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The information highway and other metaphors in specialised language of computers

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Carlo Grevy, “ The Information highway and other metaphors in specialised language of computers

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1. Introduction

In this article I discuss some of the results of my PhD project on metaphors in special language. The partial research concerns metaphors in IT language and consists of an examination of five issues of *PC Magazine Danmark* 1997-1998, in which I have up to the present time of writing examined around three thousand metaphors (the whole investigation will cover ten issues of *PC Magazine Danmark*). The starting point is a critique of the Lakoff and Johnson tradition’s tendency to choose utterances, to systematize them and to consider them as evidence of metaphors’ cognitive meaning. Instead of this, I consider that metaphors should be investigated in their context, and only thereby can an understanding of their function be developed. It can be documented that metaphors reflect linguistic/language experiences of various scenarios, that these are homogenous and semantically integrated. Metaphors are used in special language more out of linguistic convention than cognitive insight, capacity or creativity. The erroneous but widespread supposition that metaphors are uncommon in special language texts and when they do appear they constitute a disturbing factor, can be disproved : metaphors in special language texts are heavily represented and necessary for linguistic processing of new knowledge. The experiences from empirical evidence are used in conclusion in a short perspective with Lakoff’s interpretation of Gulf War metaphors as an example.

Within many research areas including non-linguistic research areas much attention has been paid to metaphors in the past decades. When discussions focused on speech and thought, these concepts proved difficult to ignore. When we write about metaphors we have to take into account the works of central scholars, whether we think they are right or wrong. This position is reflected in a series of dissertations and theses on the subject : scholars devote large part of their theses or even whole theses to the discussion of the development of metaphor research to find their own point of view.

If I am to find a standpoint I must position myself in relation to existing works. I have chosen to position myself to the at present leading tendency, i.e. cognitive semantics, represented by the linguist George Lakoff and the philosopher Mark Johnson, amongst others. Within this research community it is posited that there is a direct connection between language and thought. The way in which cognitive semantics regard language can thus be described a mentalist. However, Lakoff and Johnson make a series of direct and inappropriate couplings between language and thought, and I do not agree with the way they view this. I hold that there is room for research into and an understanding of metaphors, which is not mentalist. In contrast to other conceptions of metaphors, I consider that a theory can be formulated on metaphors without resorting to an underlying cognitive basis.

In the literature before Lakoff and Johnson it was often question of metaphors such as “Peter is a fox” and “George is a lion”. The metaphorical part was in the juxtaposition of the categories of “animal” and “person”. The metaphorical part was the juxtaposition, which assumes the idea of watertight separations between the categories of animal, person, thing or abstract concepts. Lakoff and Johnson nuance these concepts and speak of metaphors as a more differentiated level, e.g. “ideas are physical objects”, “problems are a region in a

landscape”, “time is money”, etc. It is here that they introduce their concepts of source field and target field: when one says something about a subject – the target field – one uses in one’s linguistic comparison words and expressions from another field, the source field. They further distinguish between the metaphorical concept that the actual expression of this concept. For example they speak of the metaphorical concept “problems are a physical object”, which implies an utterance such as “the problems can be seen from many sides”. In this utterance the expression is indirect and supposes, according to Lakoff and Johnson, that problems are physical objects, which therefore can be seen from different angles, and thereby may be understood cognitively as something concrete – in opposition to “problems” in their literal meaning, i.e. an abstract quantity.

When one needs to say something about the abstract concept “problem”, one uses words of physical things: one can see the problem from various sides (or perspectives), one can distance oneself from the solution of a problem etc. The abstract “problem” is the target field, the physical thing is the source.

I shall formulate it so that in order to express metaphors in language one fetches concepts from another field of knowledge or experience. It is my aim to show that the source which one fetches one’s knowledge from often makes up a much bigger and more integrated language system than the concept source expresses. We use concepts and experiences from a larger integrated linguistic system, a **scenario**, to give expression to concepts in special language which I have investigated.

2. Critique of cognitive semantics

When work is done in cognitive semantics, one investigates for example the **metaphorical concept** “time is money”. Lakoff and Johnson indicated this direction in their early work in the 1980’s amongst other things the concept “time is money”. This can be deduced from utterances such as “you are wasting my time”, and “I’ve invested a lot of time in her”. This metaphorical concept is very widespread, or so they thought. They are right in that. Their conclusion is that because it is widespread, time in our culture is a valuable commodity, even that we understand and experience time as a thing that can be used, lost, administered, invested, saved or wasted.

The generalizing conclusion that all of us in the western world think of and understand time as money, is in my opinion, wrong. It is a generalization that is not proven. When we observe a person to say that someone is wasting their time or that they are investing a lot of time in their family is not necessarily mean that they think or understand time as money or any other economic phenomenon. On the other hand it may well be true that when they have to say something about time then they may use as a linguistic expression that time is money. It can be said that there exists a linguistic convention which facilitates sentence construction, which follow the logic that time is money. However, it is a long way from considering that we in general think of time as money or understand it as such.

Lakoff and Johnson have made some important observations about the use of metaphor in everyday life. However, their conclusion, that these metaphors determine the way we think is a generalization : even their **metaphorical concepts** get an added idealized status.

If we look in a very large corpus how “time is money” is used, we can see that Lakoff and Johnson are right about how widespread this metaphor is. If we look on the Internet using

Kvasir as a search engine, “time is money” is represented 9686 times on English language home pages and the equivalent “tid er penge” 42 times on Danish home pages “Time is money” even appears four times in Danish language home pages – all figures for autumn 1998, the statistics will change as pages come up or are taken down, but a check made in the spring of 1999 confirm the tendency.

If we look at the partial utterance “wasting my time” or “invested a lot of time in” i.e. some of the utterances which imply the metaphorical concept “time is money” we obtain frequencies of 5618 and 155 respectively. There thus seems to be a much greater difference in frequency in the utterances which constitute the metaphorical concepts in very large text corpora.

Let us look at a couple of examples from Lakoff’s own home page. Under the heading “A problem is a region in a landscape” Lakoff quotes a series of **metaphorical concepts**, amongst others “Investigating a problem is exploring a landscape” and as an expression of this he gives various utterances, a few of which I have tested. I have looked at how often they turn up in English language parts of the Internet

We’ve got to “explore this problem” (379 occurrences)
We’ve got to “survey the problem” (45)
Let’s “map out the problem” before we do anything else (4)

On Lakoff’s home page there is also “Trying to solve a problem is looking for a solution in the landscape”, which implies :

I think we’re “heading in the right direction” (147)
How close are we to “finding a solution” (1871)
The solution still lies far ahead (searched for “solution” NEAR “far ahead”) (29)
We aren’t getting any “nearer to an answer” (0).

I could give more examples among Lakoff’s hundreds of **metaphorical concepts** of the disproportionate representativity which these utterances appear with. This is shown when we examine “Ideas are food”. The utterances which Lakoff gives are : “They ate the lesson up” and “They gobbled up this ideas [sic!]”, which are simply not to be found among the millions of pages on the Internet. Or rather, the only place they are found is on Lakoff’s own home page on the computer in Berkeley (<http://cogsci.berkeley.edu/>), where the two utterance turn up twice, as they are counted in both source and target fields! We find “He has an ‘appetite’ for learning” in a footnote, which, in spite of its status as a footnote, appears 348 times! It would suggest to me that Lakoff has not investigated the distribution of the metaphors he is dealing with if he puts a metaphor that is effectively used in a footnote and in the text itself utterances which are not even in the huge corpus of the Internet.

We see too that “time is money” is very widely used, and that there can be found utterances to a certain degree which imply this **metaphorical concept**. Other **metaphorical concepts**, e.g. “Ideas are food” with associated utterances given by Lakoff are not attested on the very large corpus that is the Internet except as the examples by Lakoff himself. I consider that it is highly problematic to accept that we Westerners consider ideas as food, if the most important utterances and expressions, which are supposed to support this statement, are not used by us.

I shall now add another perspective to Lakoff and Johnson's empirical materials. I shall look at the distribution of the **metaphoric concepts** – and so leave aside the utterances which they imply. Let us take the **metaphoric concepts** dealt with and see what occur on the Internet.

A problem is a region in a landscape (8, all the Berkeley home page)
Investigating a problems is exploring a landscape (2 both Berkeley)
Ideas are food (12, 10 Berkeley, 2 in articles on Lakoff and Johnson)

Time is money (9686, at least one from Berkeley)

Here we note firstly that not all the metaphorical concepts can be found with their implied utterances: "time is money" is used frequently and is itself a metaphorical concept and can be found directly in various text corpora, but the first three metaphorical concepts are not found as such, but only via implied utterances. Secondly there is not merely a quantitative difference between the metaphorical concepts above and below the line. It would seem to me that there is also a qualitative difference in their cognitive relevance, notwithstanding Lakoff and Johnson's remarks on this. They make out that all metaphors are general and equally essential. I see it as very problematical to assert that the first three metaphoric concepts are generally speaking there to structure the way we think. If metaphoric concepts have a bearing on our way of thinking, then they surely must be expressed somehow. Some of Lakoff's **metaphoric concepts** have not been found in the millions of pages of the Internet, as we have already pointed out, and other utterances which are given as back up for these metaphorical concepts are not found in this large corpus either. It is not to be ruled out that they are indeed used elsewhere, but in this case any possible cognitive content must be restricted to the areas of the context they are used. However, if the metaphorical concepts are the general expressions for which we think in the western world, they should be found in even limited frequencies on the net.

Let me illustrate my way of thinking by giving an example from another point of view, that is our idiomatic expressions. Not all idiomatic expressions are equally common. For example, at skifte heste i vadestedet (to change horses in midstream) (skilfte heste NEAR vadestedet : 398) whereas the expression "at kaste handske (to cast the gauntlet) is not used ("kaste handske" 0). Why should for example "at kaste handske - to cast the gauntlet" have any important meaning in Danish today, when the expression is not widespread at all? And what other conclusions can an examination of our idiomatic expression lead to, when we think of the ideological content concerning social mobility in "enhver er sin egen lykkes smed" (every man is the artisan of his own fortune) compared with "skomager bliv ved din laest" (cobbler, stay at your last!).

What are investigated in cognitive semantics are *possible* metaphors and *possible* utterances. The method used can be to systematize entries in dictionaries, even though these dictionaries are not the expression of the way people really express themselves, but the way lexicographers imagine that they express themselves. That is why it is doubtful that Lakoff's and other people's example databases (and even then with utterances chosen or selected from reality) is the expression of something quite different from what the language really puts at our disposal. This does not say anything about how anyone (as shown, except Lakoff and Johnson themselves) use language in specific circumstances, let alone think.

3. Specialized computer texts and metaphors

After giving some remarks on the problems of studying language from the point of view of how one thinks it is used instead of examining how it is really used, I shall present part of my own materials. In the investigation I have carried out on five issues of *PC Magazine Danmark*. I recorded all the utterances in all the articles and advertisements that contained a metaphor. The result is a database of around 3 000 categorized metaphors (at the time of writing). The article deals with what may be called highway metaphors : i.e. using computers seen as if it were a journey or a race on a highway. Around 500 metaphors are concerned here. The metaphors are used to express non-technological phenomena (e.g. the computer market) or technological phenomena. However, the metaphors I shall concentrate on are those that concern IT elements, for example programs and pc's.

The first thing to note when examining computer texts is a large number of usual expressions from everyday life (windows, doors, ports, exists, visits, mouse, keys, beams, boxes, trash cans, pads, visits [sic!!!], ports [sic!!!] visitors, hosts, clients, cafés, waves, streams, etc. These concepts are however not used in their most important meanings, the ones that the NDO (*Nudansk Ordbog* – much used Danish language dictionary) puts first. The expressions are immediate and familiar to us. Many have their origins in our experience of our everyday life, perhaps more precisely, of our private sphere of experience. Through these concepts a sort of familiar space is created.

3.1. Visitors and visits in metaphorical expression

A visitor in computer speak is not a visitor in the current sense of the word and a visit is not a visit. The Danish dictionary NDO gives the meaning of visitor as “a person who is on a visit at someone's home, often on invitation”, and that in computer contexts it is often a visit at so-called sites or on home pages. NDO gives as the meaning of visit : a rather short stay in someone's home or at a particular place”: as an example they quote” having people on a visit”. Visitor and visit are used metaphorically in my material, and not in the meaning that NDO gives. I have recorded all the utterances in which metaphors are used. I have further added a short form (paraphrase), which brings the metaphorically essential part out of the utterance:

In advertisements such as these you can see where you are and what people can see on your home pages. This means far more ‘visits’ at a much lower “modular price”. / far more visits at a lower price.

Lademanns Multimedia Leksikon '97 is still a respectable visitor on the PC /
Multimedia program is a visitor.

It should be noted moreover that the two metaphors hold together in their literal meaning. NDO uses visit in the definition of visitor and visitor in the definition of visit. Both concepts are used metaphorically, but in their most important or literal meaning they have something in common. In the now established **metaphorical space** you can now both visit (“besøge”) some one and be a visitor (“gaest”) (in Danish there is no morphological link between the two words, as it is the etymological equivalent of English *guest* which is used for *visitor*). It should also be noted that the writer in this case has put visit in inverted commas, the is aware that it is being used in a transferred sense.

In the investigation there turns out to be very different proportions ; the visit metaphor is used 16 times, the visitor metaphor only once in the corpus of texts. It seems probable that the visit metaphor accentuate the visitor metaphor.

3.2. “Driving” a PC

Another and more common expression : 166 times we find that we “drive” computers, instructions, environments, servers, applications, etc. (In English you could “run” a PC – in Danish you can “drive” it – these examples can not all be translated so that the exactly illustrates how integrated metaphors function). Examples:

“Note that Series 2 is also found with 4 mb, but with a slightly different technology, as the RAMDAC can only “drive” at 220 MHz, and the RAM type is VRAM or DRAM: the last-named is called Series 2./ The RAMDAC “drives” at 220 MHz.”

“The on-line instructions are driven with a firm hand and comprise a guide which gives the user a step by step introduction to the environment and to Java Workshop. /The instructions are driven with a firm hand.”

“This way of “driving”, without regard to what I reproduced in the example, where the writer distances his/herself from the concept by using quotation marks, is given by the NDO as a possible use, but not the most important:...”

“Drive : 1. Meaning : to travel or move by means of a vehicle; 2nd Meaning : to steer a vehicle: compounds [...] 3rd Meaning : be functioning or in activity e.g. Business goes on; the performance lasted a month: everything is going as it should: the machine is running/driving night and day; to run a computer program....” [author’s choice from the dictionary entry]

The reason for this meaning is given in the third most important meaning of the NDO, is that it is a widely used. It makes no difference that the utterance is a metaphor. When “drive” is used in the contexts quoted above, we can speak of a highway metaphor. It does not only mean that your can drive on a motorway. Driving is used in connection with a whole lot of other expressions, such as traffic, ways/roads, detours, signposts, accelerations. Driving therefore fits in with other words and expression to give language form to information technology - and this contributes to letting us view PC driving (running) as metaphorical.

I use the highway metaphor very broadly here. I think of everything which is literally associated with travel and movement from one place to another. To drive to be used with the meaning (to be in activity, to be functioning) does not have to be particularly widespread. However, in this meaning it is used very frequently in my corpus. When the writer does not write “the computer is functioning” it is simply because there is a widespread convention in computer writing to use the computer drives/runs. This is the way to express linguistically a very complex thing and to call upon many associations from our experience with driving on a highway. The motorway metaphor functions in conjunction with other expressions which we use when we express what happens on the roads. We have some concrete experiences of traveling, and to express ourselves with language we use these when we talk metaphorically about computers. We have a **motorway scenario** which we take experience from when we express ourselves on IT.

A series of connotations from the concept and a number of important meanings, amongst which “to travel” and “to drive a vehicle” are part and parcel of this, and go towards establishing the motorway metaphor. If “drive” makes the motorway metaphor – including that of visits and visitors metaphors (since we know through experience that we have to travel to visit someone), I shall characterize this as a **potential metaphor**. If the driving metaphor were alone and did not name anything else which could bring readers to see that there is the idea of driving in the transferred meaning, for example on an information highway, it would remain merely potential, a possibility for present language users. However, if it is included in a nexus of language use, where this driving and travel potential is developed, it participates in a metaphorical language whole. It is thus carried out metaphorically, as it can no longer be read as if it “was functioning”. The expression “drive” comes to function in conjunction with expression such as visit or visitor. I shall cite here extracts from my work, which demonstrates these integrated metaphorical relationships.

3.3. Motorway and traveling metaphors

NDO defines only one meaning for traffic: movement of people and transport on land, sea or the air. In computer speak “traffic” is used often metaphorically (28 times). In connection with moving data, the expression is data traffic, e.g. traffic on the net and internally on the hard disk. There can even be traffic between the individual computer and other units.

“A firewall can be described as a single point of contact between the intranet and the public net, though which all traffic between the two must pass.” /traffic

“The Winstone 97 test generates a bit of disk traffic, and all these”/disk traffic

“This type of firewall controls in and outgoing traffic” / traffic

“The type of traffic is again dependent on the application...”/traffic has low priority.

“He can hop round quickly between many servers, and it creates much unforeseen traffic.” / It creates much traffic

“On the computer, as there is “driving”, there is also “traffic”.”

The concept of road/way is also involved in motorway metaphors. NDO is not as restrictive as with the definition of traffic. In our material road is found 50 times, twice as much as “traffic”. “Vej” is presented in NDO with the following meanings:

“Meaning : a wide pathway designed to be walked or driven on; ...”

“Vej” has the most important meanings revolving around the idea of a carriageway and also movement towards a goal. This meaning, which is often used in our material is “to achieve something”, and it is this meaning which is invoked when the motherboard cannot manage to be installed into a particular computer. The same holds true in the utterance “the wrong way/road”. There, the user can no longer follow, is used immediately a more important meaning of road/way, i.e. when one is on the way to achieving a goal. In the right way is the meaning to obtain something: “the way to fortune” is “obtaining fortune”.

In all cases, where “way” is used in its less important meanings, it is a **potential metaphor**. If a word is used in its most important meaning, it cannot be a potential metaphor. In the less important meanings which are found in NDO can often be put down to the expression that particular metaphors are often used in many types of discourse, and therefore are clichés - this is the case for example for many discourses where life is seen as a journey (H.C. Andersen expressed himself in just these terms) – which is why people often talk about being “on the way” in connection with such a journey. The potential metaphor is actualized metaphorically in the utterances, where the user can accompany on the wrong way.

“The quicker card is only easy to be used in more professional machines, and there was supposedly no prospect that they should find a way to Aspire.”

“COA32 automatises the boring road/way, with all its weak points [vejen er kedelig og har mange fejl]

This entails, this accentuates:

“Not out of the consideration that the net is the highway to fortune (who believes that?), but that men make their way to fortune.”

Just that “way” is used in a text corpus, where the word’s meanings are used, which concern motorway thinking, makes it possible that motorway metaphor will be formulated. This is the use amongst other things of a series of the words quoted above, which are used to make possible the motorway metaphors. That the choice of meanings is so purposefully carried out, that the utterance “motorway to fortune” is produced.

“Actually 3391 bites hard into the hollow of the knee of the fast ATA hard disk.”

Computers cannot just be driven, they can be fast – two metaphorical expressions, which we know from cars, which drive on roads, often (too) quickly. The description, which I have undertaken of the motorway metaphor concerns what could be called the motorway race and which has such connotations as : technological development goes fast, it’s a question of getting along as quickly as possible, of getting traffic moving as quickly as possible too., etc. The whole picture needs to be qualified, however, when we look at linguistic expression. There are a very large number of utterances which qualify: it is not always possible to get a move on when one is on the motorway : there are obstacles in the way, a multitude of the literal obstacles that one experience on the information highway is expressed in my material.

As we can see here, when one is in “traffic” it can be hard to “find one’s way around”, one is “detoured”, do a “U turn” if it is “hard to get ahead”. One can even be “overtaken on the inside lane.”

“Hackers/pirates have always been able to find a way around all the barriers put in their way/ (hackers/pirates) can find their way around.”

“When you run/drive BigBin, the program installs itself in the process line – at the bottom in the right hand corner, where the clock is – from where redirected files are kept/redirected files.”

“BigBin is... files dragged from the DOS box are redirected to the trash can /files are redirected.”

“Artificially a U turn in dimensions and a technological jump forward. U turn.”

“The card is built into an old controller, but in spite of the card it is hard to get around it, if top output is on your wish list. / (the card) is hard to get around.”

“Woow! Overtake your friends on the Internet. /overtake friends on the Internet.”

“And note that the PC branch will overtake the hi fi branch on the inside lane and send the DVD drives more effectively onto [out to?] the market than the hi fi folk will get their DVD players out.”

If we continue qualifying the motorway metaphor, we shall see expressions of “signposts/directory”, “long way”, and “tour-guider”, which enable us to “find our way around”.

“The directory to the worst web words” /directory to web words.

“If you have the impression that it’s all beyond you, you should first read “the directory to the worst web words”” /directory to concepts.

“The graphic card gives poor output, even if it far and away the best cards you can hardly complain.”

“You can also find a monthly tour guide to the web, in which we show you thrilling sites in set subject fields” /tour guide

“Apart from this it’s possible to get a so called site map developed, i.e. a map of the whole site, which will help the visitor to find his/her way round.” /map helps find way round.

These metaphorical problems are solved with the same metaphorical means – take a “short cut”.

“Via the Start menu on the process line or via the short cut to the desk top.” /short cut

“Most of the icons on the desktop are short cuts to all targets on the start menu.” / Icons are a short cut

”TrayLaunch can be removed from the system by just deleting the program file and removing the short cut which you have set up.” /remove the short cut you have set up.

If we go on thinking about visitors, visits in metaphorical utterances (see: 3.1. Visitors and visits in metaphorical expression), we realise that we end up by reaching one’s destination and getting “entrance”, via “ports”, “doors” and “gateways”. This access is achieved because amongst other things, products are “open”.

“The in built disc cache, VACAOHE, tries to hold the FAT in memory, so as to ensure quicker access to the disc.” /access to the disk.

[Just a few examples translated out of a long list!]

You have access to the CD ROM

ISDN access

Access to information

Port

Post is send through the port

A door opens into the drive

The door of the cassettes protects against dust

Gateways allow access

Gateway

The operative system is open

The product’s openness

Picture : for Java Workshop! Entrance to an exotic south sea island tribal village

As a conclusion to the motorway metaphor I shall give some examples from a central metaphor of this series : the metaphor of the car. First a couple of examples, where the writer is critical of the user surface of certain applications: he puts himself at a distance from the program’s use of metaphors: we are out “driving the car, and computer’s RAM is the petrol... beep, beep, it’s going well...”

“The user is out driving a car.”

“The computer’s ram is petrol... beep beep.”

Even if the author of the article is critical of the metaphor, his colleagues make great use of it, as we find many of these car metaphors in the corpus. As we saw earlier, the PC can be “driven fast” - but we also saw that they could be “slow on the uptake”

At the other end of the speed scale there is the possibility to “speed up” and to “exceed the speed limit”.

“The PC is slow on the uptake.”

“The specifications speed up.”

“Break the speed limit : drive REC.”

More concrete are the metaphors when specific makes of cars are mentioned, for example Skodas and Ferraris

“OS/2 is an old Skoda – Windows a Ferrari which limps.”

“To use the program is to drive a Ferrari.”

“Rent a Lotus.”

The car metaphor is linked with the motorway metaphors.

“The PC drive card.”

“The PC drive card builds the right drive card on a practical and theoretical trial.”

Such metaphors, which the magazine’s own writer disliked - above-mentioned - are found elsewhere in the same issue of the magazine. Thus the programs have “fuel gauges” and have to be “run in”.

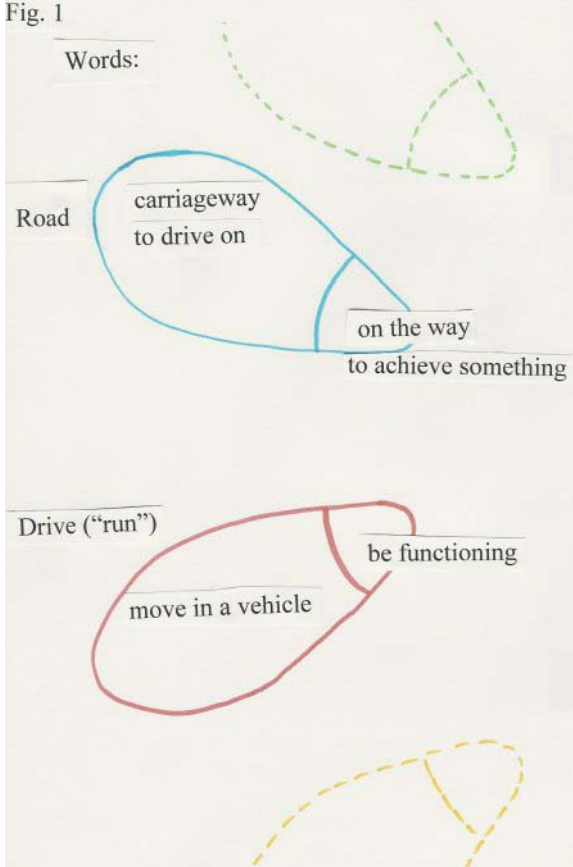
“MonsSys has a fuel gauge.”
“The program is tuned.”

The motorway metaphor is thus particularly developed here. It is established not only through utterances with words like “motorway”, “main road”, but also as we have shown through a varied system which are connected with the main meanings. The connections are varied and form a delicate network throughout the whole corpus.

3.4. The Integrated metaphors

What words are used for in their important and less important meanings can be illustrated thus.

Fig. 1 Important and less important meanings of a word

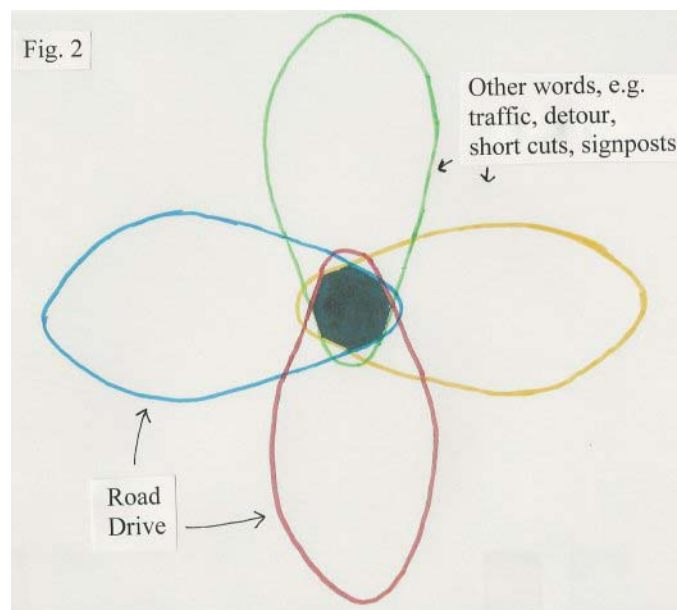


Words: Important meanings (left) and less important meanings + possible lexicalised metaphorical meanings (right).

The left side of the figure 1 illustrates what could be characterised as a literal source of the metaphor. The way I understand metaphors is as integrated metaphors: the less important

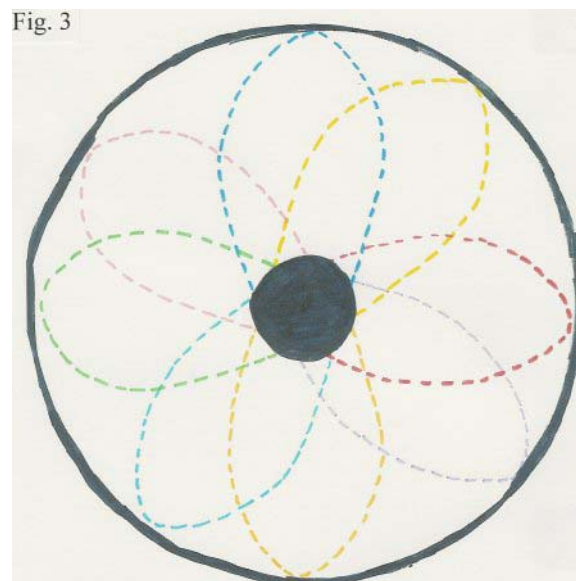
meaning/metaphorical meaning (illustrated in the figure by the smaller part), and the part that is used in the metaphor is never the most important meaning. The integrated metaphors let the language users express themselves on something that is new to their experience: the words are not used with their literal meaning. But when “drive”/”run”, “visit”, “visitor” are used, and because these expressions are connected we take this logic or this experience which we have from the abovementioned scenario: the motorway. This means, for example, that the experience we have when we drive on the motorway, when we accelerate and overtake other cars, can be transferred to the computer: the computer too must go faster. The computer must for example work as fast as possible, it must be “driven” at the highest “CPU speed”. The data, which moves round the computer must find “detours”, etc.

Fig. 2. Integration of the secondary meanings of a word



This model results from laying four of the five circles together, as we had in figure 1. The circumferences of the secondary meanings are superimposed (common denominators). The part that touches the important meanings is that part of the circle that lies outside the common denominator. The arrow for e.g. “way/road” points at the whole word “road” from fig. 1 – the upper part contains the most important meaning: carriageway to drive on.: the lower part contains the secondary meanings: “to obtain something”. For the word “to drive” the corresponding situation holds – the other words “traffic”, “short cut”, “detour”, “sign posts” have corresponding circles (not indicated with arrows). There can be many words which can be integrated in this way (so the choice of illustrating four circles is a simplification). In the center of the figure we have the words’ less important/secondary meanings; which do not have any immediate relationship. The word’s less important meanings are often to be found in the center of the model. In the small circle in the center of the model there can also be metaphorical meanings, which are not lexicalised (for example “short cuts”). The common denominator in figures 2 and 3 can be characterised as the **metaphorical space**, where the works receive a new and different meaning often a new meaning that is not lexicalised.

Fig. 3 The integrated metaphors



The large circle contains all the related words literal and metaphorical meanings, but if we deduce the innermost circle we have a belt round the metaphorical meaning, i.e. round the **metaphorical space**. In this space – the black hole - we do not necessarily know how things really are; we do not necessarily know what the computer does, when it “runs/drives” or develops data “traffic” and we do not necessarily know what we do, when we use a “short cut” or “visit” a “home” page. However, we have an idea of what the computer does, and what we do with the computer, because we borrow relationship and logic from the belt outside the metaphorical space. When we use the words drive, visit, traffic, and roads we borrow in our understanding of the logic of the computer from these words literal and primary meanings. We borrow the logic from what we can call the **motorway scenario**. These meanings are transferred into the **integrated metaphorical space**, integrated because all the words gain cohesion from this scenario. These meanings are transferred into the center of the figure, where the words are used in a new, independent and integrated manner- and where new, perhaps hitherto unexpressed knowledge is expressed through language. The words’ most important meanings have semantic coherence (the outermost arrow points at the circle with the semantically integrated words). The words are used for the new knowledge in the innermost circle of the figure. This is of central importance, at the cohesion (logic) in this new space (illustrated by the inner arrow) is taken over from the coherence of the words’ most important meanings.

3.5. The motorway metaphor in a broader perspective

The motorway metaphor makes up a very large part of the metaphorical expressions in computer texts. Many of the metaphorical utterances which we do not at first sight put into this category turn out on closer inspection to be part of this metaphor (e.g.; queue, travel bag.

Here is an example of the technical term “bus”. The word has in fact nothing to do with the English word “bus” or with any other means of transport, but is connected with cables and wires (and how they are constructed), that data in electrical form moves through. “Bus” consists therefore of a **potential metaphor**. Even on a syntactical level this word functions just like the NDO “bus”.

Some metaphors are more to the periphery of the way of thought of the motorway, e.g. speaking of express trains. However, the fact that there is only found one express train metaphor indicates that the integrated metaphor system does not leave much out.

“Your computer is brought into the 20th century at the speed of an express train.”

There are other large metaphor systems however, notably those that build on the ship scenario – experience from sailing ships, at using the sea:

“You navigate through the pictures on the screen.”

“Docking station.”

“On-board (memory).”

“The switches are flooded.”

You navigate through the pictures on the screen. Things in the computer are connected to a sort of “dock” The memory is “on-board” on a “motherboard”. The sea voyage as a scenario is evoked when there is talk of something “flooding”.

The “flagship” also functions in this metaphor (lexicalised in this meaning in the NDO) just as is “hold water”.

There are several of these sorts of integrated metaphors. In this case, the fact of traveling is determining for all of them. Several important concepts are derived from and are linked to navigation metaphor: e.g. we read about “pirates”, and words that go with “flagships” and cartridges (though this last one does not work syntactically).

“Pirates.”

“The plans will give protection against pirates.”

“The highest pirate rate.”

“The color cartridge.”

Both the motorway and the navigation metaphors give rise to a number of expressions. For example when we read about “heavy products”, we realise that this is something to be avoided when traveling, and that it is meant negatively.

The weather metaphors can also be considered as being an integrated part of the travel metaphors. Bad weather is usually used as a negative expression, but is used here as an expression for violence: technology is set in a scenario with storms, gales and lightning, in which we the users are surprised and overcome as with the other bad weather.

“Technology is storming forward.”

“The drive will blast data through.”

“A lightning fast machine.”

If the above mentioned metaphors are used, it is because they work well. They do not work automatically, they work because the semantic cohesion provides for certain metaphorical utterances. The potential metaphors can always be brought to life by putting the expressions into a broader context, e.g. where “drive” is used in conjunction with “traffic”, “ways”, “parking”, “detours”; etc.

4. Metaphors and linguistic experience

The connection which is in literary discourse or that which are used with a word’s most important meanings is transferred to a metaphorical level. This way the **potential metaphors** become active in a transferred meaning and become the basis for an integrated, homogenous and varied linguistic connection. A single metaphor created for example from the experience of a single person’s experience or special knowledge will not necessarily function in discourse. There are conventions for how metaphors are established.

I have insisted on how in connected knowledge, which is allocated, comes from different scenarios. These scenarios are embedded in language and should not be considered as mentalist. I have demonstrated here how the motorway, travel, navigation function as sources for linguistic expression.

Lakoff and Johnson claim that cultural experiences determine how we think. If we look at concrete experience of travel, which I have investigated, one can accept that many in our society have common and homogenous experiences of the motorway. These motorways are the cultural background which we think of as background. But how many of us are “attacked by pirates” or have been hove-to in a week? Many modern people know the motorway – though not all – and not all experience it in the same way. However, not all know it with the experiences which the scenario provides; they do not race, they do not overtake on the inside lane, drive as fast as possible or even see this as goal. These experiences which form the basis for the metaphors are therefore essentially linguistic. There are conventions about how people express linguistically the motorway, travel or navigation when talking about computers, and it is not an expression for how people experience these relationships themselves or how they drive themselves. There are linguistic conventions which are used in establishing the **integrated metaphorical space**.

5. Lakoff and Johnson’s metaphors

Some of Lakoff and Johnson’s conclusions about the way metaphors work remain problematical from the experience of my research:

- Several of the metaphorical utterances which Lakoff and Johnson find and consider as expressions of **metaphorical concepts** are simply not to be found. Therefore these metaphorical concepts do not have the relevance that Lakoff and Johnson attribute to them. The language system makes Lakoff and Johnson’s metaphors possible – but in the absence of their realisation (low frequency or worse!) means that evidence is lacking for the cognitive status that they attribute to them.
- Lakoff’s metaphors are to be found in dictionaries but not used in the corpus of texts which I used. Lakoff and Johnson show some possibilities for metaphors which language users have, but as I have shown, their metaphors are to be found in a very large corpus with very variable frequencies, down to frequency zero.

- The method which aims at finding model examples simply does not work. We hear of idealised metaphors and we do not know how they actually work. From the point of view of methodology we must start out by examining metaphors in genuine contexts.
- Idealised constructions (which don't tell us how language is used) are just hypotheses, which are given by logic, but which do not say anything about how language functions in various contexts.

Some metaphors function, others do not. Some metaphors are widely used, and used in certain special discourses, others not. The criteria for how far metaphors succeed are not that a single person manages to express a unique, single metaphor. If a person's metaphorical usage is to succeed, it must fit into an **integrated metaphoric system**, or be established out of existing **potential metaphors**. When for example H. C. Andersen managed to create the metaphor "to travel is to live", it was not because the metaphorical expression is unique, but rather that it builds on pre-existing linguistic material. For this reason well-functioning metaphors cannot be constructed arbitrarily. The starting point has to be what the language has to provide; e.g. concrete motorway metaphors which I have spoken of.

It is often said that metaphors allow us to see a new subject in a new light. It is perhaps more accurate to say that they allow us to see new subjects in an *old* light. The **integrated metaphor** indeed often uses old knowledge about something new. Metaphors allow us to see something new through old eyes. In Lakoff's analysis of the metaphorical system used to legitimize the Gulf War (Lakoff 1992), he shows how Saddam Hussein is metaphorically presented as Hitler. He puts forward a series of metaphorical concepts, which he thinks are used to give linguistic expression to the war: "the state as a person", "politics as business", "war as crime", "war as medicine", etc. This system of metaphors looks very plausible, but Lakoff does not demonstrate the variety in language use as it warrants in such a system. But he puts forward three points of view:

"First, there is a widespread, relatively fixed set of metaphors that structure how we see things (Lakoff 1992: 464).

"Reality exists. So does the unconscious system of metaphors that we use without awareness to comprehend reality (Lakoff 1992: 481).

"I have analyzed the system, checked it to see what the metaphors hide, and have checked to the best of my ability to see whether the metaphors fit the situation in the gulf, even if one accepts them (Lakoff 1991: 1).

From my experience, it seems that metaphors do not structure how we see things but do structure how certain people in certain circumstances give linguistic expression to a certain subject. Lakoff is dealing here with an unconscious system of metaphors. Yet the system is often used consciously by speakers: they put words in quotation marks, and they often exaggerate so grossly (cf. the car metaphor) that the effect is most unaesthetic. Sometimes the uses of the metaphors are particularly conscious as the politicians behind the Gulf War are presumably could attest. I consider that the metaphors of the Gulf War as a particularly conscious choice of perspective. What they do is rather the opposite: they tell us something we already know. Or rather they tell someone something they already know, only those who have been to school and know something about the Second World War, and the linguistic

expression of this. The receiver of texts with Gulf War metaphors can of course take a stand with regards to the text : they do not conceal anything. For those who do not know about the Second World War the metaphors do not work – and do not hide anything either. Moreover, for those who know about the Second World War, the metaphors are clear, they hide nothing either. And if they do not raise objections it may be because the metaphors suit them in their linguistic universe: they get served linguistic rationales, explanations and positions which are easy to accept: war and its misfortunes are more understandable – and the receivers can be blamed for accepting this not the metaphors!

The Gulf War metaphors limit, in that they do not tell us anything new, but rather tell us something that is already known. This situation does not stop people from refusing the metaphors – but this is a political and not a linguistic discussion, as it concerns the power to use the media. It is the media and not metaphors which get us to believe at something should be understood in a certain way. The metaphors simply tell us something we already know.

6. Potential and integrated metaphors

Metaphors do not necessarily have anything to do with cognition. It is doubtful that we always think in a scenario, which we borrow words and expressions from, when we have to formulate something new. Nevertheless, the scenario is there and it works!

When my four-year old daughter says to me when I spill coffee on the table “you clown” she does not think it has anything to do with a circus. She knows that a clown is something who is clumsy with things in the house, probably mostly out of her own experience. According to the NDO “clown” in the meaning of “a person who entertains in a circus” the most important meaning, whereas “a person who behaves clumsily” is less important.

I do not think that it is decisive if a word and its use are found in a dictionary or not. It can be a coincidence that a new use of a word is included or not. Is “mouse” in the meaning of “computer peripheral...” or “port” in the meaning of “the place for...” included in the dictionary or is the answer decisive for how far mouse and port should be understood metaphorically? My answer is no. To back this up, it may be pointed out that those who have written that “Peter is a fox” had not concerned themselves with metaphors, as foxes in the meaning cunning are quoted in the dictionary. But when is something so metaphorical? I would regard many of the lexicalised metaphors as **potential metaphors**. Clown, mouse, port and fox are used in the secondary meanings and are thus potential metaphors. But to qualify as **integrated metaphors** more is needed. They must function in a broader context. The example of the clown is not necessarily enough.

We cannot always decide this by asking people: do you think of something metaphorical, do you think of the circus? Etc. Users are not particularly aware of the way they use language, so their perception of their use can hardly be decisive. But when potential metaphors function in conjunction with one another, when clown is seen in conjunction with say circus ring, acrobatics, Dumbo, next performance, tent, troupe, we can speak of a metaphorical system, and its homogeneity will fit in with different real utterances into the **integrated metaphors** in the context of language use.

7. Metaphors' function and status

The function of metaphors in computer texts is amongst other things to create cohesion. The knowledge which swirls around new worlds of experience tends towards chaos. By using a homogenous, stringent, integrated and varied choice of words from the motorway scenario for example creates an illusion of cohesion in a new world of experience. So far so good, when the scenarios used are known to us. The metaphors give an understanding of how things function, what is aimed at with them, what is good and what is bad about them, in as much as it is referred to an established linguistic universe.

One problem is that these metaphors not only give an overview, but they also limit. In metaphor research the idea is often put forward that metaphors are creative, innovative and creating new things. As we have already seen, much of what is said is redundant. We can predict what metaphors will be used in the next issue of PC Magazine Danmark. The machines will drive faster, the broad band will be broader, there will be a new winner of a test, there will always be a fight for the market, and data will overtake on the inside to get ahead quickly.

The experience that the computer world uses is linguistic experience. The **space** which is established must be seen as linguistically coherent and understood from a non-mentalist point of view. For example the experiences we used in our way to express new computer technological knowledge rests on linguistic experience of transport, travel, driving etc. This can be seen that linguistic usage, and not just semantics, is also taken over in this linguistic expression of words in their most important meanings. Many of the above-mentioned experiences from idioms or figures of speech, when experience or logic is adopted, are not self experienced experiences.

The experience that is drawn in to the computer world's **integrated metaphoric space** is already familiar to the user. The new world does not necessarily have cohesion, but an image is formed to do this : it seems familiar and intimate and makes the user *understand* it. The metaphors do not say much new, do not say much we don't know already. But metaphors are intentional – they make it easier for users to express themselves.

Notes

1. [Carlo Grevy](http://home13.inet.tele.dk/grevy/kontakt.htm), Associate Professor at University College of South Jutland, Lembeckesvej 3-7, DK 6100 Haderslev, Denmark. Homepage : <http://home13.inet.tele.dk/grevy/kontakt.htm>.

2. Thanks to John Humbley for translating this article which originally was published in Danish in *Hemes, Journal of Linguistics*, 24, 1999. His comments are in square brackets. All examples of metaphors are originally in Danish and translated into English – which not always is unproblematic. Small changes are made by the author in 2003.

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