Layering Processes in Metaphorization

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Abstract
This paper deals with the ongoing research on conceptual metaphor theory (CMT), introducing the notion of *metaform*, in order to link CMT with other dimensions of cultural symbolism, not just language. Specifically, it is argued that coneptual metaphors are types of *forms* that are created by various associative processes that can be called *layering* processes. Each *layer* constitutes a type of abstraction that itself becomes a source for further abstract thinking nad modes of representation.
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1. Introduction

One of the central problems of psychology, cognitive science, psycholinguistics, and theoretical semiotics, among other "sciences of them mind" is determining how abstract concepts are formed and used for gaining knowledge about the world. The interdisciplinary approaches to the mind that various disciplines now espouse has, in recent years, permitted the serious study of how information is acquired, processed, and used to generate knowledge systems. In itself, *information* is literally meaningless, unless it is connected to some system of interpretation, so that it can be utilized for some purpose. It is, as its etymology suggests—from Latin *information* "a sketch, an outline"—nothing more than encoded *form*. Deriving *content* from this form requires knowledge of how it has been represented and how it has been used. Not only, but the relation between the representation of information and the information itself is so intrinsic that it is often impossible to differentiate between the two. Information in human knowledge cannot be studied independently of its specific content or meaning. Human information-processing simply does not work according to the same mathematical laws as mechanical information systems. A disembodied view of how humans encode information—a view that ignores the sensory, emotional, and intellectual structures that undergird it—is essentially a useless one (Emmeche 2000, Kull 2000, Brier 2000). The information that a medical doctor uses to diagnose disease, for instance, is not measurable in the same way that the information contained in electronic signaling systems is. The information that a piece of music contains can similarly not be reduced to a mere probability event. Indeed, most of human information processing is unmeasurable. So, the study of information as a *human system* requires much more than a computational framework.

The extensive scientific research on the role of metaphor in human knowledge systems has, since the mid-1950s, has become central to investigating the critical question of how abstract knowledge is *formed*. From the extensive research (e.g. Allwood and Gärdenfors 1998; Dirven and Verspoor 1998), it has become obvious that metaphorical processes are not only a regular inbuilt features in *forming* vast

components of the semantic system of a language, but also the source of many abstract concepts, grammatical categories, and cultural symbolism. As is well known, interest in metaphor was kindled in antiquity by Aristotle (384-322 BC), the philosopher who coined the term *metaphor*—itself a metaphor (*meta* 'beyond' + *pherein* 'to carry')—pointing out that many abstract forms of knowledge were grounded in associative metaphorical reasoning. However, Aristotle also affirmed that, as knowledge-productive as it was, the most common function of metaphor was to decorate literal ways of thinking and speaking. Remarkably, this latter assertion was the one that was embraced by most Western philosophers until the twentieth century. But nothing could be farther from the truth. In 1977, the research team of Pollio, Barlow, Fine, and Pollio conducted an extensive investigation of common discourse texts and found them to be immersed in metaphorical reasoning. They found that speakers of English, for instance, uttered on average 3,000 novel metaphors and 7,000 idioms per week. Obviously, they remarked, metaphor can hardly be considered an ornamental option to literal language.

Since then, the massive amount of data collected on metaphor suggests very strongly that many abstract concepts, if not most, are encodable and knowable primarily as "metaphorized ideas," i.e. as concepts that are derived cognitively through metaphorical reasoning and a process of metaphorical association that will be called *layering* in this paper (detailed summaries of relevant work in this domain can be found in Gibbs 1994 and Goatley 1997). The ever-burgeoning literature on what has come to be known as *conceptual metaphor theory* (henceforward CMT) (e.g. Lakoff and Johnson 1980, 1999, Lakoff 1987, Johnson 1987) has made it obvious that metaphorical concepts form the basis of many abstractions. However, in my view, CMT still lacks a satisfactory framework for interpreting the diverse, multiform manifestations of the many *layers* of metaphor in human symbolic and communicative behavior. The purpose of this paper is to provide such a framework, developed from previous work in this area (e.g. Danesi 1998, Sebeok and Danesi 2000). The idea of layering claims that information-processing involves a monitoring of the sensory system in terms of the cognitive one: i.e. a loop between the sensory and the cognitive domains is established through a layering of metaphorized meanings. It is this idea that, in my view, can inform the most suitable approach to human knowledge systems.

2. Layering Theory

Traditionally, human concept-formation has been the target of investigation within philosophy and its nineteenth century offshoot, psychology. Since the middle part of the twentieth century, however, it has also come within the purview of the cognitive sciences, artificial intelligence, cybernetics, semiotics, and other cognate areas. The most popular way to investigate concepts within many of these fields has been to adopt an information-processing approach. This method—using metaphors from computer technology—asks how information is encoded, transformed, stored, retrieved, and transmitted (output) by humans. Thus, this method considers people as if they were designed along the same functional lines as computers. Although the information-processing approach has been fruitful in suggesting models of human thinking and problem solving that can be tested in narrow, limited situations, it has also been shown that general models of human thinking will be difficult to achieve in these terms. Going

counter to this general *modus pensandi* was, of course, the school of Gestalt psychology, which emphasized configuration, relationship, and active organization in concept-formation. it is little wonder, therefore, that metaphor was first studied experimentally by the Gestalt psychologists. They found that, by and large, abstractions could be stripped down to concrete ideas by removing the *layers* of meanings that they generate once they have been introduced into human knowledge systems. It is this notion of *layering* (itself a metaphor) that can be used to expand upon CMT (e.g. Fauconnier 1985, 1997, Sweetser 1990, Croft 1991, Deane 1992, Indurkhya 1992, Fauconnier and Sweetser 1996). It is intended simply to provide a framework for investigating representational systems, such as language, in terms of metaphorical layers. In this paper, a *conceptual metaphor* will be renamed a *metaform*, for it is, in essence, a new *form* referring to an abstract concept by connecting it to an existing concrete one (Sebeok and Danesi 2000). The formula [thinking = seeing], for example, is a metaform because it is made up of an abstract concept, [thinking], that is conceptualized in terms of a concrete one, [seeing]. This metaform underlies utterances such as:

1. We cannot *see* what use your *idea* might have.
2. They cannot quite *visualize* what that *theory* is all about.

In line with CMT, each of the two parts of the metaform is called a *domain*: [thinking] is called the *target domain* because it is the abstract topic itself (the "target" of the metaform); and *seeing* is called the *source domain* because it enfolds the class of vehicles that deliver the meaning of the metaform (the "source" of the metaphorical concept) (Lakoff and Johnson 1980). A specific metaphorical statement uttered in a discourse situation is now construable as a particular manifestation of a metaform. So, in metaphorical statements as the following,

3. Many of his ideas are *circular*.
4. I have never been able to see the *point* of your idea.
5. His ideas are *central* to the whole debate.
6. It seems that our ideas are *diametrically* opposite, etc.

it is obvious that they are not examples of isolated, self-contained metaphorical creations, but rather, specific instantiations of the metaform whose target domain is [ideas] and whose source domain is identifiable as [geometrical figures/relations]. Metaforms constitute the first layer of metaphorically-generated abstractions.

Psychologically, metaforms relate the "experience" of some target domain to something that is familiar and easily picturable in both mental and representational terms. They reveal a basic tendency of the human mind to think of abstract concepts iconically and through association. Among the first to point this out was the Italian philosopher Giambattista Vico (1688-1744), perhaps the first to see metaphor as the unique ability of the human mind to interconnect things and events in the world (Danesi 1993). Before Vico, metaphor was viewed as a manifestation of *analogy*. In traditional logic, analogy is defined as an inductive form of reasoning asserting that if two or more entities are similar in one or more respects, then a probability exists that they will be similar in other respects, as some continue to claim (Skousen 1989, Way 1991, Mitchell 1993). For Vico, on the other hand, metaphor was hardly an analogical strategy; it was

the primary mental tool humans use for creating analogies themselves and, thus, for thinking about otherwise unknowable things.

Metaforms—making up the first layer of metaphorized ideas—result from a process that can be called *association-by-inference*. In psychology, *associationism* is the theory that the mind comes to know concepts by combining simple, irreducible elements through mental connection. Aristotle recognized four strategies by which associations are forged: (1) through *similarity* (e.g. an orange and a lemon), (2) through *difference* (e.g. hot and cold), (3) through *contiguity* in time (e.g. sunrise and a rooster's crow), and (4) through *contiguity* in space (e.g. a cup and saucer). British empiricist philosophers John Locke (1632-1704) and David Hume (1711-1776) saw sensory perception as the underlying factor in such processes. In the nineteenth century, the Aristotelian view was examined empirically, leading eventually to the foundation of an associationist school of psychology, guided by the principles enunciated by James Mill (1773-1836) in his *Analysis of the Phenomena of the Human Mind* (1829). In addition to Aristotle's original four strategies, the school found that such factors as *intensity*, *inseparability*, and *repetition* added to the strength of an association: e.g. *arms* are associated with *bodies* because they are inseparable from them; *rainbows* are associated with *rain* because of repeated observations of the two co-occurring; etc.

The one who developed associationism experimentally was Edward Thorndike (1874-1949), who extended the work initiated by the Russian psychologist Ivan Pavlov (1849-1936) in 1904. Pavlov provided an empirical basis for investigating how associations through repetition are made. When Pavlov presented a meat stimulus to a hungry dog, for instance, the animal would salivate spontaneously, as expected. This was the dog's "unconditioned response". After Pavlov rang a bell while presenting the meat stimulus a number of times, he found that the dog would eventually salivate only to the ringing bell, without the meat stimulus. Clearly, Pavlov suggested, the ringing by itself, which would not have triggered the salivation initially, had brought about a "conditioned response" in the dog. By *association* the dog had learned something new. Every major behavioral psychologist has utilized the Pavlovian notion of associationism. Although behaviorists believe all thought processes can be accounted for through associations of stimuli and responses, other psychologists strongly reject such an approach as inadequate to explain creative thought and verbal behavior.

The meaning of *association* as used in the layering theoretical framework is not the Pavlovian one. In line with nineteenth century associationists and twentieth century Gestalt psychologists, it is used here to stress that abstract concepts beget their meanings only in relation to other concepts. The relations can be forged by sense, i.e. by observing physical features of referents, or by inference, i.e. by applying the sense associations to referents that are perceived as possessing the same features.

The above metaform, [ideas = geometrical figures/relations], is, in effect, the reason underlying the common practice of representing ideas and theories with diagrams based on geometrical figures (points, lines, circles, boxes, etc.). All "models" are, in effect, geometrical diagrams based on metaforms. Metaforms reveal the deployment of an associative-inferential mental strategy that allows for abstractions to become knowable in concrete picturable ways.

Since the source domain of a metaform encompasses concrete ideas, it follows that the selection of one idea or another from a particular domain will produce connotative nuances. Take, for example the metaphorical statement "The professor is a *snake*," which is a specific manifestation of the metaform [human personality = perceived physical features of animals]. The meaning of [snake] that this statement embodies, however, is not its literal one, but rather, the culture-specific connotations perceived in snakes, namely "slyness," "danger," "slipperiness," etc. It is this complex of connotations that is projected onto the depiction of the topic, [professor]. Each different use of this metaform changes the view we get of the topic: e.g. in "The professor is a *rat*," the [professor] is portrayed instead as someone "aggressive," "combative," "rude," etc.—a complex of connotations which are implicit in the new selected vehicle [gorilla].

Now, once the first layer of abstract metaforms in a language has been formed, on the basis of concrete source domains, then this layer itself becomes a new productive source domain for creating a higher (= more abstract) layer of concepts. Associations among metaforms can be called *meta-metaforms* (Sebeok and Danesi 2000). Thus, for example, in utterances such as the following the target domain of [ideas] is rendered by source domains that are themselves metaforms [devising something in the mind = upward motion] and [reflecting = scanning motion].

7. Where did you *think up* that idea?
8. I *thought over* carefully your ideas
9. You should *think out* the whole problem before attempting to solve it.

Even though these phrasal verbs have abstract referents, they nonetheless evoke images of location and movement. The phrase *think up* elicits a mental image of upward movement, thus portraying the abstract referent as an object being extracted physically from a kind of mental terrain; *think over* evokes the image of scanning with the mind's eye; and *think out* elicits an image of extracting something so that it can be held up to the scrutiny of the mind's eye. These constructions allow users to locate and identify abstract ideas in relation to spatiotemporal contexts, although such contexts are purely imaginary. It's as if these imaginary indexes allow us to locate thoughts in the mind, with the mind having the features of a territory and thoughts of objects within it. Meta-metaforms like this one imply indexicality in reference. Meta-metaforms are indexical in their representational focus.

The third layer of metaphorical reasoning is a level made up of what can be called *meta-symbols*. Metaforms and meta-metaforms are frequently the sources of cultural symbols, of grammatical categories, and of the other representational techniques that make up the "signifying order" of a culture. Symbol formation involves the form, the form-user, and the referent, which are linked to each other by the forces of historical and social convention. Meta-symbols are those that result from associating metaforms and/or meta-metaforms with each other. For example, a rose is a meta-symbol for love in Western culture because it derives ultimately from the metaphorical association of [love] to a [sweet smell], to the color [red], and to the notion that love grows like a [plant]. These are all metaforms that lead to the formation of the meta-symbol: [rose = love].

In summary, layering theory posits that abstract concepts are, first, experienced in terms of concrete ones producing, metaforms with iconic properties. These then become themselves source domains for further metaphorization producing meta-metaforms with indexical properties. Finally, the metaforms and meta-metaforms are themselves the basis of many symbolic processes, producing meta-symbols.

Layering theory suggests that human thinking is the fact that it is mediated by the innumerable *forms of meaning* created and conveyed by the words, drawings, artifacts and other models of the world that people make and use routinely. These constitute feedback as to what the human perceptual system actually is capable of using as *information*. In this framework, abstract knowledge is, thus, definable simply as "representational know-how," so to speak—the innate ability to produce *metaforms* to stand for objects, events, feelings, actions, situations, and ideas perceived to have some meaning, purpose, or useful function. Metaforms serve many functions in human life. They allow people to recognize patterns in things; they act as predictive guides or plans for taking actions; they serve as exemplars of specific kinds of phenomena; and the list could go on and on.

In my view, *layering* processes reveal how the human brain carries out its work of transforming *sensory knowing* into *conceptual knowing*. Concepts are mental forms. There are two basic types of concepts—concrete and abstract. A *concrete concept* is a mental form whose external referent is demonstrable and observable in a direct way, whereas an *abstract concept* is a mental form whose external referent cannot be demonstrated or observed directly. So, for example, the word *car* stands for a concrete concept because its referent, [a self-propelled land vehicle, powered by an internal-combustion engine], can easily be demonstrated or observed in the physical world. The word *love*, on the other hand, represents an abstract concept because, although [love] exists as an emotional phenomenon, it cannot be demonstrated or observed directly, i.e. the emotion itself cannot be conceptualized apart from the behaviors, states of mind, etc. that it produces.

The central claim of *layering theory* is that many abstract forms are derivatives of more concrete, sense-based forms. The key concept in semiotics has, in fact, always been that no single form can bear meaning unless it enters into systematic connections with other forms, revealing that most abstractions are, in effect, "informed best guesses" based on concrete experiences.

The difference between a *metaform* and a *metaphor* is, in effect, one of hyponymy. A specific metaphor is a verbal instantiation of a metaform. Metaforms are *primary connective forms*, portraying abstractions in terms of concrete source domains. The [thinking = seeing] metaform, for instance, is linked to how we conceptualize [ideas], [theories], [awareness], [discernment], [clarification], [perspective], etc. These abstract notions are all conceived as *ways of seeing internally* that are modeled on *ways of seeing externally*.

3. Metaforms: The First Layer of Abstraction

The relevant psychological research shows that concepts are formed in one of three general ways. The first is by *induction*—i.e. by the extraction of a pattern from *specific* facts or instances. For example, if one were to measure the three angles of, say, 100

specific triangles (of varying shapes and sizes), one would get the same total (180^0) each time. This would then lead one to *induce* that the sum of the three angles of *any* triangle is the same (180^0). Induction reveals a type of conceptualization process whereby a *general* pattern is extractable from its *specific* occurrences. The second way in which humans form concepts is by *deduction*, the opposite of induction—i.e. by the application of a *general* pattern to a *specific* occurrence. For instance, if one were to prove, by the use of Euclidean notions that the sum of the angles of *any* triangle is 180^0, then one would *deduce* that the sum of the angles in a given *specific* triangle (no matter what its size or shape as scalene, isosceles, etc.) would add up to 180^0. Finally, concepts are formed through *abduction*. For the present purposes, this can be defined simply as the visualization of an abstract concept on the model of an existing concrete, or already known, pattern. Abductive thinking is essentially a "hunch" as to what something means or presupposes. A classic example is the theory of atomic structure originated by the English physicist Ernest Rutherford (1871-1937), who conceptualized the inside of an atom as having the structure of an infinitesimal solar system, with electrons behaving like little planets orbiting around an atomic nucleus. Rutherford's model of atomic structure was, in effect, an intuition as to what the inside of an atom looked like.

The distinction between concrete and abstract concept-formation is, needless to say, a general one. In actual fact, there are many degrees and layers of concreteness and abstraction in conceptualization that are influenced by connotative, social, affective, and other kinds of factors (Leech 1981: 9-23). But it is beyond the purpose here to investigate the role these factors play in concept-formation. Suffice it to say that most of the raw, unorganized information that comes from seeing, hearing, and the other senses is organized into useful *concepts* by induction, deduction, or abduction. Moreover, it is now evident that the type of conceptualization or representational process enlisted depends on the type of pattern that the human mind seeks from a specific situation. Often, all three processes—induction, deduction, abduction—are involved in a complementary fashion.

Metaforms are produced by abduction. In the [human personality = perceived physical features of animals] metaform it is the externally-demonstrable physical properties of [animals] that are abducted in order to understand human traits ("slipperiness," "aggressiveness," etc.). This form of reasoning has been amply documented by the CMT literature, which gained momentum in 1977 when Howard Pollio and his associates showed that metaphor was hardly a discourse option, but its very backbone (Pollio, Barlow, Fine, and Pollio 1977). This turning point led in the late 1970s and throughout the 1980s to the development of two significant trends: (1) conceptual metaphor theory itself (e.g. Ortony 1979, Honeck and Hoffman 1980, Lakoff and Johnson 1980, 1999, Lakoff 1987, Lakoff and Turner 1989, Kövecses 1986, 1988, 1990, Johnson 1987, Indurkhya 1992), and (2) a new branch of linguistics that now comes under the rubric of *cognitive linguistics* (Langacker 1987, 1990, Croft 1991, Deane 1992, Taylor 1995, Fauconnier 1997). The relevant research within CMT strongly suggests that most of our abstract concepts are stored as metaforms by our memory systems.

As discussed above, in CMT a specific *metaphor* is not considered to be an isolated construction, but rather, a specific instantiation of a metaform:

10. The professor is a *snake*.
11. Keep away from her; she's a *rat*.
12. What a *gorilla* he has become!
13. She's a sweetheart, a true *pussycat*!
14. He keeps everything for himself; he's a real *hog*.

As these examples show, the [human personality = perceived physical features of animals] metaform is one of the conceptual strategies used for understanding notions such as *slyness*, *betrayal*, *aggressiveness*, *kindness*, etc. Also as mentioned above, each different selection of a vehicle from the source domain—[snake], [rat], [gorilla], [pussycat], [hog], etc.—provides a different connotative depiction of the specific personality to be evaluated. Needless to say, perceptions of animal behaviors vary according to situation. But the fact remains that people the world over react experientially and affectively to animals in specific ways and that these reactions are encoded into a source domain for evaluating human personality.

Once this concept has been formed, then it becomes itself a source for providing further descriptive detail to our evaluations of human personality, if such a need should arise. Thus, for instance, the specific utilization of [snake] as the vehicle can itself become a sub-domain (made up of types of snakes), allowing one to zero in on specific details of the personality being described:

15. He's a *cobra*.
16. She's a *viper*.
17. Your friend is a *boa constrictor*; etc.

In effect, within each source domain, there are sub-domains that provide the metaform-user with an array of connotations that can be utilized to project subtle detail on to the description of a certain personality. This is perhaps why in 1973 the psychologist Elinor Rosch (1973a, 1973b) came to the conclusion that there are three levels in concept-formation. Some concepts have a highly general referential function. She called these *superordinate*. The metaform [human personality = perceived physical features of animals] itself is, in her scheme, a superordinate concept, because it refers to the general phenomenon of personality. Other concepts have a typological function. Rosch called these *basic*. The choice of specific metaphorical vehicles from the [animal] source domain—[snake], [rat], etc.— produces, in effect, basic concepts because vehicular choices allow for reference to types of personalities. Finally, some concepts have a detailing function. Rosch called these *subordinate*. The selection of sub-types of [snake], [rat], etc.—[cobra], [viper], etc.—are all subordinate concepts that might be needed for specialized purposes, as we saw above.

Metaforms are not generated in an arbitrary fashion, but on the basis of an experience of beings, objects, events, etc. The [human personality = perceived physical features of animals] concept is guided, arguably, by a common experience, namely that animals and humans are interconnected in Nature's scheme of things. What does talking about people in this way imply? It means that we actually perceive humans as behaving like animals, and that our reactions are parallel to those experienced physically when we see or have encounters with certain animals.

Lakoff and Johnson trace the psychological source of metaforms to *image schemas*. These are mental impressions of our sensory experiences of locations,

movements, shapes, reactions, feelings, etc. They are the mental links between experiences and abstract concepts. These schemas not only permit us to recognize patterns within certain bodily sensations, but also to anticipate certain consequences and to make inferences. Schemas are mental *Gestalten* that can reduce a large quantity of sensory information into general patterns. Image schema theory suggests that the source domains enlisted in delivering an abstract concept were not chosen originally in an arbitrary fashion, but rather, that they are derived from the experience of beings, objects, events, etc. The formation of a metaform, therefore, is the result of an experiential abduction. This is why metaphors often produce aesthetic or synesthetic effects, and this explains why metaphorical utterances are more memorable than others.

Lakoff and Johnson identify three basic types of image schemas. The first one involves mental orientation—*up vs. down, back vs. front, near vs. far*, etc. This guides the formation of such abstract concepts as [mood] ("I'm feeling *up* today"), the [economy] ("Inflation is *down*"); [growth] ("My income has gone *up*); etc." The second type involves ontological thinking. This produces metaforms in which concepts are perceived as entities and substances: e.g. [the mind = a container] as in "I'm *full* of memories," My mind is *empty*;" etc. The third type of schema is an elaboration of these two. This produces metaforms that distend orientational and ontological concepts: e.g. [time = a resource] and [time = a quantity] underlie concepts such as "My *time* is *money*;" You cannot *buy* my *time*; etc.

As Lakoff and Johnson emphasize throughout their 1980 study, we do not detect the presence of such image schemas in common discourse because of repeated usage. For example, we no longer interpret the word *see* in sentences such as "I don't *see* what you mean," "Do you *see* what I'm saying?" in metaphorical terms, because its use in such expressions has become so familiar to us. But the association between the biological act of seeing outside the body with the imaginary act of seeing within mind-space was originally the source of the conceptual metaform [understanding/believing/thinking = seeing], which now permeates common discourse:

18. There is more to this than *meets the eye*.
19. I have a different *point of view*.
20. It all depends on how you *look* at it.
21. I take a *dim view* of the whole matter.
22. I never *see eye to eye* on things with you.
23. You have a different *worldview* than I do.
24. Your ideas have given me great *insight* into life.

The presence of such metaforms in common everyday discourse challenges the Saussurean (1916) "arbitrariness" view of meaning. It is only after they have become conventionalized through frequent usage and routinization in a cultural context that their original metaphoric relation to concrete referents is attenuated or lost to awareness. This view of concept-formation is not new. It has been implicit in the work of various semioticians, linguists, and philosophers for quite some time, not just in the work related to CMT (Lucy 1992). It simply has never been identified as such. Studying the link between perception and language was, of course, the goal of von Humboldt (1836), Sapir (1921) and Whorf (1956)—a goal that has never been truly entertained by mainstream linguistics until fairly recently. Many of the findings that are now discussed

under the rubric of CMT theory, moreover, can already be discerned in the writings of Bühler (1908), Staehlin (1914), Vygotsky (1931, 1962, 1978), Richards (1936), Asch (1950, 1958), Osgood and Suci (1953), Brown, Leiter, and Hildum (1957), Black (1962), and Arnheim (1969), to mention but a few, well before the great upsurge of interest in metaphor in the late 1970s and throughout the 1980s and 1990s. Their work showed, cumulatively, that the meaning created by a metaphor was hardly a decorative one. They argued that, like two chemicals mixed together in a test tube, the result of mixing two domains through metaphorization created a dynamic interaction which retained properties of both domains but also unique ones of its own. CMT has added mainly that the resulting "semantic mixture" is the primary ingredient in abstract concept-formation.

Knowledge of human personality entails knowledge of metaforms such as the [human personality = perceived physical features of animals] one discussed here. Clearly, this kind of knowledge is culture-specific. The very same source domain could have been utilized differently; i.e. applied to a different target domains such as [justice], [hope], etc. Or else, a different source domain could have been used, in tandem with this metaform. In Western culture, for instance, the target domain of [human personality] is frequently conceptualized in terms of [mask-wearing]. Indeed, the original meaning of the word *person* reveals this very conceptualization. In ancient Greece, the word *persona* signified a "mask" worn by an actor on stage. Subsequently, it came to have the meaning of "the personality of the mask-wearer." This meaning still exists in the theater term *dramatis personae* "cast of characters" (literally "the persons of the drama"). Eventually, the word came to have its present meaning of "living human being." This diachronic analysis of *person* also explains why we continue to this day to use "theatrical" expressions such as *to play a role in life*, *to put on a proper face*, etc. in reference to persons.

Whatever the case, once a metaform gains currency in a cultural context, it makes representation and communication efficient and convenient, conditioning its users to anticipate or project its occurrence in other domains of reference and knowledge. In effect, any metaform can become a productive resource for further meaning-making activities (see also Levin 1977, 1988 on this point).

4. Meta-Metaforms: The Second Layer of Abstraction

Once metaforms such as the [thinking = seeing] metaform have entered the language, then they can themselves become new source domains for further abstract concept-formation—as for example, the linkage of the [thinking = seeing] metaform with the [thinking occurs in the light] metaform, resulting in a new metaform [thinking/knowing = seeing in the light]:

25. I finally *saw* what you meant in the *light* of what you had told me previously.
26. I now *see* what you said in a different *light*.
27. They *saw* eye to eye in the clear *light* of all the evidence.

Such conceptual assemblages are, as mentioned, *meta-metaforms*. Their presence in language and discourse can, clearly, be enlisted to explain: (1) why there are various ways of conceptualizing the same target domains, and (2) why these are not separate from one another. The layering of metaforms to produce higher abstractions is

an unconscious culture-based process. The higher the density of layering, the more abstract and, thus, more culture-specific, the concept (e.g. Dundes 1972, Kövecses 1986, 1988, 1990). Metaforms such as the [thinking = seeing] one are relatively understandable across cultures: i.e. people from non-English-speaking cultures could easily figure out what the statements that instantiate this metaform mean if they were translated to them, because they connect concrete source domains—e.g. *seeing*—to abstractions—*thinking*—directly. *Meta-metaforms*, on the other hand, are more likely to be understood primarily in culture-specific ways, and are thus much harder to translate, because they connect already-existing metaforms to abstractions.

Lakoff and Johnson (1980) refer to the process of layering as *cultural modeling*. The following is an example of how a partial cultural model of [ideas/thinking] results from the layering of metaforms:

[ideas/thoughts = food]

28. What he said left a *bitter taste* in my mouth.
29. I cannot *digest* all that information..
30. He is a *voracious* reader.
31. We do not need to *spoon feed* our students.

[ideas/thoughts = people]

32. Darwin is the *father* of modern biology.
33. Medieval ideas are *alive* and *well*.
34. Artificial Intelligence is still in its *infancy*.
35. She *breathed* new life into that idea.

[ideas/thoughts = clothing/fashion]

36. That idea is not in *vogue* any longer.
37. New York has become a center for *avant garde* thinking.
38. Revolution is *out of style* these days.
39. Studying semiotics has become quite *chic*.
40. That idea is an old *hat*.

[ideas/thoughts = buildings]

41. That is a *well-constructed* theory.
42. His views are on *solid ground*.
43. That theory needs *support*.
44. Their viewpoint *collapsed* under criticism.
45. She put together the *framework* of a theory.

[ideas = plants]

46. Her ideas have come to *fruition*.
47. That's a *budding* theory.
48. His views have contemporary *offshoots*.
49. That is a *branch* of mathematics.

Knowledge of the source domains—[food], [people], [clothing], [buildings], [plants]—is relatively independent of culture. However, not all concrete source domains are more or less culture-independent. There are some source domains that are dependent upon specific cultural knowledge, such as, for instance, the source domains for [ideas/thoughts] based on Euclidean geometry and on commodities:

[ideas/ thoughts = geometrical figures]

50. I don't see the *point* of your idea.
51. Your ideas are *tangential* to what I'm thinking.
52. Those ideas are logically *circular.*

[ideas = commodities]

53. He certainly knows how to *package* his ideas.
54. That idea just won't *sell.*
55. There's no *market* for that idea.
56. That's a *worthless* idea.

People living in cultures without knowledge of Euclidean geometry would be hardpressed to decipher statements (50)-(52); people living in non-materialist cultures would have a hard time understanding the rationale behind statements (53)-(56). The constant juxtaposition of such conceptual formulas in common discourse produces, cumulatively, a meta-metaform of [ideas/thoughts]. This is, of course, only a partial model of the target domain; indeed, there are many more that can be added to it. Not only, but other linkages and associations from different and often new source domains can be added to this meta-metaform according to new experiences, new cultural situations, etc. The two points to be made here are: (1) that highly abstract notions are built-up from meta-metaforms (cultural models) which coalesce into a system of abstract meaning that holds together the entire network of associated meanings in the culture, and (2) that since this system is constructed intuitively (abductively) it can be changed at any time to suit new needs.

5. Meta-Symbols: The Third Layer of Abstraction

At a cultural level, metaforms and meta-forms can be seen to be the sources of symbols, grammatical categories, discourse flow, etc. The [knowing = seeing in the light] meta-metaform crystallizes, for example, in the art of *chiaroscuro*—the technique of using light and shade in painting, invented by the Italian baroque painter Michelangelo Merisi da Caravaggio (1573-1610). It is also the conceptual source for the fact that *illumination* is emphasized by religions (Ong 1977, Wescott 1978, Hausman 1989). So-called "visionary" or "revelatory" experiences are regularly portrayed in terms of dazzling sensations of light. The metaform [justice = blindness], to use another example, crops up not only in conversations, but also in pictorial representations. This is why there are statues of blindfolded women inside and outside courtrooms to symbolize *justice.* The [love = a sweet taste] metaform, to use one further example, finds expression not only in discourse ('She's my *sweetheart*;' 'I love my *honey*;' etc.), but also in rituals of love-making. This is why sweets are given symbolically to a loved one at St. Valentine's day, why matrimonial love is symbolized at a wedding ceremony by the eating of a cake, why lovers sweeten their breaths with candy before kissing, and so on.

A *meta-symbol* is a complex metaphorical idea. For example, the [human personality = perceived physical features of animals] metaform is the source of such meta-symbolic activities as the use of animals in totemic codes, in heraldic traditions, in the creation of fictional characters for use in story-telling to children, in the naming of sports teams, and in the creation of surnames, to mention but a few.

More often than not, meta-symbols are traces to a culture's historical past. A common expression like "He has fallen from grace" would have been recognized instantly in a previous era as referring to the Adam and Eve story in the Bible. Today we continue to use it with only a dim awareness (if any) of its Biblical origins. Expressions that portray life as a journey—"I'm still a long way from my goal," "There is no end in sight," etc.—are similarly rooted in Biblical narrative. As the Canadian literary critic Northrop Frye (1981) aptly pointed out, one cannot penetrate such expressions, and indeed most of Western literature or art, without having been exposed, directly or indirectly, to the original Biblical stories. These are the source domains for many of the abstract concepts we use today for talking about and judging human actions, bestowing a kind of implicit metaphysical meaning and value to everyday life. All *mythical* stories are, in effect, extended meta-symbols. These allow people to depict supernatural, mythical entities in terms of human images, with human bodily forms and emotions.

The use of meta-symbols extends to scientific reasoning. Science often involves things that cannot be seen—atoms, waves, gravitational forces, magnetic fields, etc. So, scientists use their metaphorical know-how to get a look, so to speak, at this hidden matter. That is why waves are said to *undulate* through empty space like water waves ripple through a still pond; atoms to *leap* from one quantum state to another; electrons to *travel in circles* around an atomic nucleus; and so on. The poet and the scientist alike use metaphorical reasoning to extrapolate a suspected inner connection among things. Metaphors are slices of truth; they are evidence of the human ability to see the universe as a coherent organism.

The presence of meta-symbols can be found, moreover, in grammatical phenomena. The linguist Ronald Langacker (e.g. 1987, 1990) has formulated a theory of grammar suggesting that certain aspects of sentence grammar are, in effect, generated by what can be designated a *metaformal reflex system*, built from source domain thinking. Nouns, for instance, trace a "region" in mind-space—e.g. a count noun is imagined as referring to a bounded region, whereas a mass noun is visualized as referring to a non-bounded region. Thus, for example, the noun *water* elicits an image of a non-bounded referent; whereas, a noun like *leaf* evokes a picture of bounded referent. This entails a *grammatical reflexivization* in the forms and functions of these nouns—*leaves* can be counted, *water* cannot; *leaf* has a plural form (*leaves*), *water* does not (unless the referential domain is metaphorical); *leaf* can be preceded by an indefinite article (*a leaf*), *water* cannot; and so on. Similar reflex patterns can be found in other representational systems—in painting, for instance, *water* is represented either with no boundaries or else as bounded by other figures (land masses, the horizon, etc.); *leaves*, on the other hand, can be depicted as separate figures with circumscribable boundaries. As this suggests, the parts of speech are end-products of experiential factors and, more significantly, are interconnected with other representational forms and activities.

Grammar is really a meta-symbolic code, "summarizing," so to speak, our direct perception of things in the world as they stand in relation to one another. It probably originated in the human species as a system of organizing the perceptual experiences encoded by metaphorical thinking. This is perhaps why we can understand stories in

virtually the same ways that we understand music or paintings. In the same way that a painting is much more than an assemblage of lines, shapes, colors, and melodies a combination of notes and harmonies, a sentence in language is much more than an assemblage of words and phrases built from some rule system in the brain. We use the grammatical elements at our disposal to model the world in ways that parallel how musicians use melodic elements and painters visual elements to model it.

6. Implications for Knowledge Systems Study

In the human body, the brain and nervous system function to coordinate information, which is then used to determine a future course of action. Metaforms, in my view, allow for this information to become organized cognitively through connectivity, making abstract knowledge about the world highly systematic, *post factum*, i.e. after it has been formed. Information is perceived as a pattern or a whole rather than merely as a sum of distinct component parts. Layering theory is consistent with *field theory* in physics—the idea that interaction is transmitted from one body to another through a field. The Gestalt psychologists, for instance, found perception to be heavily influenced by the context or configuration of the perceived elements. The parts often derive their nature and purpose from the whole and cannot be understood apart from it. Moreover, a straightforward summation process of individual elements cannot account for the whole. Activities within the total field of the whole govern the perceptual processes. Layering theory suggests, too, that many abstract concepts, are the result of field effects on perception and cognition. Determining how these are converted into metaforms will require, clearly, a truly interdisciplinary approach. The main thrust of such an approach should be on how *sense* becomes *meta-sense*, so to speak, and given *meta-form*. Metaforms allow the organism to synchronize sensory modalities with purely cognitive ones, concrete with abstract notions. Once these enter the system of social life they become sources of further self-organization, producing meta-metaforms and eventually meta-symbols. In this way, it may be possible to get a different kind of "glimpse" into how the brain carries out its work of transforming sensory forms of knowing into internal forms of thinking and external forms of representation.

Metaforms, meta-metaforms, meta-symbols, as far as can be ascertained, are unique to human semiosis. These make it possible for humans not only to represent immediate reality, but also to frame an indefinite number of possible worlds. The layering capacity in humans has led to what Bonner (1980: 186) calls "true culture," requiring "a system of representing all the subtleties of language," in contrast to "nonhuman culture." It is through layering processes that signifying assemblages blend together in the most creative modeling system that Nature has thus far produced. The main purpose of this paper has been to show that the notion of *layering* can be used to provide a synthetic framework for relating what would appear to be disparate and heterogeneous findings on human abstract systems to each other.

This notion is not new. It has been identified in various ways, and with differing terminological guises, in the relevant literature. I have offered it here as a target to make it testable for use in further research. As Henry Schogt (1988: 38) perceptively remarks, all languages "have meaningful units that articulate human experience into discrete elements." The domain of concrete concepts comprises the "discrete elements"

of all human thinking. In this domain, concept-formation is "pattern-inferencing" based on concrete sensory perception. As argued in this paper, many common abstract concepts are based on such concrete source domains; they are the result of a form of metaphorizing that produces what has been called metaforms. These in turn constitute source domains on their own that produce higher and higher orders of abstraction (meta-metaforms). Metaforms and meta-metaforms surface not only in discourse but also in most representational systems, in the form of meta-symbols. Since a large portion of human knowledge-based information is encoded in this way, the implications for a true interdisciplinary study of such information is obvious.

References

Allwood J. and Gärdenfors P. (eds.) (1998). Cognitive Semantics: Meaning and Cognition. Amsterdam: John Benjamins.

Aristotle (1952). Poetics, in The Works of Aristotle, vol. 11, W. D. Ross (ed.). Oxford: Clarendon Press.

Arnheim R. (1969). Visual Thinking. Berkeley: University of California Press.

Asch S. (1950). On the Use of Metaphor in the Description of Persons, in On Expressive Language, H. Werner (ed.), pp. 86–94. Worcester: Clark University Press.

Asch S. (1958). The Metaphor: A Psychological Inquiry, in Person Perception and Interpersonal Behavior, R. Tagiuri and L. Petrullo (eds.), pp. 28-42. Stanford: Stanford University Press.

Black M. (1962). Models and Metaphors. Ithaca: Cornell University Press.

Bonner J. T. (1980). The Evolution of Culture in Animals. Princeton: Princeton University Press.

Brier S. (2000). Biosemiotics as a Possible Bridge between Embodiment in Cognitive Semantics and the Motivation Concept of Animal Cognition in Ethology. Cybernetics & Human Knowing 7/1: 57-76.

Brier S. (forthcoming). The Construction of Information and Communication: A Semiotic Re-entry into Heinz von Foerster's Metaphysical Construction of a Second-Order Cybernetic. Communication and Information Sciences Review.

Brown R. W., Leiter R. A. and Hildum D. C. (1957). Metaphors from Music Criticism. Journal of Abnormal and Social Psychology 54: 347-352.

Bühler K. (1908 [1951]). On Thought Connection, in Organization and Pathology of Thought, D. Rapaport (ed.), pp. 81-92. New York: Columbia University Press.

Croft W. (1991). Syntactic Categories and Grammatical Relations. Chicago: University of Chicago Press.

Danesi M. (1993). Vico, Metaphor, and the Origin of Language. Bloomington: Indiana University Press.

Danesi M. (1995). Giambattista Vico and the Cognitive Science Enterprise. New York: Peter Lang.

Danesi M. (1998). The "Dimensionality Principle" and Semiotic Analysis. Sign Systems Studies 26: 42-60.

Deane P. (1992). Grammar in Mind and Brain: Explorations in Cognitive Syntax. Berlin: Mouton de Gruyter.

Dirven R. and Verspoor M. (1998). Cognitive Exploration of Language and Linguistics. Amsterdam: John Benjamins.
Dundes A. (1972). Seeing is Believing. Natural History 81: 9-12.
Emmeche C. (1998). Defining Life as a Semiotic Phenomenon. Cybernetics & Human Knowing 5/1: 33-43.
Fauconnier G. (1985). Mental Spaces. Cambridge: Cambridge University Press.
Fauconnier G. (1997). Mappings in Thought and Language. Cambridge: Cambridge University Press.
Fauconnier G. and Sweetser E. (1996) (eds.). Spaces, Worlds, and Grammar. Chicago: University of Chicago Press.
Frye N. (1981). The Great Code: The Bible and Literature. Toronto: Academic Press.
Gibbs R. W. (1994). The Poetics of Mind: Figurative Thought, Language, and Understanding. Cambridge: Cambridge University Press.
Goatley A. (1997). The Language of Metaphors. London: Routledge.
Hausman C. R. (1989). Metaphor and Art. Cambridge: Cambridge University Press.
Honeck R. P. and Hoffman, R. (1980) (eds.). Cognition and Figurative Language. Hillsdale, N.J.: Lawrence Erlbaum.
Humboldt W. von (1988 [1836]). On Language: The Diversity of Human Language-Structure and Its Influence on the Mental Development of Mankind, P. Heath (trans.). Cambridge: Cambridge University Press.
Indurkhya B. (1992). Metaphor and Cognition. Dordrecht: Kluwer.
Johnson M. (1987). The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reason. Chicago: University of Chicago Press.
Jones R. (1982). Physics as Metaphor. New York: New American Library.
Kövecses Z. (1986). Metaphors of Anger, Pride, and Love: A Lexical Approach to the Structure of Concepts. Amsterdam: Benjamins.
Kövecses Z. (1988). The Language of Love: The Semantics of Passion in Conversational English. London: Associated University Presses.
Kövecses Z. (1990). Emotion Concepts. New York: Springer.
Kull K. (2000). Organisms Can Be Proud to Have Been Their Own Designers. Cybernetics & Human Knowing 7/1: 45-56.
Lakoff G. (1987). Women, Fire, and Dangerous Things: What Categories Reveal about the Mind. Chicago: University of Chicago Press.
Lakoff G. and Johnson M. (1980). Metaphors We Live By. Chicago: Chicago University Press.
Lakoff G. and Johnson M. (1999). Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought. New York: Basic.
Lakoff G. and Turner M. (1989). More than Cool Reason: A Field Guide to Poetic Metaphor. Chicago: University of Chicago Press.
Langacker R. W. (1987). Foundations of Cognitive Grammar. Stanford: Stanford University Press.
Langacker R. W. (1990). Concept, Image, and Symbol: The Cognitive Basis of Grammar. Berlin: Mouton de Gruyter.
Leech G. (1981). Semantics: The Study of Meaning. Harmondsworth: Penguin.
Levin S. R. (1977). The Semantics of Metaphor. Baltimore: Johns Hopkins Press.

Levin S. R. (1988). Metaphoric Worlds. New Haven: Yale University Press.
Lucy John A. (1992). Language Diversity and Thought: A Reformulation of the Linguistic Relativity Hypothesis. Cambridge: Cambridge University Press.
Mitchell M. (1993). Analogy-Making as Perception: A Computer Model. Cambridge, Mass.: MIT Press.
Ong W. J. (1977). Interfaces of the Word: Studies in the Evolution of Consciousness and Culture. Ithaca: Cornell University Press.
Ortony A. (1979) (ed.). Metaphor and Thought. Cambridge: Cambridge University Press.
Osgood C. E. and Suci G. E. (1953). Factor Analysis of Meaning. Journal of Experimental Psychology 49: 325-328.
Pollio H., Barlow J., Fine H., and Pollio M. (1977). The Poetics of Growth: Figurative Language in Psychology, Psychotherapy, and Education. Hillsdale, N. J.: Lawrence Erlbaum Associates.
Richards I. A. (1936). The Philosophy of Rhetoric. Oxford: Oxford University Press.
Rosch E. (1973a). On the Internal Structure of Perceptual and Semantic Categories, in Cognitive Development and Acquisition of Language, T. E. Moore (ed.), pp. 111-144. New York: Academic.
Rosch E. (1973b). Natural Categories. Cognitive Psychology 4: 328-350.
Sapir E. (1921). Language. New York: Harcourt, Brace, and World.
Saussure F. de (1916). Cours de linguistique générale. Paris: Payot.
Schogt H. (1988). Linguistics, Literary Analysis, and Literary Translation. Toronto: University of Toronto Press.
Sebeok T. A. and Danesi M. (2000). The Forms of Meaning: Modeling Systems Theory and Semiotics. Berlin: Mouton de Gruyter.
Skousen R. (1989). Analogical Modeling of Language. Dordrecht: Kluwer.
Staehlin W. (1914). Zür Psychologie und Statistike der Metapherm. Archiv für Gesamte Psychologie 31: 299-425.
Sweetser E. (1990). From Etymology to Pragmatics: The Mind-as-Body Metaphor in Semantic Structure and Semantic Change. Cambridge: Cambridge University Press.
Taylor J. R. (1995). Linguistic Categorization: Prototypes in Linguistic Theory. Oxford: Oxford University Press.
Vygotsky L. S. (1931). Storia dello sviluppo delle funzioni psichiche superiori. Firenze: Giunti-Barbèra.
Vygotsky L. S. (1962). Thought and Language. Cambridge, Mass.: MIT Press.
Vygotsky L. S. (1978). Mind in Society. Cambridge, Mass.: Cambridge University Press.
Way E. C. (1991). Knowledge Representation and Metaphor. Dordrecht: Kluwer.
Wescott R. W. (1978). Visualizing Vision, in Visual Learning, Thinking, and Communication, B. Randhawa and W. Coffman (eds.), pp. 21-37. New York: Academic Press.
Whorf B. L. (1956). Language, Thought, and Reality, J. B. Carroll (ed.). Cambridge, Mass.: MIT Press.