

What is “Cultural” about Conceptual Metaphors?

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INTRODUCTION

The story of the “cognitive turn” in the social sciences and the humanities over the last 20-30 years is partially a story of a renewed interest in the phenomenon of metaphor.¹ The “cognitive” theory of metaphor, proposed by Lakoff and Johnson (1980), emphasizes the conceptual nature of metaphors.² It claims that metaphor has to do first of all with thinking, not with speaking. Metaphors in language are regarded as a function of the metaphorical structure of our conceptual system.³ This approach has made metaphor an interesting object of research for scientists beyond linguistics and literary science. Work based on the cognitive theory of metaphor (further: CTM) has been fruitfully conducted within psychology (Ortony 1979, 1993; Gardner 1985; Indurkha 1992, 1994; Sinha in prep.; and many others), archaeology (e.g. Mithen 1997), anthropology (Fernandez ed. 1991), and economy (e.g. MacCloskey 1985), to name just a few examples.

This adoption of the CTM framework by different scientists with different interests has however made visible certain drawbacks of the “standard” theory. One such drawback is the neglect of social and cultural aspects of cognitive activity in the theoretical modelling of metaphors and metaphor use. This neglect has been criticised mainly by researchers doing analyses of metaphors in authentic discourses from the viewpoint of different disciplines.⁴ But although the need for such a development in the CTM has been stated by defenders of the CTM themselves in recent years (Cienki 1999; Gibbs 1999; Dirven (ed.) 2002 and others), more concrete research is still needed.

In this paper we will sum up our thoughts on the cultural aspects of metaphor, which have arisen in the course of our empirical work on public, especially media, discourses on politics (Hellsten 1997; Hellsten & Renvall 1997; Zinken 2002; Zinken in prep.a and b), biotechnology (Nerlich et

al., 2000; 2001; 2002 a and b, in press; Hellsten 2000; 2001; 2002), epidemics (Nerlich et al. 2002a) and biodiversity (Valiveronnen & Hellsten 2002).

We claim that metaphor, as a device for understanding many aspects of reality is “cultural” in two global respects. The first has to do with the “cultural foundations” of cognitive systems themselves. The imaginative act of seeing something as something else, which underlies much of metaphor production, is based on concepts that are culturally shaped. When we think of progress in science in terms of a metaphor like SCIENTIFIC PROGRESS IS A FRANKENSTEINIAN ENDEAVOUR, we “lean” on an obviously culture-specific concept (FRANKENSTEIN) to interpret processes going on in our society. But even strongly “embodied” metaphors can be cultural in this sense. When thinking of ACTION as MOVEMENT, I take a concept (MOVEMENT) as my cognitive starting point and it certainly has a firm basis in bodily experience. However, it has been argued that the English notion of MOVEMENT is culturally shaped, that its structure is not universal (cf. Foley 1997). It is this culturally shaped notion, which serves as the immediate basis for my reasoning about ACTION, not my actual movements in the world.⁵

The second sociocultural aspect of metaphor has to do with the fact that certain metaphorical ways of interpreting the world are enacted in specific contexts. They then might be taken up, rejected, reformulated etc., according to the communicative needs and social points of view of the interlocutors. This is what Hellsten (2002) calls the “politics of metaphor”. For example, the metaphor of CLONES ARE MASS PRODUCTS can be used for opposing purposes depending on the reformulations of the concept “mass products”: they may be perfect human beings or, perhaps lousy copies. These two formulations of the metaphor may be used to either support cloning or to oppose it (Hellsten, 2000).

These two, rather neglected, aspects of metaphorical activity, (1) the cultural situatedness of cognition, and (2) the communicative uses of metaphors, are closely interwoven. It makes sense, though, to describe them separately, because they are about the structure of the cognitive system and about its dynamics, respectively. The following two sections of this article will explore first the structure then the dynamics.

2. METAPHORIC COGNITION AND CULTURAL SITUATEDNESS

Problem-solving is determined to a large degree by problem-setting (Schön 1993/1979). This holds not only for policy-making, but also for scientific

theorising. It is obvious that the differences in approaches to the phenomenon of metaphor are based on what different authors choose as their best example for a metaphor. The differences within linguistics alone are significant: Whereas for some researchers, “freshness”, which causes difficulties in the comprehension process, is a defining criterion of metaphor (Keller 1995, Searle 1993), proponents of the CTM call metaphors what lay people would, in fact, not recognise as a metaphor, such as “my life has come to an end” (based on the conceptual metaphor: LIFE IS A JOURNEY).

Authors subscribing to different theories of metaphor thus narrow their perspective on metaphor to some degree. This works as long as the theorising is based on made-up examples. In authentic discourse, however, one can find all types of metaphor: conventional (or conceptual) ones (such as “take a step into the right direction”), not regarded as metaphorical by some, as well as “fresh” ones (such as “NATO nazis“ (V. Kennedy, 2000), dismissed as rather uninteresting by those supporting the CTM. Both types of metaphor have important functions in discourse and thus have to be theoretically accounted for. The distinction between conventional and fresh metaphors correlates significantly with the distinction between bodily based (correlational) and culturally based (intertextual) metaphors.⁶

The CTM takes the bodily experience that individuals have of their physical surroundings to be the source of imaginative and conceptual activity. In this section, we want to suggest that a person’s cultural situatedness, the experience s/he makes in the interaction with other people and within specific cultural contexts, is another important source of imaginative and conceptual activity. We will first be examining the significance of culturally based metaphors in authentic discourse. Then we want to show why the standard version of the CTM cannot account for metaphorical activity in its whole discursive complexity. Finally, we will make a few suggestions about how to account for metaphorical imagination with regard to body and culture.

INTERTEXTUAL AND CORRELATIONAL METAPHORS

In authentic discourse (especially discourse dealing with topics of public and popular interest, such as science and politics), linguistic metaphors can be found in nearly every sentence.⁷ From a cognitive point of view this should not be surprising. We discursively negotiate all aspects of social life, but in particular abstract topics that have not yet been fully conceptualised and have not yet been given a ready communicable form.

Metaphor is known to be a helpful device for these purposes. Thus, when analysing authentic discourse, we frequently find metaphors that use the logic of conceptual domains such as PATH, MOTION, ENCLOSURE, etc. to reason about abstract phenomena that lack such a spatial existence. Consider metaphors like the following:

We can't take any more foreigners into our boat; THE STATE IS A BOAT or "Cancer research took again a small step forward"; SCIENTIFIC PROGRESS IS A JOURNEY

The motivation for such metaphors can to some degree be explained within the standard framework of the CTM. The notion of the BOAT is, of course, culture-specific, in so far as different cultures have developed different kinds of vehicles. But the metaphorical implication that is most relevant for political reasoning is motivated by the notion of ENCLOSURE, the fact that there is limited space on a boat. A metaphor like THE STATE IS A BOAT is ultimately grounded in experientially primary scenes that make certain metaphorical projections sensible to us – and this is where the CTM and the theory of image schemata, such as container-contained, path-goal, etc., comes into its own. In the boat case a primary scene in our experience, in which we see the correlation between an increase of material and decrease of space in a container (a cup, box etc.) should be relevant. Similarly, the notion of JOURNEY makes use of the bodily experiences of MOTION in space, and PATH. Grady (1999) calls such conceptual metaphors correlational metaphors because their construction is motivated by the experience of correlation in cognitive ontogeny – e.g. the recurrent correlation of motion with achieving something.⁸

Going now beyond such examples, one should stress that in authentic discourse, we also regularly encounter metaphors that cannot be accounted for with reference to recurrent nonverbal experience and image schemata, such as CONTAINERS. Yet this is the standard version of the CTM (and also of extensions to it, as proposed by Grady). Consider these examples:

We don't want science to produce new Frankensteinian monsters.
SCIENTIFIC PROGRESS IS A FRANKENSTEINIAN ENDEAVOUR
"Jeff is a gorilla" A ROUGH PERSON IS A GORILLA

Metaphors like these differ from correlational metaphors or metaphors analysed in the CTM, in so far as they are grounded in a type of experience that is necessarily cultural. The source concepts of the above metaphors

are built up through the experience of culturally salient texts, where the notion of text has to be understood in a broad sense, including novels, films, the media, art as well as school knowledge and knowledge about cultural history. The key notion unifying this type of cultural knowledge is that of a stereotype (Putnam 1975) ⁹. We would like to call metaphors using this type of source concept intertextual metaphors (Zinken 2002).¹⁰ Correlational and intertextual metaphors differ in some respects: The metaphorical character of intertextual metaphors is much more easily noticed than that of correlational metaphors. They tend to be less conventionalised. This does not mean, however, that they are the product of a rhetoric genius; they are firmly grounded in a group's cultural imagination. Another difference, linked to the reduced conventionality of intertextual metaphors, is that they use the logic of a certain concept and the associated popular script or myth (cf. Turney 1998) (e.g. FRANKENSTEIN) rather than of a relatively abstract conceptual domain (e.g. ENCLOSURE) as correlational metaphors do. Nevertheless, both correlational and intertextual metaphors function against the background of more complex cultural narratives of the world, often those of (wild) nature and (human) culture (Hellsten, 2002).

Authors within the CTM-framework have focused on strongly conventionalised metaphors that are pervasive in everyday language (so called conceptual metaphors). However, for discourse studies and media studies, the less conventional intertextual metaphors certainly are interesting. Statistical analyses have shown (Zinken in prep.b) that in a representative sample of political discourse correlational metaphors were more frequent than intertextual metaphors. However, intertextual metaphors appeared in a much higher percentage in headlines, first and last parts of articles, and texts under photographs, that is in those parts of newspaper articles that stay in the readers' minds. It can thus be argued that intertextual metaphors that build on culturally salient stereotypes and not on general bodily experience play a central role in conscious "problem-setting" on the text level (Schön 1993).

THE PIAGET-METAPHOR OF IMAGINATION

If culture plays an important role in producing and understanding metaphors, then the influence of an individual's cultural situatedness on the development of his/her imaginative capacities should be theoretically modelled. In Cognitive Linguistics, imagination is seen to arise from human experience. The notion of experience is construed in a broad sense:

‘Experience’ is thus not taken in the narrow sense of the things that have ‘happened to happen’ to a single individual. Experience is instead construed in the broad sense: the totality of human experience and everything that plays a role in it – the nature of our bodies, our genetically inherited capacities, our modes of physical functioning in the world, our social organisation, etc. (Lakoff 1987, 266)

In this quote the individual’s cultural situatedness is at least alluded to in terms of ‘social organisation’. This shows that there is by no means a stark divide between the cognitive linguistic research agenda and what we are proposing to do. In the following section, we want to illustrate one factor that might have caused a bias in Cognitive Linguistics in favour of individual bodily experience at the cost of cultural situatedness. We claim that work in Cognitive Linguistics has been carried out on the basis of a theoretical model based, at least implicitly, on Piaget’s metaphor of imagination (Zinken 2002).

Imagination is a notion of central importance in those cognitive sciences that go beyond the computational paradigm. It is therefore surprising to find that in Cognitive Linguistics there has been relatively little explicit theorising about this concept, and this despite Johnson’s (1987) early attempt at founding cognitive linguistics on a new theory of imagination. The concept of image schema, which Johnson introduced as part of this theory, has, by contrast, been very widely discussed.

According to Johnson (1987), an approach that gives due credit to the role of imagination in cognition has been further developed in Kant’s later works. Two of Kant’s ideas on imagination¹¹ in particular have been taken up by Johnson. First of all the Kantian notion of schema has inspired Johnson to develop his notion of image-schema. Kant had proposed that imagination does not simply reproduce what has been experienced (that was the traditional Aristotelian standpoint), but that the human mind actively organises experience. Imagination thus expresses schematised experience. Johnson’s image-schemata are similarly construed. The “rich images” of actual experience are abstracted into schemata that show their sensual origin but nevertheless serve as cognitive models for rational thought. Note that it is the daily recurrent experience we have of our body in its physical environment which leads to the construction of image-schemata: the experience of ingesting and excreting food causes the construction of an image schema CONTAINER, the experience of crawling somewhere causes the construction of an image-schema SOURCE-PATH-GOAL, etc. Thinking thus emerges ontogenetically from action, it is based

on our experience of operating, handling and manipulating things and on the fact that the human body is subject to certain physical forces.

In the act of imagination the individual focuses his/her consciousness onto a part of the cognitive structure constructed in this way and re-organises it in order to arrive at creative solutions for cognitive tasks. To support his claim Johnson quotes Kant:

Kant saw that the mind does not go about only with a fixed stock of concepts under which it organizes what it receives through its senses. It also engages in the creative act of reflecting on representations in search of novel orderings of them, which thereby generates new meaning. (Johnson 1987, 157)

Johnson's neo-Kantianism shows some interesting parallels with the genetic epistemology of Jean Piaget. As Chris Sinha points out:

The psychologist most associated with the development of schematization in ontogenesis, however, is Jean Piaget.¹²

Piaget must be counted as a major, if somewhat ambiguous, forerunner of cognitive linguistics, and of current CL-inspired work in developmental psychology. Piaget's account of sensori-motor development in infancy is one in which successive re-organizations and co-ordinations of action schemata, arising from bodily movement and interactions with the physical world, lead to increasingly abstract cognitive representations (or internalized operational structures). The dynamic processes that underpin cognitive development are designated as assimilation, accommodation and equilibration (Sinha, in prep.)

The concept of schema is central to Piaget's thinking. In his view the child abstracts these schemata from the interaction with the physical surroundings, and the reflective combination and reorganization of schemata leads to a conceptual system. Here Piaget, like Johnson, is influenced by Kantian ideas. But there is a further parallel between the concepts of schema in genetic epistemology and in Cognitive Linguistics. This has to do with the question as to why people can share meanings and arrive at a common understanding of aspects of the world despite the ultimate individuality of experience. The need to answer this question had led Kant to the invention of schemas. This concept is designed to explain how individual, singular experience can lead to an intersubjective conceptual system. Kant's solution is to claim that schemas are given a priori, that they are subject to objective, universal laws which are

independent of human experience. In this respect Piaget departs from Kant, and Johnson too can hardly accept it, because one of the most important claims made by cognitive linguists is that language and thought are based on subjective experience and universal pre-conceptual structures, but not a priori, objective concepts.

Thus, Johnson's image-schemas are not given to mankind from above. They are rooted in sensual experience. They do not only organise experience (which is the Kantian element), they are also themselves construed through experience (which is the neo-Kantian element). But nevertheless Johnson wants them to be seen as universal cognitive models, as the basis of a shared rationality. It is obvious that, given the neo-Kantian stance on the genesis of schemata, this can only mean that image-schemata give form and structure to supposedly¹³ (plus or minus 7, one might say, paraphrasing George Miller, 1956) universal aspects of human experience. Only with respect to universals of human living can it be sensible to claim that image-schemas are construed through bodily experience and at the same time objective. These pre-conceptual 'wirings' in our heads are the reason, claim Johnson and his followers, why it makes sense for us to talk of continents or relationships as of containers: 'in Europe', 'in our relationship' and so on. Such linguistic practice is seen as a function of our most basic bodily experiences. This is where we see a third parallel between Piaget and Cognitive Linguistics: language expresses, not causes, cognitive development.

Let us repeat that cognitive linguists are explicitly not interested in what has "'happened to happen' to a single individual" (Lakoff 1987, 266). However, bodily experience ultimately is the experience of individuals – as long as language is assigned a minor role in cognitive development, as it is the case in the Piaget-Metaphor of imagination.

THE INTERACTION OF BODY AND CULTURE

Humans are not the only beings capable of building image-schemata and concepts – other primates also show these abilities to some extent (Tomasello 1999). The specific cognitive and imaginative abilities that humans possess therefore seem to be linked to the fact that humans inherit the results of cognitive activity built up (in the Humboldtian sense) through linguistic and cultural symbols transmitted by their conspecifics. The claim that thought is embodied, an important notion in Cognitive Linguistics, does not only mean that human cognition is enabled and restricted by the way our bodies function, it also means that human cognition is influenced

by the process of taking ‘outer’, symbolised cognition into the body in ontogenesis. The role of linguistic and symbolic communication with the others is crucial for humans. Not only do our bodies shape the range of possible human cultures; the culture we grow up in also shapes the experiential space of our bodies. The goal of theoretical modelling in Cognitive Linguistics thus should be to view body and culture as two levels of experience of the ecologically situated actant. In linguistic activity these levels constantly intermesh.

A different notion of embodiment, helpful in broadening the theoretical basis of the CTM, may be derived from Bourdieu’s theory of habitus. According to Bourdieu the habitus is a durable system of dispositions which is not exterior to a person. It is not like a set of rules that a person knows about. Rather it might be said that a person is habitus: “Ce qui est appris par corps n’est pas quelque chose que l’on a, comme un savoir que l’on peut tenir devant soi, mais quelque chose que l’on est” (Bourdieu 1980, 123). Habitus has a social genesis, it is a result of the naturalisation of the culturally arbitrary (Bourdieu 1977, 87ff.)¹⁴. The emphasis here is therefore not on the construction of cognitive structure out of bodily (individual) experience but on the organisation of bodily experience inside a culture, inside a social context.¹⁵

Such a theory chimes in with a theory of metaphor developed by Weinrich (1958; see also Jäkel 1999) and could be used to broaden the theoretical remit of modern theories of metaphor. Weinrich treated conventional metaphors such as THE WORD IS A COIN as parts of image-fields (Bildfelder) which are not so much part of languages, but of larger cultural communities, and that are used naturally and unconsciously in language and thought. From a “cultural” point of view, it seems reasonable to view a culture’s system of conventional or conceptual metaphors as a habitus that is naturalised in the ontogenetic process of imitatively learning clusters or patterns of consistent linguistic metaphors.

According to Tomasello, habitus is one major influence on a child’s cognitive development. The other one is active instruction:

I will distinguish two ways in which the human cultural environment sets the context for the cognitive development of children: as cognitive ‘habitus’ and as a source of active instruction from adults. (Tomasello 1999, 79)

Now, if we regard discourse as a form of continued cognitive development, then we can view conventional metaphors – which most often have

conceptual source domains that build on procedural knowledge – and ‘fresh’ metaphors – which very often have source concepts that are in some sort socially and culturally salient – as two types of influence on discourse. Whereas a culture’s conventional metaphors function as habitus, the metaphorical pursuit of communicative goals is a sort of ‘active instruction’ to the audience. It seems that for active instruction, intertextual metaphors are especially useful. They are used in specific situations to meet certain communicative goals. When representing clones as Frankensteinian monsters, linguistically and pictorially, the aim is to evoke a negative feeling towards cloning and to set off a train of negative associations. A metaphor like “the wages are falling” doesn’t seem to have a specific aim in that sense and doesn’t set off this type of cognitive associative rippling effect. However, the subjective intentions expressed in texts are possible only on the basis of the objective intentions of a cultural habitus (Bourdieu 1980).

Another difference between these two types of metaphor is that conventional, conceptually based, metaphors are mostly used and understood unconsciously, whereas the ‘active instruction’ metaphors are used mostly intentionally and can only be understood after actively engaging with them. This also means that they can be used for more strategic political, social, didactic, and aesthetic or poetic purposes. One should stress however that conventional metaphors can always be resurrected from their cognitive and social interactive slumber in specific contexts for similar purposes. It makes therefore sense to study the uses of the second type of culturally grounded and culturally significant metaphors in public and media discourses where they can best fulfil their purposes, without however forgetting the almost omnipresent appearance of conceptual metaphors in such texts and their cumulative effects (see Nerlich, Hamilton and Rowe, 2002b)

Take for example conceptual metaphors such as EUROPE IS A HOUSE (Chilton & Ilyin 1993; Musolff 2000; Schäffner & Trommer 1990), THE STATE IS A SHIP (Musolff 1996), or SCIENCE IS A JOURNEY (Hellsten 2000, 2002) and their respective linguistic expressions, such as “We have to build a better Europe”, “All European nations are in the same boat” and “Cancer research took a small step forward today”. These metaphorical projections are, as argued above, firmly grounded in bodily experience. At the same time, however, notions like the HOUSE, SHIP, JOURNEY have strong culture-specific aspects. But both the conceptual and the cultural foundations of these metaphors might never come to the fore of consciousness when readers of newspapers read

such phrases. This is different in metaphors, such as CLONES ARE COPIES, where the cultural image of a clone and the cultural images of (photo) copying are of vital importance for the conceptualisation of cloning in the popular 'mind', something often overlooked by scientists who use such phrases in culturally neutral scientific discourse.

But Musolff (2000) has shown that even for metaphors such as EUROPE IS A HOUSE the view that we unconsciously map elements of the conceptual source domain of buildings onto the conceptual target domain of a political entity is too deterministic and stems from the static view cognitivists have of metaphorical mappings. His analyses show that discourse participants freely and intentionally take up, reject, or reformulate the metaphor of EUROPE as a HOUSE according to their own communicative goals, rather than being trapped in the prison of unconscious metaphorical mapping¹⁶.

This critique might be a bit unfair towards the current level of theorising in the CTM. The claim that inferential structures of the source domain structure the target domain is now made only with respect to primary metaphors. In secondary metaphors, which build on them, only some aspects of the projection are preserved. EUROPE IS A HOUSE is a secondary or even tertiary metaphor. It functions against the background of more general metaphors such as STATES ARE BUILDINGS and INSTITUTIONS ARE BUILDINGS. These are grounded on primary metaphors such as FUNCTIONING IS LINKAGE, PERSISTENCE IN TIME IS STANDING UPRIGHT, and on the image-schema container. Only these structurings might be claimed to have some cognitive impact on the conceptualisation of EUROPE as a HOUSE.

We claim that the more a metaphor is based on culture-specific concepts (e.g. HOUSE), the more elements of cultural, textual knowledge determine the sense of the metaphor. An example within the metaphor of the EUROPEAN HOUSE would be to talk about the nations LIVING TOGETHER in that house ("The European nations should be living together like a real family"). This would be an intertextual metaphor, because it is not only grounded in the experiential stereotype of the family as it really is, but on the mythical-textual stereotype of the family as it should be.¹⁷ However, such images, which are primarily cultural, have a slightly different epistemological status than the source concepts of correlational metaphors, which are tied to procedural knowledge acquired in bodily experience. Cultural imagination does not determine individual cognition, it is more like an offer to individual cognition. This is what Musolff (2000) highlights. Such an offer seems to be especially testing.

when it is, bottom up, bound to general procedural knowledge, and at the same time, top-down, bound to culture-specific values, myths, and perspectives. This is the case with basic-level-mappings:

CULTURAL MODELS

Table 1: Sources of metaphoricity interacting in the formation of basic-level-mappings in discourse.

Motivating (linguistic) intertextual metaphors	Motivating (linguistic) conventional metaphors
LIVING TOGETHER LIKE A REAL FAMILY; POSITIVE/NEGATIVE ROLE MODELS (SIMPSONS, WALTONS, ...); etc. BASIC-LEVEL-MAPPINGS EUROPE IS A HOUSE CORRELATIONAL MAPPINGS	STATES ARE BUILDINGS; INSTITUTIONS ARE BUILDINGS PERSISTENCE IN TIME IS STANDING UPRIGHT; FUNCTIONING IS LINKAGE IMAGE SCHEMATA HORIZONTAL/VERTICAL; LINK; CONTAINER

Metaphor as a cognitive phenomenon can therefore be seen as cultural in important ways - the cognitive and cultural aspects of metaphors complement each other, they should not be seen as mutually exclusive. Conventional metaphors are a cultural heritage that we inherit and 'embody' during ontogeny. The conscious use of metaphor in discourse draws most often not on bodily experience, but on elements of an image of the world that is socially and culturally pre-structured. Both types of imaginative activity, the behaviour in terms of the objectified habitus, and the action in form of construing metaphors that make sense from our socially defined point of view, form the basis of cultural imagination.

3. THE POLITICS OF METAPHOR

We have argued that metaphoric cognition is culturally situated and structured. Correlational metaphors, such as A STATE IS A BOAT, use concepts that are culturally shaped, and there is a wide array of intertextual

metaphors, such as CLONES ARE COPIES that cannot be reduced to our bodily experiences with the physical environment. However, metaphors are not only important cognitive tools in making sense of the world but also in communicating about the world with others. In this section we will turn to the communicative (dynamic) aspects of metaphor use.

In discourse the participants try to contribute to the organisation of parts of social reality. Metaphor is a valuable instrument here, because it suggests a certain perspective on a given problem in a catchy way. At the same time this perspective is flexible enough to allow for several interpretations that can be negotiated with others in ongoing discourse¹⁸. An important part of the discursive negotiation of social reality consists of taking up, reformulating or rejecting proposed metaphors. Chilton and Ilyin (1993) call this the interactional function of metaphor. This interaction, which leads to the establishment of certain metaphorical views on a topic, is obviously a social and cultural phenomenon, and thus a second cultural dimension of metaphor.

Let us now examine an example from authentic political discourse. In the discursive interpretation of the end of communism in Middle and Eastern Europe, most authors in Polish newspapers tend to describe the changes in terms of the metaphor of CHANGE AS MOTION (Zinken in prep.b). However, in post-socialist discourse, there sometimes appear metaphors that conceptualise the change leading to the transformation of a system as a RIPENING PROCESS. These metaphors can be found in Polish as well as in German post-socialist discourse (Zinken in prep.a). They make sense from a certain ideological point of view, as they hide the fact that it was the active, dangerous commitment of the political opposition that actually lead to the transformation. The 'organic' view on politics construed through plant-metaphoricity generally takes away the responsibility for the change from the socialist politicians – if political change is a ripening process, then there is little that people can do about it. These metaphors are used strategically and intentionally to shift possible political blame and influence public opinion.

The communicative function of metaphors consists of three processes. First, the selection of one metaphor instead of any other – this may lead to different views on the topic. Second, the selected metaphor can be elaborated in different ways – these different elaborations or formulations may lead to different cultural views on the topic. Third, these reformulations of conventional metaphors and the introduction of new metaphors may lead to semantic changes – this is a temporal process (Hellsten 2002). The first two processes are intentional and interactional,

the third is their unintentional cumulative result (see Keller 1994). All three processes are the dynamics of metaphor use.

SELECTION OF METAPHORS

Metaphors are effective in communication because they restrict the complexity of issues. In communication every metaphor opens up one perspective at a time on an issue (Burke, 1989). However, in society there are always many possible perspectives on issues. The same issue can be metaphorised in many ways. Some of these metaphors compete with each other.

For example, it is quite common to use the metaphor of POLITICS IS A GAME in discussing the competition between political candidates (“if he plays his game right, he can win the election”, “she has put her cards on the table in the campaign leaflet”). At the same time, the metaphor of POLITICS IS A JOURNEY is also commonly used, for instance when talking about “the race between the candidates”, “the speech was the first step towards a new political programme”. These two metaphors are conventional ways of talking about politics. The metaphor of POLITICS IS DANCE would offer an unconventional view on politics, and perhaps, change the perspective heuristically.

The selection of one of the metaphors instead of another is a social and cultural phenomenon, and it depends on the context of the use as well as the purpose of the user. Whereas the metaphor of POLITICS IS A GAME highlights the competitive aspects of politics, the metaphor of POLITICS IS A JOURNEY focuses more on the processual aspect of politics. These two popular metaphors offer competing views on politics and may influence the actions that are taken. POLITICS IS A GAME suggests that citizens are spectators of a game played by different political actors (Hellsten & Renvall 1997). The metaphor of POLITICS IS A JOURNEY may also include citizens as active participants in politics. The selection of one metaphor instead of another often encompasses ideological functions. What guides the selection of certain (mostly intertextual) metaphors from a possible pool of conventional metaphors, falls outside of the remit of the CTM. However, it is studied more often in analyses of popular discourses.

REFORMULATION OF METAPHORS

The selection of one metaphor instead of another is a social and cultural process that takes place in the communication between the participants in a debate. Further, metaphors are ambiguous and they can be formulated as

to fit in the intended communicative goals. The reformulation of the selected metaphors is culturally grounded and takes place in the process of communication. If the two terms of the metaphor, such as CLONES and MASS PRODUCTS, have many properties in common from which to select, metaphors can be used for even contrary purposes. This flexibility makes them important tools in communications.

For example, in the debate about cloning Dolly the sheep the same metaphor CLONES ARE MASS PRODUCTS was used both to support and to oppose cloning – depending on its further elaborations, where mass-products can either be seen as being perfect doubles or perfect copies of body-parts (so called spare parts) or else as inferior and therefore less valuable copies (see Hellsten 2000; Nerlich et al, 2000). Although both views are based on the view that cloning is a form of mass-production, these two images lead to very different views on the issue. The concept of MASS PRODUCTION can therefore be regarded as an intertextual metaphor steeped in a long tradition of western industrial production methods and linked to the western concept of PROGRESS. The concept of progress itself has deep historical roots in western societies and, since the enlightenment, mainly positive connotations. These positive connotations of ‘progress’ may lead to situations where the opponents of certain scientific innovation are negatively categorised as opposing progress in general. The word clone by contrast has mainly negative connotations, given the appearance of clones in dystopian sci-fi novels and the use of that metaphor therefore provokes highly negative associations.

Especially the basic level metaphors play an important role in public discourses because they are flexible enough to allow for several interpretations while maintaining a basic set of conventional associations. On the other hand, highly conventionalized metaphors such as “the wages are falling” are seldom formulated any further.

The ambiguous and flexible use of metaphors has not yet attracted much attention in the CTM tradition, although it seems to contradict, at least partially, Lakoff & Johnson’s (1980) thesis that metaphors are used largely unconsciously. We contend that in public debates, metaphors are often used purposefully and consciously to highlight, defend or attack certain views about socially relevant issues

THE DYNAMICS OF METAPHOR

The selection and the formulation of such politically charged metaphors is a complex process of communications, often a debate between antagonists.

Some of the metaphors created in these debates are conventionalised in use, and new metaphors and new formulations of the metaphors have to be introduced all the time to keep the debate going. Metaphors live in use. The dynamics of metaphors is based on the conventionalisation of the selected metaphors and their reformulations over time (Hellsten 2002). For example, the metaphor of GENES ARE THE LETTERS OF LIFE, very popular in the debates on modern genetics, is based on a long line of metaphors, most notable those of NATURE IS A BOOK used from Antiquity onwards. It has a long history in the Judeo-Christian tradition where it referred to natural, eternal and universal texts (Kay 2000, 31). Later, in the debates on genetics it refers to a book of life which we as humans have to learn to read, and more recently, to rewrite (Nelkin & Lindee 1995; Hellsten 2001; Nerlich et al. 2002a). The meaning of this metaphor has changed over time through being used in a variety of social, cultural and political contexts. Again, this dynamic process of metaphorising seems to fall outside of the focus of the CTM, but has been studied in the social studies of science and in the history of science.

Some recent accounts in the social studies of science have focused on the role of (intertextual) metaphors as a tool of exchange between and within discourses (Bono 1990, 71-72), as ‘messengers of meaning’ (Maasen & Weingart 1995), and as a means for knowledge transfer between different domains (Maasen 1994; Maasen & Weingart 2000). In these approaches metaphor is considered as important because it provides the participants with a common point of departure. This common point of departure has to be also flexible to allow for reformulations. In this, metaphors may prove to be indispensable. The common point of departure is the result of temporal processes of negotiating the metaphors and their formulations.

The temporal dynamics of metaphors has to do with the different generalisation levels of the metaphors. The level of linguistic expressions, such as “the race between the political candidates” or “steps in the right direction” show the most significant variation and diversity. The next level, the basic-level mapping, such as POLITICS IS A GAME or LIFE IS A JOURNEY, allows for a wide variety of linguistic expressions while maintaining a noticeable structure. The most general level which deals with wide narratives about the world, such as MOTION IN PLACE IS DEVELOPMENT IN TIME, remains the same despite the different formulations. These different levels seem to change according to different time scales: the narrative level is more stable than the intermediate level, which is more stable than the linguistic level (Hellsten 2002). The interaction between these different levels of metaphor provides

communication with both a common ground (Maassen & Weingart 1995) and flexibility in the interpretations (Hellsten 2000).

In summary, the second cultural aspect of metaphor, the communicative function of metaphors, consists of the selection, reformulation and the change of metaphors over time and in various contexts. Metaphors co-evolve in the cultural practices of specific societies. One part of cultural practice is popular imagination. To close this article we shall briefly examine the role of popular imagination and popular metaphors on the public understanding of science and public understanding of risk. In this context metaphors can be regarded as both cultural and cognitive tools that structure scientific knowledge as well as public understanding.

4. METAPHORS AND POPULAR IMAGINATION

In 1998, at the height of the debate about cloning and genetic modification of plants and animals, José van Dijck pointed out that dissemination of genetic knowledge is not uniquely contingent on the advancement of science and technology, but is equally dependent on the development of images and imaginations. ‘Imaginary tools’ are crucial assets in the dissemination of genetic knowledge, as they are used to shape this science’s public face’ (Van Dijck, 1998: 2-3)

When scientists announced in 1997 that they had been able to clone a mammal for the first time, namely Dolly the sheep, public imagination, as displayed in the newspapers, on the web and in focus groups went into overdrive, exploiting the full potential of intertextual metaphors. We saw monsters, androids, armies of little Hitlers, human spare-part factories, humans on assembly lines everywhere. Frankenstein and Brave New World became the catch-phrases of the day. What was astonishing was that the same images, metaphors, stock characters, clichés and cultural narratives were used over and over again and are still being used in debates concerning the ‘new genetics’, be it GM food, designer babies or stem cells. Some of the most stereotypical tools used by the public and the press in public discourse about genetics are the following:

Metaphors: clones are copies, clones are products; these metaphors then invite mainly negative inferences, such as ‘clones are used as a means for an end’ and ‘cloned children are consumer options’;

Intertextual references: to works of literature, such as Frankenstein and Brave New World, or films, such as Boys from Brazil, Gattaca, AI, to stock characters (Frankenstein), to sci-fi scenarios (that we will

create armies of monsters or little Hitlers; that clones will be cyborgs or androids), to historical events, such as eugenics and genocide; people then base on these references mainly dystopian predictions;

Recurrent themes: ‘gaining immortality’, ‘resurrecting the dead’, ‘playing God’; these themes run through the factual and fictional discourse about cloning; *Recurrent argumentative clichés:* e.g. opening Pandora’s box, crossing a line, taking the next step, or going down a slippery slope - again inviting mainly negative inferences; These metaphors, images, and argumentative clichés help journalists and the public to cut through a dense ethical jungle about cloning and other issues, but they can also lead to short-circuiting scientific and political arguments. It can be noticed that the linking element motivating this variety of imaginative tools is not universal bodily experience, but social evaluation.

As Jonathan Miller once said, once a metaphor “lodges in the imagination, it can successfully eliminate or discredit any evidence which might be regarded as contradictory” (Miller, 1978). Framing novel issues in terms of certain stock images or metaphors, that is as something well known, might therefore prevent us from seeing alternative solutions to a problem. In this way metaphors can become sources of error or bias. As the media sociologist Conrad has pointed out, “how we frame a problem often includes what range of solutions we see as possible” (Conrad 1997: 140). Seeing a social situation or contentious social or genetic issue through the glasses of a dominant metaphor might lead us either to overexaggerate the risks associated with it or else undervalue the benefits associated with it.

Seeing a factual issue (e.g., cloning through nuclear transfer) through the lenses of an intertextual metaphor (clones as replicators, duplicators, androids) and in conjunction with stereotypical and culture specific themes and clichés can therefore be as illuminating as it can be adumbrating. This demonstrates how dependent some metaphors are on cultural context and the political intentions with which they are used and how flexibly they can be used in various social, journalistic, scientific and political contexts. In such contexts the choice of a metaphor is not only an aesthetic one, but a strategic one. It can change the world or prevent it from changing. To understand such processes we really have to take metaphor out of the heads of individuals and put it in the cultural world (see Gibbs, 1999). In modern western societies this world is a supremely technological world. but still a world where metaphor plays a major role as mediator between mind, body and culture. Why did it take so long, for example, for a real understanding

of the heart's function to develop? In his 1978 book *The Body in Question*, Jonathan Miller gives the following explanation:

In primitive societies, where technical images are few and far between and very simple at that, most explanatory metaphors are drawn from nature.... But the development of technology created a new stock of metaphors – not simply extra metaphors, but ones altogether different in their logical character (Miller, 1978: 181)

The invention of the pump and other technological advances made it possible to imagine how the heart worked and therefore to understand the human body better and to invent better cures for heart disease. Culture, bodily experience and technology all interact, with metaphor as the mediating device.

NOTES

- 1 Compare the bibliography on metaphor by Noppen and Hols (1990), also Hellsten (2002, 13ff.).
- 2 The ideas put forward in the cognitive theory of metaphor didn't, of course, come out of nothing. Very similar ideas have been voiced by the linguist Weinrich, as well as by a range of philosophers from Blumenberg back at least to Vico. See Nerlich & Clarke, (2001) on the interest in metaphor in the 19th century German philosophy.
- 3 There exists a vast introductory literature on cognitive metaphor theory. The latest achievement in this field is Kövecses (2002).
- 4 The neglect of cultural aspects in metaphoric activity has been extensively criticised by Naomi Quinn (Quinn 1987; Quinn & Holland 1987; Quinn 1991; Quinn 1999). It seems, however, that Quinn has taken her opposition to a dangerous extreme, claiming that metaphors do not structure understanding but simply express existing cultural models. However, the CTM and Quinn's cultural theory of metaphor share certain similarities, such as the adoption of a brain metaphor of (cultural) cognition on both sides (Lakoff & Johnson 1999; Quinn & Strauss 1997). Our aim is to make steps towards an integration of universal, bodily grounded knowledge and culture-specific knowledge used in metaphoric activity rather than claiming a supremacy for one aspect.
- 5 Thus, few people have to deal with (literal) obstacles on their (literal) ways. Nevertheless, expressions like "overcoming obstacles" are frequently used

by cognitive linguists to illustrate the bodily basis of metaphors such as LIFE IS A JOURNEY. Of course, Lakoff (1987) explicitly says that it is not “what has happened to happen to a single individual” (...) what motivates metaphors. However, in theoretically modelling metaphoric activity, Lakoff and Johnson actually build on individual bodily experience, as will be argued below.

- 6 The two distinctions do not completely overlap and the distinctions made are not categorical ones, but should be seen as being situated at two ends of a continuum.
- 7 This begs the complex question of what to count as metaphor in terms of “freshness” vs. convention. The largely implicit and intuitive standpoint in Cognitive Linguistics seems to be to regard as metaphorical all those projections from one domain to another that potentially can be noticed by lay persons and to exclude expressions whose metaphorical character can be noticed only by experts in etymology.
- 8 A culture-specifically correlational metaphor like THE STATE IS A BOAT would, in his terminology, be a secondary correlational metaphor.
- 9 One should mention Black’s (1962) interaction view on metaphor here. In metaphor, he claimed, a “system of associated commonplaces” is projected onto the target concept. In a later text (Black 1993/1979) he abandoned that notion, however in favour of the notion of an “implication complex”. He felt (and was criticised by Ricoeur for this), that the notion of commonplace was too closely associated with worn-out half-truths, which would downplay the creative character of metaphors, their potential to form new semantic relations.
- 10 Grady (2002) proposes to account for metaphors like “Achilles is a lion” by saying that they are motivated by a resemblance between “Achilles” and “a lion”, felt by the author of the metaphor. It would lead us to far away from the main argument to extensively discuss this approach here, but we think that the notion of (subjective) resemblance only partially solves the problems that the notion of (objective) similarity has. Resemblance might be the reason that an articulated (intertextual) metaphor is understandable, but it is not the motivation for construing such a metaphor in the first place. The distinction between metaphors that are primarily bodily motivated and such that are culturally motivated has been in the air for some time. Searle (1993/1979) distinguished between six types of metaphor that activate different types of knowledge in the comprehension process. In each case a stereotype is cognitively profiled according to a specific context (which the target concept is part of), and the most salient feature is projected onto the target concept.

- 11 Kant wrote about the notion of *Einbildung*, a notion whose inner form might express and suggest other ideas than the notion of imagination. However, we are referring to Johnson's interpretation of Kant, and we will therefore stick to Johnson's terminology.
- 12 Piaget was a biologist by training and did not designate himself as a psychologist; for his interdisciplinary science of cognitive development used the term (coined by James Mark Baldwin) genetic epistemology.
- 13 In Cognitive Linguistics the rather large step tends to be made from linguistic metaphors like "in Europe" to the existence of an image-schema CONTAINER. Recent research shows that the cognitive-linguistic story is surprisingly complex and variable across languages even in a basic cognitive domain such as CONTAINMENT (Bowerman 1996).
- 14 The notion of arbitrariness might sound to contradict the findings of the interlinguistic and intercultural stability of the bodily basis of many conceptual metaphors. Nevertheless, these are arbitrary to some degree: whereas e.g. the English talk of MOOD as of a CONTAINER ("I'm in a bad mood"), the Finnish talk of MOOD as of a SURFACE ("Olen huonolla tuulella"). This Finnish _expression 'tuulella' is conventionalised to refer to 'mood' even though the _expression literally means "I have a bad wind" Our bodies leave space for cultural variation.
- 15 According to Bourdieu, habitus organizes bodily experience in the most fundamental ways, which he illustrates with what he calls the "sexual division of labor" (Bourdieu 1977, 93ff.).
- 16 Similarly, Hellsten (2000) has shown the purposeful uses of the metaphor of CLONES ARE MASS PRODUCTS in the debate on cloning.
- 17 On the modality of stereotypes see: BartmiDski/Panasiuk (1993).
- 18 Metaphors resemble boundary objects (Star & Griesemer 1989), objects that are robust enough to carry certain implications while being flexible enough to allow for several formulations and uses

REFERENCES

- Bartmi*ski, Jerzy; Panasiuk, Jolanta. 1993. *Stereotypy j*zykowe* [Linguistic Stereotypes]. In: Bartmi*ski, J. (ed.) *Encyklopedia kultury polskiej XX. wieku* [Encyclopedia of Polish culture in the 20th century]. Band II. *Współczesny j*zyk polski* [Modern Polish]. Wroc*aw, 363-388.
- Bono, J. 1990. Science, discourse and literature. The role/rule of metaphor in science. In : St. Peterfreund (Ed). *Literature and Science: Theory and Practice*, pp. 59-89. Boston: Unwin Hyman.

- Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge.
- 1980. *Le sens pratique*. Paris.
- Bowerman, Melissa. 1996. The origins of children's spacial semantic categories. Cognitive versus linguistic determinants. In: Gumperz, J. J.; Levinson, S. C. (ed.): *Rethinking Linguistic Relativity*. Cambridge, pp. 145-176.
- Chilton, Paul A.; Ilyin, Mikhail V. 1993. Metaphor in political discourse. The case of the 'Common European House'. *Discourse and Society* 4.1: pp. 7-31.
- Cienki, Alan 1999. Metaphors and cultural models as profiles and bases. In: Gibbs Jr., Raymond W.; Steen, Gerard J. (1999; ed.): *Metaphor in Cognitive Linguistics*. Amsterdam, pp.189-203.
- Conrad, P. 1997. Public eyes and private genes: Historical frames, news constructions. and social problems. *Social Problems* 44.2: pp. 139-154.
- Dirven, René. 2002. ed. *Metaphor and Metonymy in Comparison and Contrast*. Berlin.
- Foley, William A. 1997. *Anthropological linguistics. An Introduction*. Oxford.
- Gardner, Howard. 1985. *The Mind's New Science. A History of the Cognitive Revolution*. New York.
- Grady, Joseph E. 1999. A typology of motivation for conceptual metaphor. Correlation vs. Resemblance. In : Gibbs Jr., R. W.; Steen, G. (ed.): *Metaphor in Cognitive Linguistics*. Amsterdam, pp.79-100.
- Hellsten, Iina. 1997. Door to Europe or Outpost towards Russia? Political metaphors in Finnish EU-journalism. In L Koivisto, Juha & Lauk. Epp (Eds.) *Journalism at the Crossroads. Perspectives on Research*. Tartu University Press.121-141.
- 2000. Dolly: Scientific breakthrough or Frankenstein's monster. In : *Metaphor and Symbol* 15.4: pp. 213-221.
- 2001. Opening the Book of Life: Politics of metaphors and the human genome. In : Kivikuru, U. & Savolainen, T. (eds.) *The Politics of Public Issues*. University of Helsinki, Department of Communication Publications 5: pp. 179-194.
- 2002. *The politics of metaphor: Biotechnology and biodiversity in the media*. Acta Universitatis Tamperensis. 876. Tampere University Press. Tampere. Also partly available on-line at <http://acta.uta.fi/pdf/951-44-5380-8.pdf>
- & Renvall, Mika 1997. Inside or outside of politics? Metaphor and paradox in journalism. *Nordicom Review* 2/1997: pp.41-48.
- Indurkha, Bipin. 1992. *Metaphor and Cognition. An Interactional Approach*. London.
- 1994. The thesis that all knowledge is metaphorical and meanings of metaphor. In : *Metaphor and Symbolic Activity* 9.1: pp. 61-73.
- Jäkel, Olaf. 1999. Kant. Blumenberg. Weinrich. Some forgotten contributions to the cognitive theory of metaphor. In : Gibbs Jr., R. W.; Steen, G. J. (ed.): *Metaphor in Cognitive Linguistics*. Amsterdam, pp. 9-27.
- Johnson, Mark. 1987. *The Body in the Mind. The Bodily Basis of Meaning, Imagination, and Reason*. Chicago.

- Kay, Lily. 2000. *Who Wrote the Book of Life: A History of the Genetic Code*. Stanford University Press.
- Keller, Rudi 1994. *On Language Change: The Invisible Hand in Language*. London: Routledge.
- 1995. Zeichentheorie. Zu einer Theorie semiotischen Wissens. Tübingen. .
- Kövecses, Zoltán 2002. *Metaphor. A Practical Introduction*. Oxford.
- Lakoff, George. 1987. *Women, fire, and dangerous things. What Categories Reveal About the Mind*. Chicago.
- Johnson, Mark. 1980. *Metaphors We Live By*. Chicago.
- Johnson, Mark 1999. *Philosophy in the Flesh. The Embodied Mind and its Challenge to Western Thought*. Chicago.
- Maasen, Sabine & Peter Weingart. 1995. Metaphors - Messengers of Meaning. A Contribution to an Evolutionary Sociology of Science.' *Science Communication* 17.1: pp. 9-31.
- 2000. *Metaphors and the Dynamics of Knowledge*. London and New York: Routledge.
- MacCloskey, Deirdre N. 1985. *The Rhetoric of Economics*. Madison, WIS.
- Middleton Murry, John. 1931. *Countries of the Mind: Essays in Literary Criticism*, 2d series, London: Oxford University Press, 1-2.
- Miller, Jonathan. 1978. *The Body in Question*. New York: Random House.
- Miller, George A. 1956. The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information. *The Psychological Review*, 1956, 63: pp. 81-97
- Mithen, Steven. 1996. *The Prehistory of the Mind: The Cognitive Origins of Art, Religion and Science*. London.
- Musolf, Andreas. 1996. *Metaphern im 'Geleitzug' der Europäischen Union*. In: Böke, K.: Jung, M.: Wendeler, M. (ed.): Öffentlicher Sprachgebrauch. Praktische, theoretische und historische Perspektiven. Georg Stötzel zum 60. Geburtstag gewidmet. Opladen, 180-189.
- 2000. Political imagery of Europe. A house without exit doors? In: *Journal of Multilingual and Multicultural Development*. 21.3: pp. 216-229.
- Nelkin, Dorothy & Susan Lindee. 1995. *The D.N.A. Mystique. The Gene as a Cultural Icon*. Reeman, New York.
- Nerlich, Brigitte; Clarke, David D.; Dingwall, Robert. 2000. Clones and crops. The use of stock characters and word play in two debates about bioengineering. In: *Metaphor and Symbol*. 15.4: pp. 223-240.
- Nerlich, Brigitte & David Clarke. 2001. Mind, meaning and metaphor: the philosophy and psychology of metaphor in 19th century Germany. *History of the Human Sciences* 14.2: pp. 39-61.
- Nerlich, Brigitte; Hamilton, Craig A.; Rowe, Victoria. 2002a. Conceptualizing foot and mouth disease. The socio-cultural role of metaphors, frames and narratives. In: *metaphorik.de* 2.
- Nerlich, Brigitte; Dingwall, Robert; Clarke, David D. 2002b. The Book of Life: How the human genome project was revealed to the public. *Health: An*

- Interdisciplinary Journal for the Social Study of Health, Illness and Medicine* 6.5: pp. 445-469.
- Noppen, J. P. van; Hols E. 1990. *Metaphor II. A Classified Bibliography of Publications, 1985 to 1990*. Amsterdam.
- Ortony, Andrew. 1979. Beyond literal similarity. In : *Psychological Review* 86.3: pp. 161-180.
- 1993. Metaphor, language, and thought. In : Ortony, Andrew (Ed.): *Metaphor and Thought*. 2. edition. Cambridge, MASS, 1-16.
- Putnam, H. 1975. *Mind, Language, and Reality*. Cambridge.
- Quinn, Naomi 1987. Convergent evidence for a cultural model of american marriage. In: Holland, D.: Quinn, N. (ed.): *Cultural Models in Language and Thought*. Cambridge. pp.173-192.
- 1991. The cultural basis of metaphor. In : Fernandez, James W. (ed.): *Beyond Metaphor: The Theory of Tropes in Anthropology*. Stanford, CAL, pp.56-93.
- 1999. Metaphor and culture. In: Wilson, Robert A.: Keil, Frank C. (ed.). *The MIT Encyclopedia of the Cognitive Sciences*. Cambridge, MASS, pp. 537-539.
- Holland, Dorothy. 1987. Culture and cognition. In : Holland, D.: Quinn, N. (ed.): *Cultural Models in Language and Thought*. Cambridge, pp. 3-40.
- Strauss, Claudia. 1997. *A Cognitive Theory of Cultural Meaning*. Cambridge.
- Schäffner, Christina; Trommer, Sylvia 1990. Zum Konzept des 'gemeinsamen europäischen Hauses' im Russischen und Englischen. In: Schäffner, C. (ed.). *Gibt es Eine prototypische Wortschatzbeschreibung? Eine Problemdiskussion*. Berlin. pp. 80-91.
- Schön, Donald A. 1979/1993. Generative metaphor. A perspective on problem-setting in social policy. In: Ortony, A. (ed.): *Metaphor and Thought*. 2. Auflage. Cambridge, MASS, pp. 137-163.
- Searle, John R. 1979/1993. Metaphor. In: Ortony, Andrew (ed.): *Metaphor and Thought*. 2. Auflage. Cambridge, MASS, pp. 83-111.
- Sinha, Chris (in prep.) *Cognitive Linguistics, Psychology and Cognitive Science*. Draft Chapter for Dirk Geeraerts and Hubert Cuyckens, Handbook of Cognitive Linguistics.
- Tomasello, Michael. 1999. *The Cultural Origins of Human Cognition*. Cambridge, MASS.
- Turney, J. 1998. *Frankenstein's Footsteps: Science, Genetics and Popular Culture*. Yale University Press.
- Van Dijk, J. 1998. *ImagEnation: Popular Images of Genetics*. London/New York: Macmillan.
- Väliveronen, Esa & Hellsten, Iina. 2002. From "Burning Library" to "Green Medicine". The role of metaphors on communicating biodiversity. *Science Communication* 24.2: pp. 229-245.
- Weinrich, Harald. 1958. Münze und Wort. Untersuchungen an einem Bildfeld. In: Lausberg, H.: Weinrich, H. (ed.) *Romanica. Festschrift für Gerhard Rohlfs*. Halle, pp. 508-521.

- Zinken, Jörg. 2002. *Imagination im Diskurs. Zur Modellierung Metaphorischer Kommunikation und Kognition* [Imagination in discourse. On modelling metaphoric communication and cognition]. Bielefeld.
- Zinken, Jörg (in prep.a) Das metaphorische modell PFLANZE [The metaphorical model PLANT]. In: Zybatow, L.; Baranov, A.; Dobrovolskij, D. (ed.) *Kulturelle Vorstellungswelten. Eine kontrastive Untersuchung metaphorischer Modelle im russischen und deutschen öffentlichen Diskurs* [Cultural imagination. A contrastive study in metaphorical models in Russian and German public discourse]. Bielefeld.
- Zinken, Jörg (in prep.b) *Ideological imagination: Intertextual and correlational metaphors in political discourse*. Ms.

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