no less than 12 dimensions of the term embodiment in cognitive science. In the fourth dimension, called "perspective", he points out that "we routinely project the canonical orientations of our embodiment onto the objects of the world" (2005: 9). This explains the use of prepositions such as "in front of" or "at the back of". It also motivates many of the names chosen to describe landscapes:

> "In English we can speak metaphorically about features of the landscape in terms of the body, such as *the face of a mountain, the mouth of a river, the foothills,* and so on… In other words we understand features of the landscape metaphorically, using our bodies as the grounding frame of reference." (2005: 5)

Mutatis mutandis, the adoption of "*arms*", "*backbones"* and "*faces"* in chemical parlance is also due to a projection of bodily experience onto molecular structure. The personification of molecules in the CR article therefore has a double cognitive role: enabling us to describe phenomena at an infinitesimal scale, and to make sense of their spatial geometry.

In the CR article, the most popular target domain for metaphors, after molecules, is theories, which comes as no surprise for a survey dealing with fairly abstract models. Two major conceptual metaphors are used: THEORIES ARE JOURNEYS, and THEORIES ARE MINING. The THEORIES ARE JOURNEYS metaphor foregrounds an ongoing process. Problems regarding discoveries are mapped onto a horizontal plane, with obstacles to be overcome: "*One hurdle that remains* in these systems is the coordination of endogenous anions..." (C p. 2334). In this context, the obstacles which runners have to jump over in a race are projected onto the difficulty of designing safe small molecule contrast agents which do not lose part of their relaxive power when coordinating with anions such as phosphate or bicarbonate. Framing the journey as a race of hurdles implies that the only permissible way of overcoming obstacles is to jump over them: "*Once the chemist makes the mental leap*, however difficult it is, that this exchange labile metal ion forms essentially inert complexes, then the chelate can be viewed as an intact drug molecule." (CR: 2295). Here, the obstacle is not experimental, as in the case of molecule design, but theoretical: how does gadolinium complex? As this positive metal ion has only a weak bond with each of the negatively charged atoms it is linked to, an easy escape from these bonds is to be expected in traditional coordination chemistry, creating potential health hazards. Surprisingly, it happens to be safely trapped in some complexing molecules. Each of the two plausible scenarios accounting for the complexation of gadolinium is represented as a plot of ground, and their incompatibility as a ditch, or a river. Leaping over the gap from one field to the next one maps onto the intellectual risk involved in giving up the safe old field of coordination chemistry, and venturing into risky gadolinium pharmacology. Although very general in scope, the conceptual metaphor THEORIES ARE JOURNEYS seems nevertheless appropriate for a review article in which the expert is taking the medical readers by the hand to guide them through difficult chemical theory and call their attention to some of the issues at stake in order to achieve the end of better care for patients.

While the THEORIES ARE JOURNEYS metaphor foregrounds an ongoing process whose different stages are mapped onto theory, THEORIES ARE MINING frames problems regarding scientific discovery on a vertical plane, with precious ore awaiting excavation. This conceptual metaphor is common in English, with instantiations such as "*he was a gold-mine of ideas*", "*now we have to refine those ideas*", "*What I like about his book is that he brought some deeply buried ideas to light*". In the history of mining, however, the work of geologists and that of chemists which refined the ore into elements are interestingly intertwined, which provides a more subject-specific motivation for this metaphor. The opening sentence in the introduction of the CR article reads: "Gadolinium, an obscure

lanthanide element *buried in the middle of the periodic table*, has in the course of a decade become common place in medical diagnostic." (2293). The whole article is thus framed within the THEORIES ARE MINING metaphor, and all the efforts made to save gadolinium from centuries of neglect highlighted. All the hard work reviewed, however, may not suffice, as the following sentence, taken from the end of the article, shows: "However, as noted by the authors, *layers of targeting and pharmacokinetic challenges remain* before receptor-based MRI agents can be used in vivo." (CR: 2341). This sentence stresses the main challenge MRI biomedical researchers are currently faced with: targeting contrast agents to particular organs or specific tissues, while avoiding any harmful side-effects for the patients. The THEORIES ARE MINING metaphor therefore highlights the efforts necessary to come to a "deeper" understanding of the subject.

The THEORIES ARE MINING and THEORIES ARE JOURNEYS metaphors draw on different spatial dimensions, and are construing different problems in different frames (“digging” versus “hurdling”). And yet they both have the same function: they help us to visualise abstract problems: difficulties are pictured in terms of "*layers of targeting and pharmacokinetic challenges*" to be cleared away, or as "*hurdles*" to be overcome by "*mental leaps*". The digging or travelling frames do not seem to have any direct cognitive impact here, as they do not contribute to a new understanding of the difficulties encountered. However, they draw the lay readers’ attention to some of the major theoretical issues at stake, therefore enabling them to gain time.

5. Practical applications for ESP

At the end of this brief survey of models and metaphors in a scientific review article, let us come back to the initial question asked: can metaphors help the ESP teacher understand models, when reading scientific articles? Black (1962) and Hesse (1966) have successfully used traditional metaphor theory to account for the explanatory and predictive properties of models. The analysis of models and metaphors in the CR article exemplifies this point of view: both models and conceptual metaphors on gadolinium complexes work by creating a mapping between different domains: atoms and balls, molecules and persons, theories and journeys, etc... This common mechanism can prompt us to consider models as a special type of metaphor (Crease, 2000). One can further argue that models are a special type of conceptual metaphors, because they are more precise about what topographies and topologies they preserve as they map knowledge from the source domain into the target domain. Specifically, models preserve topologies that have predictive power, typically in the sense of a mathematical prediction. Metaphors preserve these, but to a much lesser extent. In the case of gadolinium complexes, all the models can be seen as instantiations of the underlying conceptual metaphor A MOLECULE IS A BALL.

The question of whether metaphors can help in the understanding of models seems therefore justified, from a theoretical point of view. But does it have practical use? If we remember that both metaphors and models work by setting up analogical

mappings between a well-known domain and a less well-known field on the one hand, and that theoretical models make an intensive use of abstraction on the other hand, it follows that metaphors may rightly be used as a shortcut through equations, tables of figures, diagrams, etc... But does it in fact work? In other words, are they a suitable tool to help us grasp the issues at stake, even if we don't understand all the mathematical subtleties involved?

In the CR article, metaphors give us useful insights into theory. In the introduction, for example, gadolinium is described as "*this clear odorless 'magnetic light'* " (C p. 2293). The use of inverted commas in the text clearly indicates that the phrase '*magnetic light'* should not be taken literally, and earmarks it as metaphorical. One of the properties of light is to reveal contrasts coming from differences in properties. These contrasts can come either from various parts of the object considered, or from discrepancies between the object and its environment. This power to reveal differences in properties is mapped onto an ability to create different relaxation rates thanks to the presence or absence of gadolinium. In MRI diagnoses, contrasts appear when various tissues relax at different rates, and these relaxing rates depend in turn on the quantity of contrast agents absorbed (here gadolinium complexes). The greater the absorption, the quicker the relaxation. Just as the observation of different light contrasts enables us to constitute a picture, MRI images are based on the more or less intense colouring of different relaxation zones. The *'magnetic light'* metaphor thus enables us to grasp the function of gadolinium directly, without delving into molecule structures or relaxation theory. The fact that it appears in the opening page of the article is also worth noting: by providing a quick overview of the state of the art in gadolinium studies, it allows radiologists and other members of the medical profession to skip to the medical applications at the end of the article with a general understanding of the issues at stake in mind, if they wish to. The context in which "*magnetic light*" is placed thus enables us to say that it may indeed be used as a heuristic tool to facilitate the understanding of relaxation models, as it is pragmatically cutting short through theoretical paraphernalia.

Unfortunately, all the metaphorical expressions used by Caravan et al. do not work this way. If we go back to the exchange dynamics of DTPA molecules in a solution, for example (cf. appendix n°5), the metaphorical expressions "*backbone ethylenes*" and "*acetate arms*" can be quite confusing to the lay reader. The ethylenes are situated on the outside of the molecule, and drawn in an elongated shape suggesting an arm, whereas the acetates are represented with curved lines reminiscent of a bent back. In this case the metaphor is intended to focus the reader's attention on a particular aspect of molecular shape change, which proves misleading for the layperson.

This pair of contrasting examples shows quite clearly that an understanding of models gained solely through metaphors may prove relevant. A metaphor such as GADOLINIUM IS MAGNETIC LIGHT has a source domain rooted in bodily experience, so that no specialized knowledge is required for its understanding. Yet

it sums up the scientific argument at stake efficiently, thereby giving the ESP teacher a general grasp of the subject, and allowing her to gain time. However, the counter-example of backbone ethylenes and acetate arms also shows that common sense and everyday experience cannot be assumed to be totally reliable. These mixed results stem from the fact that although different theories of models and conceptual metaphor hang together, because they are motivated by similar concerns about pattern preservation, yet they function to preserve patterns at different levels of generality, which can create misunderstandings.

6. Conclusion:

To conclude, a comparative analysis of models and metaphors (in the case of gadolinium complexes) reveals differences in their functions. Conceptual metaphors map bodily experience onto the molecular world, but they also throw light on the difficulties of the research process, whereas models allow visualisation, explanation and prediction. These discrepancies nevertheless hide a common core: models can also be considered as surface instantiations of the conceptual metaphor A MOLECULE IS A SPHERE, on which the personification of molecules is based. Tying up models with conceptual metaphors also has practical implications as far as the comprehension of scientific English is concerned. Seeing metaphors as a help in order to understand scientific models in fact follows the same line as using models in order to understand the world. We take a familiar domain (metaphors), and apply it to another less well-known domain, i.e. scientific models, in order to understand them. This approach can allow ESP teachers to cut short through equations and theoretical discussions, and grasp the scientific issues at stake in a global way, which can certainly save time. However, just as the insights gained through models must be in agreement with experimental results, vicarious understanding of models through metaphors should always be checked with an expert informant.

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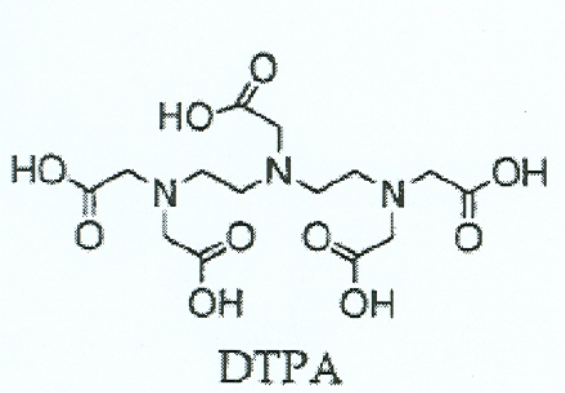
APPENDIX n°1 :
scale models in chemistry



Developed chemical formula of DTPA

Three-dimensional model of DTPA

APPENDIX n°2

Contents of the CR article	**Metaphors**	**Scale models**	**Numerical tables**	Mathematical equations	Chemical equations
I Introduction (pp2293-95)	**26**	**0**	**0**	0	0
II Solution and Solid State Structures (pp 2295-2320)	**111**	**128**	**11**	8	5
III Relaxation theory (pp 2320-2325)	**6**	**1**	**1**	19	0
IV Physical Properties of Small Molecule Gadolinium Complexes (pp 2326-2336)	**4**	**41**	**8**	1	0
V Macromolecular Conjugates (pp 2336-2341)	**14**	**9**	**4**	0	0
VI Relaxivity of Non-Covalently Bound Adducts of Gadolinium (III) Complexes (pp 2341-2344)	**6**	**9**	**2**	0	0
VII & VIII General Physicochemical Properties and Safety (pp 2344-2346)	**3**	**0**	**1**	0	0
IX Applications (pp 2346-2348)	**13**	**2**	**0**	0	0
X Conclusion (p 2348)	**1**	**0**	**0**	0	0
Total	**184**	**190**	**27**	28	33

APPENDIX n° 3

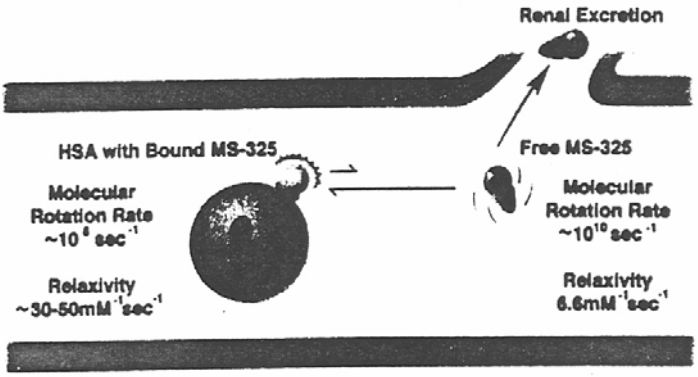


Figure 45. RIME mechanism of action for MS-325. The agent is shown schematically as consisting of two parts: a circular gadolinium chelate and a bullet-shaped protein-binding moiety. Within the bloodstream, MS-325 binds, on average, to one of many available sites on HSA. The bound form is in equilibrium with a small amount of the free form which is renally excreted steadily over time. The bound form of MS-325 has greatly enhanced relaxivity by virtue of its slower molecular tumbling rate.

APPENDIX n° 4

macokinetics, protein binding, elimination, and safety. Equilibria between gadolinium(III) and other competing endogenous metals and anions can potentially contribute to the dissociation of gadolinium(III) from the complex, an event which removes the critical magnetic core of the drug. By design, the magnitude of the thermodynamic stability constant K_{GdL}, defined in eq 7,[120] is large for all of the clinically viable

$$M + L = ML \qquad K_{ML} = \frac{[ML]}{[M][L]} \qquad (7)$$

contrast agents, ranging from $10^{16.85}$ for [Gd(DTPA-BMA)] to $10^{25.6}$ for [Gd(DOTA)] (Table 10). Clearly, the equilibrium in eq 7 lies heavily to the side of the complex, GdL, and little, if any, free metal is present at equilibrium under conditions where eq 7 is valid.

The coordination chemist will appreciate the fact that protons will compete for the ligand L as the pH is lowered; this competition must be taken into account if one is to understand the solution equilibria at physiological pH. This is critical for the multidentate, multiprotic ligands which are being discussed in this review. Given the protonation constants of the ligands and the formal stability constant K_{ML}, the conditional (or pH dependent) stability constant K^*_{ML} can be calculated using eq 8. The conditional stability constant K^*_{ML} is often used to compare the relative thermodynamic stability of different chelates at pH 7.4. Table 10 also reports the conditional stability constants for the series of clinically relevant contrast agents as well as $[Gd(EDTA)(H_2O)_n]^-$.

$$K^*_{ML} = \frac{K_{ML}}{(1 + K_1[H^+] + K_1K_2[H^+]^2 + \ldots + K_1K_2K_n[H^+]^n)} \qquad (8)$$

where K_1, K_2, K_3, ... K_n are the stepwise protonation constants of the ligand.

Given that there is a difference in the relative thermodynamic stability of these compounds at physiological pH, how do these data correlate with observed in vivo results, particularly the deposition of dissociated gadolinium(III) in the skeleton? To investigate this question, Wedeking et al.[121] have measured the %ID (initial dose)/gram found in the femur at 7 days postinjection (mouse) for a series of clinically relevant extracellular contrast agents (Table 10) with similar pharmacokinetic and elimination characteristics. $[Gd(EDTA)(H_2O)_n]^-$ was not an approved contrast agent, but was included for comparison purposes.

When comparing the complex stability in Table 10 to the amount of gadolinium(III) found in the rodent skeleton at 7 days, it is immediately striking that while thermodynamic (K_{ML}) and conditional stability constants (K^*_{ML}) values for $[Gd(EDTA)(H_2O)_n]^-$ and $[Gd(DTPA\text{-}BMA)(H_2O)]$ are relatively similar (for example, K^*_{GdL} = 14.9 and 14.7, respectively, for L = EDTA and L = DTPA-BMA), the amount of Gd(III) deposited in the mouse at 7 days is rather significant (~0.8%ID/gram) for $[Gd(EDTA)(H_2O)_n]^-$ and small for $[Gd(DTPA\text{-}BMA)(H_2O)]$ (~0.03%ID/gram).[121] Likewise, the amount of Gd(III) found in the bone for $[Gd(DO3A)(H_2O)_n]$ is surprisingly small given the rather low conditional stability constant. Thus, it is clear that thermodynamics, i.e., the gadolinium(III) stability constant alone, is not sufficient to explain in vivo stability trends.

Cacheris et al. evaluated the relationship between thermodynamics and toxicity for a series of gadolinium(III) complexes and also concluded thermodynamic stability of the Gd(III) complexes in itself was insufficient to correlate observed acute toxicity (not bone deposition) for a series of Gd-153 labeled DTPA derivatives examined in rodents. In their study, the authors assumed that acute toxicity was related to the dissociation of gadolinium(III). Consideration of the relative affinity of the ligands for Gd^{3+} as well as biologically relevant cations such as Ca^{2+}, Zn^{2+}, and Cu^{2+} led the authors to propose the use of a "selectivity" factor, log K_{sel}, to accommodate the biological data. Table 10 shows the observed LD_{50} in mice,[122-125] stability constants for the ligands with Gd(III), Ca(II), Cu(II), and Zn(II),[28,47,51,126-130] as well as a selectivity factor, log K_{sel}, which was calculated using eq 9. This factor takes into account the ligand

APPENDIX n° 5

Table 8. Kinetic Data for Rearrangements in Ln(III) Complexes

complex	$\Delta G^{\ddagger}$ (kJ mol^{-1})	$\Delta H^{\ddagger}$ (kJ mol^{-1})	$\Delta S^{\ddagger}$ (J mol^{-1} K^{-1})	k_{ex} (s^{-1})	dynamic process[a]	ref
Pr(DTPA)	56.5(3.6)	35.2(2.0)	−71.4(5.8)	265 (278 K)	A	92
Eu(DTPA)	55.4(4.6)	38.5(2.4)	−56.8(7.0)	360 (278 K)	A	92
Yb(DTPA)	49.4(10)	37.0(5.0)	−41.7(16)	4300 (278 K)	A	92
Nd(DTPA-BPA)	53(1)			350 (283 K)	A	80
Eu(DTPA-dienH$^+$)	57.5(0.3)					41
La(DTPA-BPA)	71(1)	47(8)	−84(25)	0.7 (283 K)	B	80
Lu(DTPA-BPA)	67(1)	42(8)	−88(20)	2.4 (283 K)	B	80
La(DTPA-BGLUCA)	66	34	−116	2.7 (283 K)	B	100
La(DTPA-BENGALAA)	65	37	−100	0.7 (283 K)	B	100
Lu(DOTA)	65.9(1.2)	100.5(0.6)	116(2)	18 (298 K)	C	45
Yb(DOTA)	65.9(1.0)	82(12)	52(39)		C	93
La(DOTA)	60.7(1.2)	59.4(0.8)	−4.6(3.3)	23 (278 K)	D	103
La(DOTP)	101(11)				D	105
Lu(TETA)	63.7(7.5)	71.7(5.3)	27(8)	7 (278 K)	E	114

[a] A: exchange between wrapping isomers. B: racemization of terminal backbone nitrogens. C: enantiomerization. D: ring inversion. E: exchange between dodecahedral conformations of TETA.

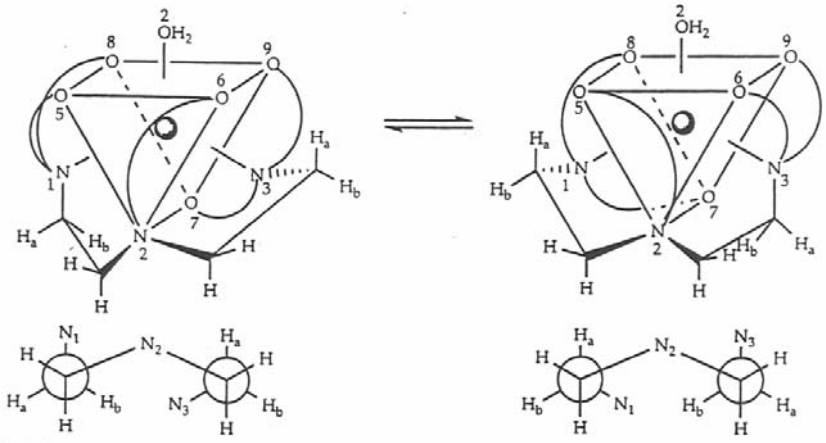


Figure 28. Rapid exchange interconversion between wrapping isomers of Ln(DTPA) results in a psuedo mirror plane, reducing the number of observed proton resonances by half.

The major feature of the exchange process involves the shuffling of coordinated acetates accompanied by a flip of the backbone ethylenes between staggered conformations (see Figure 28). This results in a change in the helicity of the complex and leads to the equilibration of two of the acetate arms, which alternate coordination of position 7, and converts axial ethylenediamine protons to equatorial.

APPENDIX n° 6 :

Metaphors found in the Chemical Review (CR) article

A MOLECULE IS A CIVIL ENGINEERING STRUCTURE
a *bridging* bidentate group occupying the ninth coordination site of a neighbouring metal center (2297)
bridging carboxylates (2301)
carboxylate *bridged* dimmer (2302)
bridged trimer (2303)
a bidentate carboxylate group which *bridged* from the first complex (2303)
bridging carboxylate groups (2305)
ethylene *bridges*(2311) +1
bridging ligands (2311)
a *scaffold* for the attachment of various chelates (2339)

A MOLECULE IS A LIVING BEING
magnetic *core* (2315) *"core"* molecules (2338) acid *core* (2339)
stems from (2294)+1
nitrogen *mustard* (2295)
to *muck up* our DNA (2295)
the *tether* between amide groups (2311°

A MOLECULE IS A PERSON

MOLECULAR PARTS ARE BODILY PARTS
backbone 10
backbone ethylene 2
the *backbone* of the ligand (2300)
the diethylenetriamine *backbone* 2
terminal *backbone* nitrogens 3, central *backbone* nitrogen 2
lysine *backbone* (2336), dextran *backbone* (2340)
acetate *arms* 9, hydroxypropyl *arm* 3
pendant *arm* 3, phosphonate *arm* 2
the phosphinate oxygen *face* of the molecule(2304)
the twist angles between the *faces* (2306)

MOLECULAR POSITIONS ARE BODILY POSITIONS
capping position(s) 6
monocapped arrangement (2301) *monocapped* plane (2306)
capped planes 3 (2302) 2 (2303)
a water molecule *capping* the phosphinate oxygen face of the molecule(2304)
wrapping isomers 4
the ligand is then able to *wrap* round the metal center (2299)
ligands incapable of *wrapping* around the metal center (2311)

the *shuffling* of coordinated acetates accompanied by a *flip* of the backbone ethylenes (2310)
exchange by *flip* of the backbone ethylenes… and *shuffling* of the donor acetates (2311)

MOLECULAR MOVEMENTS ARE BODILY MOVEMENTS
this potentially toxic metal ion which swiftly *floats* among the water molecules, *tickling* them magnetically (2293)
the successful *penetration* of gadolinium(III) chelates into radiologic practice (2293)
the unique magnetic properties of the gadolinium (III) ion *placed* it right in the middle of a revolutionary development (2293)

MOLECULAR ACTIONS ARE BODILY ACTIONS
there is nothing a good nucleophile or electrophile can *attack* (2295)
a good T1 agent would not significantly *affect* the bulk magnetic susceptibility of the tissue compartment in which it is localised (2295)
small iron particles can *function* as T1 agents (2295)
the texaphyrin ring …*acts as* a monoanion (2308)
it is not uncommon for a ligand to *form* isostructural chelates (2308)
these isomers *exchange* very slowly (2311)
a blood pool agent which…*exhibits* enhanced reaxivity (2342)
this compound was designed to *targe*t tumour cells… (2343)
encapsulated chelates do not *show* the same r1 enhancement as… (2343)
prolonged *trapping* in the liver (2346)

MOLECULAR ROLES ARE HUMAN ROLES
donor atom(s) 10
neutral *donors* 2, Amide *donors*, *Donor* groups (2317), ligand *donor* set (2336)
a ligand carboxylate *donor* (2297)
oxygen *donor* atom 4, oxygen *donors* (2305)
a bridging carboxylate *donor*, amide oxygen *donors* (2300)
the 4 *donor* phosphinate oxygens (2304)
donor acetate (2311) acetate *donor* (2336)
parent ligands (2318)
a *key-role* (2316)

MOLECULAR FEELING IS HUMAN FEELING
In the *intricate dance* that gives rise to relaxivity, water protons *hardly feel* the effects of ions such as Dy(III), much like a leaf near the incredibly rapid wings of a hummingbird (2297)
MRI agents which *sense* their biochemical environment (2348)
MRI enzymes which *sense* the presence of particular enzymes (2348)

MOLECULAR JUDGMENT IS HUMAN JUDGMENT
lanthanides tend to *favour* high coordination numbers in aqueous media (2296)

AN OBJECT/PROCESS IS A PERSON:

- an object is capable of ostention as well as a person:
table 11 *shows* …the data *show*...(2318) Table 28 *shows*… (2345)
several examples have *shown* (2314) the data *show* (2318) an accumulated body of literature has *shown* (2316) chelates do not *show* (2343) A field that *shows* a great deal of promise ... the results *show*...(2344) Clinical trials repeatedly *showed* no significant difference… (2346)
an accumulated body of literature has *shown* (2316)…
this result *highlights* a key-point (2316)
a blood pool agent which... *exhibits* (2342)

- an object is capable of description as well as a person:
table 1 *lists* (2293) Table 11 *lists* (2316)
papers have appeared which *detail*... (2317)
these equations *describe* (2321)
these equations *describe* relaxation as a function of magnetic field (2321)

- an object is capable of logical reasoning as well as a person:
iron particles... *lead to* a much larger increase 2294)+2
the solution structures... *agree with* their solid state structures (2316)
examination of table 10 *reveals* (2316)
absorbtion spectroscopy… also *suggested*… (2316)
the studies of Wedeking and others *contradict* this prediction (2316)
the accumulated body of literature which *has established* (2316)
data accumulated over the past ten years *indicate*… (2320)
neutron diffraction studies… *demonstrate*… (2322)
the simulation of vanadyl EPR lines shapes *can distinguish between* isotropic an anisotropic motion(3223)
the tables *will explicitly note* the chemical structure (2336)

THEORIES ARE MINING
the LIS effect has an r-3 dependance from which structural information about the chelate *can be extracted*, eq 5 (2309)

CHEMISTRY IS MINING
the metal ion *is buried* in the cage (2295)
with EXSY, chemical exchange *is probed* using a standard NOESY pulse sequence (2309)
layers of targeting and pharmacokinetic challenges remain before receptor-based MRI agents can be used in vivo (2341)

THEORIES ARE JOURNEYS
once the chemist *makes the mental leap* (2295)
structural characterisation *is the first step* in understanding… (2295)
one *hurdle that remains* in these systems… (2334)

GADOLINIUM IS MAGNETIC LIGHT
'magnetic light' (2293)
the ability *to image* low concentration receptors (2336)
blood pool *imaging* (2336)
the goal of *imaging* receptors using MRI… (2336)
new applications involve faster *imaging* drug injection to obtain images of arteries or of blood flow to the heart (2346)
prolonging blood half-life and *imaging window* (2346)
early interest in *tumour imaging* (2347)
MRI *images* (2347)
the *detailed images* of biological functions (2348)

Miscellaneous:
activation parameters... are expected to *reflect* the data (2311)
the perceived clinical properties of this agent *mirror* the biochemical consequences of its chemical structure (2346)
a *trade-off* (2324)
this *translates to*… (2327)
phosphate *buffer* (2334) *buffered* aqueous solution (2339)
"magic bullet" targeting (2346)
Just a tuning-fork (2348)

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ABSTRACT

"A clear magnetic light" - can metaphors help with scientific models in ESP? The case of gadolinium

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Key-words
ESP, mapping, metaphor, model, science

Most English teachers in science and technology deal more easily with metaphors than with scientific models, especially if they are fraught with equations or figures. And yet, both models and metaphors are based on a transfer of meaning from one domain to another. The main question addressed in this article is whether metaphors can be used to help in making sense of models. To answer this question, an in-depth analysis of the models and conceptual metaphors found in a review article on gadolinium was carried out in comparison with a corpus of six "hot" articles published by the American Chemical Society. The results show that metaphors can indeed be used as a short-cut through theory, helping English teachers to grasp the main issues at stake. However, this vicarious knowledge always needs to be checked with an expert informant, just as the insights gained through models must be in agreement with experimental results.

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The Dialectic Nature of the Rhetoricals Structure in the Editorials of two Finnish Business Newspapers

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1. Introduction

Business newspapers have become more and more important in contemporary society. They appear to interest an increasing number of readers. Therefore, there is a need to study business newspapers in order to find out in what way rhetorical strategies are employed in this particular discourse.

It is widely agreed on that political speaking and writing are to be found at the core of rhetorical practice (Gill & Whedbee 1997: 157). Political discourse has also been the object of many studies, whereas for example, economical discourse has not been a popular subject for rhetorical or linguistic research. The discourses of politics and economy often convene in business newspapers, construing economical media discourse. In this article I will focus on the genre of editorials which is an interesting forum for the meeting of these two discourses.

Editorials in business newspapers can be interpreted as realisations of instrumental discourse. Editorials are used to influence an audience towards some end. In short, they are rhetorical by nature (see Gill & Whedbee 1997: 157). Furthermore, editorials can be approached as an argumentation the purpose of which is to resolve a difference of opinion (van Eemeren & Grootenburst 1984). Van Eemeren et al. (1997: 218) point out that

> Argument is seen as a kind of interaction that arises in the context of other interactional business, when something said, implied, or otherwise conveyed makes plain that there is a difference of opinion between two parties. This description is necessarily abstract, since argumentation can take any form from a single, written text by an author addressing an unknown audience to a heated back-and-forth debate between two people talking face to face.

Taking the point of view of van Eemeren and Grootenbusrt's pragma-dialectical theory, editorials are interesting objects for a closer study. Editorials are monologues, and like Fowler (1991: 221) has pointed out, they are inevitably authoritarian. The writer of an editorial has the power to decide what to include and what to exclude. One of the writer's decisions is whether to offer only his own point of view or to simultaneously include opposing points of view. It has been claimed that it is possible to make editorials seemingly impartial by presenting opinions diverging from the writer's point of view. Therefore, when approaching the rhetorical strategies applied one important key character is whether the argumentation is dialectical or not. In this case study my aim is to study the potentially dialectical nature of the rhetorical structure in the 10 editorials of two Finnish business newspapers. In addition, I take note of the use of sources when presenting different standpoints in the editorials. Both the dialectical nature and the use of sources are important factors grounding how subjectivity is construed in texts. The article is connected with my ongoing PhD-research where my aim is to describe the subjectivity in 40 editorials in Finnish business newspapers. The standpoint taken in this article is that subjectivity is more obvious when opinions of others than writer are left implicit.

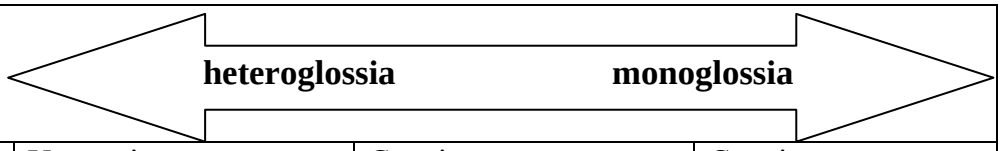
The material of my study consists of 10 editorials from the Finnish Business newspapers, Kauppalehti (KL) and Taloussanomat (TS). The editorials were published during the first week of September 2001. The topics discussed in the editorials are multiple, they comprise the gambling business, the economic situation in Japan, assessing the budget proposal of the state, consumers' faith in the economical situation, the development of the market situation in technology, the sale of Kemira (which is a state-owned company within the chemical industry), regulations for pension insurance companies, presumptions of trend cycles, the economy of municipalities, and the risks of entrepreneurship. To put it simply, the editorials concern macro-economics rather than micro-economics. The macro-level discusses economical questions from a national point of view rather than from an individual point of view, and the topics are therefore quite abstract. As such, they are descriptions of the economical and sometimes also political issues as processes to which the welfare of Finnish national economy are connected. This means that issues are basically evaluated on the basis of whether they generate welfare (counted in money) or not. It also means that the claim of the primary thesis is concerned with macro-economical processes or decisions, and therefore, they may have a quite distant connection to the faces of the readers (see Brown & Levinson 1987). This distance might in fact diminish the need for dialectically constructed texts.

2. The dialectic nature of editorials

I base my investigation of the potentially dialectic nature of the editorials on argumentation analysis. Although the starting point is content-based, I am focusing on the discussion procedure (see van Eemeren et al. 1997: 218). The analysis of argumentation starts with the interpretation of the primary thesis of the editorial. Based on this interpretation the other claims in the editorial can be judged to be

supportive or non-supportive. Support of the thesis can be achieved by giving supporting arguments and conclusions. Opposing can be achieved by the presentation of a point of view contesting the primary thesis, by contesting the supporting arguments, or by contesting the conclusions. Theoretically it is possible that conclusions are not connected to the primary thesis and they cannot, therefore, be supportive or contestive. However, in my data all conclusions seem to be connected to the primary thesis.

The interpretation of the primary thesis plays a crucial role in my analysis. The interpretation is based on the reading of the whole text. This pragmatic view is a necessity, as the primary thesis can not be found on the basis of semantic reasoning alone (Tirkkonen-Condit 1986: 375). Tirkkonen-Condit (1986: 373) has compared editorials of the Finnish newspaper *Helsingin Sanomat* and the English newspaper *The Observer* and has found that Finnish argumentation tolerates vagueness and delay in the articulation of the primary thesis. It must be noted that the approach towards argumentation taken in Tirkkonen-Condit's (1986) study differs from the starting point taken in this study. Tirkkonen-Condit (1986: 377) proposes that "shared views and opinions need not be argued for", and in fact, she finds 5 Finnish editorials lacking a primary thesis. In this article my assumption is that despite the level of factuality or taken-for-granted the editorials resolve a difference of opinion. Also in my material the primary thesis of two editorials respectively was vague in the sense that the theses were implicit and not explicitly argued in any paragraph.



	Uncertain & options	Certain & options	Certain & no options
Writer representing	two standpoints both are supported, cannot decide	two standpoints only one (own) is supported, the other not	one standpoint which is supported
	(opposing) options are given for the primary thesis, for supporting arguments or conclusion and they are supported	(opposing) options are given for the primary thesis, for supporting arguments or conclusion but they are either disproved or just stated	no oppositions
Number of editorials	1	3	6

Figure 1. Possibilities for dialectical nature in editorials (compare Hemánus 1979).

In the top of Figure 1 the arrow exemplifies the continuity of dialecticality. At one end there is heteroglossia and at the other monoglossia. On the side of heteroglossia

there is an editorial in which a writer is representing two standpoints and supporting both of them. In such a case the writer could be described to be uncertain and giving options. On the side of monoglossia the writer is representing only one standpoint, his own, and supporting it. Therefore, he could be described as a confident writer who does not give any options. As Figure 1 shows, the editorials in the Finnish business newspapers seem to be mainly monoglossic. As many as 6 out of the 10 editorials are monoglossic. They express only the writer's opinion which is supported by arguments, and they do not take up opinions which are contesting the writer's opinion. When being monoglossic the editorials give an impression that there are no differences in opinion. However, as pointed out in the beginning, the starting point of my article is that this kind of agreement does not exist as the purpose of argumentation is to resolve differences.

Heteroglossic editorials appear to be exceptional, at least in my material. Heteroglossia in the editorials is created by introducing opinions which are contesting the primary thesis (1 editorial), or contesting a supporting argument (1 editorial), or contesting the primary thesis **and** a supporting argument (1 editorial), or contesting a supporting argument **and** a conclusion (1 editorial).

In an editorial concerning the sale of Kemira, the writer ventures an opinion which contests the primary thesis. As Example 1 shows, the primary thesis is given in the first phrase (opens new opportunities), and it is contested by a remark stating that, at the same time, dependency will increase. In the last phrase the contesting opinion is denied. Linguistically, contesting opinions can be constructed in many ways. Contestations can e.g. be marked explicitly as counter-arguments. In Example 1 this is done by the use of the modal adverb *toisaalta* (*on the other hand*). In the same example the denial of the counter-argument is made explicit by use of the modal adverb *toki* (*of course*).

(1) Keskittyminen metsäteollisuuden kemikaalitoimittajaksi *avaa uusia mahdollisuuksia* erityisesti Yhdysvalloissa. *Toisaalta riippuvuus yhdestä toimialasta kasvaa*. Toki muut vedenpuhdistuskemikaalit tasapainottavat tilannetta, sillä niitä myydään lähinnä julkisyhteisöille, joiden kysyntä on suhdanteista riippumatta vakaata. (TS0409)
/
Creating a concentration of suppliers of chemicals for the forest industry *opens new opportunities* especially in the USA. *On the one hand it leads to an increased dependency* on one field of business. But of course other chemicals for water cleansing will balance the situation, because they are mostly sold to public bodies the demands of which are stable despite changes in trend cycles.

In an editorial concerning the risks of entrepreneurship (example 2) the writer's primary thesis is that more citizens and companies should be allowed to take part in debt arrangements. After his presentation of the primary thesis he supports it by claiming that it is possible to avoid abuse of such arrangements. The next

paragraph presents opinions which contest the primary thesis as well as the supporting argument. We can notice from the example 2 that contesting opinions can be presented more implicitly by the stating of an antithesis, without the use of linguistic markers, like modal adverbs.

(2) Ylivelkaantumisongelmia hoidetaan *velkajärjestelyillä, joiden piiriin pitäisi kelpuuttaa entistä useampi kansalainen ja yritys. Tapauskohtaisella harkinnalla viranomaiset voivat karsia järjestelyyn hakevien joukosta vähintään suuren osan edesvastuuttomista velanottajista ja suoranaisista vilpistelijöistä.*

Oikeusministeriö valmistelee parhaillaan velkajärjestelylain muutosta. Velkajärjestelymenettelyn kehittäminen ja velkojen osittainen anteeksianto eivät suju hankaluuksitta. Perjantain Taloussanomissa Suomen Yrittäjien johtaja Rauno *Vanhanen esitti järjestönsä hyvin varauksellisen kannan velkojen anteeksiantoon*. Verottaja kun ei ole usein ainoa saataviansa vaativa velkoja, vaan velkaongelmainen yritys merkitsee luottotappioiden uhkaa myös monelle pk-yritykselle: tavarantoimittajille, kauppiaille ja kuljetusyrittäjille. *Suomen Yrittäjät kantaa huolta yleisestä maksumoraalista ja suhtautuu nihkeästi ajatukseen automaattisesta velkojen anteeksianta-misesta*. (TS0809)

/

Debt handling arrangements which have been created to deal with overly large indebtedness should *make allowances for admitting more citizens and companies into the system*. *By considering each case separately the authorities will be able to prune out at least the majority of irresponsible borrowers and even fraudulent exploiters*.

The Ministry of Justice is in the process of preparing a legislative change concerning debt handling arrangements. The development of the process of debt handling and partial debt cancellation has not advanced without difficulties. In Friday's Taloussanomat Rauno Vanhanen, the Director of the Federation of Finnish Entrepreneurs, *on behalf of his association presented its most reserved view on the matter of debt cancellation*. As the tax authority is not the only debtor claiming its money a company with debt problems poses a threat of credit losses for many small and mid-sized companies: material suppliers, traders and transportation companies. *The Federation of Finnish Entrepreneurs is worried about the general repayment morale and takes a critical position on automatic cancellation of debts*.

An editorial concerning regulations for pension insurance companies is exceptional in the way which it in the same clause opposes both a supporting argument and the conclusion. Example 3 shows that the writer concludes that some exceptional measures should be taken. The claim is furthermore repeated in a more unspecific way through the use of a question. After the question there is a statement contesting the conclusion. This contesting statement claims that deviating solvency

requirements are always risky. Through the emphasis on the generality of the risks it becomes clear that also the supporting arguments are contested.

(3) Työeläkeyhtiöiden kohdalla olisikin syytä nyt harkita jonkinmoista poikkeusmenettelyä. Olisiko vakavaraisuussäädösten suhteen syytä tehdä jonkinlainen poikkeus? Ratkaisua on kuitenkin hyvin vaikea tehdä, sillä vakavaraisuussäännöistä poikkeaminen sisältää aina riskin. Toisaalta nykyisen kaltainen tilanne, jossa säädökset ovat menestyksellisen sijoitustoiminnan este, on myös erittäin epäsuotava. (TS0509)
/
As far as the pension insurance companies go some kind of exceptional measures should be considered. Would some kind of exception to the solvency requirements be in place? However, a decision of this kind is very hard to make as there are risks involved with deviating from the solvency requirements. On the one hand, today's situation where the regulations prevent successful investing is definitely not preferable.

In order to present contesting opinions several options are available. Instead of presenting counter-arguments, these can be denied, supported or just stated. Stating means that a contesting opinion is given, but it is not denied or supported. When stating a contesting opinion, it could be interpreted as being left open, a not-discussed issue the function of which is to bring the other point of view into focus, but at the same time diminishing its importance. This is the case essentially in argumentative genres like editorials where argumentation against contesting opinions can be expected.

	TS0409	TS0509	TS0609	TS0709	TS0809
Opinions contesting primary thesis	yes	no	no	no	yes
denied	*denied*				*denied*
Opinions contesting supporting argument	no	yes	no	no	yes
denied					*denied*
supported					
stated		*stated*			
Opinion contesting conclusions	no	yes	no	no	no
denied					
supported		*supported*			
stated					
monoglossic	no (certain & options)	no (uncertain & options)	yes	yes	no (certain & options)

Table 1. Contestation of opinions in the editorials of Taloussanomat.

Table 1 shows how the discourse procedure of contesting opinions is presented in 5 editorials of Taloussanomat. As many as 2 of the 5 editorials are monoglossic (TS0609 and TS0709). The others are to some extent heteroglossic, and two of these have counter-arguments which are denied. In one editorial (TS0509, see also example 3), an opinion contesting the conclusion is supported. In this case, the conclusion gives the impression of undecidedness. It seems that the author does not know what to recommend. In a case like this, the point may be to elevate the question onto the level of public knowledge. Although the editorial is indecisive on the level of rhetorical structure, it describes the world from a point of view which is concerned rather with the success of companies and institutions, than with individuals or other aspects of life.

3. The use of sources

The linguistic resources available in order to construe monoglossic and heteroglossic rhetorical structure in editorials are multiple. One essential resource is the author's engagement with what is said. By using diversified resources of lexico-grammatical features the author can negotiate heteroglossic diversity. Engagement includes features which have elsewhere been described under the heading of polarity, modality, reality phase, counter expectation, causality, projection and negation. These features can, according to White (1998: 19), be considered "as operating to reflect the process of interaction or negotiation within a text between alternative socio-semiotic positions". In other words, the author can engage either closely or loosely with what is said. Close engagement means that the author assumes shared opinions, and therefore uses positive declarative. The loose engagement means that the author recognizes the existence of diverging opinions, and uses for example modality, reality phase, negation and sources. (White 1998: 19, 78, 84−88.) In this chapter of my article, I will narrow the scope and analyze whether the argumentation is construed by the use of sources or not.

Approaching the use of sources as a part of the discourse procedure means taking into consideration the function of the sources whether it is to support or to contest the writer's point of view, or whether the sources are used in paragraphs where their main function is giving background information. The use of sources is not seen only as descriptive of the world where people are active and do something, but in a wider sense as functioning as a part of the argumentation. The analysis of sources means transferring from the top-level (in this article: dialectical nature of rhetorical structure) to a lower level (discourse-semantic level). The use of sources can also be seen in the continuity of being either mono- or heteroglossic.

The writer sometimes uses outside sources when representing his own point of view and sometimes when representing the point of view of other parties. An explicit use of sources is not necessarily needed in all cases. However, the sources can be used in order to weaken the writer's engagement with the claim. This means that the writer can weaken the engagement with either his own point of view or to that of other parties, for example by using sources to state the primary thesis. In this sense the use of sources is highly rhetorical.

However, the editorials are not totally free of constraints. This means that also rhetorical choices are limited. Even though the constraints are extensive, we can approach them by dividing them into two dimensions: typological and topological constraints. Some of the constraints are typological rather than topological. Typological constraints are generic to all the editorials while topological constrains differ from one editorial to another. Despite this diversity, even these constraints can be analysed. (See White 1998: 21.) For example, from the typological perspective it seems that the editorials prefer token ownvoicedness, personal pronouns like *I* and *we* are not used in editorials. From the topological perspective of genre, the writer of the Finnish business editorials seems to have many possibilities for presenting his own point of view. In short, he may or may not use sources. The same is possible with the contesting opinions. When sources are used for the first time in a text the title and the whole name of the person quoted are mentioned, as well as the institution represented by that person (Katajamäki 2001). The sources used are recontextualised in the editorials to fit the editorial conventions of the texts. Often this recontextualisation means that there is no need to mention this chain of connections by mentioning the source explicitly and when it is mentioned, it then supports the writer's point of view.

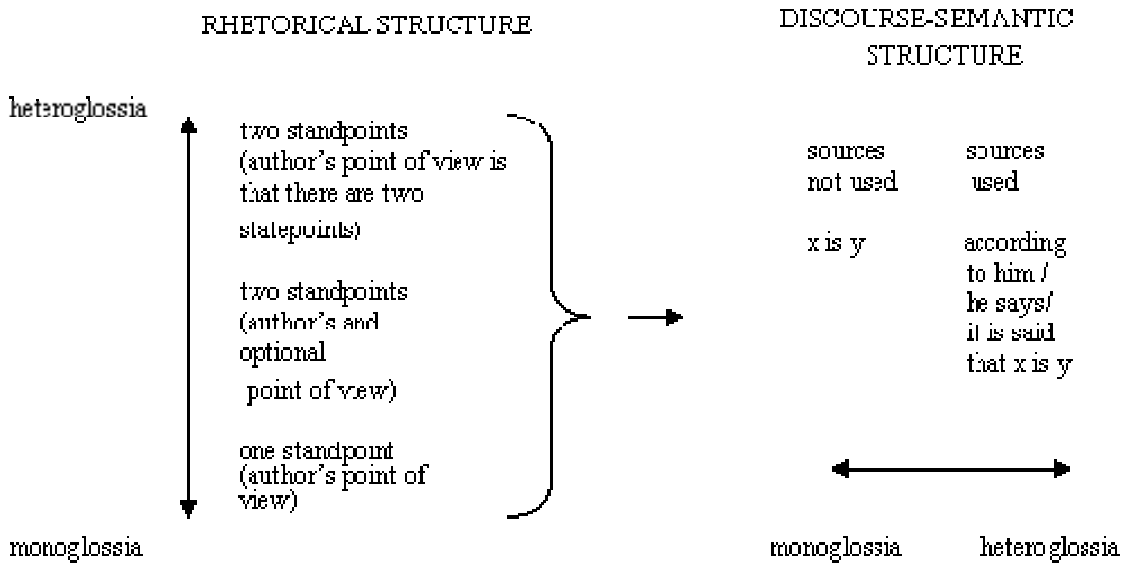


Figure 2. Mono- and heteroglossia on the level of rhetorical structure and discourse-semantic structure in business editorials.

As table 2 (below) shows, in 4 of the 10 editorials sources are not used or they are used only when giving background information. On the other hand, in 6 of the 10 editorials sources are used. For the most part, the sources are used in the supporting arguments (in 3 editorials). In addition to this, they are used to support the primary thesis and a supporting argument and to support the primary thesis. In one editorial sources are used when contesting the primary thesis and the arguments (see example 2).

Sources	
Not used (or used only when giving back-ground information)	4
Used	6
- to support the primary thesis and the supporting arguments	1
- to support the primary thesis	1
- in the supporting arguments	3
- to contest the primary thesis and in the contesting arguments	1
Number of editorials	**10**

Table 2. Sources as a part of the argumentation in the editorials.

In example 4 the use of sources supports the primary thesis which claims that restructuring is inevitable. In example 4 the use of sources supports the arguments. In example 4 the sources are formal and institutional, in example 5 an institutional text is used as a source. The sources can also be used to contest the primary thesis and an argument (see example 2 above).

(4) *Monet alan asiantuntijat ennustavat* (KL 6.9.), että kodintekniikan markkinoilla tapahtuu väistämätön uusjako. (KL0709)
/
Many professionals predict (KL6.9.) that a restructuring of the market for home appliances is inevitable.

(5) Ensi vuonna valtion verotulot eivät *budjettiesityksen perusteella* juuri nouse, … (KL0509)
/
Based on the budget proposal the state tax revenue will not increase much next year…

One of the editorials studied, the one that concerns the economical situation of Japan, appears to be typical of the Finnish business newspapers, because it is monoglossic on the level of rhetorical structure. The editorial represented in Table 3 describes an economical development which is going on at the moment of writing, and the primary thesis makes claims about the future. The purpose of the primary thesis is to convince the reader that the economical situation will develop into very deep recession, and all the paragraphs in the text can be interpreted as supporting the primary thesis, which is also stated in the headline. Even though the editorial is monoglossic on the level of rhetorical structure, it contains sources which are used when presenting the primary thesis and some of the supporting arguments. Particularly the choice to present the primary thesis by the use of sources gives an impression of authorial reticence. In a way, the use of sources can be identified as depending on the subject: A Finnish editor is predicting an

economical process within a foreign culture. The use of the Japanese expert Hama gives credibility to the claims, and at the same time this means that the author himself is not closely engaged in what is said.

In the following description I will present an example of an editorial in order to show how monoglossia on the rhetorical structure level meets heteroglossia on discourse-semantic level. The top of Table 3 presents my interpretation of the primary thesis, the supporting arguments and the conclusion. In the text the primary thesis is expressed by using the Japanese expert Hama as the source, as in many other expressions, which are underlined. The continued use of Hama as a source poses the question of which sections of the texts are the writer's own. Even though the use of sources does not constitute the majority of the text, their use in rhetorically essential places (like in the primary thesis) plays a significant role for interpreting the meaning of the text.

Interpretation of the primary thesis, supporting arguments and the conclusion. Primary thesis 1: Japan dives deep (The economic situation will go into recession) Supporting argument 2a: The economic situation is deteriorating and this will continue (personnel cutbacks, falling Nikkei index) Supporting argument 2b: A change is inevitable, the good days in Japan's economy are over Supporting argument 2c: Structural reforms are needed but the Japanese politicians have not been able to carry them out Conclusion 3: Japan has become a warning example	
Headline Japan dives deep	primary thesis 1: The economic situation is going to deteriorate
Summarising lead The days when Japanese companies considered USA as their market, Australia as their mine and Europe as their museum, are over.	supporting argument 2b: The present (and the future) times are not as good as earlier (development is going on)
First paragraph Large personnel cutbacks announced by the Japanese companies are just the beginning, says Noriko Hama, the research director at the Research Institute of Mitsubishi. Hama, interviewed by Kauppalehti (3.9.), says that Japan has to dive even deeper before it finds a new fundament for its economy. The unemployment rate may increase to the double compared with today's 5 percent.	detailed supporting argument 2a primary thesis 1: The economic situation is going to deteriorate (repeated)
Second paragraph One after the other the big Japanese companies have announced imminent personnel cutbacks. Hitachi intends to dismiss 20 000, Toshiba almost 19 000 and Fujitsu over 16 000 employees. Only within the car industry 50 000 employees are expected to be laid off within the next two or tree years. Before the year 2004 every tenth job threatens to vanish from the companies.	detailed supporting argument 2a (personnel cutbacks)

Third paragraph Problems affect also the stock markets. The Nikkei index has fallen to the same level as 17 years ago.	detailed supporting argument 2a (falling Nikkei index)
Fourth paragraph The unemployment rate of five percent is unforeseen in a country which is used to life-long employments. Japanese companies have been able to avoid large personnel cutbacks until lately because it has been possible to temporarily move employees to daughter companies or sub-contractors. According to Hama, there are 6,5 million workers who do not have a function in the companies at the moment.	supporting argument 2a / size of change, why this have not happened before
Sixth paragraph The old ways do not function any longer, and personnel cutbacks are unavoidable. Japan is also badly prepared for unemployment because unemployment benefits are small and they do not last long. For many workers there is the threat that they will end up living in the streets. The economy in Japan has already been in the state of semi-recession for more than ten years. The world's second largest national economy has lost its economical advantage in Asia. China which a few years ago surpassed Japan as to the amount of foreign investments has become the competitor. The days when the director of a Japanese company could say that he considered USA as his market, Australia as his mine and Europe as his museum, are over.	supporting argument 2b / change is inevitable, the good times in Japan's economy are over (development is going on)
Seventh paragraph Hama belongs to a group of economists who have challenged the political leaders to make structural reforms. The markets should be opened to international trade and investments, competition should be increased and regulation decreased. Structural reforms are needed also within the administration which lacks transparency and flexibility. According to Hama, Japan needs reforms as radical as the ones carried out after the Second World War.	supporting argument 2c / structural reforms are needed →
Eighth and last paragraph The political elite has not been able to carry out the reforms. Economical improvements have not introduced real options and the economy has not grown. Today's Japan is a warning example of the kind of economical situation which political emptiness may lead to.	supporting argument 2c / but the Japanese politicians have not been able to carry them out conclusion 3

Table 3. An editorial concerning Japan (KL0409).

In analysing the author's engagement with the claims presented in the editorials it is important to take into consideration whether the sources are used for supporting

or contesting the writer's point of view. Contestations are possible to present without the use of sources. In these cases, an author could be described as subjective on the discourse-semantic level. However, on the level of rhetorical structure the author could be described as more objective.

4. Conclusions

The editorials of the Finnish business newspapers investigated are monological texts. When comparing editorials to news stories, the editorials appear to be texts written in an independent manner. Firstly, the writer of an editorial may choose topics which do not necessarily meet any news criteria at the moment, but which regardless of this are important issues in society. Secondly, the editorials are independent also from the point of view that they can be openly subjective and even instructive. The writer's attitude is allowed to show in an explicit manner. In spite of this relative freedom, even editorials are constrained by genre conventions, shaped by editorial practices in order to fulfil certain sets of communicative purposes (see Swales 1990), and especially the primary, basic purposes of the genre (Mauranen 1993). It appears that in the Finnish business editorials the author has a number of options for presenting his point of view. He may write monoglossic or heteroglossic text both on the level of rhetorical structure and on the discourse-semantic level. However, when approaching the editorials in more detail, the conventions become more obvious and explicit. This is possible by analysing the use of linguistic resources. Therefore, an investigation of linguistic resources is essential in order to prove that the conventions exist, but the level of rhetorical structure can simultaneously reveal significant aspects of the texts.

Based on this case study it is possible to claim that the writer prefers to exclude opinions contesting his own. Sources are used mainly to support the writer's own opinions. To all appearances, there is no need for the editor to give the impression of being impartial. The writer prefers to make the choice of being certain (and subjective) to giving an impression of possible conflicts. One reason for this might be that the editorials comply to hegemonic ideologies, or at least ideologies shared with the assumed readers.

The other reason for the editorials being mainly monoglossic appears to be linked to their subject matter. Finnish business editorials are focused rather on macro-economical subjects than on micro-economics. Political topics constitute a minority. For example, the need to be polite and impartial is not essential when describing economical or political crisis, or events and issues in Japan or the USA, as it can be assumed that parties which are the object of criticism do not read the editorials. The interesting question is why the editorials give the impression of trying to discuss Finnish political issues from a macro-economical point of view. One reason for this may be the awareness on behalf of the editors of the multi-dimensional interests of the readers. The editorial managements of the business newspapers are highly aware that "what goes up must come down" in the spinning wheel of the world of money. The editorial policy of Kauppalehti says:

> When the editorial policy of Kauppalehti was created it was taken into consideration that companies and different aspects of economic life have conflicting interests. Because of this, very rare issues of the newspaper will be able to uphold a unified policy to suit the breadth of economic life. The only possible option available to Kauppalehti is to offer a diversity of content, taking into consideration the conflicting problems and interests. (Kauppalehden toimituksellinen linja 29.9.1998; my translation.)

The other reason may be that there is already a forum for exerting this kind of influence, i.e. the daily newspapers. Whatever the reason, the topics of the editorials are greatly influencing the need to write monoglossic or heteroglossic editorials, and this is a fact which has to be considered when drawing conclusions. While mono- and heteroglossia function as a continuity, the same could be said also of the topics. Some topics are more "dangerous" and undecided, effecting the need for heteroglossia. But in the end, all topics and issues are sites of possible conflicts, because the discourses are dynamic. However, by being decided and monoglossic it is possible for the editor to hide the conflicting nature of the discourse and write in a manner which may be interpreted to be descriptive. Ultimately, this is a purpose for those who wish to maintain current hegemonic ideologies. When widening the time frame, the monologic ideas represented in the editorials can be resisted and contested in other texts, in news stories or letters to the editor. The media discussion begins and continues. However, it must be noted that the readers, availing themselves as writers of the genre of letters to the editors, are always powerless compared to editors, who have the power to edit and thus choose to promote opinions or marginalize them, or to close the discussion. The directions in which discourses are allowed to develop are construed in the editorials.

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ABSTRACT

The Dialectic Nature of the Rhetoricals Structure in the Editorials of two Finnish Business Newspapers

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In this article is studied the potentially dialectical nature of the rhetorical structure in the 10 editorials of two Finnish business newspapers, *Kauppalehti* and *Taloussanomat*. In addition, it is also analysed the use of sources when presenting different standpoints in the editorials. The dialectical nature is approached as a continuity, where at one end is heteroglossia and at the other monoglossia. On the side of heteroglossia there is an editorial in which a writer is representing two standpoints and supporting both of them. In such a case the writer could be described to be uncertain and giving options. On the side of monoglossia the writer is representing only one standpoint, his own, and supporting it. Therefore, he could be described as a confident writer who does not give any options.

Based on this case study it is possible to claim that the writer prefers to exclude opinions contesting his own. Sources are used mainly to support the writer's own opinions. To all appearances, there is no need for the editor to give the impression of being impartial. The writer prefers to make the choice of being certain (and subjective) to giving an impression of possible conflicts. One reason for this might be the subject matter of the editorials. The other reason might be that the editorials comply to hegemonic ideologies, or at least ideologies shared with the assumed readers.

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Personality and impersonality in biotechnology discourse[1]

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1. Introduction

In recent years, natural scientists have had to face mounting pressure from two sides. For one thing, large parts of traditional life science disciplines such as biology, mycology, botany, etc, have changed into what has come to be known as biotechnology. Secondly, as demonstrated by Bergenkotter and Huckin (1995: p. 42) scientists have been increasingly burdened with high information loads, pressures to promote their research due to cut-edge competition among researchers and pressures to obtain external funding. As a consequence, it has become of paramount importance for researchers to publish articles promoting their discoveries, inventions or claims and at the same time to change their reading practices to accommodate a need for selecting newsworthy information without wasting time. The changes in reading processes, combined with the above-mentioned technologization of the life sciences, constitutes a change in the social practices reflected in scientific discourse to the effect that genre conventions used in the traditional research article are no longer strictly followed. (For detailed account on these developments, see Bazerman 1988; see also Gross, Harmon and Reidy 2002).

If we consider the example of biology, much of the fieldwork that biologists used to do has nowadays moved into the laboratory to be taken care of by biotechnologists. As a result, what used to be referred to by biologists as a field account has been replaced by something that we may refer to as a laboratory

[1] I am grateful to Professor Greg Myers and Professor Torben Vestergaard for insightful comments on an earlier version of this article. I would also like to express my gratitude to an anonymous reviewer, who offered some very helpful comments in the final revision process.

account – a kind of narrative that seems to be an obligatory move in scientific articles structured in accordance with the IMRD model (introduction, methods, results and discussion). (For a study of laboratory accounts, see also Lassen (2006)). Moreover, research focusing on field accounts from geology (Dressen, 2002; Dressen and Swales 2000; Swales 2004) has shown that the author is usually 'silenced' in this type of discourse, and Dressen's research corroborates findings by other researchers who have studied the role of authorial presence and absence in biology and molecular science research articles (see e.g. Myers, 1990, p. 80; see also Knorr-Cetina, 1981, 1999; Bazerman 1988; Gross, Harmon and Reidy 2002).

1.1. Aims

The aims of this paper are threefold. First, I wish to show a number of ways in which researcher-authors are silent, objective and implicit, but still present in the Materials and Methods section of two scientific research articles. Secondly, by comparing the written texts to an oral discussion of one of the texts analysed, I am going to demonstrate that the researcher-authors are considerably more salient and personal in the oral text, where epistemic modality is frequently used while the written texts are characterized by a high degree of affinity with propositions, which are presented as scientific fact. Thirdly, on the basis of my analysis I argue that the Materials and Methods section is so condensed and implicit that even researchers from within the field may have comprehension difficulties, unless they belong to the same community of practice and are part of the context in which the research article was written. The implications are that it may be difficult or even impossible to replicate research results, which used to be the litmus test of scientific method. This observation adds new perspectives on the significance of impersonality/ personality and consequently on the construal of scientific knowledge.

1.2. Historical background

The changes described in the introduction invariably reflect changes happening in scientific communities over time. In a study comparing scientific research written in the 17th century with 20th century articles, Gross et al found there to be marked variation. The 17th century style was characterized by elements from story telling. Facts were recounted, using verbs in the active voice, first-person narrative, minimal abstraction, few instances of specialized terminology (except for Latin names of plants), and few quantitative expressions or theoretical explanations (ibid: p. 29). Fact rather than argument was given priority (ibid: p. 19). The 20th century research article, on the other hand, hardly uses any of these features. Theory is given prominence over data, but there is a close interplay between the two. Visuals are used to support arguments, hedging is frequently used to signal objectivity, personal pronouns are rare, passive voice verbs relate to things and not to people, and there is a shift in syntax from clause complexity to group complexity.

Gross, Harmon and Reidy's findings are in line with Bazerman's (1988) analyses of articles from The Philosophic Transactions of the Royal Society of London (Transactions) published between 1665 and 1800 and experimental articles from Physics published in Physical Review between 1893 and 1980. Bazerman found a

gradual development towards increasingly argumentative style and hypothesis-testing (ibid. pp. 66-68), which occasioned a need for a more detailed Materials and Methods section to function as proof of experiments or to challenge other researchers as shown in Bazerman's analysis of Newton's Optics (ibid: p. 69; pp. 80-127). Thus the research article, including the Materials and Methods section, seems to have evolved and changed style in answer of social requirements such as establishing credibility or convincing readers of the plausibility of results (ibid. p. 141).

Gross, Harmon and Reidy (2002: p. ix) do not find the change of style to be a problem, but rather perceive of it as 'an accurate reflection of the world as science conceives it, an effective means of securing the claims of science, and an efficient medium for communicating the knowledge it creates'. However, they stress the point that the changes in style do not necessarily reflect an improvement but serve as indication that what 20th century researchers have to say is more complex than what 17th century researchers had to say. This may be seen as a result of a number of 'selection pressures' such as increased cognitive complexity, higher standards of proof, a greater volume of data, and a dramatic increase in the number of scientific articles (ibid: p. 29). In their view, the scientific research article has thus not evolved to become better or worse, but to cope with communicative needs. (ibid: p. 219). I would argue that although the scientific research article in its present form may accurately reflect the world 'as science conceives it', then analysis of my data seems to indicate that it may not be 'an efficient medium for communicating the knowledge it creates'. Among other things, the stylistic changes referred to above raise the question whether these changes of style would possibly constrain the possibility of verifying scientific results, which is also known as replication. It is generally accepted that the laboratory account, embedded in the Materials and Methods section, is intended to make replication possible. In other words, if a researcher wishes to go over the experiment again, s/he should be able to do so just by following the 'recipe' offered in the Materials and Methods section. I shall revert to the problem of replication in section 7.

2. Methods

To bring to the fore some of the differences between scientific writing and scientific discussion, - differences which testify to the difficulties of replication - I have analysed 1) the Materials and Methods section of a research article written by an American research group, 2) the Materials and Methods section of a research article written by a Danish research group, and 3) a tape-recorded discussion where the authors of the Danish research article discuss the American article mentioned under point 1. [2] The Danish research article (written in English) was published in 2001 without revision, while its American counterpart was published in 2003, following 3 weeks of revision and resubmission. To tease out similarities and differences between the two texts and taking inspiration from Dressen (2002), I

[2] I am indebted to a Danish biotechnology research team for access to invaluable data used in this study.

explore authorial traces in the Materials and Methods section of the two articles, which both describe and discuss the sequencing of Expressed Sequence Tags (ESTs) in potato tissue. My linguistic analyses are based on Systemic Functional Linguistics (Halliday 1994; Halliday in Matthiessen 2004; White 2001; Martin and White 2005). I then compare traces of authorial presence in the texts studied with a tape-recorded discussion of the American article, which took place in the Danish research group.

3. Data and situational context

The data used in this article is obtained from two sources, viz. a Department of Life Sciences (DLS)[3] at a Danish university where I had permission to attend and record presentations and discussions by a biotechnology research group. My other data source is an article published by an American-based Institute (ABI). DLS is home to three engineering programmes, including biochemistry, environmental engineering and biotechnology. The biotechnology section was established in 1999 with four research groups, one of which is a protein chemistry group. The group concentrates on protein and enzyme structure, function, evolution, stability and application. In addition global tissue analyses such as proteome and transcriptome analyses are carried out on a starch-rich potato variety.

ABI is an American non-profit research centre, which was founded in 1992. The Centre has a number of research departments including microbial genomics, parasite genomics, plant genomics and bioinformatics, and in addition it provides education and conferences to scientific and local communities. The centre is a complex web of research activities with many partners, who – among other things – have been active in recording Expressed Sequence Tags (ESTs) in potato, including stolon, tuber, leaves, shoots and roots and deposit information about these parts in libraries of a public database. DLS sees the efforts by ABI as complementary and as a possible platform for their proteomics, bioinformatics and starch biosynthesis work.

4. Theoretical foundation

4.1. The scientific paper as a genre

The generic structure of scientific articles has been studied by Swales (1990, 1994 and 2004; Swales and Feak 1997), who found the scientific article to have four parts: introduction, methods and materials, results and discussion. Swales's contribution consisted mainly in suggesting a model for analysing the introduction section, but he also briefly commented on the methods, discussion and results sections, and it would seem that most science research articles follow the pattern described by Swales. On the basis of Swales's work, it is possible to identify a section I have referred to in this paper as a laboratory account because it enumerates steps taken in the laboratory experiments and seems to be embedded in the Materials and Methods section.

[3] Names of Institutions, Departments and researchers have been anonymized in this paper.

The scientific paper represents the interface between laboratory processes and the outside world. Its function is to produce and document a result and at the same time argue a point. It is based on rationality, and it reflects but at the same time ignores what goes on in the laboratory. As observed by Knorr-Cetina (ibid. p. 94) 'the scientific paper hides more than it tells on its tame and civilised surface'. In other words, despite the generally accepted view that the scientific paper constitutes a report of laboratory work, it also leaves out much detail observable in practice; moreover, in the process of transforming laboratory practice into a written paper, the unordered scientific reasoning taking place in the laboratory is institutionalised into a strictly monitored flow of reason in the research paper (Knorr-Cetina, 1981, p. 95). (For observations of a similar nature, see also Latour and Woolgar 1979; Latour 1987). In a presentation of scientists' different approaches to reasoning in the laboratory compared to their approaches to reasoning in the writing situation, Knorr-Cetina (1981) offers a splendid overview of and rationale behind the various moves of the scientific paper. Following the convention of the IMRD model she describes the introduction as a reduction of laboratory work to just one line of argument, entirely leaving out what she refers to as 'personal interest structures' exemplified in mandates such as the need to find results that could be patented, the need to find more economical methods of production, or the need to succeed in qualifying for a position. Therefore what appears in the laboratory as a response to a chance to become a successful research team by following a new path of research is represented in the introduction as a response to filling a research gap, such as e.g. finding a new protein recovery method (ibid. pp. 100-101).

By implication, the introduction recontextualises laboratory discourse and at the same time decontextualises it in that agents, personal interest structures and mandatory concerns are suppressed. Knorr-Cetina (ibid.) illustrates the decontextualizing process through examples from the Materials and Methods section, which she refers to as an 'action description' of laboratory operations, but which are totally devoid of the types of epistemic modality frequently used in the laboratory and of the problems accounted for in the laboratory protocols. Knorr-Cetina (ibid. p. 114) finds that the Materials and Methods section typically brims with names of instruments, materials and descriptions of procedures ordered in sequence, but has no dynamic structure. All verbs are in the past tense, and it reads more than anything like a formula or as Knorr-Cetina puts it 'a check list of steps taken' (ibid. p. 115). In short the Materials and Methods section does not reason, but rather creates a logical, but decontextualised context for the Introduction.

While the Materials and Methods section is characterised by 'formulaic recitation of procedural steps' (ibid. p. 121), the Results and Discussion sections focus on similarities, differences and evaluations, and importantly, the order in which they are presented in the scientific paper in no way reflects the order in which they may be observed in the laboratory where results and discussion tend to influence and intermingle with method. All of this leaves the general impression of the scientific paper as an exercise in recontextualisation and depersonalisation, to which the

Materials and Methods section contributes through its conventionalised and formulaic style.

However, as demonstrated by Knorr-Cetina (1981) the style is motivated by human reasoning and social interaction, and one might assume that this will leave certain traces in even the most depersonalised and decontextualised parts of the research article, a point I shall argue later. From what has been said above, it would seem that the moves found in the research article following the IMRD model tend to serve the purpose of providing contexts for each other, but that the research article as a whole tends to both recontextualise and decontextualise laboratory work.

4.2. Authorial traces

In an impressive study of textual silence and salience in field accounts from three areas of modern geology, Dressen (2002) explored authorial traces in a corpus of 103 recent research articles from 9 different journals published between 1996 and 1999. The three areas were geochemistry, petrology and structural geology. Comparing field accounts to what she called 'sampling discourse', Dressen found that unlike sampling discourse, the field account makes up a specific part-genre due to its functional viability and more elaborate nature (2002, pp. 131, 135). By contrast, sampling discourse was found to be limited to one sentence indicating that samples were collected (ibid. p. 124), - an observation that also seems to be valid for the research articles discussed in this paper. Dressen further made the observation that due to a shift during the 60s in geology work practices from field research to laboratory experimentation, 'primary research concerns have been relocated from the field into the laboratory' (ibid. p. 87), a change that is demonstrated in Dressen's comparison of field accounts past and present.

Dressen's findings are further corroborated in some of her studies of research articles written by geochemists, where field activities seem to centre around the collecting of samples for experimental purposes (ibid. p. 118), but where little or no information is offered about the field mission as such. Dressen's findings are thus very much in line with Gross, Harmon and Reidy's analyses of the scientific research articles from the 17th and the 20th centuries (2002) – results that are also supported by other studies of scientific research articles (see e.g. Swales 2004).

Inspired by Halliday (1993: p. 146), who recognises part-genres through the 'clusters of features' they represent, Dressen (2002, p. 168) bases her approach to identifying linguistic features on what she calls authorial traces, salience and silence, and in what follows I shall use the same approach on the Materials and Methods sections of the two research articles described above. The framework suggested by Dressen indicates a cline of traces moving from researcher salience to silence. An adapted version of Dressen's model is shown in table 1:

Table 1: Traces of research activity in the laboratory (adapted from Dressen, 2002)

1. **Strong authorial implicature**
   a. Personal pronouns
   b. Agential statements of activity
   c. Evaluative adjectives and adverbs

2. **A disguised account of research activity**
   d. Nominal indications of activity
   e. Verbal indications of activity
   f. Measurements
   g. Location markers

While the researcher is relatively salient with strong authorial implicature in a), b) and c), this position is gradually backgrounded with only very vague evidence of the researcher's presence in the field or laboratory as we move towards g.

5. Analysis: Materials and Methods sections

In what follows I shall offer examples from the categories shown in table 1 found in the Materials and Methods sections of the two articles explored.

5.1. Strong authorial implicature: The passive voice

In the texts (shown in the Appendix) there are no examples of personal pronouns or self-reference in the Matrials and Methods sections, which rules out the most salient of author positions. However, in spite of its depersonalising nature, the passive voice then becomes the clearest authorial trace available in that it reflects human activity even when agency is elided as shown in the following sentence: *field grown potato tuber was harvested at the end of season*. The researchers who did the harvesting are only present by inference, but we have no difficulty in inferring that 'harvesting' involves human activity. In both articles the majority of verbs in the Materials and Methods section are past tense Material Processes in the passive voice, used for recounting research activity. The Journal's styleguide made no requirements on authors to use the passive voice, but authors were recommended to consult recent issues for style. Topics seem to determine which processes are used and in the Amrican article where libraries are a constant topic, 'to construct' is the most frequently used process, which is not surprising as it collocates with 'library'. Other frequent processes are *isolated, extracted, cloned, frozen, fractionated, grown, trimmed, prepared, discarded, added* and *stored*, all of which signal research activity. However, despite the high level of activity indicated in the Materials and Methods section, all grammatical subjects consist of non-

conscious Participants that are Goals dressed up as Actors with all human Agents elided.

5.2. Strong authorial implicature: Evaluative adjectives and adverbs

An area in which authorial presence may be observed is in evaluative statements, often centred on adverbs and adjectives. There are remarkably few of these in the two articles, in fact only one example in the Danish article, shown in example 1:

Example 1:

> *Polymerase chain reaction (PCR) products suitable for sequencing were generated*

in which *suitable for sequencing* may be said to convey the researcher's Judgement of the products as *suitable* or *unsuitable* for sequencing. If assessed suitable, the products are sequenced, if not suitable, they are discarded. The American article has only 3 evaluative terms (underlined), viz. *low-quality*, *low-complexity* and *high* stringency. One of these is shown in its co-text in example 2:

Example 2:

> *Vector and low-quality bases were trimmed, using an in-house program.*

The fact that certain *bases* may be assessed to be of low quality by the researcher indicates that some kind of evaluation has been going on in the laboratory, resulting possibly in a selection of high-quality bases and a trimming of inferior bases. What is meant exactly by low quality in this context is not clear due to the vagueness of the term, and this might cause problems if the experiment were to be replicated, unless the values of low-quality, low-complexity and high stringency are pre-defined by the research community or by the biotechnology programme used.

5.3. Disguised research activity: Nominal indications

As we move down the continuum of authorial traces, we find other markers of disguised research activity such as process-derived nouns, which may be seen as hybrids of human Actors and verbal Processes. In other words, if the hybrid allows us to discern human activity dressed up as a depersonalised nominal structure, what we see is disguised research activity. There are various motivations for presenting information as Nominal rather than as Verbal groups. For one thing it offers the possibility of word economy; secondly, it makes it possible to pack information by adding premodifiers in front of the head-noun; thirdly, by deleting the agent the text becomes less precise and perhaps even ambiguous because it may at times be difficult to decide whether an agent-less verbal process was initiated by a human or a non-human Actor. In the two articles there were many examples of process-derived nouns as shown in table 2:

Table 2: Nominal indications of research activity: Process-derived nouns

The DLS-article		The ABI-article	
Nominal group	Function in clause	Nominal group	Function in clause
cDNA synthesis was carried out	Participant/Grammatical subject	….after *ligation* they were cloned	Circumstance (time)
CDNA was size fractionated *by gel filtration*	Circumstance (manner)	…after *challenging* incompatible leaves	Circumstance (time)
…followed by in vivo *excision*	Circumstance (time)	…allowing for *the segregation* of possible alternative splice forms	Circumstance (manner)
The PCR included *a final extension*	Attribute	…were used for cluster *analyses*	Circumstance (purpose)
The control of size was performed	Participant/ Grammatical subject	K means *clustering* with initial *calculation* was performed	Participant/ grammatical subject
Primers were removed *by enzymatic digestion*	Circumstance (manner)		
..followed *by inactivation*	Circumstance (time)		
Putative identification was carried out	Participant/ Grammatical subject		

It will appear from table 2 that the Materials and Methods section of both articles has examples of process-derived nouns, but without using nominal style extensively. In most of the examples the process-derived noun functions as Circumstance in a clause. This serves the purpose of packing the contents of what would otherwise have been a sub-ordinate clause into a nominal group, thus economising on space.

5.4. Disguised research activity: Verbal indications

This category includes, in addition to the passive voice and deleted agency, the type of process-derived adjectives that may function as pre-modifiers and post-modifiers in the nominal group. The use of pre-modifying adjectives does not vary much in the two articles studied, while postmodified reduced relative clauses are only used in the ABI-article as shown in table 3:

Table 3: Verbal indications of research activity: process-derived adjectives

The DLS-article	**The ABI-article**
Pre-modifying adjectives	**Pre-modifying adjectives**
Field-grown potato tuber	*Transposable* element sequences of Arabidopsis
The *excised, amplified* library	…*unmatched* overhangs
Defrosted bacterial glycerol	..using *in-vitro grown* tubers
A *searchable* flat database	…late-blight *pathogen-challenged* leaf tissue
An *unclassified* group	
Post-modifying reduced relative clauses	**Post-modifying reduced relative clauses**
No examples	..the protein *required* for a TC or singleton EST
	By using transcript abundance in each TC *inferred* from the EST frequency…
	…leaf tissue *collected* at 24 h post-challenge
	..stem cuttings *cultured* on a medium
	…*obtained* from greenhouse-grown plants
	…roots *grown* in vitro

In terms of disguising research activity, pre-modifying as well as post-modifying reduced relative clauses are a stylistic device used by writers for 1) elegance, 2) economy of language and 3) eliding the agent or Actor, depending on whether the reduced relative clause originates in a clause in the passive or the active voice. There are thus clear traces of the author in these structures.

5.5. Disguised research activity: Measurements

Human research activity and presence in the laboratory may moreover be indicated through numerous measurement markers as shown in examples 3, 4 and 5:

Example 3:

> *The average insert size was 1.5 kb (DLS-article)*

Example 4:

> *Glycerol was added to a final concentration of 15% (DLS-article)*

Example 5:

> *Sequences sharing greater than 94% identity over 40 or more contiguous bases with unmatched overhangs less than 39 bases in length were placed into clusters (ABI-article).*

In example 3 there is trace of a researcher who has calculated the average insert size of the information load added to a library consisting of cloned cells. Example 4 implicitly tells us that a researcher has measured the glycerol content added. If we placed the sentence in its proper context we would find that the adding of glycerol is part of an experiment involving infected plant cells. Similarly in example 5, we discern the researcher as someone who measures the identity of sequences in order to select bases for cluster analysis.

5.6. Disguised research activity: location markers

Research activity may further implicitly manifest itself through markers identifying the movements or locations of the researcher in the field or the laboratory. This may be illustrated through examples 6 and 7:

Example 6:

> *Field grown potato tuber was cut into pieces and frozen in liquid nitrogen in the field (DLS)*

Example 7:

> *Sequences sharing greater than 94% identity over 40 or more contiguous bases with unmatched overhangs less than 30 bases in length were placed into clusters (ABI).*

Example 6 indicates a geographical place (the field) where a specific activity (cutting potato tuber into pieces and freezing the pieces in liquid nitrogen) takes place. It thus indicates the presence of a human being in the particular location in which the sampling activity took place. Example 7 is more implicit in that there is no indication of a specific location in the laboratory, but instead, a directional movement is instigated by the researcher, who instructs the computer to do the *placing into clusters*. The movement is signalled through the preposition *into* combined with a Process indicating movement caused by a human actor (to place).

5.7. Collecting sampling material in the two articles

In addition to the authorial traces discussed above, the Materials and Methods sections further embed what Dressen 2002) has referred to as sampling discourse and none of the articles had a separate field account. The DLS-article opens the first sub-paragraph with sampling discourse as shown in example 8:

Example 8:

> *Field grown potato tuber (var. Kura) was harvested at the end of flowering, washed in 9.5% sodium dodecylsulfate, cut into pieces and frozen in liquid nitrogen in the field. RNA was extracted from 5 g as described by Scott et al. [12][….] cDNA was size fractionated by gel filtration and cloned unidirectionally into the λZAPII vector.*

It will appear that part of the sampling, indicated by a full stop, took place in the field while part of it was carried out in the laboratory. Whereas the sampling information is presented in the DLS-article as finite clauses in the passive voice with the potato and cDNA as Goals in subject position, the same type of information is constructed either as Circumstance or as reduced relative clauses (underlined) in the ABI-article as shown in example 9:

Example 9:

> *The healthy leaf library was constructed from leaflets and petioles obtained from greenhouse-grown (8-week-old) plants. The sprouting eye libraries were constructed from 2- to 15-mm germinating eyes from Kennebec tubers. The stolon library was constructed from developing axillary buds of potato nodal stem cuttings cultured on a medium that induces tuber formation (Bachem et al., 1996).*

The implications of these differences are that in example 8 the plant material being operated on (the potato tuber) is foregrounded as the object or focus of activity while this position is occupied by various types of libraries, using circumstances of manner (means) to construct the libraries. The plant materials are thus backgrounded in example 9. However, irrespective of the differences in their construction of sampling activities, both articles show clear traces of researcher activity in the laboratory and to a limited extent in the field, although it seems that field activities have been reduced to a minimum as suggested earlier. It should be noted, however, that in spite of the limited space given to the embedded field account and thus to personality, many hours of work have been put into growing, harvesting, cutting and freezing potatoes for subsequent laboratory work, although the majority of sampling time is spent in the laboratory, preparing the experiments.

6. Analysis of oral discussion of a scientific research article

To have an idea of how specialists construe meaning from a Materials and Methods section written by specialists from a different community of practice, I compared the written material with an oral discussion that took place in a Danish Life Sciences research group on 5 August 2003[4]. In what follows I present extracts from the recorded and transcribed discussion of three research group members, whom I shall refer to as Head of Project (HP), Associate Professor (A/Prof) and Assistant Professor (Assist/Prof). The discussion was held in English due to the presence of researchers from abroad and the transcription renders as accurately as possible what was said.

The discussants approached their task from a critical angle and may thus be characterized as resistant readers. The article was selected by the head of a project on potato research and was discussed in a Wednesday morning laboratory group meeting attended by Ph.D. students, master's students and staff members affiliated

[4] The discussants were native speakers of Danish using English as the language of communication in laboratory group meetings.

with the biotechnology group. The assistant professor had been assigned to present the article, which reported on research similar to research carried out by the Danish research group. Moreover, the article referred to research by the Danish group, which further motivated the choice. As we shall see, the discussion foregrounds a number of purposes that each contributes to our understanding of how the Danish research group negotiates different knowledge positions in a joint attempt at construing and coming to terms with the methods used by a foreign and competing research group to achieve the goal of *understanding potato physiology better* – a goal shared by the two communities of practice.

In the discussion, a great many rhetorical purposes may be identified through language resources used interpersonally as well as ideationally. The discussants look for errors to substantiate their critical attitude towards the contents of the article and in the process negotiate knowledge, legitimize scientific approaches, position themselves in an interchangeable hierarchy of learners and experts, and express concerns about risk resulting from what they find to be a lack of trustworthiness caused by inadequate research methodology. In what follows I shall offer examples illustrating some of these rhetorical purposes. In Text 1 HP, taking on the role as chair, initiates the discussion by setting up a teacher/ student relationship in which the hierarchical pattern is made clear from the outset.

Text 1:

HP: OK – today I suggest that we actually go through a recent paper from an American research group. [,,,,] And I think that it is important that we know what **they** think **they** can extract from **their** data and Assist/ Prof will go over it, and I must admit that really in this …. I am rather disappointed – yes – at how little **they** got out of this mass of data – but let's see – it seems that it's – eeh – a purely bioinformatics person who has been writing this and not a biologist.

Assist/ Prof: First of all I must say that I was also disappointed in it all because this seems like eh – one man's work – eh – well I think that I could have done eh ….

A/ Prof.: And **they** are twenty writers?

HP's skepticism is indicated through *the attribution* of epistemic modality to the research group that wrote the article, exemplified in *what they think they can extract from their data.* HP makes her Attitude clear in a statement of Affect: *rather disappointed*, and the object of her disappointment is quantified in how *little* they got out of this *mass of data*. The Assist/ Prof shares HP's disappointment, adding a new quantification, viz. *one man's work* – an observation that is supplemented by a third example of quantification uttered by A/Prof, who mentions that there were *twenty writers*, thus suggesting that in spite of the many writers, only little came out of it. In spite of their different positions in the hierarchy of academics, the three discussants thus set out from a common platform of being critical towards the article, which has a bonding effect indicated by the use of personal pronoun *they* about the American research group. Skepticism over research results continue throughout the discussion, which may be illustrated with examples shown in text 2.

Text 2:
HP: But they don't document anything.
Assist. Prof.: No, no, no, it's really annoying that ….
A/Prof.: So they might just have screwed up their blast and then polluted …..
Assist. Prof.: No, I don't think so, but …. I mean …. Why do they mention comparisons to private data which they cannot look at ….
[…..]
HP: What is annoying me is that they list genes that they just see in one pattern. That's not significant …. I mean if they had seen it 5 times or a certain number …. But one time
[…..]
HP: Ok, one thing that …. I'm surprised that good scientists like NN and NN want their names in this kind of a paper.
Assist/ Prof: Don't you think it's …. For me it's just a status paper, but it shouldn't have been in a prestigious journal – they should have had more biology.
[….]
Assist/ Prof: But I think it is also stupid that why didn't they just include our library in the analyses so they could give a potato-wide analysis and not just a …. That would have been more interesting to include everything.
A/ Prof: I think, they, they feel they have a dataset – *the* dataset – and then this is driven by computer people who are just analyzing the dataset – and then that's it – and that's that – and I think ….. *we have a different approach in the sense that we realize that we need to integrate all the information we have.*
Assist/ Prof.: This is the paper I would have made from all the data that was available. The only thing I needed was a bit more information on the libraries and the cells.
A/ Prof: Then you can be happy that there is still room for your paper.
[……]

In text 2, attitude is expressed through the emotion of Affect such as *it's really annoying*, *what is annoying is that…* and *I'm surprised that….* Moreover, negative Judgement is used to signal incapacity or lack of research integrity in examples like *they don't document anything*, *they might just have screwed up their blast*, *they should have had more biology*, or *they mention comparisons to private data, which they cannot look at*. In the last of these examples negation is used to signal that 'they' omitted doing something they ought to have done, and negation is frequently used to express inadequacy such as in the statement: *they don't document anything*. The adverb *just* plays a salient role in text 2 in the way it is being used to downplay the significance of the American research results, again stressing that very little has been achieved from massive data. Examples are: *it's just a status paper* or *why didn't they just include our library* or *computer people who are just analyzing the dataset*. Text 2 signals various types of bonding such as between biologists against computer people (who are just analyzing the dataset) and between the three discussants against the American research group. This is made clear in the A/Prof's final comment: *then you can be happy that there is still room for your paper*, a statement that indirectly evaluates the research results of the article negatively and encourages Assist/ Prof to publish a research article in which he could include all necessary information. Bonding is also created by setting up a social role

relationship of 'we' versus 'them' exemplified by the A/Prof's comment: *we have a different approach in the sense that we realize that we need to integrate all the information we have*. In the context, saying that 'our approach is different' would imply that it is better.

Text 3 is an extract from the discussion where the legitimization of research methods is foregrounded and where at the same time the three discussants negotiate their knowledge capital to arrive at a shared platform of understanding:

Text 3:
HP: Annexin – is that a system incorporating proteins and membranes or what's the function of annexin? You ought to see an annexin spotter on the codereading. [….] But here they also just write something messy and they're not very …..
A/Prof.: *That's why we should make a proper naming of stuff* …. We still have this problem, I mean …. We don't get information from the names they put …. Except for us that have similar lists that we compare to, because there is no biological information.
Assist.Prof.: Not a lot.
HP: But DnaJ we agree is highly abundant.
A/Prof.: And there is also C2 – they see DnaJ and the DnaJ light, and of course, obviously, we don't know how much alive it is.
Assist. Prof.: And then there is also catalase, but I suspect that this is present in all 9 libraries but most in the pathogenesis related libraries.
HP: So, after all, there is ….
Assist. Prof.: Yes, because if you look.. ehm…
HP: It should be very predominant in the incompatible libraries as one of the defence mechanisms that ….
Assist/Prof: I mean .. if you compare it to this one you find that catalase, which is this one, was one of the most abundant proteins in that library …. There were 19 of it…
A/Prof.: …which is our library or what?
Assist. Prof.: That's their library
A/Prof.: OK
Assist. Prof.: That's the incompatible EST library.
HP: This is the Assist/Prof's analysis of their leaves compatible and incompatible library.

In text 3, HP continues evaluating the article negatively, stating: *But here they also just write something messy, and they are not very* ...., presupposing through the adverb 'also' that there are other examples of 'messy writing'. A/Prof uses the opportunity to bring into the discussion the need for integrity in research methodology by suggesting: *That's why we should make a proper naming of stuff*, at the same indicating that only scientists with similar lists would have a chance of interpreting the labels in the article because of their lack of informative value for those outside the discourse community. In the rest of text 3, the discussants try to make meaning of what they read in the research article, helping each other to interpret what they do not immediately understand. In this process, the three discussants navigate through the text by using interrogative clauses to tease out

meaningful answers, however not always with success, as shown in the A/Prof's last comment: …..*which is our library or what*? And the Assist/Prof's clarifying response: *That's their library*, - a comment that is set straight by HP, who explains: *This is the Assist/Prof's analysis of their leaves compatible and incompatible library*, thus disclaiming responsibility for her utterance by attributing it to the Assist/Prof. The subject matter of the article, viz. sequencing of ESTs, was done not by the A/Prof, but by the Assist/Prof, who is then expected to be in a position to interpret the results found by the American research group. This indicates that although the HP is on top of the hierarchy, followed by the A/Prof and then by the Assist/Prof, there are certain areas where the Assist/Prof is 'in the know' while the other two are in a learning situation. However this social role relationship is reversed in other situations as indicated in text 4, where HP instigates a teacher/ student relationship, asking the Assist/Prof to explain a special method of clustering.

Text 4:
HP: Would you go over the K-means method?
Assist. Prof.: Well, the K-means is …. What you are looking at here is just the K-means or zero. So there is one cluster here. So what you can do is – you can say I already know – I suspect there will be this number of clusters. E.g. there are 6 libraries here so I will expect 6 different gene expression patterns to occur.

And in text 5 we see how the social role relationship shifts from HP being in a teaching position to being in a learning position, and A/Prof taking over the role of instructor.

Text 5:
HP: But I don't know, why are your counts lower than the last count here in table 2?
Assist/Prof.: Ehm, you mean compared to the previous one?
HP: Yeah
Assist/Prof: Certainly, I don't understand.
HP: Unique sequences or sequences?
A/Prof: OK, I can explain if I may.
Assist/Prof.: Yeah, sure.
A/Prof: You see, the unique sequences in table 2, ok the first one is just the sum of TCs and the number of singletons within a library. OK? So for example for stolon, that will be eh 3570 + 1676. OK – in the other two, now we say all these unique sequences we have for the other one, now we subtract for each library the sequences that are seen in another library. Then that 5246 comes down to 2,000 of these sequences which are not seen in any of the other libraries.
Assist. Prof.: You mean this is a … this is a transcriptome wide analysis and the other is just for each library?
A/Prof.: Yes, you can put it that way.
HP: So that means that actually they never count more than 13,000 different genes?
Assist. Prof.: and some which are uniquely present
HP: no that must be…
Assist. Prof. and A/Prof.: No, no because they then …..
A/Prof.: …. All the ones that are …. All housekeeping genes for example won't show

up in this sum … because they are seen in more than one library ….
Assist. Prof.: yeah, yeah….
A/Prof: and so .. eh … the total there is without any interest, really
HP: Yes, of course.

There is a high frequency of Sensing and Verbal processes in text 5, such as *know, mean, understand and see* (Sensing), and explain, say and to put it (Verbal), which indicates cognitive and verbal activity. This is to be expected in a text part in which something is being explained with the purpose of being understood. It is therefore of some interest to look at who explains to whom as this may show something about social role relationships, which play a salient role in interactions of the sort reported here and which invariably have a bearing on the outcome of the scientific research article, which may be seen as the end result of knowledge negotiated in discussions about science. At the beginning of the extract, HP asks a question: *But I don't know, why are your counts lower than the count here in table 2*? It is difficult to assess at this point whether HP's question should be seen as a genuine question asked in order to learn or it is a question to assess the Assist/Prof's knowledge. However, towards the end of the extract, HP indicates that she has understood the nature of things when she replies *Yes, of course*, and it would therefore seem that she takes on the role of learner in the brief text passage. This is a role she shares with the Assist/ Prof, who bluntly admits that he is unable to explain. This is seen from his utterance: *Certainly, I don't understand*, which signals an attitude of incapacity. But the A/Prof comes to their rescue with an explanation that both the HP and the Assist/Prof seem to be willing to accept, and they thus accept the roles of learners, while the A/Prof temporarily takes on the role of expert. Of further interest in Text 5 are the frequent interruptions and incomplete sentences, which tend to increase in frequency with the discussants' eagerness to get their message across.

An additional point to be made is that throughout the discussion, the A/Prof shows a great deal of concern about research integrity and trustworthiness, and he repeatedly points to the importance of using legitimate approaches. This may be seen from the following extract:

Text 6:
A/Prof.: I always have – like a worry gene …. Ok. If we are doing this kind of a new biology, the principle of this new biology is that we do stuff – we sort through the data in automatic unbiased fashion and then see what comes up. If we have to introduce steps, somehow where we have a manual interpretation to make sure things make sense, then we are short circuiting the basic principle, and that's where my worry gene activates, you can say. And so – ok – here is a dangerous area – or we might introduce potential areas that they dub from the trustworthiness of the result in the end.

In text 6, the A/Prof suggests that the research article discussed raises doubts about trustworthiness, due to inaccessible representation of research results and the

consequent need to interfere with test results through manual interpretation rather than relying solely on automatic and unbiased generation of results. This way a new problem is created as a result of solving the old problem of bias caused by human observation and the lack of proper and accurate criteria for replication.

It will appear from the extracts that the three Danish researchers generally have difficulties understanding the approach described in the Materials and Methods section of the American research article. This may be due to a number of factors such as the very condensed style required by conventional practice, inadequate coding systems, important details perhaps having been omitted, or lack of properly labelled categories for proteins, etc. Some of these problems may occur because the discussants do not belong to the same community of practice as the American scientists. However, it should be noted that even researchers belonging to the same community of practice negotiate knowledge from different levels of understanding as has been demonstrated in the present analysis. For one thing, research communities of practice have members at all levels, ranging from Master's students to Ph.D-students, post-docs, assistant professors, associate professors and full professors, and it goes without saying that a hierarchical scale of qualifications, and hence positions, is reflected in a hierarchical scale of knowledge. But equally important is the fact that not every member of a community of practice possesses the same skills. A scientist who has specialized in mass-spectrometry may not be literate when it comes to reading RNA-sequences or gene sequences, but by convention scientists normally write joint research articles, thus combing different skills and knowledge negotiated in discussions like the one analysed in this article.

A striking feature is that compared to the Materials and Methods sections in the written research articles, the oral discussion has many evaluative Judgements such as *that's a problem*, *it's really annoying*, etc. In extract 5, which offers examples of negative Judgement of the Danish researchers' comprehension capacity (I don't understand) and in extract 3, which stresses the American group's lack of skill (we don't get information…), we see how criticism continues and foregrounds a comprehension problem with perhaps dire consequences for the construal of science.

7. Replication of results

As mentioned in the introduction, one of the purposes of the Materials and Methods section is assumed to be the replication of results. In a study undertaken by Mulkay and Gilbert (1991: 154-166), in which scientists were interviewed about approaches to replication, it was found that in spite of scientists' claim that 'exact experimental repetition is crucial to science', they rarely engage in reproducing results by other scientists, even if they still maintain that other scientists have confirmed their work through experimental variation (ibid: 160). In other words, what is crucial to the validation of science is that the same conclusions may be reached by using a different method. Therefore what Mulkay and Gilbert - quoting an interviewee - have referred to as 'mere replication' is rarely done. This is also confirmed in Knorr-Cetina (1981: 129) through a statement made by a scientist, who was

interviewed about the difficulty in understanding the description of how an author has proceeded (cited in 1981: 129). As further corroborated by the data analysed in this article, it is also questionable whether the Materials and Methods section actually contains all the information necessary for confirming scientific research results:

> *There is a problem, of course, if one wants to replicate a result or repeat a method. As a rule, however, one does something else anyway. Hence, it is not so interesting to know exactly why and how certain things were done ….*

The quotation suggests that the possibility to replicate results may not be of crucial importance to some scientists who see it as their primary task to produce innovative and patentable results rather than to engage in time-consuming basic research. This point is also argued by Collins (1985), who discusses some of the complexities of doing replication. Collins suggests that results are often not replicated as a result of lack of a common understanding of what replication entails. Thus, difficulties in defining criteria relating to accuracy, personal bias and analytical approach present a serious obstacle to replication. However, these difficulties bring about what Collins (ibid: p. 148) has referred to as 'changing orders', which are brought about by scientists who are 'prepared to risk new ways of doing things, which may again enable the flow of new ideas.

However, whether scientists try to reproduce results or they give priority to experimental variation as suggested above, they will invariably take an interest in how other scientists have reached their conclusions, and they rely on the Materials and Methods section for the necessary information. Therefore, it is not unimportant whether the Materials and Methods section of the scientific research article is comprehensible. In spite of the many complications and varying attitudes, it is however the commonly accepted rationale behind the Materials and Methods section that replication ought to be possible.

The paradox of replication expectations poised against the absence of replication efforts may in part further be explained by requirements by scientific journals. To give an example, the American Journal of Plant Physiology states in their instructions for authors that the Materials and Methods section 'should reference all standard procedures but must be complete enough so that results can be verified by other laboratories' (2005: p. 5), a requirement that is summarized by the Journal in the following statement: 'To summarize, sufficient detail should be provided for the experiments to be reproduced' (ibid.: p. 6). As my analyses have demonstrated, it is, however, uncertain to what extent the Materials and Methods section, by its very nature, contains the information necessary for replication purposes; and it is furthermore uncertain whether it is at all possible to produce a Materials and Methods section that is sufficiently elaborate to make up for a reading situation removed from the original context in which the research was undertaken and the research article written.

8. Conclusion

In the present paper I have analysed the Materials and Methods section of two biotechnology research articles, which were selected by the Head of a Danish research project for discussion in laboratory group meetings. Both articles focused on the genetic makeup of the potato. Incorporating sampling discourse as well as laboratory accounts, the Materials and Methods sections contained a wide variety of authorial traces even if the authors/researchers did not use personal pronouns, epistemic modality or other interpersonal cues in any of the written texts studied. It may be concluded that there was more personality, albeit implicit, in the articles than one might anticipate – a feature common to the two articles. There was thus little variation in the ways in which knowledge was represented, - an observation that cannot, of course, justify any claims about typicality even if both articles reveal something about the social contexts in which they were written. While similarities outrivaled differences in the written texts, it was interesting to notice certain differences between the written texts and a tape-recorded discussion among biotechnology researchers, who made widespread use of epistemic modality, first-person pronouns and evaluative statements. The researchers were thus backgrounded in the written texts, but foregrounded in the oral discussion.

Given these examples of textual variation, my findings raise questions about the construction and mediation of knowledge in scientific discourse. This resonates with Bazerman's (1988: 21) observation about written texts that they 'appear context less and socially meaningless in comparison with spoken language that arises out of the needs of a moment'. The quotation from Bazerman points to one of a number of explanations of why the discussants found the written text difficult to make sense of. By convention, prominence has been given to written documents, which have been taken as true reports of scientific inquiry in the laboratory. But one might wonder why this is so since written text does not necessarily construe reality once it gets filtered through a reader. It therefore seems surprising that the written research article still follows the institutionalised convention of silencing the researcher in spite of the replication requirement imposed on the Materials and Methods section and the changes in social and discursive practices demonstrated in Dressen's work. A further explanation might be, as suggested by Berkenkotter and Huckin (1995, p. 38), that journal editors and reviewers insist on a conventionalised form that fits into the journal format, ignoring that this may be a constraint on the researcher's possibilities to make their ideas accessible and hence on their possibilities to make their research replicable. Accessibility and replication go hand in hand and if scientific research articles are not comprehensible to scientists, then they are even less so to students, translators and journalists who try to disseminate scientific information through the media.

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Appendix 1

The Materials and methods section of the DLS- research article

2.1. RNA extraction and library construction

Field grown potato tuber (var. Kuras) was harvested at the end of flowering, washed in 0.5% sodium dodecylsulfate, cut into pieces and frozen in liquid nitrogen in the field. RNA was extracted from 5 g as described by Scott et al. [12]. Poly(A) mRNA selection (MagneSphere technology, Promega, Madison, WI, USA), and cDNA synthesis (Stratagene) were carried out by standard procedures, except for using a different5´ linker adapter (5´-AATTCGGCTCGAGG). cDNA was size fractionated by gel filtration and cloned unidirectionally into the ZAPII vector. The resulting DNA was packed into phages using Gigapack III Gold (Stratagene). From the initial plating the library was estimated to contain 105 clones. An aliquot of the library was amplified, followed by in vivo excision of the pBluescript SK() phagemid. The average insert size was 1.5 kb.

2.2. DNA sequencing

An aliquot of the excised, amplified library was used for infecting Escherichia coli SOLR cells of OD600 1.0 and subsequently plated on LB agar containing ampicillin. The resulting colonies were picked into a 96 well culture plate and grown for 10 h at 37°C and 200 rpm. Glycerol was added to a final concentration of 15% and a backup plate was created. Plates were stored at 45°C. Polymerase chain reaction (PCR) products suitable for sequencing were generated from 0.5 µl of defrosted bacterial glycerol stock as template and T3-EST1 (AATTAACCCTCACTAAAGGG) and M13-21 (TGTAAAACGACGGCCAGT) as primers (present in the pBluescript vector arms). The PCR included 95°C 3 min, 95°C 30 s, 53°C 30 s, 72°C 105 s for 35 cycles and a final extension at 72°C 7 min. The control of size and quality of the PCR products was performed by gel electrophoresis of a representative number of samples from each plate. Excess primers and nucleotides were removed by enzymatic digestion using 5 U exonuclease I (New England Biolabs) and 0.3 U of shrimp alkaline phosphatase (Amersham Pharmacia), 37°C for 60 min, followed by inactivation of the enzymes at 80°C for 20 min. The resulting PCR product was then used as template for a sequence reaction using 5 pmol of a nested primer (GTGGCGGCCGCTCTAGAA) 38 bp upstream of the cDNA insert, and dye terminator cycle sequencing chemistry. For each reaction, 4 µl of PCR product was used (50-100 ng DNA) in a total reaction volume of 12 µl. Sequencing reactions were subjected to 95°C 20 s, 57°C 15 s, 60°C 1 min for 30 cycles and 60°C for 5 min. These were cleaned by Sephadex G50 (DNA grade, Amersham Pharmacia) in filter plates (Millipore MAHV N45) prior to capillary electrophoretic separation and detection by a MegaBace 1000 (Amersham Pharmacia).

2.3. Sequence processing and analysis

A custom PERL script processed sequence files automatically. This script linked sequence backup, basecalling by Phred (trimming option on, cut-off set to 0.05; CodonCode), discarding sequences shorter than 150 bp, and vector trimming by Cross Match (CodonCode) into one routine. DNATools [13] was used to automatically BLAST and analyze results, build EST submission files for the dbEST (GenBank dbEST BI405291-BI407114), and edit sequences. It was also used to build a searchable flat database containing sequences and BLAST results. BLASTX searches and putative identification were carried out locally because of speed. A 600 bp sequence was blasted against 660,000 non-redundant GenBank protein entries in 25 s using a 1100 MHz AMD CPU with 768 MB RAM. Inverted sequences and sequences originating from E. coli and Lambda inserts were removed. Contigs were built with the edited sequences using Phrap (CodonCode): phrap>readslog.txt-revise_greedy-confirm_score 40-vector_bound 10-maxgap 10.

2.4. Functional analysis of EST sequences

The MIPS functional classification applied to Arabidopsis genes [9,10] was adapted for potato. Translated potato ESTs were sorted into 12 functional groups and an unclassified group by sequence comparison to classified Arabidopsis proteins using an E-value cut-off at 105 [14]. Some were assigned more than one function in agreement with the homologous Arabidopsis proteins. All Arabidopsis protein sequences were downloaded from TIGR in batches of separate functional class [11]. These flat file databases were concatenated into one file, and a BLAST searchable database called At-Class was built with format db.

Appendix 2

The Materials and Methods section of the ABI- research article

MATERIALS AND METHODS

Library Construction

Libraries were generated from mRNA isolated from multiple tissues of potato (*Solanum tuberosum*). All libraries were constructed from potato cv Kennebec, with the exception of the stolon and microtuber libraries, which were constructed from the potato cv Bintje. All libraries were directionally cloned into pBluescript vectors (Stratagene, LaJolla, CA) and after ligation, cloned into SOLR cells (Ausubel et al., 1994). The healthy leaf, sprouting eye, stolon, root, and tuber libraries were constructed in the Steve Tanksley lab. The healthy leaf library was constructed from leaflets and petioles obtained from greenhouse-grown (8-week-old) plants. The sprouting eye libraries were constructed from 2- to 15-mm germinating eyes from Kennebec tubers. The stolon library was constructed from

developing axillary buds of potato nodal stem cuttings cultured on a medium that induces tuber formation (Bachem et al., 1996). The microtuber library was constructed using in vitro-grown tubers. The dormant tuber library was constructed from internal tuber tissue (excluding epidermal and bud tissue) that had been stored for 1 month after harvest at 4 C. The root library was constructed from roots grown in vitro on CM medium.

Two libraries were constructed from late-blight pathogen (*Phytophthora infestans*)-challenged leaf tissue. The BLPI library was constructed in the Barbara Baker lab after challenging incompatible leaves with late-blight pathogen US-1 (US 940501; 450,000 sporangia mL_1) in the Biotron (University of Wisconsin, Madison). RNA was isolated from leaf tissue collected at 1, 2, 5, 12, and 24 h post-challenge. The PPC library was constructed in the William Fry lab after challenging leaves with the compatible late-blight pathogen isolate US 940480 (20,000 sporangia mL_1). RNA was isolated from tissue collected at 3, 6, 9, 12, 24, 48, and 72 h after inoculation.

Sequencing Methodology

Clones were grown for 18 h in yeast tryptone media (Biofluids, Rockville, MD). Templates were prepared using the Eppendorf-5 Prime Direct Bind prep kit (Eppendorf, Boulder, CO). The 5_ ends of the cDNA clones were sequenced on ABI 377 or 3700 sequencing machines using standard sequencing methods. Bases were called using either phred (Ewing and Green, 1998; Ewing et al., 1998) or the TraceTuner program (Paracel, Pasadena, CA). Vector and low-quality bases were trimmed using an in-house program.

Computational Methods

EST sequences were trimmed to eliminate vector, adaptor, and lowquality sequences. Sequences sharing greater than 94% identity over 40 or more contiguous bases with unmatched overhangs less than 30 bases in length were placed into clusters. Overlaps based exclusively on lowcomplexity regions were excluded. Each cluster was assembled at high stringency using the Paracel Transcript Assembler (version 2.6.2, http:// www.paracel.com; Huang and Madan, 1999) to produce TC sequences. Alignments containing gaps (or inserts) longer than nine nucleotides were discarded, allowing for the segregation of possible alternative splice forms. Sequences not assembled into a TC were termed singleton ESTs. The TCs and the singleton ESTs were searched against a nonredundant protein database to provide a putative function with a minimum of 30% identity over 20% of the length of the protein required for a TC or singleton EST to be annotated (Quackenbush et al., 2000, 2001). Transposable element sequences of Arabidopsis, potato, and tomato (*Lycopersicon esculentum*; 93, 12, and 99 sequences, respectively) were downloaded from the GenBank as of October 31, 2002. BLASTN (WU-BLAST 2.0, http://blast.wustl.edu; Altschul et al., 1990) was used to identify the presence of transposable elements in the 19,892 TC and singleton EST sequences using a cutoff criterion of E _ _05. Tomato and potato EST sequences were searched using WU-BLAST 2.0 (W. Gish, unpublished data;

http://blast.wustl.edu; Altschul et al., 1990). Potato EST data described in this study are available online (http://www.tigr.org/tdb/potato/plantphysiologypaper /specialgeneindex). Digital analyses of gene expression were performed with the TIGR MultipleExperimentViewer software (version 1.1; Quackenbush, 2001) by using transcript abundance in each TC inferred from the EST frequency for that TC in all seven libraries. Only TCs that were composed of at least six ESTs were used for the cluster analyses. Hierarchical clustering (Eisen et al., 1998) with statistical support for the nodes of the trees, based on resampling the data, was performed. *k* Means clustering (Soukas et al., 2000) with initial calculation of the figures of merit (Yeung et al., 2001) was also performed.

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ABSTRACT

Personality and impersonality in biotechnology discourse

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Key-words
IMRD model, Materials and Methods, genre and discourse analysis, scientific research article, accessibility, implicitness, evaluation

With the emergence of biotechnology, the field account has been replaced by something that we may refer to as a laboratory account – a kind of narrative that constitutes the Materials and Methods section of the IMRD model (introduction, methods, results and discussion). Research focusing on field accounts from geology (Dressen 2002; Dressen and Swales 2000; Swales 2004) has shown that the author is usually 'silenced' in these accounts, and Dressen's research corroborates similar findings by other researchers (see e.g. Myers 1990). Following Dressen (2002), this paper explores authorial traces in the Materials and Methods sections in two scientific research articles and compares the results with data from a discussion of one of these articles by a Danish research group. It is found that while the Materials and Methods sections are characterized by impersonality, the oral discussion foregrounds personality and at the same time demonstrates how the impersonal written texts cause comprehension problems - even to practitioners - with adverse implications for the replication of results.
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REPORTS:

Réflexions sur la variation : étude de cas dans le domaine médical

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Introduction: CRTT et CIBLSP

CIBLSP (Corpus Informatisés Bilingues de Langues de Spécialité), en linguistique de corpus.

Ce groupe de travail s'est constitué en 2002 autour de six chercheurs au centre de recherche en terminologie et traduction (CRTT) à l'Université Lyon 2 afin de travailler selon une méthodologie commune à la genèse de corpus électroniques, ouverts, bilingues français-anglais, dans plusieurs domaines de spécialité (écologie, médecine, pharmacologie, toxicomanie, volcanologie). Ce vaste travail répond à des objectifs terminologiques (observer l'évolution des termes et des concepts et permettre des analyses transversales entre les différents domaines compilés pour le projet), didactiques (trouver de nouveaux outils d'aide à l'apprentissage de la traduction spécialisée), et aussi lexicologiques (repérer le traitement des termes spécialisés dans les dictionnaires de langue générale).

Il n'est de terminologie que relativement à un domaine de spécialisation. Dans une culture donnée, avec une langue donnée et dans un domaine bien précis, on considère que le concept est constitué de traits plus petits appelés « traits conceptuels », et appartient à un système structuré (qu'on appelle « conceptologie ») fonctionnant au niveau cognitif, et proposant un découpage différent d'une même réalité selon les cultures.

Au niveau linguistique, le concept est désigné (dans le cadre idéal d'une relation biunivoque) par un terme appartenant à une « terminologie » et constitué lui aussi d'éléments plus petits, les « éléments de nomination ».

On pourrait imaginer que pour une langue donnée, chaque élément de nomination serait, idéalement, dans une relation biunivoque avec chaque trait conceptuel. Mais cette situation idéale aboutirait à la création d'un « terme-définition », ce qui poserait des problèmes considérables au moment de la mise en discours. Dans la plupart des cas, en réalité, on constate que la dénomination est en fait limitée à un sous-ensemble de traits conceptuels.

Point de vue du groupe CIBLSP sur la variation

Le principe de la biunivocité des termes, qui faisait autorité dans le passé, a été remis en cause récemment (Royauté 1999, Bowker 2006, Freixa 2006). A défaut d'être la règle, la variation semble largement présente non seulement lorsque les termes, idéalement supposés invariables, sont mis en discours, mais aussi parfois au niveau de la langue elle-même.

On recense plusieurs définitions possibles de la notion de variation :

- au sens très étroit (adopté en lexicographie, par exemple pour la constitution de glossaires et de bases de données), il ne s'agit que de variation orthographique (le CILF[1] définit les variantes comme des « mots qui s'écrivent de deux ou plusieurs façons différentes ») ou géographique, les synonymes, abréviations et autres sigles étant classés à part ;
- au sens très large (adopté notamment en linguistique et terminologie computationnelles), la variation peut affecter la forme d'un terme à tous les niveaux linguistiques (phonologique, morphologique, morphosyntaxique, syntaxique, lexical, sémantique), voire extralinguistiques (variation géographique ou socioprofessionnelle) ; elle peut également affecter le sens, notamment par le biais de la métaphore, ou bien de la synonymie ou de l'hyponymie ; la variation syntaxique en particulier peut donner naissance à des termes synonymes ou hyponymes par expansion ou insertion (inclusion);
- la voie du milieu (que nous avons choisi de suivre) consiste à considérer dans le cadre de la variation toutes les unités terminologiques qui désignent un même concept, ce qui inclut les synonymes, mais exclut les hyponymes.

Notons bien que les limites de la variation ne sont pas toujours clairement définies ; des questions se posent, par exemple lorsqu'un concept évolue dans le temps grâce à (ou en raison de) l'évolution des connaissances, et que le terme correspondant varie pour en rendre compte, le nouveau terme sera-t-il considéré comme synonyme ou comme hyponyme ?

Typologie des variations

Malgré quelques divergences (variations !) dans la classification, divers auteurs mettent en évidence les types de variation suivants :

[1]Le Conseil international de la langue française a publié en 2001 *VARLEX : Variation lexicale et évolution graphique du français* (http://www.cilf.org/pub/varlex.fr.html, consulté le 18 juillet 2006).

- individuelle (stylistique) ou collective,
- extralinguistique (géographique ou socioprofessionnelle) ou linguistique,
- affectant la forme (graphique, morphologique, morphosyntaxique, syntaxique - permutation, inclusion, coordination, expansion, substitution) d'un terme ou son sens (variation lexicale - synonymie ou synonymie supplétive - ou sémantique - évolution du concept, métaphore, etc)[2].

C'est la variation syntaxique qui a été largement exploitée dans des tentatives d'extraction automatique de relations interconceptuelles.
Notons qu'un exemple particulier de variation peut être analysé selon plusieurs de ces critères et donc être « étiqueté » de plus d'une façon ; ainsi une variation individuelle (stylistique) peut être à la fois syntaxique (par permutation) et lexicale (générer un synonyme), comme : *rate of reaction* / *reaction rate*.

Voici un échantillon d'exemples extraits des corpus CIBLSP (pour une typologie détaillée des variations, voir Bowker : 2006) :

type de variation	***exemples issus des corpus CIBLSP en anglais***	***exemples issus des corpus CIBLSP en français***
géographique / graphique	*randomisation / randomization; antidiarrhoeal / antidiarrheal; haemoglobin / hemoglobin; pyelocalyceal / pyelocaliceal*	calcul rénal / pierre aux reins ; ecstasy / ecstacy
morphologique	*impairment of renal function / impaired renal function*	cancérogène / cancérigène
syntaxique : permutation	*trigone of bladder / bladder trigone*	?
syntaxique : inclusion	*renal cell / renal epithelial cell / renal tubular epithelial cell*	
syntaxique : coordination	*renal and liver function; renal disease and treatment*	tissu rénal et hépatique broyé ; maladies et affections non transmissibles
syntaxique : expansion	*renal cell / renal cell cancer; prostatectomy / radical prostatectomy*	insuffisance rénale / insuffisance rénale aiguë
syntaxique : substitution	*renal failure / kidney failure*	insuffisance rénale / atteinte rénale

[2] Certains auteurs traitent également de la variation au niveau discursif (Cabré : 1998).

lexicale : sigle	*acute glomerulonephritis / AGN;* *chronic renal insufficiency / CRI*	attaché de recherche clinique / ARC ; effet indésirable médicamenteux / EIM
lexicale : synonyme	*renal failure / kidney failure;* *mammography / mastography*	calcul rénal / pierre aux reins ; aspirine / acide acétylsalicylique ; essai clinique / étude clinique
lexicale : métaphore	*Adam / Love*	ecstasy / soleil avec visage souriant

Tableau 1 : Exemples de variation issus des corpus CIBLSP.

Exemple 1

Le travail de toxicomanie au sein du groupe CIBLSP traite plusieurs sous-domaines, comme les substances, les personnes, l'environnement social, les organisations, les lieux géographiques, les types de trafic… Ces domaines fonctionnent comme des unités ontologiques et contiennent sept classes d'unités conceptuelles et leurs sous-classes.

Deux types de terminologie ont été prévus pour répondre aux besoins évoqués.

- une terminologie dite « stricte », qui recouvre des termes scientifiques précis et univoques – comme par exemple des noms génériques et chimiques de substances
- une terminologie dite « soft » qui couvre un vocabulaire plutôt oral : argot de la rue (utilisé par les toxicomanes) et jargon utilisé par les trafiquants.

L'extraction des termes a été quelque peu problématique : en effet, les textes sources étaient pour la plupart confidentiels comme par exemple des rapports de police.

Variations morphosyntaxiques :

Etant donné que dans le domaine de la drogue, l'anglais exerce une influence importante et qu'il représente la langue exclusivement utilisée par les trafiquants de drogue dans le monde entier, les termes anglais ont été utilisés comme point de départ des analyses des relations entre différentes unités terminologiques.

- Différences de singulier et de pluriel :

  groupe de substance au lieu de groupe de substances en français

- Variation dans les deux langues entre classes de mots : verbes au lieu d'adjectif :

  planer donné comme équivalent français de l'anglais *high* par exemple.

- Outre les erreurs orthographiques ou typographiques nous avons également repéré des variations de construction :

  syndrome immunodéficitaire acquis au lieu de syndrome d'immunodéficience acquise
  blanchissage de l'argent au lieu de blanchiment de l'argent.

Variation sémantique / métaphores :

Une centaine de métaphores a été relevée pour le cannabis qui est de loin le domaine le plus traité dans la base de données multilingue GOT où nos terminologies stricte et soft sont enregistrées. Voici des exemples **:**

> cannabis : apaculco, gold ariane, black bombay, black russian, buddha gold, cashmire, etc.

Les nouvelles drogues et les drogues de synthèse comme l'ecstasy sont très propices à la variation sémantique pour cacher le concept dont on parle.

D'abord les métaphores de type non-humain reflètent à la fois la forme du comprimé et l'effet :

> demi-lune avec un visage souriant
> croissant de lune sans visage
> soleil avec visage souriant
> soleil avec rayons stylisés.

Deuxièmement, les métaphores humaines reflètent, entre autres, l'impression de voler et comprennent les variations comme oiseau, dauphin et éléphant.

Les abréviations / sigles en terminologie stricte pour refléter la formule chimique de l'esctasy, comme MDMA.

> MDMA est l'abréviation de **m**éthylène-**d**ioxy**m**éth**a**mphétamine : substance amphéthaminique psychostimulante qui se présente sous la forme de comprimé ou de gélule (plus rare) et se vend à l'unité.

Exemple 2

Le mot grec HAIMA[3] (sang) a généré une multitude de termes dans les langues modernes comme le français et l'anglais, où l'on trouve environ 1200 termes qui en sont issus (Meletis : 2002). Il fournit un exemple riche de variation géographique (<-ae-> en anglais britannique, qui est plus fidèle à l'orthographe étymologique ; <-e-> en anglais américain, où la tendance est à la simplification orthographique), mais aussi et surtout morphologique.

[3] Ce mot grec est translittéré en alphabet latin de différentes façons, dont nous retenons la plus courante : HAIMA, génitif : HAIMATOS.

En anglais, il peut s'agir :

- soit d'un mot à part entière, simple (*h(a)ema*[4] ou *haem / heme*[5]) ou dérivé (*h(a)emal, h(a)ematal, h(a)ematid, h(a)ematin*),
- soit d'un morphème lié apparaissant sous des formes différentes (dites allomorphes), au nombre de quatre, ou de huit si l'on tient compte de la variation géographique :

  h(a)em- dans *h(a)emangioma* ou (suivi de la voyelle de liaison ***-o-)*** dans *h(a)emoglobin* ; *h(a)ema-* dans *h(a)ematherapy* ;

  h(a)emat- dans *h(a)ematid, h(a)ematuria*, ou (suivi de la voyelle de liaison ***-i-***[6]) dans *h(a)ematimeter*, ou (suivi de la voyelle de liaison ***-o-)*** dans *h(a)ematopoietic*, dont on note aussi la variante *h(a)emapoietic* ;

  enfin ***(a)em-*** avec élision du <h-> initial dans *an(a)emia*, en particulier lorsque le formant issu de HAIMA se trouve en position non-initiale et signifie « dans le sang », suivi du suffixe ***-ia***, par exemple *ur(a)emia* « présence anormale d'urée dans le sang ».

  Notons que l'ordre dans lequel s'enchaînent les formants gréco-latins dans un terme composé savant peut être significatif. Ainsi, *h(a)ematuria* signifie au contraire « présence anormale de sang dans les urines ». L'ordre des éléments de sens n'est cependant pas forcément significatif ; les paires de synonymes comme *h(a)emagioameloblastoma* et *ameloblastic h(a)emagioma* sont courants.

Les tableaux ci-dessous présentent des exemples des variantes en anglais et en français:

Variante	***exemples***
h(a)ema(-)	*h(a)ema, h(a)ematherapy, h(a)emapoietic*
h(a)em(-)	*haem / heme, h(a)emangioma*
h(a)em- suivi de la voyelle de liaison –o-	*h(a)emoglobin*
h(a)emat-	*h(a)ematid, h(a)ematuria*
h(a)emat- suivi de la voyelle de liaison –i-	*h(a)ematimeter*
h(a)emat- suivi de la voyelle de liaison –o-	*h(a)ematopoietic, h(a)ematology*
(a)em-	*an(a)emia, ur(a)emia, hypoglyc(a)emia*
(a)em- suivi de la voyelle de liaison –i-	*ur(a)emigenic*

Tableau 2 : Variantes du formant issu du grec HAIMA : exemples en anglais.

[4] *h(a)ema* désigne le sang : "[Gr. *haima, haimatos* blood] [TA] the blood (q.v.). Spelled also *hema*. Called also *sanguis* [TA alternative]." (http://www.mercksource.com/pp/us/cns/cns_hl_dorlands.jspzQzpgzEzzSzppdocszSzuszSzcommonzSzdorlandszSzdorlandzSzdmd_h_01zPzhtm, consulté le 9 juillet 2006, TA : Terminologia Anatomica, 1998)

[5] *haem / heme* désigne une composante du sang : "Compounds of iron complexed in a porphyrin (tetrapyrrole) ring (…) found in most oxygen carrier proteins. " (http://cancerweb.ncl.ac.uk/cgi-bin/omd?haem, consulté le 9 juillet 2006)

[6] La voyelle de liaison **-i-** est plus fréquente dans les composés à base d'éléments latins que dans ceux à base d'éléments grecs, où l'on trouve surtout **-o-** (cf. exemple 3 ci-dessous).

Variante	*exemples*
héma-	(?) hémathérapie
hém- / hèm-	hème, hémangiome
hém- suivi de la voyelle de liaison -o-	Hémoglobine
hémat-	hématie, hématurie
hémat- suivi de la voyelle de liaison -i-	Hématimètre
hémat- suivi de la voyelle de liaison -o-	hématopoïétique, hématologie
ém-	anémie, urémie, hypoglycémie

Tableau 3 : Variantes du formant issu du grec HAIMA : exemples en français.

Signalons enfin, à l'attention particulière des traducteurs, que de nombreux termes contenant les éléments issus de HAIMA ont moultes variantes et synonymes, dont certains impliquent aussi les éléments supplétifs SANGU- issu du latin SANGUIS ou vernaculaire *blood*.
Pour d'autres exemples, voir Depierre (2006).

Exemple 3

Le domaine de la pharmacologie est riche en variations terminologiques de différents types. Le travail terminographique qui nous a menés à l'élaboration du dictionnaire DIBPHARM (Dictionnaire Informatisé Bilingue de Pharmacologie) a permis de relever, notamment, des synonymes (variantes sémantiques) nombreux, des variantes graphiques et orthographiques, des sigles, abréviations et acronymes, des formes réduites et des variations morphologiques. En revanche, ce domaine scientifique ne semble pas riche en métaphores, à l'inverse du domaine de la toxicomanie.

Pour le rédacteur et le traducteur non spécialistes, la variation terminologique pose le problème évident de l'utilisation correcte des termes car l'existence de plusieurs variantes peut prêter à confusion dans la mesure où, dans les textes sources consultés par le rédacteur ou le traducteur, le choix d'une variante peut paraître subjective. En effet, comme le souligne Freixa (2006), un même spécialiste pourra utiliser des termes différents pour nommer un concept (*self-variation*), et des experts appartenant au même domaine de spécialité exprimeront la même idée par des termes considérés comme synonymes (*hetero-variation*).

Parmi les exemples énumérés dans le tableau 1, nous avons choisi de nous pencher sur deux cas de variation : tout d'abord les différentes variantes terminologiques construites sur les formants **cancér(o)-**, **cancér(i)-**, **carcin(o)-** et **onc(o)-**. Ces formants donnent naissance à divers termes et produisent des synonymes dont l'utilisation peut être problématique. L'autre exemple choisi concerne le « couple » essai clinique et étude clinique, deux termes qui sont souvent utilisés comme synonymes mais dont une étude plus poussée révèle qu'ils ne le sont pas.

cancér(o)-, cancér(i)-, carcin(o)-, onc(o)-

L'utilisation des dictionnaires permet dans un premier temps de déceler des formes éventuellement incorrectes ou déconseillées (dans notre cas cancérigène, carcinogène) et, par le biais des définitions, de vérifier la synonymie exacte entre plusieurs variantes. Certains textes scientifiques font allusion à l'usage des différentes variantes ou à l'évolution de l'usage des termes dans le temps (voir le *Dictionnaire des cancers de A à Z* à propos de **onc(o)-**). Nous avons ainsi pu établir une typologie des variantes terminologiques construites à partir des formants **cancér(o)-**, **cancér(i)-**, **carcin(o)-** et **onc(o)-**, et délimiter plus précisément les notions d'essai clinique et d'étude clinique.

Une consultation du *Grand Dictionnaire Terminologique* (http://www.granddictionnaire.com/btml/fra/r_motclef/index1024_1.asp), du *Dictionnaire des cancers de A à Z* (http://www.fnclcc.fr/fr/patients/dico/alpha.phop) et du *Dictionnaire de médecine Flammarion* (1994) permet de conclure que les formants **cancér(o)-**, **cancér(i)-** et **carcin(o)-** sont équivalents. Cancérigène, formé du mot latin CANCER dérivé du grec KARKINOS et d'une racine grecque unis par la voyelle **-i-**, est signalé par certains (http://ec.europa.eu/comm/translation/reading/periodicals/verba_volant/verba3.pdf) comme « le terme le plus ancien, attesté dans la littérature médicale depuis 1920-1924 (TLF) et le plus fréquemment employé », mais cancérigène et carcinogène sont unanimement « peu recommandés » par Flammarion et le GDT. D'après le *Dictionnaire des cancers de A à Z*, carcinologie est un terme « tombé en désuétude, remplacé par *cancérologie* ou *oncologie* ». Le GDT précise que « selon certaines sources, le terme *carcinologie* est réservé à l'étude des seuls carcinomes et non de l'ensemble des tumeurs malignes » mais que « cette interprétation restrictive n'est toutefois justifiée ni par l'étymologie ni par l'usage ».

Quant à **onc(o)-**, qui vient du grec OGKOS, signifiant grosseur, tumeur, il devrait se rapporter à tous les types de tumeurs, bénignes comme malignes, et donc être de sens plus large que **cancér(o)-** (**tumor(i)-** étant équivalent à **onc(o)-**). Pourtant, les définitions du nom oncogène, ainsi que de proto-oncogène, oncogenèse, oncologie, oncogénétique montrent que ces termes concernent plus spécifiquement les cancers. Par ailleurs, le *Dictionnaire des cancers de A à Z* précise que le formant **onc(o)-** est utilisé « depuis les années 1970 pour composer des mots concernant les tumeurs et les cancers ».

Le tableau suivant reprend les principaux termes construits sur ces formants ; chaque partie présente un groupe de variantes auquel nous avons dans deux cas ajouté un synonyme partiel.

terme	*catégorie grammaticale*	*remarque*
cancérogène	nom et adjectif	
cancérigène	nom et adjectif	terme le plus ancien attesté ; peu recommandé
carcinogène	nom et adjectif	peu recommandé

Les adjectifs oncogène, oncogénique et tumorigène sont d'après la définition du GDT des synonymes partiels car ils concernent les tumeurs et non spécifiquement les cancers.

carcinogenèse	Nom	
cancérogenèse	Nom	

Le nom oncogenèse, d'après le GDT, désigne la formation des tumeurs et serait donc un synonyme partiel.

cancérogénicité	Nom	
carcinogénicité	Nom	

cancérologie	Nom	
carcinologie	Nom	désuet
oncologie	Nom	concerne spécifiquement les cancers, et non toutes les tumeurs

oncogène	Nom	Concernent spécifiquement les cancers, et non toutes les tumeurs
gène oncogénétique	Nom	

oncogénétique	Nom	Concernent spécifiquement les cancers, et non toutes les tumeurs
oncologie génétique	Nom	

Tableau 4 : variantes construites sur les formants **cancér(o)-**, **cancér(i)-**, **carcin(o)-** et **onc(o)-**

Exemple 4

Le deuxième cas de variation que nous avons choisi de présenter dans cet article a été relevé dans le domaine spécifique des essais cliniques à l'issue d'une demande de validation de définitions auprès d'un spécialiste du domaine.
Celui-ci a en effet souligné que nous avions attribué à tort le terme *étude clinique* comme synonyme de la vedette *essai clinique.*

Une vérification des définitions et des contextes issus de références telles que le *Lexique des Bonnes Pratiques Cliniques,* le *Grand dictionnaire terminologique*, ainsi que d'ouvrages didactiques ont démontré l'emploi erroné, mais fréquent, de la variante étude clinique. La même constatation est à noter pour l'anglais *clinical study* utilisé comme synonyme de *clinical trial*.

D'après le GDT, la typologie des études cliniques est la suivante : étude analytique, étude cas-témoins, étude de cohortes, étude descriptive, étude épidémiologique, étude expérimentale, étude longitudinale, étude d'observation, étude prospective, étude rétrospective. L'étude clinique peut donc se limiter à une simple observation comme c'est le cas dans les études épidémiologiques mais, si elle s'accompagne d'une intervention expérimentale, alors on parlera d'essai clinique. L'essai clinique est habituellement conduit dans le cadre d'une étude clinique dont il constitue une étape alors que l'étude clinique ne comporte pas obligatoirement un essai clinique.
Etude et *study* sont donc des termes plus généraux que essai et *trial* et l'utilisation du terme hyperonyme comme variante synonymique est abusive. La variante française du terme essai clinique est essai thérapeutique.

Exemple 5

Le terme *nephritis* fournit un exemple de variation sémantique due à l'évolution des connaissances médicales, et donc à une évolution du concept.
Dans le passé, toute maladie inflammatoire des reins chez les enfants était appelée *nephritis* (néphrite), en l'absence d'un diagnostic plus précis. Quelques découvertes médicales plus tard est apparu *glomerulonephritis* (glomérulonéphrite), généré par composition savante (ou expansion à gauche en termes de typologie de la variation), qui à son tour est devenu insuffisant pour établir un diagnostic de plus en plus précis au fil des années[7].

Dans l'usage médical, contrairement à ce que pourrait laisser penser son mode de formation, *glomerulonephritis* n'est pas un hyponyme, mais un synonyme de *nephritis*, par conséquent *acute nephritis* et *acute glomerulonephritis*, sont également synonymes ; ils le sont non seulement entre eux, mais aussi des deux précédents, car l'adjectif *acute* qualifie la maladie dans la quasi-totalité des cas.

Quant à *postinfectious glomerulonephritis*, formé par une nouvelle expansion à gauche, on peut se demander s'il s'agit d'un hyponyme, autrement dit d'une affection différente (un sous-type de *glomerulonephritis*), ou bien si l'adjectif

[7] "Nephritis is an older term used to clinically denote a child with hypertension, decreased renal function, hematuria, and edema. Technically, nephritis suggests a noninfectious inflammatory process involving the nephron; glomerulonephritis (GN) generally is a more precise term. (…) The general terms glomerulonephritis and nephritis are not specific enough to be very useful for treatment or prognosis." (http://www.emedicine.com/ped/topic1561.htm, consulté le 10 juillet 2006).

postinfectious apporte simplement davantage de précisions, en l'occurrence sur la cause[8].

Enfin, un des principaux agents d'infection en milieu hospitalier étant le streptocoque, il n'est pas étonnant de trouver dans de nombreux cas l'adjectif *poststreptococcal* qualifiant *glomerulonephritis*, le plus souvent associé à *acute*, ce qui aboutit à des termes de longueur suffisamment encombrante pour justifier une siglaison ; d'autre part, l'ordre des adjectifs étant sujet à variation, quatre termes entrent en concurrence, sur lesquels nous avons été en mesure de mener une mini-étude 'diachronique' sur la fréquence d'occurrence sur Google le 24 février 2004 (premier chiffre entre parenthèses), puis deux ans et demi plus tard le 10 juillet 2006 (second chiffre entre parenthèses) :

acute poststreptococcal glomerulonephritis (571 / 12 100),
poststreptococcal acute glomerulonephritis (103 / 234),
APSGN (322 / 610),
PASGN (83 / 184).

La montée en flèche de la première variante (12 100 occurrences) montre une tendance à la stabilisation du terme sans doute liée à la préférence pour le sigle correspondant, ce qui confirme la remarque de Bowker et Hawkins (2006) : « the establishment of a widely accepted shortened form may contribute to the acceptance of one term over another ».

Conclusion

Le choix d'une variante terminologique par un scientifique dans la rédaction d'un texte peut certes, dans certains cas, ne pas être motivé, mais il convient de rappeler, comme l'ont fait Bowker et Hawkes (2006), ainsi que Freixa (2006), que la variation terminologique peut être justifiée. Le traducteur et le rédacteur non spécialistes, pour choisir le terme correct lorsque des variantes existent, doivent s'interroger sur le but recherché. Concernant les termes construits à partir des formants **cancér(i)-**, **cancér(o)-, onc(o)-**, on peut par exemple supposer que le choix des variantes construites sur **onc(o)-** plutôt que sur les deux autres formants peut être motivé par une volonté d'opacification. Ne pas se faire comprendre volontairement est un but que l'on retrouve d'ailleurs dans le domaine de la toxicologie avec l'existence d'une terminologie dite « soft ». Nous avons vu le cas de l'ecstasy dans le tableau 1 et l'exemple 1.

L'exploitation d'un corpus *ad hoc* pour comparer l'utilisation de variantes terminologiques, par exemple selon différentes situations de communication (de spécialiste à spécialiste, de médecin à patient, entre patients), ou selon différents contextes linguistiques (textes spécialisés, textes vulgarisés, textes traduits, textes

[8] Notons ici que les maladies et autres affections, à l'instar des artefacts (cf. Thoiron et Béjoint : 1998), peuvent être décrites et définies selon un faisceau de traits conceptuels, dont certains seulement sont activés dans la dénomination, tels que l'étiologie (cause), l'organe ou le système affecté, les symptômes, les techniques de diagnostic, la phase, l'évolution, les traitements.

rédigés par des locuteurs non natifs ou non spécialisés) devrait permettre de mieux connaître les causes et les buts qui motivent le choix d'une variante.

En montrant l'importance de facteurs extralinguistiques, tels que l'usage prévalent entre spécialistes de différents domaines, les exemples 4 et 5 mettent en garde contre un étiquetage automatique des relations sémantiques entre les termes d'un corpus qui serait basé uniquement sur la variation syntaxique. L'avis d'un expert est indispensable pour valider ou infirmer les résultats en tenant compte de ces facteurs.

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ABSTRACT

Réflexions sur la variation : étude de cas dans le domaine médical

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Key-words
variation, concept and definition

Following recent trends and developments in computational terminology, this report addresses the issue of the variation of medical terms. After an attempt at (re)defining variation from a linguistic standpoint and an overview of the most frequent types of variation affecting the meaning of terms (synonymy, metaphor or adaptation to the evolution of a concept), as well as their form (spelling, morphology, syntax), which were encountered in some of the CIBLSP1 corpora, it focuses on a few representative examples.
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[1] The CIBLSP project started in 2002 at CRTT, Lyon 2 University, where a group of researchers in corpus linguistics and terminology are currently working with corpora in the domains of health (toxicology, pharmacology, nephrology and haematology) and the environment (ecology and volcanology).

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Elegance and Relevance: Plain English from a Student Perspective[1]

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Introduction

After six years of teaching professional communication skills to law students, I firmly believe that their ability to put Plain English to effective use depends upon two pre-requisites. Firstly, they need a comprehensive grasp of grammar. Secondly, students need to be able to source appropriate role models whose writing style they can emulate. I now find myself having to give grammar lessons to final year law students, many of whom are already working in law firms in anticipation of being admitted to practice very soon, whilst at the same time listening to their concerns about resistance to Plain English by members of the legal profession as well as clients. This paper explores my experience of how law students engage with the concept of Plain English, and what it means to them in the context of their vocational training[2].

Background

The benefits of the use of Plain English as an important tool in legal and business communications are well researched and documented. Government departments in many English speaking countries devote vast resources to ensuring that modern documents are written in a way that ensures their comprehension. Large corporations pay consultants huge sums of money to re-write agreements and

[1] This paper is based on a paper of the same title which I presented at the Clarity Conference entitled *Clarity and Obscurity in Legal Language* held at Boulogne sur Mer, France, in July 2005.
[2] The whole notion of whether or not completing a law degree is in fact vocational training is a moot point which I will not explore in this paper, except to say that I believe vocational training is a large part of a law degree, although not the sole focus.

policies in Plain English. The use of Plain English is an accepted component of client-centred legal practice.

I teach professional legal skills (including drafting, interviewing, negotiation, mediation, research and problem solving) at Flinders University in South Australia where we have run a Professional Legal Training (PLT) program since 1999. The PLT program is integrated within the undergraduate degree. Our students graduate with a Bachelor of Laws and Legal Practice, at which point they are fully qualified to be admitted to practice as a barrister and a solicitor of the Supreme Court of South Australia, and if they choose, to be admitted in any other state of Australia as well.

Over the years that I have taught Plain English drafting techniques, students have repeatedly expressed concern that writing in Plain English means a "dumbing down" of the English language. At the same time, I have also been struck by two further issues:

1) The average law student's spelling and grasp of English grammar is poor;

2) The ability of most students to express themselves or to provide written advice to a client is weak.

I was inspired to write this paper when, during a class discussion, a number of my students expressed the view that clients expect lawyers to communicate in a certain "legal" way, because "that is what clients are paying for." A catalyst for exploration sprang from this twofold assumption expressed by my students:

1. "Clients expect lawyers to communicate in a certain way"

2. Complicated documents = value for money

This classroom discussion prompted me to investigate the matter further, which I did by asking all students enrolled in the topic to complete a questionnaire about what students were really experiencing in the context of plain language, and what they thought about it. I asked them[3] to complete a short survey about their perceptions of Plain English drafting. I told them I wanted them to be completely candid. I was particularly looking for answers from students who were already employed or had done some work experience in legal offices[4].

[3] 119 students in total

[4] Part of our LLB/LP program involves a six week work experience Placement in a legal office which may be in a private firm, a community legal centre or a government legal office such as the Office of the Director of Public Prosecutions.

The Survey

The first three questions in the survey required the students to describe their own level of confidence in performing certain drafting tasks:

1. Do you feel confident writing legal letters?
2. Do you feel confident drafting simple pleadings?
3. Do you feel confident drafting simple commercial documents?

If they answered “slightly unconfident” or “not confident at all” to the first three questions, they were then invited to explain why.

The next seven questions asked students to relate their perceptions and experiences:

5. What does "Plain English" mean to you?
6. Have you tried to implement Plain English drafting techniques in your work or Placement and encountered resistance, either from clients or colleagues / supervisors?
7. Some lawyers perceive that clients actually think they are getting value for money when they receive documents written in legalese? What do you think about this?
8. Do you feel that there are some drafting skills that you lack or need help with? Explain.
9. Do you think a grasp of basic English grammar is necessary for a lawyer? Why or why not?
10. Any other comments about legal drafting?

Twenty students provided responses. The results of the responses to questions 1, 2 and 3 are summarized in Table 1. Out of the 20 students who responded, 84% said they were confident writing legal letters but would like someone to check their work, 55% said they were confident but would like someone to check their work when drafting simple pleadings and 50% felt confident but would like someone to check their work when drafting simple commercial documents.

The responses from students to the survey indicated that they were most confident when drafting letters. The next level of confidence was in drafting simple pleadings and the lowest level of confidence was expressed in drafting simple commercial documents.

The responses to the other questions are reproduced and analysed later in this paper.

TABLE 1

Question 1: Do you feel confident writing legal letters? Out of 20 replies		
1 – very confident	2 students	10%
2 – confident but would like someone to check my work	17 students	84%
3 – unsure	1 student	0.05%
4 – slightly unconfident	none	0.0%
5 – not confident at all	none	0.0%
Question 2: Do you feel confident drafting simple pleadings? Out of 20 replies		
1 – very confident	1 student	5.0%
2 – confident but would like someone to check my work	11 students	55%
3 – unsure	2 students	10%
4 – slightly unconfident	6 students	30%
5 – not confident at all	none	0.0%
Question 3: Do you feel confident drafting simple commercial documents? Out of 20 replies		
1 – very confident	1 student	5.0%
2 – confident but would like someone to check my work	10 students	50%
2-3 – between confident and unsure	1 student	5.0%
3 – unsure	2 students	10%
4 – slightly unconfident	6 students	30%
5 – not confident at all	none	0.0%

Language Skills in Secondary Education

Often, the way to truly discover one's own language is to learn another language. However, learning a second language is not compulsory in Australian schools. Interestingly, I have found[5] that students for whom English is not their first language generally have better English grammar skills than students for whom English is their first (and usually only) language. I am convinced that this is because students who have learned English as a second (or third etc) language have had to actually learn the rules of English grammar. One student commented in a survey response:

> *So many students I studied with in Legal Practice topics had a below average to average understanding of sentence structure – including myself. This is an issue that I will have to battle with…In fact the most advanced student I have worked with commented that the only reason she had sound knowledge of*

[5] This hypothesis is based on my informal observations.

> *English grammar was because she was studying another language. This knowledge did not come from her studies at law school.*

Another student said:

> *… I feel that I am at an advantage for having undertaken a Major in English in my Arts degree, as well as professional English in Law. It makes it easier to understand judgments in a case, and interpret them. It also makes it easier to make the transition from uni to firm life, as I have been undertaking a great deal of letters to clients, memos to supervisors and drafting of documents.*

The requirements for secondary school students to study English vary around Australia. In South Australia, there are various English topics which secondary school students may study (such as English as a Second Language, English Communications, English Studies), but the study of English is compulsory only until year 11 in South Australian schools. It is not compulsory to study any form of English in the final year (year 12) prior to going to university. In other parts of Australia, English is compulsory in the final year. English is an essential pre-requisite for entry into some law schools. It is not a pre-requisite for entry into Flinders Law School where I teach, so we have students who may not have studied English in their final year at school.

Upon arrival at Law School, these students are faced with long slabs of text contained in judgments, academic articles and text books which they have to read in order to pass the course. They become familiar with convoluted language. They are in fact immersed in convoluted legal jargon for four or five years. When they attempt to write letters to clients, some find it very difficult. For many law students, the transition from writing academic essays to letters and documents which a lay client can understand is a difficult one. Many students have acknowledged this. For example:

> *I would like to have had more experience with drafting. I have no problems writing an essay as I have done so many of these; it would be helpful if more assignments were focused on what we will be doing in the workforce rather than writing essays.*

Written English in the LLB/LP

Law students at Flinders University encounter principles of Plain English drafting in various guises throughout their degree. As English is not a pre-requisite to being accepted into the Law School, the standard of English expression covers a wide spectrum – from poor to highly articulate. I am sure that this is typical of any Law School. It is true that obtaining a place in a School of Law requires high academic achievement, which is often paired with a good grasp of the English language, but this is not always the case. The student body may include those who do not know how to use apostrophes, have a poor understanding of sentence construction and

make far too many spelling mistakes (my current source of annoyance is "tennant"). At the other end of the scale, we have students who have an outstanding command of the language and write extremely well. Students' understanding and usage of appropriate grammar ranges from poor to excellent.

Students are required to complete a number of drafting tasks in the first year of their Law degree, by way of introduction, and then they are specifically taught Plain English concepts in the second year topic, *Professional English in Law*. In that topic, they cover basic English grammar and how to write in English in a professional context[6].

Flinders continues the Plain English education within the third year topic *Corporate Law [Drafting]*. In that topic, students are required to produce a competent letter of advice to a client about a commercial matter. They learn about tone, formality, structure, avoidance of legal jargon and gender neutral language, and revise certain aspects of grammar such as the benefits of using the active rather than the passive voice.

Many students express the view that grammar should be taught in the first year of a law degree. A common student observation is that by the time students do *Professional English in Law* in second year, they have already been inculcated in "legalese" and find it hard to go "back" to Plain English. One student, in response to the survey question "**Do you think a grasp of basic English grammar is necessary for a lawyer?"** said:

> *Yes, but [i]t should be studied in first year before we're too set in the 'legal frame of mind.'*

The recognition of the importance of grammar varies amongst students. One student, in response to the survey question above, expressed it thus:

> *Obviously need to be able to structure some basic sentences but I think that it is overrated! I don't think most people care if you split the definitive (sic) or whatever. Obviously need to be careful that a grammatical error does not change the meaning of what you write, and in that way it is important.*

On the other hand, the overwhelming majority of students who responded to the survey said that they thought grammar was important. A cynic might argue that only those who agree with the notion of Plain English and grammatically correct English as a cornerstone of legal professional practice would have responded to the survey. Those students who disagreed with the concept of Plain English might have chosen not to respond at all. However, the responses to the question "**Do you think a grasp of basic English grammar is necessary for a lawyer?"** are nevertheless

[6] My ultimate goal is to expose students to Plain English right from the start of their legal education.

very interesting. The majority of students who answered the survey indicated a significant acceptance that correct use of grammar is important in legal communications.

> *Absolutely, Professional English should remain a compulsory subject.*
>
> *Definitely, a lack of grammar in a written letter to a client or another party would not give an ideal impression. It is important to speak and write eloquently.*
>
> *Yes, completely, if only for the fact that you will be picked up on it – and a split infinitive (or any grammar mistake) is never taken as a marker of intelligence, or of being careful and detailed.*
>
> *Yes because it helps them to communicate more effectively and also gives a more professional impression.*
>
> *Absolutely. Some lawyers have completely lost sight of writing and speaking as "normal" people, which I think alienates the community.*
>
> *Yes it is necessary. I think it is unprofessional not to have basic understanding of English grammar as a lawyer. Clients expect lawyers to have a basic understanding of English grammar and there is nothing unacceptable about this expectation.*
>
> *Of course it is important, this is a profession entrenched in the use of the English language. I'm beginning to believe that all we do is sit at a computer and draft letters and documents. That said, my grammatical skills are appalling so if passing the bar relied on a grammar test, I would have to wait tables for the rest of my life.*
>
> *Yes, better English will allow for better communication between solicitor and client.*
>
> *Absolutely. One cannot write cohesively, smoothly and fulfil all their obligations as a lawyer if they do not have a sound grammatical basis from which to work upon, as the English language is the pillar upon which all lawyer's (sic) work stems.*
>
> *Yes. The law is confusing enough as it is, and in order to explain issues to clients (which is mostly done via letters) lawyers need to be able to write in a concise and clear manner. Waffling just confuses clients, and it is quite a skill to get straight to the point.*

Yes, definitely. Because clients and lawyers from other firms that you are writing to must be able to understand what you are writing, and it must always look professional.

Obviously. I have always considered myself to be reasonably (oops passive)[7] *good at plain written English. However, given the difficulty I had with your English grammar exercises that were disguised as short drafting exercises, I am concerned about the extent of your definition of 'basic' English Grammar. Does this mean I can never be a lawyer?*

Yes – people expect lawyers to have a strong grasp on grammar and good word use skills as a result of their education.

Yes, I think as lawyers we use language as a professional tool, we use both written and oral means of communication and it is essential that we use this to our advantage. Law suits can arise from ambiguity and it is essential that we know how to spot the ambiguous phrases and try to eliminate them from our own documents.

One student compared language to music:

Yes, I think if a lawyer is going to strive for a clearer and more precise use of the language s/he must know about the elements and rules that comprise the language. I could hardly hope to play music without knowing the names of the notes, the rules of rhythm or the structures which allow different instruments to play together in order to make up music. If nothing else, I think it would make teaching English a lot easier and more meaningful.

This comparison with music is an excellent analogy. I have also used a sporting analogy with students in the past. I have suggested to them that if they want to play football, they could get out there on the field without knowing the rules of the game, and have a great time kicking the ball in any direction and disregarding what the other players are doing and what the rules dictate. In doing so they may, over time, play a passable game and will probably have some fun. But to reach their best potential, and play football as well as they possibly can, it is critical that they know the rules of the game. So it is with writing. To be a really great writer and communicator, it is critical to know the rules. Only from that starting point can excellence be produced.

[7] This is an interesting reference back to my lectures and assignments on using the active voice rather than the passive voice. This student had not grasped the concept of the use of the passive voice as opposed to *being* passive.

In this regard, I stress that just as in football, the aim is to kick goals, the aim in writing well is to communicate. Sometimes lawyers lose track of the aim of their writing.

Several students expressed the importance of grammar to clear communication:

> *Yes because it helps them to communicate more effectively and also gives a more professional impression.*
>
> *Absolutely. Some lawyers have completely lost sight of writing and speaking as "normal" people, which I think alienates the community.*

Interestingly, today's students are well used to using inclusive, non-sexist language and use it with ease. In fact, a new rule seems to have developed. It is common practice to express every pronoun as plural and to avoid using gender specific pronouns. Plural pronouns are used with singular verb conjugations, as in:

> *A lawyer needs to tell their client that ...*
>
> *A lawyer should always empathise with their client.*

What I do find interesting is the use of this "New Grammar" even when the subject under discussion is known to be either male or female. For example, in a simulated interview environment where the "client" is expressed to be female, the students often use "them" or "they" rather than "she" or "her". For example, in a letter to a client about a particular (female) witness, a student wrote:

> *I spoke to the witness. The witness said that they were unable to attend court on 12 June.*

This "New Grammar" is becoming commonly accepted although there is debate amongst my law school colleagues as to whether it is simply a product of the evolution of language or laziness on the part of students who don't bother to find another way of expressing what they wish to say. Some colleagues would find this perfectly acceptable:

> *A lawyer needs to tell their client that…*

Others argue that it would be far more elegant, and grammatically correct to say:

> *Lawyers need to tell their clients that…*

Certainly students are well aware of the need to write in gender-neutral terms, and in fact do it quite naturally, to the extent that occasionally, when a visiting lecturer

uses gender-specific pronouns (usually “he”), it is glaringly obvious and the cause of comment.

Whilst gender-neutrality seems to have become an accepted fixture, the use of Plain English rather than legalese is not as readily sold to all students. In their survey answers, many students indicated a belief that lawyers have to provide “value for money” by producing letters of advice and documents that are complicated and hard to understand because that is the proof that that they have been created by a wise lawyer who holds the key to legal understanding. Some students have said to me that if a document looks too simple, the client will think they have wasted their money by paying a lawyer to draft it. One student said in a survey response:

> *I think that the use of legalese helps the lawyers ensure that the mystic (sic) that surrounds the profession is not eroded by allowing the average ‘punter’ the opportunity to actually understand what the lawyer has drafted. Secondly the use of legalese is occurring because of the need to ensure that some documents are ‘water tight’ with regard to what is trying to be conveyed.*

Conflicting Messages

These observations create an interesting backdrop against which law is taught at law school. Law teachers are faced with a dichotomy. We teach students to write Plain English, and suggest Plain English guidelines in relation to how to draft documents, what a comprehensible pleading looks like, how to create contracts which are reader-friendly, and how to write letters to clients so that they understand the advice we give. For example, a basic rule of Plain English is to include white space on the page. It is fairly well accepted nowadays that a page covered in long sentences within long paragraphs is uninviting to a reader, whereas the same information conveyed in a series of paragraphs with headings and dot points or numbered lists is much clearer. This is nothing new. Yet students are obliged to read judgments and academic texts which contain paragraphs which extend for pages, sentences which cover entire paragraphs with no headings, and nothing to make them reader-friendly at all.

If we are holding out our judges and textbook authors as the paradigm of legal intellectual excellence, then of course our future legal leaders will seek to emulate their writing style. Unfortunately, in many instances, this is not a style which showcases Plain English at all. Students are also required to read and write long academic essays which have a particular character, tone and style. Law students spend at least four years perfecting that scholarly style. When they try to write a letter of advice to a client, it is no wonder that they feel enormously frustrated when they are told to write that advice in Plain English because it seems at odds with the other writing they produce in essays and research papers.

The Plain English dilemma faced by students is twofold. Firstly, they seek to emulate the convoluted style of judges and academics but appear not to have the linguistic skills to do so. Secondly, they confuse formal language with convoluted language, or what is commonly termed "legalese", the language unique to one profession. The coining of the term "legalese" suggests in itself that this is a language spoken and understood only by lawyers, only taught in Law Schools, and inaccessible to all others.

One of the major problems in relation to both sides of this dilemma is that many law students are unfamiliar with basic grammar. I am sure that this is not confined to law students, but is widespread across other disciplines. However, it is a serious issue for students who are preparing to enter a profession where they are required to be wordsmiths. For example, Plain English stalwarts advocate the composition of documents in the active voice rather than the passive voice. Many students do not know what this means. In relation to an exercise involving changing sentences from the passive to the active voice, one of my students wrote, "If I say this, it will be more active". This student clearly did not understand the concept of active and passive voice. So before we can teach them the merits of using the active voice, we have to teach them first of all what it is.

A knowledge of sentence construction is critical to drafting logical documents. Students who lack the ability to form proper sentences have difficulties with drafting agreements and pleadings, not least because they have no idea where to put sub-paragraphs and where to split sentences into a), b), c) etc. In turn, this leads to great difficulties with correct numbering of paragraphs in documents and pleadings. They find it difficult to put agreements into numbered paragraphs and sub-paragraphs which flow properly as grammatically correct sentences.

1. *If the author of the document does not*
   a) Know where to break the sentence into dot points or where to start
   b) a new paragraph or sub-paragraph or where, to punctuate, the sentence
   c) the revised attempt at "Plain English" will be
   d) A disaster. (Like this example)

It was clear from the students' survey responses that they are aware that client-centred legal practice involves empathy, communication, and trust and that the exercise of client-centred practice is also sound risk management. I was interested to find out if students consider the use of Plain English as a necessary component of client-centred practice.

First of all, I wanted to know what students understood by the expression "Plain English". I asked them, "**What does "Plain English" mean to you?"**

The answers I received revealed an overwhelming acceptance that clarity is necessary in order to communicate advice to a client. Students were very clear on the meaning of "Plain English" and its purpose:

> *Drafting documents in words that any person of average intelligence without any knowledge of the law would be able to understand. Not using legalese or unnecessary long words and sentences. Stating how it is – no fluff.*
>
> *Clear language, without overly technical words, legalese etc*
>
> *The average person in the street should be able to read and understand the underlying message of any legal document, otherwise what is the point?*
>
> *Being able to convey a clear message without relying on obscure or specialised terminology that would most probably confuse or alienate the layperson.*
>
> *Easy to understand, absence of legal terms however when legal terms used they should be explained. Not colloquial language but straightforward and easy to read once without having to stop and think after each line.*
>
> *Plain English means using language that the reader can understand. It means using simple language or explaining words that don't have an everyday meaning.*
>
> *Plain English to me means that the words written do not contain any legalese, and that any layman from any profession can understand comprehensively what is written.*
>
> *It means not using legal jargon, instead using normal everyday language*
>
> *Simple short sentences devoid of jargon. Easy to read, but more importantly, easy to understand.*
>
> *Plain English means not writing in "legalese". It means being to the point.*
>
> *Something the 'lay' person can read and not have to employ a lawyer to de-crypt it.*
>
> *It means leaving out legal jargon so that what you are writing can be understood by clients who have no legal training.*

> *Plain English is unambiguous, yet concise, written as if directed at a lay-person and uses the least amount of legal jargon practical.*
>
> *English written in a format that allows the average person on the 'Bondi tram'[8] to be able to read and understand what is intended to be conveyed. The use of jargon and Latin words is absence (sic).*
>
> *Plain English means conveying a legal message in simple, straight forward terms. It means writing something that your client can understand without needing you as their lawyer to explain it to them. It is an effective means of communication.*
>
> *Writing something that the client can easily understand without too much use of legal jargon or excessive wordiness.*
>
> *Everyday language that the lay person understands – not legalese.*
>
> *Writing in a way that any normal person without special experience will understand what is being said.*
>
> *Clear precise non-technical language. No legal terms which are not readily understood by lay people.*
>
> *Using language that is easy for people to understand. Avoiding "legalese" or unnecessary complicated words when a simple word will suffice.*

The students have emphasised that the function of Plain English is to enable the non-lawyer (especially a client) to understand. These answers indicate that students do in fact want their clients to understand their advice. There is an apparent acceptance of legal advice being provided as a service, which is indicative of client-centred practice rather than a paternalistic model.[9]

However, one student knew exactly what "Plain English" means and agreed with its use, but expressed doubt about its use in future practice:

> *[Plain English is a] format that is intended to revolutionise legal drafting including but not limited to matters such as letters – legislation etc. It is a great idea and format. However I doubt I*

[8] This is the Australian version of the famous "man on the Clapham Omnibus".
[9] See Binder & Price, *Client Centred Counselling*, West Group 1989 and Dinerstein, 32 Arizona Law review, 1990.

> *will use it after uni because law firms/practitioners will teach us to write how they do – majority of students will be sucked into a style that is not consistent with plain English.*

This doubt about how the practising profession views Plain English usage undermines much of the teaching of plain language principles in law schools and practical legal training programs. Teaching law students how to write letters of advice and documents which are clear and unambiguous involves breaking through many pre-conceived ideas about how lawyers represent themselves in written form. For many students, convoluted language matches the pin-striped suit which they can't wait to wear. There is a notion that Plain English is alright if your client is downtrodden, destitute or inarticulate, but the corporate high flying lawyer wants to work for corporate high-flying clients, and presumes that those clients want value for money in the form of fancy words and fine print that needs further explaining. One student said:

> *I think it's an easy trap to fall into. Not even necessarily in using legalese but excess verbosity or complex vocab as is seems smarter. If something is too clear and simple you wonder why you paid $300 an hour for it.*

Another response was:

> *Depends on the area of law. In corporate of commercial [the belief that complicated documents represents value for money]… may be the case. In Family or Criminal Law I believe clients prefer simple English that they can properly understand.*

In response to these pre-suppositions I always advise students of statistics which indicate that a very low level of literacy is prevalent in society. Statistics are readily available in relation to literacy levels. For example:

> 44% of 15–64 year olds in 1996 were recorded as having poor or very poor prose literacy skills (in English) and could be expected to experience some or considerable difficulties in using many of the printed materials encountered in daily life.
>
> Only 37% of people have skills that would enable them to cope with many printed materials found in everyday life.
>
> Only 19% of the population have good or very good prose skills and would be capable of managing all the literacy demands of everyday life.
>
> The average reading age in the UK is equivalent to an educated nine-year-old. [10]

[10] 1996 statistics - Dr Maged Boulos from Bath University – in the context of internet health sites and how hard they are to understand (10 September 2004), http://news.bbc.co.uk/2/hi/health/3641634.stm

An Australian study, "where respondents were asked to rate their reading, writing and basic mathematical skills for the needs of daily life and for the needs of their main job, revealed that of people who did not speak English as their first language, between 43% (on the quantitative scale) and 48% (on the prose scale) were at Level 1 (very poor literacy skills), representing approximately one million people. Of people whose first language was English, 14% (on each scale) were at Level 1, about 1.5 million people. Some 18% to 20% of those whose first language was English were at Level 4/5 (good to very good literacy skills), compared with 7% to 8% for those whose first language was not English."[11]

Language as Image

The way we write is a reflection of ourselves. Writing tends to evoke strong emotions, even in a commercial or professional context. What is created under our names is representative of us and no-one likes to be misrepresented. Whilst I teach the importance of conveying an appropriate professional image through all forms of written communication, I am aware that many law students take great pride in their writing, and are highly offended if it is criticised. Most lawyers and law students consider themselves to be good writers. To be told that one's writing is less than perfect can be a crushing blow. To have one's draft document corrected and altered is often seen as very belittling and embarrassing and can be damaging in terms of self-esteem and confidence.

One student expressed this feeling:

> *Sometimes I feel that to sound intelligent and to know what I am talking about…I should be using legal jargon*

Many students also see the use of language to portray a certain professional image as important. For example, one student said of the correct use of grammar:

> *Essential. … Grammer (sic) is completely necessary for clear communication. An incorrect apostrophe, comma etc can completely change the meaning of a document and it makes you look incredibly stupid too.*

In order to obtain entry into Law School, students must demonstrate that they have a high level of intelligence and an aptitude for academic rigour. After three or four years of passing law exams and writing extensive research essays, it is understandable that students often regard the manipulation of their written work as offensive. After all, it is confronting for someone else to presume to be able to re-

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[11] Australian Bureau of Statistics, Aspects of Literacy, Assessed Literacy Skills 08/09/1997 http://www.abs.gov.au/ausstats/abs@.nsf/b06660592430724fca2568b5007b8619/887ae32d628dc922ca2568a900139365!OpenDocument

write your creation, especially if you really believe that you do have literary talent. It is sometimes said that many lawyers are frustrated actors, and that the drama of the court room is the antidote for the thespian lawyer who longs to be quoting Shakespeare and Moliere instead of citing statutes and arguing about costs. Many lawyers and law students have an interest in language and literature and consider themselves to be better than average writers.

One student expressed:

> *… a wish that we could have more poetic freedom to express legal concepts and procedures which could 'warm up' the use of language in law. I think there must be a lot of top barristers, lawyers and judges that would write poetry or literature, it is evident from the eloquence in their legal writings, but somehow law remains a cold and 'harsh' vehicle for the development and enjoyment of the language.*

Also of significance is the fact that not all new lawyers are young lawyers. Many law students today are of a mature age and have been in the workforce for several years and have career and life experiences which cause them to resist change to their writing style. However, even professional writers know that editing is the key to great writing, and so I encourage Plain English as an editing process as well as a drafting one.

Some students have expressed the view that Plain English is a "dumbing down" of the English language. I have had students say to me that they have "dumbed down" their letter of advice "for the purpose of the exercise" (which was to write a letter to a client). The desire for linguistic elegance amongst law students is strong, although many students do not see that their convoluted language and poorly constructed sentences are far from elegant. In discussing the use of Plain English, students have said to me, "I don't want to sound simple." So even though they are aware of the need for clients to understand, there is a deep-seated need for recognition of their own worth which they want to demonstrate in their writing. One student argued:

> *Some clients may think that a complicated letter means that the lawyer knows what they are talking about and that it's all very complicated, but I don't think that makes up for the client not understanding a letter as they will be less likely to know what is going on and may not assist their solicitor with info because they don't know what is needed.*

Students are acutely conscious that language can be used to mislead[12] and that sometimes, the rights of parties may be intentionally "hidden" in documents. The

[12] See Dale Barleben, *The Plain English Movement and Present-day English Registers*, 2003 http://www.chass.utoronto.ca/~cpercy/courses/6362/2/Plain.htm

popular caricature of the lawyer using “fine print” and “legal loopholes” feeds upon the clichés adopted in popular culture which depicts lawyers as shady characters with unethical business practices. The number of “lawyer jokes” websites which can be found on the Internet is indicative of the poor standing of lawyers in the community. However, those students who see themselves as smart, strategic commercial movers and shakers might not like to discard the image of the sharp practice, and may actually aspire to moving in fast and cut-throat business circles. They see themselves as strategists and are not interested in client centred lawyering to unsophisticated clients. So the use of “dumbed down” English has no appeal.

For these students, the sales pitch for the concept of Plain English can take a slightly different tack. In recounting the virtues of clear language, I explain to students that client-centred communication is important whoever your client is (especially if you want to keep them as a client) and that in a global economy, where transnational and multinational transactions involve complex legal documents, the need for clarity in those documents is paramount, not just so that all parties are sure of their rights and obligations, but also because many documents these days must be translated into different languages. Precision in the originating document is critical if the document is to undergo the process of translation into another language, sometimes more than once. Furthermore, it is also very important to use clear English for clients whose first language is not English. Clients in this category might range from a refugee, to a small business owner, or a client seeking custody of a child, or the owner of a multi-billion dollar enterprise.

For legal educators, to embark upon teaching students how to write is challenging and the reaction can be hostile. To be accepted into Law School is a high achievement. Law students, upon arrival, are already glowing with the success of having got into Law School, before they have even read a case. Many of them consider that their language skills are acceptable when they are clearly not; others reject suggestions that their expression could be improved. Yet, in my experience, students at all levels find putting even the simplest advice into a letter very difficult. They tend to write long convoluted sentences. They use complex vocabulary which is often incorrect or inappropriate. A recent howler I read in an essay was “the stigmata of being accused of a crime”.

I have seen too many poorly constructed sentences and badly drafted letters to accept that Law School guarantees the likelihood of a law student being able to write coherent English. Somehow, a lot of these students have by-passed learning about sentence construction. In popular usage at the moment is ‘whereas’ at the beginning of a sentence, although it leads to something which is not a sentence at all, as in:

> Whereas the other driver was not at fault.

Incorrect use of punctuation, or complete lack of it, is also an impediment to learning how to construct an agreement or a pleading. “Translating” a document

into Plain English means eliminating unnecessary verbiage and making the document reader-friendly and clear. Clarity is paramount, but it is very difficult to teach Plain English when the starting point is a grammatical quagmire.

However, I do not believe that a lack of grammar skills is a new phenomenon. It is likely to have always been there. The difference now is that we are teaching lawyers to write so that everyone can understand them, and they are no longer able to hide their defects in long sentences and page covering paragraphs.

Client-Centred Legal Practice.

There is a tendency today to talk about "client-centred lawyering". As an aside, I actually dislike the word "lawyering" and never use it. If Plain English for some people means the end of linguistic elegance, then that word "lawyering" is a prime example. Plain English need not be inelegant, but it is true that it is inextricably linked to a client-centred approach. We teach students to focus on their clients, to empathise. This they readily accept and do well.

Empathy is reflected in the way lawyers communicate with their clients. I hold firmly to the belief that if we teach law students to establish a relationship of trust with their clients, then communication is the key to developing such a relationship. Further, language is the key to communication. If we use language that our clients understand, they are more likely to understand our advice, which means that our service is appreciated. The strategists amongst us will identify that as a good risk management strategy.

The new lawyer may be very keen to share with a client the benefit of knowledge, gleaned over years of hardship and sacrifice whilst plodding through a law degree**.** However, Lewis and Kyrou's advice is sound: "Your client is not interested in the intricacies of the cases and statutes that you spent years mastering. Your client wants you to solve his or her problem quickly and with a minimum of fuss."[13] It is the lack of fuss that is a key component of Plain English writing. Many times I have had students and junior lawyers say to me that they are having trouble putting their advice into words. They know what steps they have to take, and what the client has to do, but they just don't know how to say it. I say to them, "Don't try and write it, just tell me in your own words what your advice is." Usually, the student/lawyer is then able to elegantly and easily say to me in a few sentences what they have been trying to write for hours. "Oh, well, what I'm trying to say is that they have to do this and then do that and then we'll need to speak to Mr X. And so on." And then I tell them, "That's what you have to put in the letter." When students approach their writing from this perspective, they find it much easier and end up with a clear, concise, elegant result which conveys advice in a way that the client can understand but is not in "baby talk" or "dumbed down" language.

[13] Lewis & Kyrou, *Handy Hints on Legal Practice*, Second Edition, The Law Book Company Limited, 1993, p3.

It is often not until students come into contact with real clients and the need to convey information that the penny finally drops in the context of using Plain English. In addition to my work with Practical Legal Training, I am involved in running a Clinical Legal Education program. We operate a legal advice service for unrepresented litigants in the Minor Civil Claims division of the Adelaide Magistrates Court. This jurisdiction covers civil claims of up to $6,000 (approximately €3850). Students deal with real clients with real legal problems and the concept of using Plain English to provide an effective client service becomes very real. Many students have commented to me that being able to work in this way is the most effective method of learning the importance of Plain English drafting techniques.

Precedents

Another area fraught with difficulty is the use of precedents, especially for junior lawyers. Teachers of Plain Language drafting need to first of all acknowledge that all lawyers rely on precedent documents. Law teachers must teach our emerging lawyers how to interpret precedent documents, and then how to recognize if they need amendment. The final step is to teach lawyers and law students how to amend them as necessary.

Over-reliance on precedents can be a problem. Many law students who already work in law firms as clerks tell me that when they need to draft something they just use one of the hundreds of precedents already available in the firm precedent bank. Using precedents in itself can be sound business practice. Why spend hours creating a new document when a perfect precedent exists? The problem lies in detecting whether or not a particular precedent is satisfactory for the proposed purpose. If not tailored to meet the exact measurements of the client, using a precedent may not do the perfect job, and may even be detrimental to the client's case. An experienced lawyer knows how to use a precedent effectively, but this is a skill which develops with experience. Many new lawyers are lulled into a false sense of security by relying on precedents which have been used before in similar situations. Our law students need to learn how to understand and use precedents effectively. Students answering the survey recognized this:

> *I think the most difficult time to avoid legalese is with court documents. They are often precedents, or there are certain phrases you have to use, that always contain legalese. It is difficult to avoid in these situations.*
>
> *I think where precedents are used it is harder to draft using plain English because it saves time to use the precedents and unless there's a conscious effort from above to revise precedents it makes it hard to break from the norm.*

The Impact of Technology

We are also now dealing with a generation of students who have lived with email since they started writing. This is a generation who have rarely, if ever, written letters, they nearly all own and use mobile telephones, and they use email and text messaging as their regular form of written communication. They never knew life before stereo radio and most have grown up in a house with more than one television. They expect instant answers to their questions because their world has always involved information at the push of a button on a keyboard. Most importantly, they are used to instant communication. They have all grown up with computers and have done their homework on computers. They don't write a lot of letters! They don't know about tone or appropriate vocabulary so they write text messages and emails with smiley faces at the end so as to ensure that their addressee knows that this is a happy letter. They send emails without correcting mistakes and with no need to format, and they expect an instant reply. They don't even need to remember to put the date because it is all there for them, pre-packaged and formulaic. Composing a formal professional document is challenging in every respect, not just in relation to its technical competency or the soundness of the advice it contains.

So in order to engage students who are skeptical about Plain English, it is important to explain that a key aspect of it is professional detachment, and learning to write in an appropriate tone, using appropriate vocabulary. An experienced lawyer can spot at a glance a letter which has been written by another lawyer who has become emotionally involved with their case. The tone is anxious or angry. Affidavits seethe with resentment or long-held animosity, revealing sensitive hidden nerves. I teach students that it is the hidden nerve which must remain concealed, because its exposure can reveal a cracking of the professional mask.

I also teach law students that professional legal writing is entrenched in a historical mire. Lawyers have traditionally written lawyers because they were once paid by the word (and not for punctuation, hence the lack of it in many old legal documents). Lawyers often write letters when they should be just picking up the telephone and having a conversation about the matter which needs to be discussed. Letters are often a way of actually avoiding direct contact with the client. So one of the first questions a lawyer should ask when commencing the letter is, "Why am I writing this? Why is it necessary?"

Lewis and Kyrou[14] say that one of things new lawyers get wrong is the belief that partners don't make mistakes. Just as this is true, so is the fact that partners might not draft documents in the best possible way either. This creates a dilemma for new lawyers who have learnt the concepts of Plain English drafting, and valiantly try to put these ideas into practice, only to have their work crossed out and told "we do it this way here." Do they stick to their Plain English principles or do they cling to

[14] Gordon D. Lewis & Emilios J. Kyrou & Albert M. Dinelli, *Lewis & Kyrou's Handy Hints On Legal Practice*, Sydney, Law Book Co, 2004.

their tightly won job? The answer is not difficult to determine. Just as many senior practitioners initially resisted the intrusion of new technologies into their practices (and some still do), so too do some resist Plain English and continue to pepper their letters "of the 17th inst" with "heretofore" and "aforesaid" and sprinkle liberal quantities of "hereunder" and "whereas" as if living out a Dickens novel.

Most modern Australian law firms and government sponsored agencies use and produce documents in accordance with "Plain English" policies. However, there is an undercurrent of doubt about this amongst students. I have been concerned for some time about resistance to Plain English by the profession. I asked my focus group of students if, in the event that they had worked in a legal office or completed a Practicum placement[15], if they had attempted to use Plain English. I also asked them, if they had ever encountered resistance, either from clients, colleagues or supervisors when trying to implement Plain English drafting techniques at work or on Placement. The responses were varied, but overall, the impression is that the profession has embraced Plain English:

> *I think because I am still new in the legal profession my use of English has not yet been overridden by legalese or rhetoric, therefore I tend to use plain, but formal English whenever drafting documents. Nevertheless, my lack of experience means that some times more precise wording is needed to convey the same message that I had constructed in a simpler form. I imagine sometimes it becomes a difficult balance to strike, between simple clear language and the need for unambiguous and precise documents.*
>
> *… there appears to be a general attitude of resistance to such use by older more conservative established members of the profession.*
>
> *Yes, however, these are mostly for valid reasons, e.g. a certain phrase is used because it has been tested by courts and so we can be sure 'that it works'. Certain clients also want documents which are 'legal' in the sense that they seem official (this is particularly so for some commercial contracts). Also sometimes being precise is easiest done by using a legal term, the term brings with it meaning from many cases etc, to explain it using 'non legal language' can be lengthy and difficult.*
>
> *Yes, and there is a handbook that says we have to use Plain English, also a continuing education course within the firm that teaches it.*

[15] As part of their Practical Legal Training, all law students at Flinders University must undertake a six week Placement in a legal office.

Yes – especially in draft letters of advice - I try to make advice as simple and straightforward as possible whilst still including all the important information.

I always try and implement Plain English in my drafting techniques at a legal service I work at. I have not encountered resistance from colleagues or supervisors.

The firm I have been working at has a plain English style in their letters already.

Working in an accounting firm, I have had a couple of letters changed in ways that I think deviated them from plain English but didn't actually change the subject matter.

I have not started my Placement yet. From legal firm: didn't get to do much legal work, but one file gave me the opportunity to draft a letter/claim in plain English.

Have tried to write letters to clients that explains (sic) the situation without using typical legal language. My firm likes to keep letters to clients simple and understandable, so no, I haven't encountered resistance

No, the issue hasn't come up at work yet.

Haven't done my placement yet – but would want to try and use plain English whenever possible because I find it makes my life easier as well.

I find that sometimes I don't use plain enough language and that my supervisor encourages me to be less formal in my letter writing than I am.

In placement at [Community Legal Centre] I have assisted in drafting/editing information brochures so that people with little understanding of legal terminology can understand the issues. The use of plain English has been encouraged. I know from experience as a legal secretary in criminal law firms, that practitioners often prefer convoluted language and can be quite pompous even in the way they speak. For instance, I told a young lawyer about a year ago that the location of his lunch meeting had changed. Rather than simply say "thank you" or "okay" his response was, "Right, I'll take that on board." Silly.

One student already speaks legalese and does not seem to realize it:

> *As per yet, I have not commenced my Placement, however I do not forsee it to be a problem. In fact, my belief is that they would be in favour of it.*

Value for money?

In the survey, having asked for comments about Plain English and what they thought of its use in practice, I then asked the major question which had led me to conduct the survey in the first place: **Some lawyers perceive that clients actually think they are getting value for money when they receive documents written in legalese? What do you think about this?**

Although some students were familiar with this assumption, they did not all necessarily agree with it. The majority of the answers I received argued in the same vein as this response:

> *Clients need to fully understand the advice given (whether written or verbal) in relation to their instructions. Otherwise they may feel removed from the process, powerless and be more willing to complain about any outcomes.*
>
> *I don't see how this could be the case. If the work is done properly and thoroughly then the client will know they are getting value for money anyway. Particularly when the work is easy to understand down the track if/when a problem arises.*
>
> *I do not believe this is the case. I believe that a client would see a letter that contains valuable and easily understood information more valuable than having to call the lawyer to find out what they have just been told.*
>
> *If a client can't understand the document then they are not going to think that they are getting value for money.*
>
> *This is definitely not true. What happens is that if you write a letter in legalese, it actually ends up costing the client more money, as they then have to call you up and ask you to explain what you wrote in the letter!*

However, the very existence of the notion of clients expecting legalese is concerning. Several students acknowledged that some clients might feel this way:

> *I would tend to agree, but I still think that that is not necessarily a good thing. I think people that (sic) expect legalese have come to expect that precisely because of the alienating nature of legal*

work (more so in the past). In other words since legal documents have always had this mystic aura about them which makes them difficult to understand…anything that is not like that must not be as good as or as 'professional'. Having said that, I don't see anything wrong with 'dressing up' a document a little with language to give it an air of formality which would befit the document, e.g. a will. Again, I think a balance is required in order to convey a clear message but still be able to distinguish it from everyday mundane language use. I believe that language is a versatile and powerful tool which more than allows for this balance to be achieved.

This is a common perception. I do not think it benefits the client because it is not value for money if they cannot understand what is going on in their case.

I think that is definitely still the way some lawyers think and maybe it is true to an extent. If clients received a drafted document that seems really simple because it is in plain English they may not think they've got their money's worth. On the other hand, if they can understand what is going on they are probably also more likely to feel satisfied with the work the lawyer has done.

I think this could definitely be true, it does make them sound more professional, however the client is probably fooling themselves if they can't actually understand what is being said!

One student spoke about the expectations of clients in relation to the tone of a lawyer's letter. Clearly, appropriate tone is a critical component of a professional document, but a formal tone does not need to be in legalese. This is where the confusion lies. One student said:

I think some clients do want documents written in a formal legal tone. However, the default position should be to assume that clients actually want the most 'workable' document.

This next response was very candid:

A lawyer once said to me that he wakes up in cold sweats of guilt for the amount he charges clients for basically telling them common sense. But that the reality is unless you wear a suit, charge a fortune and make it sound technical – people don't listen to common sense. I think a client wants to understand what is happening to them but they don't want to be given something that they could have just done themselves. I think

> *plain English is important because it helps the client understand the law. However I think it is important to keep a degree of formality. I don't think a very casual approach is appropriate either.*

There is an indication here that there is confusion between formal English and informal (or casual) language – and that plain English is necessarily informal. I don't think this is so, and I teach students that it is necessary to be use plain but formal English.

Some students did agree that there is an extant perception that legalese represents value for money, or proof of a lawyer's skill:

> *This is because the more complex it looks, it reflects more upon the nature of work of a lawyer, and the client believes they have a very good lawyer, as they themselves cannot understand the text. These lawyers who actually believe that clients think like that however are unfortunately misguided in my opinion, as a client would always want to understand what is going on, and so therefore when they do not understand any text, they will feel as if they are NOT getting value for money.*
>
> *I agree that some clients do think this. Client's (sic) go to lawyers as they don't understand the legal system and associated legal jargon. Sometimes client's (sic) may feel that they are paying lawyers lots of money just to write something they could have written themselves – so I can understand that some lawyers write in legalese to make their client's (sic) feel as though they are getting their money's worth. This can be counter-balanced by the ones who complain about having to go to a lawyer to interpret a simple two page letter that really could have been summed up in a couple of paragraphs.*
>
> *I had a client asking for a "legal' type letter using legal words to assist her with her submission that she was taking to the Social Security Appeals Tribunal.*
>
> *When it comes to billing the client, (and I know from the experience of a close relative) clients want all the legalese they can get in their matter but none in their account. It causes problems between the lawyer and client when all matters pertaining to the bill and charging are not clearly spelt out for the client. I think some lawyers adhere to the notion of providing as little clear information as possible.*

> *I think this perception is linked to the elitism of lawyers and thinking it's the only way to do things. I think it is a misconception. If clients had a legalistic document and a plain English document in front of them, and you explained that they meant the same thing, they would choose the plain English version. Simple and clear language should prevent future disputes based on confusion of what the terms meant. Clients will also save money if they don't have to book an extra appointment or make an extra phone call to get their lawyer to translate what they have written*

One interesting comment suggested that lawyers do not need to be concerned with their written communication skills:

> *Let the secretary make the grammatical corrections.*

Apart from the obvious questions raised by this (e.g. would the secretary have the linguistic skills to do this, would junior lawyers even have their own secretaries, would the secretary have time to do tasks such as editing grammar mistakes, will the secretary proof-read everything produced by the lawyer, etc), a more fundamental issue is raised by this suggestion. Grammar is an integral part of sentence structure. Without a concept of how to draft a sentence, a lawyer cannot draft a letter, a pleading or any kind of agreement. This underestimation of the importance and magnitude of the role which grammar plays in written communication underlines my thesis here: if you haven't grasped the building blocks of writing, you'll never be a great writer. It then becomes a question of whether our students wish to strive for excellence, or whether 'near enough' will do.

Conclusion

Those in the legal profession who are dedicated to excellent client service and access to justice for everybody have seen the connection between these concepts and the use of plain language. It is true that the use of legalese has been diluted substantially over the last ten to fifteen years, and that the legal profession has embraced the notion of clear communication with clients, if only for risk management purposes if nothing else. After all, a client who understands advice and knows what is happening is less likely to complain.

Law students are generally keen to embrace use of language that their clients will understand, and with a little grammar tuition to assist the process, the next generation of lawyers will be in an excellent position to provide that service. As in all areas of learning, students need encouragement in their endeavours to use Plain English and need to find that encouragement in their leaders, mentors and teachers.

Law schools and legal educators must start the process of teaching Plain English drafting early in the degree. Legal academics must start using Plain English

principles themselves and publish articles which are easier to read. Those who draft legislation and have embraced Plain English principles must continue to strive for excellence in that endeavour. The judiciary must also come to grips with this concept. Judges must write judgments which are clear, comprehensible and reader-friendly. Then we will be able to teach law students to not just "do as we say" but to "do as we do".

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BOOK REVIEW:

Russian Terminology Science (1992–2002)
IITF-Series 12

S. D. Shelov & V. M. Leichik, Eds.
together with H. Picht & C. Galinski

Vienna, TermNet Publishers, 2004
462 pp.
ISBN 3-901010-34-3

Reviewed by :
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Center for Language, Cognition and Mentality
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The division of Europe (and, starting from there, the world) into East and West and hence "them" and "us" was artificial in a vast number of respects – except, of course, for those quite tangible clashes of ideological, political, and economic agendas that gave birth to it in the early 20th century and led to its gradual dissolution less than a century later. Though we are not quite out of the muddy waters of post-dividedness yet, and though a strong "nostalgia" is presently being experienced and expressed by those on both sides who built their world-view and perhaps even career on this very basis, European and global developments for the rest of the 21st century are bound to be determined by much else than the "good old" East-West opposition. Just like in all centuries before the 20th.

Scientific developments is one good example. The state-of-the-art of most present-day sciences has come about through continuous synergies across (what for a period became) the gap between East and West. For example, it is hard to describe the roots of today's natural sciences without mentioning both Newton's law of gravity and the periodic table developed by Mendeleev – or the basics of modern psychology without mentioning both Piaget's work on child development and the conditioned reflexes of Pavlov's dogs. Even in periods where East and West were divided the most, some contacts were maintained in many fields, and many devel-

opments continued "in parallel" due to similar points of departure and subsequent insights and experiences.

All this is also true of language theory in general and, as one might argue, of terminology research in particular. Ever since the study and management of professional terminologies became an independent field of activity through the pioneering work of Eugen Wüster in Austria and of D. S. Lotte and others in the USSR in the early 1930s – and the exchange of experience initiated between them already then – developments in this area have had a declared cross-national orientation with regard to both principles of analysis and terminology harmonization and standardization efforts. The dialogue today involves a number of environments across Europe including also e.g. (former East and West) Germany, Czechia, Italy, France, the Nordic countries, UK, and in other parts of the world. Still, the East-West division did of course inhibit this dialogue in various respects, complicating visits and personal contacts, publication options, etc. Moreover, in the 1990s the eastern part of Europe and, to an even higher degree, Russia and the former Soviet states experienced some years with political turmoil and economic crises and disintegration which took focus (and resources) away from ongoing research activities, terminology research included. So, ironically, the first years after the fall of the Iron Curtain indeed widened the gap.

That picture is about to change too, however. Part of the "East" is now part of the EU, opening new perspectives for *inter alia* scientific development and collaboration, and Russian is now experiencing fast and stable economic growth as well as systematic restoration efforts and investments targeting those key sectors of society that suffered in the 1990s, including science and education. After some years of depression, Russian terminology research is now witnessing a revival – as well as a change of generation – with new directions and focuses in research and practice, increased publication activity, curriculum developments, etc. So the ground is definitely prepared not only for re-opening the East-West dialogue, but identifying new areas of mutual interest and possible collaboration. One barrier that still remains, however, particularly as concerns Russia, is linguistic: Most terminology work published in Russian up till now is in Russian, the lingua franca of the former Soviet Block, which poses a challenge to many researchers outside of it. Clearly, a new modus vivendi is bound to crystallize itself quite soon on this point – just as "parallel discourses" have developed for the rich research traditions that used to exist in e.g. German or French only – and the key to that is Global English whether proponents of linguistic pluralism like the idea or not. In the meantime, translation efforts are clearly an important supplement.

In view of the perspectives just outlined, the publication of the collective volume *Russian Terminology Science (1992–2002)* is of great interest, in that it provides an unprecedented basis for non-Russian readers to (re-)discover both the roots and, especially, the present-day status and current orientations of Russian terminology research and management, and the people and environments behind these activities. The book has come about through a joint effort by the Committee for Scientific Terminology in Fundamental Research under the Russian Academy of Science, the

Russian Research Institute for Classification, Terminology and Information on Standardization and Quality (VNIIKI) under the Federal Standardization Agency of Russia, and the International Network for Terminology (TermNet), Vienna. The Russian material was selected and edited by Vladimir Leichik and Sergey Shelov, and the final editing and translations into English and German were carried out in close collaboration with Heribert Picht and Christian Galinski who also provided vital practical support in carrying through the TermNet publication.

The book consists of 28 papers by Russian terminology researchers, most of them rendered in English, but a few in German, together with a comprehensive bibliography. The papers cover a vast array of theoretical issues and empirical investigations subsumed under 6 sections: "Term and Terminology Theory", "Cognitive Terminology Science", "Terms in Natural Language Lexis and LSP", "Terminography", "Some Particular Aspects of Terminology Science", and "Organization of Sci-Terminological Activities". It is impossible within the limits of this review to comment on all specific topics and terminological data addressed by the individual authors or their often opposing views on current theoretical and methodological debates.

What strikes one as a reader in general, however, is that most of the discussion is interesting not because it presents a certain Russian or "Eastern" way or looking at things, but because it contributes new angles and arguments to the status quo and future challenges of terminology research at large. Thus, up until the late 1970s, terminology researchers in both the former Soviet Union and further to the West were very preoccupied with positioning themselves relative to general linguistics, which, in turn, can be explained by the strong influence of structural linguistics on the latter (an influence that was later "enrolled" into the alleged holism of Marxist philosophy in the Eastern countries, but was nevertheless still there). The structuralist preference to describe language as a self-contained system of elements and dependencies and, in particular, the word as an indivisible unit of expression and content was challenged by, and seemed to be incompatible with, terminologists' interest in the dynamics behind the establishment of new term-concept relationships and their recognition and analysis of conceptual structures on their own terms, not only relative to their linguistic expressions (the terms). Though some terminologists, most notably Eugen Wüster, justly argued that similar phenomena may sometimes be viewed from different angles for different purposes, others found it necessary to cut the ties to general linguistics entirely, which resulted in a number of (over-) generalizations that are just as open to criticism as the dogma of classic structuralism. For example, it is still commonplace among terminologists to claim that only terms convey concepts whereas ordinary words "only" convey meanings – a rather idiosyncratic use of these terms that would make little or no sense to, say, a psychologist or a cognitive scientist. However, in the wake of what has been called the Cognitive Revolution (which reached the mainstream of linguistics and several other disciplines worldwide in the 1980s) it has now again become widely recognized that language in not autonomous, but part of the larger system of human cognition, and that the interplay between linguistic and cognitive mechanisms is not just a legitimate, but a very essential subject of investigation.

This renders the focus of earlier terminologists on the conceptual structures underlying professional vocabularies both uncontroversial and highly visionary – Lotte and Wüster were 50 years ahead of their time – and suggests new synergies, some of which are already being implemented, between terminology research and cognitive disciplines such as computer-aided knowledge management and engineering or mental modeling of space and motion. Another factor affecting current developments in terminology research is the gradual extension of empirical focus from "hard" fields like natural sciences and engineering to "softer" ones like politics, history, law, etc., and hence a growing demand for new cross-disciplinary links and synergies across the fields concerned.

All the trends and developments just sketched, and more, are abundantly reflected in the present book and approached from a variety of angles, some of which may be new to non-Russian readers, while others are merely relevant and interesting. The word-vs.-term (and/or meaning-vs.-concept) issue is addressed, inter alia, in the papers of Shelov, Alexeeva, Grinev, and Superanskaya, which may allow the reader to discover new historical facets of the debate as it developed in Russia and cross-nationally since the 1930s as well as new lines of argument such as the idea of distinguishing concepts from notions or seeing "termness" as a matter of measurable degrees rather than absolutes. The Cognitive Revolution is brought into the book most outspokenly by Novodranova, who insists on seeing terminology as but one manifestation of human cognition in terms of knowledge structuring and categorization, stressing the relevance of cognitive modeling in the analysis of professional knowledge as well as the resultant patterns of term-formation. Taking up the challenge, Manerko applies results gained on pre-linguistic spatial cognition to the analysis of complex NPs in the language of engineering, while Yeltsova applies spatial schemes to the analysis of medical terminology pertaining to anatomy. Speaking of special fields, the book spans a wide array of highly specialized and qualitatively different terminologies – from that of chemistry, over history and literary criticism, to the terminology of language theory itself. As for object languages, not only Russian, but also e.g. English, French, German, and Latin are considered in substantial depth. The book also covers e.g. sociolinguistic and text linguistic approaches to terminology work as well as recent first-hand experiences in the fields of terminography and terminology training. Yet, this review has to end somewhere.

Instead, the book itself is warmly recommended to anyone engaged in terminology research and practice who still has the courage, and time, to receive new substantial input. The book is best read not (only) as an update on the "Russian School of Terminology" (which is not "one School" at all) but as a source of new insights, reflections, and examples that may inspire and support the reader in his or her own future work.

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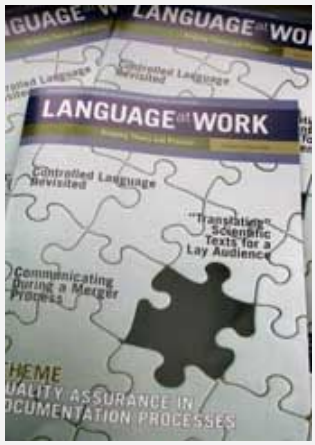
New Popular Science Journal on Professional Language: *Language at Work – Bridging Theory and Practice*



A new popular scientific journal connects researchers and professionals at international level and builds the bridge between research and professional practice in the field of communication of specialised knowledge. The Danish Society for LSP & Professional Communication is the publisher of the journal and the organiser of the publication project.

The journal is aimed at professional knowledge communicators and knowledge mediators, e.g. translators, technical writers and science journalists, as well as researchers interested in this field.

Each issue is centred on a main topic, which is discussed in a number of articles by researchers and professionals alike, but on a scientific basis, so that the topic is seen from a number of different perspectives.

The topic of the first issue is "Quality Assurance in Documentation Processes". Here you may read about the documentation processes in the major Danish company Grundfos, how Energinet.dk manages their language policy in a merger process, or how Lincoln Parc Zoo in Chicago changed their communicative strategy in order to meet the requirements of all of their different target groups.

Language at Work, which is published by the Danish Society for LSP & Professional Communication alongside with *LSP & Professional Communication*, is issued twice a year. Read more about the upcoming topics, the editorial group behind the journal etc. at the journal's website www.languageatwork.eu.

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CONFERENCE CALENDAR:

- 2006 -

November 6-9 (2006) - Montevideo (Uruguay)

X Simposio Iberoamericano de Terminología – RITerm 2006: "Terminología, conocimientos, sociedad y poder". Compatibilizar los aspectos más técnicos y las aplicaciones tecnológicas con el reconocimiento de la trascendencia social y política de la terminología es la demostración del nivel de responsabilidad que cada uno de nosotros tenemos por nuestras respectivas lenguas y países, y al mismo tiempo, una muestra del rigor del análisis, de nuestro anclaje en los datos reales y de nuestra discriminación de situaciones y soluciones en busca de la mejor opción en cuanto a adecuación y eficiencia.
Information: E-mail: ritermuruguay@adinet.com.uy
Web: www.riterm.net/xsimposio/marcos.htm

November 9-10 (2006) – Eskilstuna (Sweden)

ASLA 2006: "Mångfald och språk för en hållbar samhällsutveckling". Ett gemensamt tema blir hur vi kan skapa en samhälleligt god, hållbar utveckling, där språkens roll speciellt uppmärksammas. Vi välkomnar bidrag inom forskningsområden med koppling till språk, som berör tillämpade delar av: • Förskola, grundskola och gymnasieutbildning • Vuxenundervisning • Modersmålen och svenska som andraspråk • De nationella minoriteterna och minoritetsspråken • Främmande språk.
Information: E-mail: Jarmo.Lainio@mdh.se
Web: www.nordiska.su.se/asla

November 9-10 (2006) – Leira (Portugal)

V Jordanas de Tradução: "Trajectos para a Tradução"/ "Pathways to Translations".
Themes: • Translation Studies - emerging paradigms • Translator education and training • Interculturalism and translation • Ethics • New translation practices.
Information: Drª Dora Conde / Drª Ana Raquel Martins.
E-mail: gire@estg.iplei.pt Tel.: +351 244 820 326 Fax: +351 244 820 310
Web: www.estg.ipleiria.pt/website/index.php?id=348701

November 10-11 (2006) – Prague (Czech Republic)

EXPOLINGUA Praha 2006. 16th International Fair for Languages, Cultures, and Education. EXPOLINGUA Praha presents a rich, varied programme of workshops and lectures. Main themes of Expolingua Praha 2006 will be: • Mini Language Courses • Language Tests • Studying and Learning Abroad • European Union Programme • Translation and Interpreting • CALL Computer Assisted Language Learning.
Information: ICWE GmbH, EXPOLINGUA Praha, Att. Janica Ciglianova, P.O.BOX 51 130 11 Praha 3, Czech Republic.
E-mail: praha@expolingua.com Tel. +420 222 782 651 Fax: +420 222 782 651
Web: www.expolingua.cz

November 13-14 (2006) – Brussels (Belgium)

Troisième Sommet de Terminologie. Organisé par L'Association Européene de Terminologie (AET). Les deux journées du sommet seront consacrées aux thèmes suivants: 1. Politiques et planification terminologiques 2. Problèmes "majeurs" pour les langues "mineures" 3. Le profil du terminologue 4. Des collaborations diverses pour des besoins divers.
Information : Sommet 2006, Secrétariat de l'AET, C.T.B., Rue d'Arlon, 11, B - 1050 Bruxelles, Belgique. Tél.: +32 2/549.54.80 Fax: +32 2/511.98.37
E-mail: term@eaft-aet.net
Web: www.eaft-aet.net

November 16-17 (2006) – Antwerp (Belgium)

International Conference on Terminology: "Terminology and Society: The impact of Terminology on everyday life". Topics: • the importance of / best practices in terminology management, knowledge management & multilingual document production for such important society areas as business & services, industry, government, administration, health & human care, security, etc. • best practices for / projects of national terminology associations representing smaller languages and / or new EU member states whose objective it is to promote their own language as the language for specialised terminology; issues relating to language policy in this area • uniformity and standardisation across languages of the terminology of translation and interpreting.
Information: Prof. Dr. Frieda Steurs (Chair of the Local Organising Committee), Departement Vertaler-Tolk, Lessius Hogeschool, Sint-Andriesstraat 2, B-2000 Antwerp, Belgium. Tel: + 32 3 206 04 91 Fax: + 32 3 206 04 99
E-mail: Frieda.Steurs@lessius-ho.be
Web: www.nlterm.org/antwerpen2006.htm

November 16-17 (2006) – Kensington (UK)

Translating and the Computer 28 - Conference and Exhibition. This conference focuses on the user's perspective of how computers/software is used in translation. The conference series attracts a wide audience which includes translators, business managers, researchers and language experts.
Information: Nicole Adamides, Conference Organiser, Aslib, The Holywell Centre, 1 Phipp Street, London EC2A 4PS. Tel: +44(0) 20 7613 3031 Fax: +44 (0) 20 7613 5080
E-mail: tc28@aslib.com
Web: www.aslib.com/conferences

November 17-18 (2006) – Brussels (Belgium)

XXXI Annual Conference of the International Association Language and Business. "**Language and the Business World: Dynamic Strategies, Dynamic Synergy".** The subject of the 31st annual colloquium and conference of the International Association Language and Business addresses the close link between language and the business world bearing in mind that the knowledge of foreign languages is an extremely important and even indispensable instrument for trade beyond national borders.
Information: Manfred SCHMITZ, General Secretary of IALB, Intertext Fremdsprachendienst e.G., Greifswalder Straße 5, D-10405 Berlin, Germany.
Tel.: +49-30-42 101 777 Fax: +49-30-42 101 702 E-mail: manfred.schmitz@intertext.de
Web: www.ialb.net

November 17-19 (2006) – Manchester (UK)

Translation and Conflict II. The conference aims to respond to increased interest in the important role played by translators and interpreters in situations of violent, armed conflict; in shaping perceptions of events and cultures in the run up to such conflict; and in dealing with its aftermath. Themes: • Armed conflict: the nature and extent of interpreter and translator involvement on the ground • Mediating in the aftermath of conflict: translating and interpreting for asylum seekers and refugees • Mediating multi-modal representations of conflict • Translating and interpreting for Human Rights organizations • Translating and interpreting in the process of conflict resolution • Activist communities of interpreters and translators • Personal vs. professional ethics.
Information: Ms Gabriele Ashcroft, School of Languages, Linguistics and Cultures, The University of Manchester, Humanities, Oxford Road, Manchester M13 9PL (UK).
E-mail: gabriele.ashcroft@manchester.ac.uk
Web: www.esri.salford.ac.uk/seminars/forthcoming/translation_conflictII

November 17-19 (2006) – Berlin (Germany)

EXPOLINGUA Berlin 2006. 19th International Fair for Languages and Cultures: "Languages Advance Mobility". Themes: In cooperation with EUROCALL Germany and the FMF, the Association for Foreign Languages EXPOLINGUA Berlin 2006 presents a rich, varied programme of workshops and lectures. Main themes of Expolingua 2006 will be: • CALL Computer Assisted Language Learning • Mini language courses • Language tests • Studying and learning abroad • Foreign language professions.
Information: Project manager: Silke Lieber, ICWE GmbH EXPOLINGUA Berlin, Leibnizstrasse 32, D-10625 Berlin, Germany.
Tel: + 49 30 327 614-0 Fax: + 49 30 324 98 33 E-mail: info@expolingua.com
Web: www.expolingua.com/eng/index2.htm

November 21-23 (2006) – Helsinki (Finland)
IST 2006: "Strategies for Leadership". This year's edition of the European event in the field of Information Society Technologies will coincide with the launch of the EU's Seventh Framework Programme for Research and Development. The overriding aim: to help achieving Europe's innovative potential in developing and rolling out Information and Communication Technologies.
Information: E-mail: INFSO-IST2006-conference@cec.eu.int
Web: http://europa.eu.int/information_society/istevent/2006/index_en.htm

November 24-25 (2006) – Brno (Czech Republic)

Languages for Specific Purposes in Higher Education - Searching for Common Solutions. Topics: • Teaching Languages for Specific Purposes: identifying problems and offering possible solutions, curricula, teaching objectives, content language integrated learning – principles, pluses and minuses, sharing experience • Testing Languages in Higher Education: identifying problems and offering solutions, purposes, methods • European Language Portfolio: methods of application, results, pros and cons • ICT in Language Teaching in Higher Education: benefits, pitfalls, effects of different factors and approaches of the participants.
Information: Ms Dita Gálová, Department of Foreign Languages, Faculty of Mechanical Engineering, Brno University of Technology, Technická 2, 616 69 Brno, Czech Republic.
E-mail: galova@fme.vutbr.cz
Web: www.kj.fme.vutbr.cz/lsp

December 5-6 (2006) – Havana (Cuba)

6th Symposium on Translation, Terminology and Interpretation in Cuba and Canada: "Bridging Cultures through Language Interchange". Translation, interpretation and terminology serve as a bridge between cultures and can be adapted to fit any given situation. It is from this perspective that we call on colleagues from around the world to give some thought to important issues such as the type of ties that can be established among cultures with major or minor languages, those that coexist within the same country, those that have recently arrived in a country, and those with different historical and political underpinnings.
Information: Elisabet Ràfols-Sagués erafols@atis-sk.ca Tel.: (306) 652-4289 (in Canada) or Luis Alberto González Moreno bibliotecaws@infomed.sld.cu
Web: www.cttic.org/e_infolangind.htm

December 6-9 (2006) – Santa Cararina, Florianópolis (Brazil)

Theoretical Issues in Sign Language Research 9: "Sign Languages: spinning and unraveling the past, present and future". The theme of the 9th edition of TISLR is the development of sign language studies from the 1960's until today with a look at lines of research for the future. The TISLR is a space for socialization of studies about the world's different sign languages that seeks explanations for linguistic facts considering the visual-spatial modality that is specific to these languages. For the first time, the event will be held outside North America and Europe and will include the participation of researchers from throughout the world, and in particular, Brazilian researchers who have been studying Brazilian sign language to make this a special edition of TISLR.
Information: Projecta Eventos. Phone/Fax: 55 (48) 3222-4030
E-mail : tislr9@projectaeventos.com.br
Web : www.tislr9.ufsc.br/index.htm

Decembre 8-10 (2006) – Klagenfurt, Austria

Verband für Angewandte Linguistik bei der 34. Österreichische Linguistiktagung. VERBAL-Workshops/Sektionen: Zweisprachigkeit und Migration • Gebärdensprach-linguistik & Gebärdensprachkommunikation • Schreibforschung-Schreibdidaktik • Werbung • Fremdsprachenerwerb in der Schule • Vagheit in der Sprache/ Sprachliche Vagheit: Approximatoren, Mitigatoren, Heckenausdrücke • Sprache und Essen.
Information: ÖLT, Institut für Sprachwissenschaft und Computerlinguistik,
Fakultät für Kulturwissenschaften, Universitätsstr. 65-67, 9020 Klagenfurt
Tel. ++43(0)463 2700 2802 Fax: ++43(0)463 2700 2899
e-mail: linguistiktagung@uni-klu.ac.at
Web: www.uni-klu.ac.at/spw/inhalt/270.htm

December 15-17 (2006) – Pune (India)

International Conference on Pragmatics. Through this conference, the IASE aims at bringing together the leading Pragmaticians of the world to discuss various aspects of Pragmatics. Apart from resolving doubts and problems related to Pragmatics, the interactions are expected to promote teaching and research in Pragmatics.
Information: Dr.Ashok Thorat, Director Institute of Advanced Studies in English, Near Bodygate Bus Stop, Aundh, Pune –411 007 India.
Tel: 0091-020–25887601 Mobile: 9422313068 E-mail: ashokthorat@vsnl.net
Web: www.fcsiase.com/currentevents.htm

- 2007 -

January 11-13 (2007) – La Laguna, Tenerife (Spain)

Publishing and Presenting Research Internationally: Issues for speakers of English as an Additional Language. Topics: • Analysis of academic discourse • EAP pedagogy • Globalization of academic discourse • Editing and translating academic discourse.
Information: Sally Burgess or Margaret Cargill: ppriseal@ull.es
Web: http://webpages.ull.es/users/ppriseal/index.htm

January 24-26 (2007) – Groningen (The Netherlands)

International Research Meeting for Junior Applied Linguists. For more than 10 years, Anéla, the Dutch affiliate of AILA, has been organizing the so called 'junior days' at which beginning researchers, PhD students, and graduate students are invited to present their work in an informal and supportive setting. Stimulated by suggestions from the AILA International Committee, Anéla and GAL, the German affiliate, have now planned to organize a joint International Research Meeting for Junior Applied Linguists, aiming at an international exchange of ideas and a stimulation of contacts between European affiliates of AILA. Interaction with and feedback from both junior and senior researchers is highly emphasized.
Information: University of Groningen, CLCG, t.a.v. Marjolein Deunk, Postbus 716
NL-9700 AS Groningen, The Netherlands.
E-mail: juniorresearchmeeting@anela.nl
Web: www.anela.nl/juniorresearchmeeting

January 24-27 (2007) – Paris (France)

EXPOLANGUES 2007. Créé pour promouvoir l'apprentissage des langues, défendre le plurilinguime et encourager les échanges internationaux, Expolangues est un évènement unique qui réunit depuis 24 ans l'ensemble des acteurs du marché linguistique, professionnels et grand public. Rencontrez 200 exposants de différents secteurs : écoles de langues, séjours linguistiques, méthodes et tests de langues, formations à l'étranger, interprétation, traduction, édition, multimédia, … ; Testez votre niveau en langue dans le Kiosque ; Perfectionnez vos connaissances linguistiques dans la classe ; Participez à nos nombreuses conférences et autres animations culturelles.
Information: EXPOLANGUES, 27, rue du Chemin-Vert, F-75543 Paris cedex 11, France. Tél. : 33 (1) 48 07 41 41 Fax : 33 (1) 48 07 02 92
E-mail : expolangues@letudiant.fr
Web: www.expolangues.fr

February 9-10 (2007) – Vaasa (Finland)

XXVII VAKKI-SYMPOSIUM on LSP, Translation and Multilinguism: "Language and Life Stages". The VAKKI-symposium is an occasion for researchers in LSP, translation, multilingualism and related fields to meet in an international and multilingual environment.
Information: Heli Katajamäki, tel: +358 (0)6 – 3248 365 fax: +358 (0)6 – 3248 380
E-mail: heli.katajamaki@uwasa.fi
Web: http://lipas.uwasa.fi/hut/vakki/symposium2007/english.html

February 12-14 (2007) – Bochum (Germany)

16. Jahrestagung der Gesellschaft für Sprache und Sprachen (GESUS) e.V. Im Rahmen dieser Zielsetzung veranstaltet die GESUS im Februar 2007 eine wissenschaftliche Fachtagung in Bochum, bei der alle Vorträge, die sich in irgendeiner Form mit Sprachwissenschaft, Phonetik, Sprachunterricht, Psycholinguistik, Sprachgeschichte, Sprechwissenschaft, Computerlinguistik, Soziolinguistik, etc. beschäftigen, willkommen sind.
Information: Robert J. Pittner, Steeler Str. 168, D-45 884 Gelsenkirchen, Germany.
Tel. +49 0209/1209441 (zwischen 17 und 20 Uhr auch am Wochenende)
Web: www.ruhr-uni-bochum.de/linguistiktage

February 22-23 (2007) – Milano (Italy)

VII Congresso dell'AItLA (Associazione Italiana di Linguistica Applicata): "Aspetti linguistici della comunicazione pubblica e istituzionale". Come è ormai consuetudine, tuttavia, sarà lasciato spazio anche a tutte le principali tematiche della linguistica applicata.
Information: Cecilia Andorno - ceciliandorno@unipv.it or
Cristina Bosisio - cristina.bosisio@unicatt.it
Web: www.aitla.unimo.it

March 7-9 (2007) – Dhaka (Bangladesh)

ICICT 2007 – International Conference on Information and Communication Technology.
Information: Dr. S. M. Lutful Kabir, Organizing Chair, ICICT, Professor and Director, Institute of Information and Communication Technology (IICT), Bangladesh University of Engineering and Technology (BUET), Dhaka-1000, Bangladesh.
Tel.: +880-2-9665602 (Direct) Fax: +880-2-9665602
E-mail: chairorgicict@iict.buet.ac.bd
Web: www.buet.ac.bd/iict/icict2007

March 8-10 (2007) – Québec (Canada)

XXIes Journées de linguistique (JDL).
Information : XXIes Journées de linguistique, Association des étudiants diplômés inscrits en langues et linguistique (ÆDILL), Département de langues, linguistique et traduction, bureau 2289, Pavillon Charles-De Koninck, Université Laval, Québec (Québec) G1K 7P4. E-mail : jdl@lli.ulaval.ca
Web: www.lli.ulaval.ca/JDL.html

March 26-28 (2007) – Honolulu, Hawai (USA)

17th International Conference on Pragmatics and Language Learning (PLL). The conference will address a broad range of topics in pragmatics, discourse, interaction and sociolinguistics in their relation to second and foreign language learning, education, and use, approached from a variety of theoretical and methodological perspectives.
Information: National Foreign Language Resource Center, University of Hawai‘i at Manoa, 1859 East-West Road #106, Honolulu, HI 96822, USA .
Tel.: +1 (808) 956-9424 Fax : +1 (808) 956-5983
E-mail: nflrc@hawaii.edu
Web: http://nflrc.hawaii.edu/prodev/pll

March 28-30 (2007) – Mannheim (Germany)

13. Arbeitstagung zur Gesprächsforschung: "Gesprächsforschung: Aufgaben - Desiderate - Perspektiven". Themen: • Interaktionstheorie • Multimodalität der Interaktion • Kulturalität der Interaktion • Prosodie • Grammatik gesprochener Sprache • Daten und Korpora.
Information: Thomas Spranz-Fogasy, Institut für Deutsche Sprache, Mannheim.
E-mail: tagung@gespraechsforschung.de
Web: www.gespraechsforschung.de/tagung/call.htm

March 30 – April 1 (2007) – Washington, DC (USA)

GLS 2007. "Language and Globalization: Policy, Education and Media". The conference will explore the interaction between language and the processes of globalization. GLS 2007 is a conference run by the graduate students in the Department of Linguistics at Georgetown University. The conference will include three days of oral and poster presentations by students as well as invited plenary addresses and panel discussions by established scholars.
Information: GLS 2007 Conference, Department of Linguistics, Georgetown University, 3700 "O" Street NW, Washington, DC 20057, USA.
E-mail: gls2007@glsconf.com
Web: www.glsconf.com

April 13-14 (2007) – Lodz (Poland)

Intermedia 2007: Interpreting and Audiovisual Translation. The conference is organised in response to a growing body of research in those areas, accumulating as social and technological developments place ever greater demands on interpreters and translators worldwide. Topics: • conference interpreting • simultaneous and consecutive interpreting • community interpreting (particularly in legal and medical settings) • audiovisual translation • specialised and technical interpreting • interpreter education • ethical issues in interpreting.
Information: Intermedia 2007, University of Lodz, Department of English Language, Al. Kosciuszki 65, 90-514 Lodz, Poland. Fax: (#48) 42 6655220.
E-mail: duoduo@uni.lodz.pl
Web: www.filolog.uni.lodz.pl/intermedia2007

April 13-15 (2007) – Hangzhou (China)

2nd International Conference on Multicultural Discourses. The aim of the conference is, namely, to facilitate cultural harmony and prosperity on the one hand and on the other hand to undermine cultural domination and exclusion. Topics: • concepts and theories of language/communication/discourse outside the dominant paradigms, as well as the related research and teaching traditions • intercultural dialogue, postcolonial critique and cross-cultural fertilisation in discourse/language/communication studies • globalisation of non-western intellectual heritages • rules and needs for conducting intercultural and international communication • localization of English as international language.
Information: 'Weili (Wendy) Zhao, Institute of Discourse and Cultural Studies, Zhejiang University, Hangzhou, China 310058. Tel. ++86(0)571.88206208
E-mail: discourses@zju.edu.cn or mdiscourses@yahoo.com
Web: www.shixu.com/institute-conference

April 19-21 (2007) – Murcia (Spain)

XXVth International Congress of AESLA: "25 years of Applied Linguistics in Spain: milestones and challenge". Topics: • Language acquisition and learning • Language teaching and syllabus design • Language for specific purposes • Language psychology, child language and psycholinguistics • Sociolinguistics • Pragmatics • Discourse analysis • Corpus and computational linguistics • Lexicology and lexicography • Translation and interpreting.
Information: AESLA - Spanish Association for Applied Linguistics.
E-mail: aesla2007@um.es Web: www.um.es/aesla2007/aesla2007.html

April 21-22 (2007) – London (United Kingdom)

ITI 2007 international conference. 21st Birthday Conference of the Institute of Translation and Interpreting. The Conference will include discussion of the hot topics in translation and interpreting, and will cover issues such as training the next generation of translators and interpreters and using corpora to improve quality of output and research.
Information: Institute of Translation & Interpreting, Fortuna House, South Fifth Street, Milton Keynes, MK9 2EU, United Kingdom.
Tel: +44 (0)1908 325250 Fax: +44 (0)1908 325259 E-mail: info@iti.org.uk
Web: www.iti.org.uk/pages/events/results.asp?ID=495

April 30-May 5 (2007) – Vienna (Austria)

Multidimentional Translation (MuTra): LSP Translation Scenarios. The conference series is intended to examine multiple (multilingual, multimedia and polysemiotic) dimensions of modern translation scenarios and to address questions as to the impact of new technologies on the form, content, structure and modes of translated products.
Information: Prof. Dr. Heidrun Gerzymisch-Arbogast, Advanced Translation Research Center (ATRC), Saarland University, Postfach 15 11 50, D-66041 Saarbrücken, Germany.
Tel.: +49 (0)681 302-4248 or +49 (0)681 302-4133
E-mail: h.gerzymisch@mx.uni-saarland.de or info@euroconferences.info
Web: www.euroconferences.info

May 2-4 (2007) – Gatineau, Québec (Canada)

Colloque: "Terminologie: approches transdisciplinaires". Le colloque réunira terminologues et linguistes, responsables de politiques linguistiques, rédacteurs, traducteurs, sociolinguistes et ethnologues, politologues et sociologues, philosophes, historiens, anthropologues sociaux et culturels, lexicographes et lexicologues, terminoticiens, ingénieurs-linguistes et autres chercheurs en technologies langagières.
Information: Sylvie Villeneuve, chargée de projet, Bureau de liaison université-milieu, Université du Québec en Outaouais, C.P. 1250, succursale Hull, Gatineau (Québec) J8X 3X7 Canada. Tél.: +1 (800) 567-1283, poste 1806 Fax: +1 (819) 773-1808
E-mail: blum@uqo.ca Web: www.uqo.ca/terminologie2007

May 10-12 (2007) – Helsinki (Finland)

8th Conference on Nordic languages as second languages. The conference will have three general themes: Constructions in second language • Identity and multilingualism • Interaction in second language contexts.
Information: E-mail: nordand-2007@helsinki.fi
Web: www.helsinki.fi/hum/skl/nordand2007/english.htm

May 10-12 (2007) – Bologna (Italy)

MultimeDiaLectTranslation 2007 - Third International Conference on the Translation of Dialects in Multimedia. The conference will concentrate on a complex, interdisciplinary subject area involving linguistics, communication studies, film studies and translation studies as well as other areas of cultural studies, sociology and other disciplines. Main topics include dubbing, subtitling films in dialect and linguistic varieties; theatre translation; cultural transfer processes in the characteristics of dialects; archaisms, regionalisms, varieties in the continuum between dialect and standard language; diglossia (national language and regional or local language; "official" and "non official" language); the use of new technologies in the translation of dialect.
Information: E-mail: mgiorgiomarrano@sslmit.unibo.it (subject: « MMDT2007):
Web: http://multimedialectranslation.sitlec.unibo.it/index.html

May 25-26 (2007) – Tartu (Estonia)

Nodalida 2007 - 16th Nordic Conference of Computational Linguistics. Topics: • phonetics, phonology, and morphology • speech recognition and speech synthesis • syntax, semantics, and grammars • pragmatics, discourse, and dialogue • the lexicon and ontologies • parsing and grammatical formalisms • generation, text planning, and summarization • language modeling, spoken language recognition, and understanding • information retrieval, text categorization, question answering, and information extraction; • machine learning for natural language • multilingual processing, machine translation, and translation aids • multimodal and natural language interfaces and dialogue systems • language-oriented applications, tools, and resources • evaluation methodology.
Information: E-mail: nodalida2007@ut.ee
Web: http://math.ut.ee/nodalida2007

June 28-30 (2007) – Wollongong (Australia)

6th International Roundtable for the Semiotic of Law: "Signs of the Times". Law records the past – Law commands the Future. Do historical periods make their mark on law? How does law impact on the spirit of the times? How does time signify law? How does law read, recognise or represent *the signs of the times*? How does law signify time? In what tense is it written, pronounced or lived?
Information: Dr Rick Mohr, Faculty of Law, University of Wollongong, NSW 2522, Australia. E-mail: rmohr@uow.edu.au
Web: www.uow.edu.au/law/LIRC/semioticsoflawroundtable.html

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Our conference calendar may also be consulted on our web-site:

http://www.dsff-lsp.dk/LSP/calend.htm

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The Editors especially wish to encourage papers on: recent research within the field of LSP and new comments or reports on particular problems or on situations special to certain countries or regions. Papers should be written in an accessible though rigorous style, which also communicates to non-specialists.