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Complementary perspectives on metaphor: Cognitive linguistics and relevance theory

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Abstract

Contemporary theories of metaphor differ in many dimensions, including the discipline they originate from (e.g., linguistics, psychology, philosophy), and whether they are developed primarily within a cognitive or pragmatic theoretical framework. This article evaluates two directions of metaphor research within linguistics, cognitive linguistics and relevance theory, which both aim to capture essential aspects of the reason for metaphor, and how people ordinarily use and understand metaphor in daily life. We argue, contrary to most received opinion, that cognitive linguistics and relevance theory provide complementary perspectives on metaphor. Both theories offer important insights into the role of metaphor in cognition and language use, and suggest detailed hypotheses on metaphor understanding that surely are part of a comprehensive theory of metaphor.

Keywords: Metaphor; Cognitive linguistics; Relevance theory; Psycholinguistics

1. Introduction

Metaphor is at the nexus of mind and language. Since the time of Aristotle, scholars from many disciplines have struggled to define metaphor and understand its functions in language, thought, and culture. The late 20th century has witnessed an explosion in the study of metaphor, especially within cognitive science, where linguists, philosophers, and psychologists have offered a variety of proposals on metaphorical thought and language (see Gibbs, 1994 for a review). Many of these theories aim to firmly establish metaphor as a ubiquitous part of both ordinary language and everyday cognition, contrary to the traditional view that metaphor is an ornamental aspect of speech

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and thought. The most famous theory in this regard originates in the work of Lakoff and Johnson (1980, 1999) within the discipline of cognitive linguistics. Cognitive linguistic perspectives on metaphor have had an enormous, but still controversial, influence on the study of metaphor in many fields as scholars seek out the myriad ways that metaphor shapes human thought, as evident in the ways people speak about the world and their experiences. Contemporary research within cognitive linguistics even suggests that metaphor has its foundation in neural and bodily processes, and is not, as the traditional view argues, primarily a specific linguistic device (Feldman, 2006; Gibbs, 2006a,b,c; Lakoff, in press; Lakoff and Johnson, 1999).

A different perspective on metaphor is offered by relevance theory (Carston, 2002; Sperber and Wilson, 1995, in press; Wilson and Carston, 2006). Relevance theory also presents a cognitive orientation to thought and communication in its primary claim that human cognition is geared to the maximization of relevance, such that each act of ostensive communication conveys a presumption of its own optimal relevance (Sperber and Wilson, 1995). Under this view, speaking metaphorically is an example of ''loose talk'' that often is the best way to achieve optimal relevance. Even though verbal metaphors do not represent a completely accurate state of affairs, listeners are able to efficiently infer the appropriate contextual meanings of metaphors by following interpretive strategies based on the principle of optimal relevance. Recent research within the relevance theory perspective has focused on the pragmatic processes involved that listeners employ to infer novel categorical assertions when hearing metaphorical language.

Many metaphor scholars, including those who embrace cognitive linguistic and relevance theory perspectives, see these alternative theories as being radically different. After all, cognitive linguistics and relevance theory adhere to very different theoretical goals and methodological assumptions, despite the fact that both positions aim to present a cognitive theory of metaphor. These different goals and working assumptions are so great, in fact, that few metaphor scholars have tried to systematically compare these two theories to understand how and why they differ. Yet there is also a small underground movement, as we have personally noted at various metaphor conferences, to begin thinking about ways that cognitive linguistics and relevance theory perspectives on metaphor may be complementary. These discussions arise as metaphor scholars, particularly within linguistics, struggle with the deficiencies of each theory and begin to understand that both perspectives have something very important to contribute toward a comprehensive, cognitive theory of metaphor.

Our purpose in this article is to compare and contrast cognitive linguistic and relevance theory views on metaphor. We believe that the present disregard for alternative perspectives in discussions of metaphor results in somewhat narrow theories of why people use metaphor in language and thought and how they do so in ordinary moment-to-moment experiences of speaking and listening. We claim that cognitive linguistics and relevance theory are both much needed and can actually be integrated to a large extent as a cognitive theory of metaphor, even if there remain significant differences between these frameworks at a more global theoretical level. As a linguist (Tendahl) and psychologist (Gibbs), we have found these alternative perspectives to be extremely useful in thinking about mind and language, most broadly, and in trying to understand the complexities of metaphoric language and thought. One of us has published many articles and books that provide empirical support for specific claims of both relevance theory (Gibbs, 1986, 1999; Gibbs and Moise, 1997; Gibbs and Tendahl, 2006; Hamblin and Gibbs, 2003) and cognitive linguistics (Gibbs, 1992, 1994, 2006a,b,c,d; Gibbs and Colston, 1995; Gibbs et al., 2004). For these reasons, we are in a good position to fairly describe and criticize these different, yet complementary, positions on metaphor.

The article continues with an overview of both cognitive linguistics and relevance theory, including brief introductions to their respective views on metaphor. Our discussion is longer for cognitive linguistics than relevance theory given the sheer volume of work on aspects of metaphor from the cognitive linguistic perspective. We do not describe all of the internal debates within each approach, especially within cognitive linguistics, because of space limitations. However, we focus on eight topics/phenomena within the study of metaphor and evaluate each theory's explanations, or lack thereof, of these topics/phenomena. The following section offers some initial places where important connections can be made between cognitive linguistics and relevance theory to provide for a more comprehensive theory of metaphor.

2. Metaphor and cognitive linguistics

A traditional belief among many scholars is that metaphorical meaning is created de novo, and does not reflect pre-existing aspects of how people ordinarily conceptualize ideas and events in terms of pervasive metaphorical schemes (Grice, 1975; Levin, 1977; Searle, 1979). But in the past 25 years, various linguists, philosophers, and psychologists have embraced the alternative possibility that metaphor is fundamental to language, thought, and experience (Gibbs, 1994; Gibbs and Steen, 1999; Kövecses, 2002; Lakoff, 1987; Lakoff and Johnson, 1980, 1999; Johnson, 1987; Sweetser, 1990). These scholars, working primarily under the disciplinary umbrella titled "cognitive linguistics," have explored the idea that people speak metaphorically because they think, feel, and act metaphorically. Cognitive linguists assume that the analysis of the conceptual and experiential basis of linguistic categories and constructs is of primary importance: the formal structures of language are studied not as if they were autonomous, but as reflections of general conceptual organization, categorization principles, and processing mechanisms (Gibbs, 1994; Lakoff, 1990).

Metaphor is not merely a figure of speech, but a specific mental mapping and a form of neural coactivation that influences a good deal of how people think, reason, and imagine in everyday life (Lakoff, in press; Lakoff and Johnson, 1999). Verbal metaphors do not only exist as ornamental, communicative devices to talk about topics that are inherently difficult to describe in literal terms. Instead, verbal metaphors, including conventional expressions based on metaphor, reflect underlying conceptual mappings in which people metaphorically conceptualize vague, abstract domains of knowledge (e.g., time, causation, spatial orientation, ideas, emotions, concepts of understanding) in terms of more specific, familiar, and concrete knowledge (e.g., embodied experiences). These source-to-target-domain mappings tend to be asymmetrical (but see Fauconnier and Turner, 2002) in that completely different inferences result when the direction of the mappings is reversed (e.g., TIME IS MONEY is quite different from the, perhaps, anomalous idea that MONEY IS TIME).

Among the most important insights from conceptual metaphor theory is the observation that metaphors do not just map single elements from a source to a target, but relational structures and inferences. Lakoff (1990: 54) formulates this as the invariance hypothesis which says that "metaphorical mappings preserve the cognitive topology (this is, the image-schema structure) of the source domain." Lakoff (1993) adds that these projections have to be consistent with the structure of the target domain (for a critical discussion of the latter claim see Tendahl, 2006: 153–158). Thus, particular keywords from a source domain may activate a conceptual metaphor and thereby an inference pattern for a related target domain.

Consider the following fairly mundane utterances that are often used to talk about love and relationships in American English (Gibbs, 1994):

"Look how far we've come."
"It's been a long, bumpy road."
"We're at a crossroads."
"We may have to go our separate ways."
"Our marriage is on the rocks."
"We're spinning our wheels."

All of these phrases are motivated by an enduring metaphor of thought, or conceptual metaphor, LOVE IS A JOURNEY, which involves understanding one domain of experience, love, in terms of a very different, and more concrete domain of experience, journeys. There is a tight mapping according to which entities in the domain of love (e.g., the lovers, their common goals, the love relationship, etc.) correspond systematically to entities in the domain of a journey (e.g., the traveler, the vehicle, destinations, etc.). Most theories of linguistic metaphor assume that these expressions are "literal" or perhaps merely "dead metaphors." The hypothesis that some concepts may be metaphorically structured, however, makes it possible to explain what until now has been seen as unrelated conventional expressions.

Early cognitive linguistic analyses suggested that there are two kinds of metaphors (Lakoff and Johnson, 1980). Structural metaphors provide a means of structuring one concept in terms of another. LIFE IS A JOURNEY or ARGUMENT IS WAR. These metaphorical mappings give rise to a multidimensional gestalt: so that we are not dealing with an unspecified means of experiential information, but a "structured whole" (Lakoff and Johnson, 1980: 80). Orientational metaphors, on the other hand, are cases in which a metaphorical concept organizes a whole system of concepts with respect to one another, especially in terms of understanding experience in terms of objects, actions as substances, and states as containers. More recent analyses talk of orientational metaphors as being "primary," because of the image-schematic nature of the source domain (cf. Grady, 1997, 1999).

Furthermore, there are also two types of correspondences that arise from the mapping between source and target domains. Ontological correspondences hold between elements of one domain and elements of the other domain. For example, the conceptual metaphor ANGER IS HEATED FLUID IN A CONTAINER has the following set of correspondences (Croft and Cruse, 2004: 197):

Ontological correspondences:

Source: 'heated fluid in a container'	Target: 'anger'
Containers	Body
Heated fluid	Anger
Heat scale	Anger scale
Pressure in container	Experienced pressure
Agitation of bodily fluid	Experienced agitation
Limits of container's resistance	Limits of person's ability to suppress anger
Explosion	Loss of control

Epistemic correspondences, on the other hand, are relations holding between elements in one domain and elements in the other domain (Croft and Cruse, 2004: 197).

Epistemic correspondences:

When fluid in a container is heated beyond a certain limit, pressure increases to a point at which the container explodes.	When anger increases beyond a certain limit, ''pressure'' increases to point at which a person loses control.
An explosion is damaging to container and dangerous to bystanders.	Loss of control is damaging to person and dangerous to others.
Explosion can be prevented by applying sufficient force and counterpressure.	Anger can be suppressed by force of will.
Controlled release of pressure may occur, which reduces danger of explosion.	Anger can be released in a controlled way, or vented harmlessly, thus reducing level.

There is now a huge body of evidence on the important role that conceptual metaphors play in a vast number of conceptual domains, especially those related to abstract ideas (Gibbs, 2006a; Kövecses, 2002; Lakoff and Johnson, 1999). This linguistic work suggests that many conceptual metaphors underlie conventional expressions across different languages (Yu, 1998), including signed languages (Taub, 2002), motivate the existence of nonverbal gestures (Cienki and Mueller, in press), and explain much about the historical evolution of what many words and phrases figuratively mean (Sweetser, 1990).

Cognitive linguists have traditionally explained understanding of novel metaphors in two ways. First, many novel metaphors are crafted extensions or elaborations of conceptual metaphors. In these cases, the partial mapping from source to target domain is extended beyond the standard mapping as it is found in conventional mappings. An example of an extension of the THEORIES ARE BUILDINGS metaphor would be the utterance: ''His theory has thousands of little rooms and long, winding corridors'' (Lakoff and Johnson, 1980: 53). Such an extension of the THEORIES ARE BUILDINGS metaphor can contribute to our perception of whether a metaphorical utterance is conventional or novel, because rooms and corridors are usually not mapped to the domain of theories.

Secondly, cognitive linguists recognize that the understanding of particular novel metaphors does not involve the mapping of concepts from one domain to another, but the mapping of mental images (Lakoff and Turner, 1989). These ''image metaphors'' include expressions such as the opening line of the poem by Andre Breton titled ''Free Union'' in which he writes ''My wife whose hair is brush fire.'' We understand this metaphor by mapping our mental image of a brush fire onto the domain of Breton's wife's hair, which gives rise to various concrete images in regard to the color, texture, and shape of her hair. Experimental evidence has shown that readers draw different mappings, which are imagistic, when they read and aesthetically appreciate the meanings of these metaphorical expressions, even if they do not draw cross-domain conceptual mappings (Gibbs and Bogodonovich, 1999).

One difficulty with conceptual metaphor theory is that conceptual metaphors appear to differ in the way they are experientially grounded (Grady, 1997, 1999). For instance, the conceptual metaphor MORE IS UP (e.g., ''Inflation is up this year'') correlates having more of some objects or substance (i.e., quantity) with seeing the level of those objects or substance rise (i.e., verticality). But many conceptual metaphors do not suggest such straightforward experiential correlations. The conceptual metaphors THEORIES ARE BUILDINGS and LOVE IS A JOURNEY do not seem to have the same kind of correlation in experience as seen in MORE IS UP in that actual travel has little to do with the progress of relationships, and theories are not closely tied to the buildings which people generate, discuss, and dismantle.

A related problem with conceptual metaphor theory is that it does not explain why certain source-to-target domain mappings are not likely to occur (Grady, 1997, 1999). For instance, the conceptual metaphor THEORIES ARE BUILDINGS motivates many meaningful linguistic expressions such as "The theory needs to be buttressed" or "The foundation for your theory is shaky." But some aspects of buildings are clearly not mapped onto the domain of theories, which is one reason why it may sound odd to say "The theory has no windows."

One solution to these problems suggests that a conceptual metaphor is not the most basic level at which metaphorical mappings exist in human thought and experience. Grady (1997) argues that the strong correlation in everyday embodied experience leads to the creation of "primary metaphors," such as INTIMACY IS CLOSENESS (e.g., "We have a close relationship"), DIFFICULTIES ARE BURDENS (e.g., She's weighed down by responsibilities), and ORGANIZATION IS PHYSICAL STRUCTURE (e.g., How do the pieces of the theory fit together). In each case, the source domain of the metaphor comes from the body's sensorimotor system. A primary metaphor has a metaphorical mapping for which there is an independent and direct experiential basis and independent linguistic evidence. Blending primary metaphors and thereby fitting together small metaphorical pieces into larger metaphorical wholes, on the other hand, create complex metaphors. For instance, the three primary metaphors PERSISTING IS REMAINING ERECT, STRUCTURE IS PHYSICAL STRUCTURE, and INTERRELATED IS INTERWOVEN can be combined in different ways to give rise to complex metaphors that have traditionally been seen as conceptual metaphors. But the combination of these primitives allows for metaphorical concepts without gaps. Thus, combining PERSISTING IS REMAINING ERECT with STRUCTURE IS PHYSICAL STRUCTURE provides for a compound THEORIES ARE BUILDINGS that nicely motivates the metaphorical inferences that theories need support and can collapse, etc., without any mappings such as that theories need windows. In this way, primary metaphors solve the "poverty of mapping" problem often noted for conceptual metaphor and other theories (Grady, 1997).

Another major development in cognitive linguistics relevant to metaphor is the rise of conceptual blending theory (Fauconnier and Turner, 2002). According to this approach, mental spaces are invoked during thought and communication as partially specified constructs (frames or mental models). In blending theory, multiple mental spaces can participate in a mapping, compared to the two-space or two-domain models in conceptual metaphor theory. These input spaces project on to a separate blended space, yielding a new emergent meaning structure that is to some extent novel or distinct from meanings provided by each input space.

Consider the familiar metaphor "surgeons are butchers" (Grady et al., 1999). One may argue that this metaphor, like all others, is explained in terms of the projection of information from the source domain of butchery to the target domain of surgery. But this mapping alone does not provide a crucial element of our interpretation of this metaphorical statement, namely that the surgeon is incompetent. After all, butchers can indeed be as skilled at their job as surgeons are at theirs. Under a blending theory account, metaphor meaning is captured by a blended space that inherits some structure from each of the input spaces. Thus, from the target input space for surgery, it inherits elements such as of a person being operated upon, the identity of the person who is doing the operation, and the place where this all happens. The source domain butchery input space inherits information such as what a butcher does and his relevant activities such as using sharp instruments to slice up meat. Besides inheriting partial structure from each input space, the blend develops emergent content of its own, which arises from the juxtaposition of elements from the inputs. Specifically, the butchery space projects a means–end relationship that is incompatible with the means–end relationship in the surgery space. For instance, the goal of

butchery is to kill the animal and sever the flesh from its bones. But surgeons aim to heal their patients. This incongruity of the butcher's means with the surgeon's end leads to an emergent inference that the surgeon is incompetent.

Proponents of blending theory see it as a highly generalizable tool that can explain a broad range of linguistic and cognitive phenomena (Coulson, 2001; Fauconnier and Turner, 2002, in press). The theory is capable of explaining not only metaphor but also other types of cognitive activity, including inference and emergence of many kinds of linguistic meaning. Blending theory extends conceptual metaphor theory by allowing for mappings that are not unidirectional between multiple domains. Furthermore, blending theory may capture aspects of on-line meaning construction better than entrenched conceptual structure (i.e., conceptual metaphor theory). Thus, metaphoric interpretations of novel poetic figures are constructed on the fly, emerging from blended spaces and not from the input spaces alone, nor from some additive space of what two or more domains have in common (i.e., the generic space).

The final new development in cognitive linguistic work on metaphor comes from research on embodiment and the neural theory of language (Dodge and Lakoff, 2006; Lakoff, in press). A general assumption of this work, based on much emerging evidence from neuroscience, is that there are not specialized areas of the brain for language, and that in the case of metaphor, understanding is not confined to only a few select regions of the brain. The same neurons can function is many different neuronal groups or ''nodes.'' Computational modelling of cognitive and linguistic processes is done over networks of nodes, connections, degree of synaptic strengths, and time lapses at synapses. These features provide the tools necessary to explain various aspects of enduring metaphorical thought and language use.

Embodied simulation is the key feature of the neural theory of metaphor. Embodied experience has always been recognized as playing a primary role in structuring metaphorical concepts such that many source domains in conceptual metaphors appear to have image-schematic structure (i.e., are rooted in recurring patterns of bodily experience, such as CONTAINMENT, SOURCE-PATH-GOAL, BALANCE, etc.) (Johnson, 1987). In recent years, work incorporating computational techniques from neural modeling has led to the development of complex systems in which ''conceptual metaphors are computed neurally via neural maps—neural circuitry linking the sensorimotor system with higher cortical areas'' (Lakoff and Johnson, 2003: 255). Metaphorical mappings are physical neural maps that bind sensorimotor information to more abstract ideas as part of the neural ensembles existing in different regions of the brain. Many aspects of metaphorical thought are now understood as ''metaphorical enactments'' that occur in real-time as dynamic brain functions.

Consider, for instance, the complex expression ''I've fallen in love, but we seem to be going in different directions'' (Lakoff and Johnson, 2003: 255). Several conceptual metaphors structure the neural, imaginative enactment that enable us to understand this statement, including LOSS OF CONTROL IS DOWN (e.g., ''I've fallen''), STATES ARE LOCATIONS (e.g., ''in love''), CHANGE IS MOTION (e.g., ''fallen in love'' is a change to a new state), and LOVE IS A JOURNEY (e.g., ''going in different directions''). The particular metaphorical inferences derived from the above statement are carried out not from the simple projection of different source domain knowledge into the target domain of love and love relationships. Instead, the inferences arise from source domain enactments that are carried over to the target domain via neural links. This is a significant constraint on the type of metaphorical projections that are likely to occur.

In cases of metaphorical expressions, such as ''John finally grasped the concept of infinite numbers,'' there is activation of neural circuitry associated with actual grasping (i.e., the source

domain), which together with activation of the target domain from context (i.e., the abstract concept related to infinite numbers) creates a mapping circuit. Recent developments in cognitive neuroscience has shown the existence of ''mirror neurons'' in the pre-motor cortex that are activated when people merely see specific actions, imagine doing those actions, and even hear language referring to those actions. For instance, mirror neurons associated with grasping become active when people see others grasping objects, when they imagine grasping objects, or when they hear the verb ''grasp.'' A significant feature of this account, then, is that the totality of a source domain does not need to be processed before target domain inferences are determined. This immediate creation of an integrated circuit, in which both source and target domain are processed at once, is consistent with behavioural evidence that people can as easily understand metaphorical expressions as non-metaphorical ones, and with neuroscience evidence on the spread of activation in neural circuits.

Among the various implications of the neural theory is the suggestion that some metaphors typically explained by blending theory really demand a conceptual metaphor account. Consider again the expression ''My surgeon is a butcher.'' Lakoff (in press) claims that this example is understood by a widely held metaphor ''A person who performs actions with certain characteristics is a member of a profession known for those characteristics.'' Thus, the source domain of the metaphor is a stereotype, represented as a frame that depicts characteristic semantic information (e.g., a surgeon works with precision that leads to beneficial results and a butcher is known for working with more force than care with messy results). Using this stereotypical information, we can produce expressions like ''My lawyer presented my case with surgical skill'' and ''My lawyer butchered my case,'' as well as more novel expressions such as ''Ichiro slices singles through the infield like a surgeon'' and ''Frank Thomas hacks at the ball like a butcher.''

We personally are a bit sceptical about the specific formulation of the conceptual metaphor ''A person who performs actions with certain characteristics is a member of a profession known for those characteristics'' and need further linguistic analyses to clarify the exact conceptual metaphor at work in the above examples. But the detailed blending theory analysis of how ''My surgeon is a butcher,'' may be interpreted may indeed be assisted by the activation of some specific conceptual metaphors that offers more constraints on the possible number of blended elements.

Attempts to explain how people understand these metaphorical utterances without conventional metaphors, such as through blending, create incorrect inference patterns (Lakoff, in press). For example, literal sentences like ''My surgeon/butcher/lawyer is a Russian'' convey common stereotypes associated with being Russian, such as being very sentimental and emotional. If these were handled the way metaphors like ''My surgeon is a butcher'' were, then one would assume that saying ''My surgeon is a Russian'' implies that my surgeon were not literally Russian by nationality, and that he carries out his duties in a sentimental, emotional manner. Of course, sentences like ''My surgeon is a Russian'' do not express such meanings. The reason ''My surgeon is a butcher'' conveys the specific metaphorical meaning it does is because of the conventional conceptual metaphor of A PERSON WHO PERFORMS ACTIONS WITH CERTAIN CHARACTERISTICS IS A MEMBER OF A PROFESSION KNOWN FOR THOSE CHARACTERISTICS. This line of logic suggests, more broadly, that the application of conceptual metaphor is critical to understanding even classic resemblance type metaphors, such as ''Man is wolf'' and ''Harry's a pig,'' that express human characteristics in terms of animal stereotypes. The neural theory of metaphor, with its emphasis on enduring neural circuits, provides a good motivation for the conceptual metaphor account.

The neural theory of metaphor offers additional motivation for why conceptual metaphors arise in the ways they do, endure in thought, and are widely evident in language. Metaphor is a

natural development of the way that neural systems work with recurring mappings, predictable inference patterns, and emergent properties. Although the work on a neural theory primarily rests on ''existence proofs'' based on computational modelling, with little empirical work devoted to the neural structures involved in actual metaphor use and understanding, this theory provides a further example of how cognitive linguistic theories of metaphor often seek deeper connections between brains, minds, and language.

3. Metaphor and relevance theory

A different perspective on metaphor comes from relevance theory (Carston, 2002; Pilkington, 2000; Sperber and Wilson, 1995, in press; Wilson and Carston, 2006), which is rooted in a broad theoretical framework for explaining cognition and communication. The relevance-theoretic account of utterance interpretation proposes that a fundamental assumption about human cognition is that people pay attention to information that seems most relevant to them. Evolution has exerted selective pressures on our cognitive systems such that our brains allocate their resources efficiently, or towards relevant stimuli. In this spirit, Sperber and Wilson (1995: 260) formulate their 'cognitive principle of relevance': ''Human cognition tends to be geared to the maximisation of relevance.'' With regard to communication, Sperber and Wilson (1995: 260) specify that every utterance starts out as a request for someone else's attention, and this creates an expectation of relevance. This idea is called the 'communicative principle of relevance': ''Every act of ostensive communication communicates a presumption of its own optimal relevance.'' Accordingly, an addressee will take an utterance to be the most relevant one the communicator was able and willing to produce. In any case the addressee will assume that the utterance is worth being processed at all.

Roughly put, an input to a cognitive system is relevant when on the basis of existing information the input yields new cognitive effects. Cognitive effects are achieved when a speaker's utterance strengthens or contradicts an existing assumption or by combining an existing assumption with new information to yield some new cognitive implications. However, the relevance of an input is not only proportional to the number and quality of the cognitive effects that can be derived from the interaction of the input and some context. In addition to cognitive effects relevance is defined in terms of the cognitive effort it takes to process the input. Cognitive effort is determined, for example, by the degree to which the mental representation of the input or the access to contextual information, etc., causes effort. The relevance of an assumption is optimal when the assumption has been 'optimally processed,' i.e., the best possible context has been selected and effort and effect have been balanced. More generally, there is a trade-off between cognitive effort and cognitive effects such that listeners will attempt to maximize cognitive effects while minimizing cognitive effort. Expectations of relevance provide the criterion for evaluating possible interpretations of a speaker's utterance. The basic interpretation process that follows from these ideas is described as follows: ''(a) Follow a path of least effort in computing cognitive effects: Test interpretive hypotheses (disambiguations, reference resolutions, implicatures, etc.) in order of accessibility. (b) Stop when your expectations of relevance are satisfied (or abandoned)'' (Wilson and Sperber, 2004: 613).

For example, consider the following exchange between two university professors (Sperber and Wilson, 2002: 319):

Peter: ''Can we trust John to do as we tell him and defend the interests of the Linguistics department in the University Council?''
Mary: ''John is a soldier!''

How does Peter understand Mary's metaphorical assertion about John? Peter's mentally represented concept of a soldier includes many attributes that may be attributed to John. Among these are: (a) John is devoted to his duty, (b) John willingly follows orders, (c) John does not question authority, (d) John identifies with the goals of his team, (e) John is a patriot, (f) John earns a soldier's pay, and (g) John is a member of the military. Each of these may possibly be activated to some degree by Mary's use of ''soldier'' in relation to John. However, certain of these attributes may be particularly accessible given Peter's preceding question where he alludes to trust, doing as one is told, and defending interests. Following the relevance-theoretic comprehension procedure, Peter considers these implications in order of accessibility, arrives at an interpretation that satisfies his expectations of relevance at (d), and stops there. He does not even consider further possible implications such as (e)–(g), let alone evaluate and reject them. In particular, Peter does not consider (g), the literal interpretation of Mary's utterance, contrary to what is advanced by the Gricean view, and consistent with the psychological evidence on inferring metaphorical meaning.

Relevance theory does not view metaphors as a separate category requiring specialized language processing. Sperber and Wilson (in press) state that ''relevance theory's account of metaphor is on the lean side, and is bound to disappoint those who feel that verbal metaphor deserves a full-fledged theory of its own, or should be at the center of a wider theory of language, or even of thought.'' We do not share this view; yet agree with Sperber and Wilson (in press) and Wilson and Carston (2006) that metaphors are not an extraordinary phenomenon of language. Within relevance theory, speakers are not constrained to say what is strictly speaking true, because in many situations speaking loosely is the best way to achieve optimal relevance. Consider the metaphorical utterance ''My surgeon is a butcher.'' Listeners generally have immediate access to stereotypical knowledge about both surgeons and butchers and would normally infer that the speaker here means something like ''My surgeon is crude and sloppy in his practice.'' Speaking loosely like this requires that speakers have in mind some further idea or cognitive effect beyond the single thought ''My surgeon is crude and sloppy in his practice'' (e.g., having to do with the nature of surgeons, their imprecision, their insensitivity toward dealing with human beings, and perhaps their appearance and demeanor). These implicatures may be relatively weak, but they can be assumed to best resemble the speaker's thoughts about his surgeon. An implicature can vary in terms of its strength, because an addressee can have more or less confidence in the speaker's intention of having communicated the implicature.

Relevance theorists generally say that especially creative metaphors are characterized by an array of weak implicatures. Understanding this range of weak implicatures may require additional cognitive effort on the part of the listener, but this is offset, according to the principle of relevance, by extra effects not achievable by saying directly ''My surgeon is crude and sloppy in his practice.'' These extra effects are called 'poetic effects.' Sperber and Wilson (in press) state that not only can metaphors create poetic effects, but are particularly well suited to create them. Thus, relevance theory suggests that metaphors and other figures of speech are examples of ''loose talk'' (Sperber and Wilson, 1985/1986). Speaking metaphorically is just another way of adhering to the presumption of ''optimal relevance'' (Sperber and Wilson, 1995: 270), part of which can be achieved by poetic effects. As we describe in greater detail below, relevance theory does not assume that cross-domain mappings are a central part of metaphor understanding (Wilson and Carston, 2006).

The idea that metaphors are understood as instances of loose use has been further specified in terms of the on-line construction of ad hoc concepts (Carston, 2002). These are loosenings or narrowings of lexical concepts, constructed online, which become necessary in certain contexts.

We may inhibit some of the lexical concept's encyclopedic and logical information to make the ad hoc concept's denotation larger (loosenings), we may add some constraining information to make their denotation smaller (narrowings), we may employ both of these techniques (simultaneous loosening and narrowing) or we may even create ad hoc concepts with a completely disjoint denotation from the lexical concepts.

Consider the metaphor ''Robert is a bulldozer.'' A traditional analysis assumes that this statement cannot communicate a meaningful proposition because human beings are not machines. According to the original relevance-theory account, the statement does not have an explicature because its proposition is not being communicated. Yet, according to the ad hoc concepts account, we can assume that the encoded concept for ''bulldozer'' is loosened in a way that its denotation may also encompass human beings like Robert. A consequence of this approach is the insight that metaphors can communicate explicatures. Thus, the metaphorical meanings of an expression like ''Robert is a bulldozer'' do not necessarily and exclusively fall under the scope of the utterance's implicatures. Thus, a particular element of a logical form can initiate inferential processes that can lead to ad hoc concepts, explicatures and implicatures. These different representational formats are all communicated and are mutually adjusted to one another.

Ad hoc concept construction is a process that is typical of metaphorical interpretations, but it is not exclusive or special to metaphors. Hyperboles, for example, also make use of ad hoc concepts. According to Sperber and Wilson (in press) strictly literal interpretations are the only constructions that do not involve concept broadening or narrowing. Nevertheless, as described above, literal interpretations of utterances are not in any way privileged as they are in Gricean pragmatics. ''They are not the first to be considered, and they are not necessarily easier to construct than non-literal ones'' (Sperber and Wilson, in press). In general, relevance theory maintains that metaphors are nothing special in terms of their processing, but also acknowledge that metaphors often ''stand out as particularly creative and powerful uses of language'' (Sperber and Wilson, in press).

4. Comparing the theories

We have seen that both cognitive linguistics and relevance theory explicitly aim to provide a realistic, cognitive theory of metaphor. As the history of cognitive science demonstrates, there are various forms in which cognitive processes may be instantiated, only some of which have to do with the constraints of real human beings. Yet cognitive linguistics and relevance theory are deeply interested in the psychological implications of their claims and argue in several places that their respective approaches to language, and to different extents thought, are based on realistic human data and what is known about human cognition. We now compare the two frameworks in greater detail along various criteria to best evaluate the cognitive/psychological nature of these different theories.

4.1. Metaphor motivation

A first concern for a cognitive theory of metaphor is the motivation for metaphorical language. What motivates why people create and use metaphor and, specifically, speak/write/gesture in the particular metaphorical ways that they do both within and across languages? A classic answer to this question asserts that metaphorical language allows people to express ideas that would be difficult to convey using literal language, and can do so in a compact and vivid manner

(Ortony, 1975). But cognitive linguistics and relevance theory offer very different responses to the question of metaphor motivation.

Finding the motivations for particular forms of language is one of the central goals of cognitive linguistics. Lakoff and Johnson (1980: 3), for example, say, ''metaphor is pervasive in everyday life, not just in language but in thought and action.'' The importance of metaphor for cognition, as opposed to language, becomes apparent when Lakoff and Johnson say (1980: 153) ''Metaphor is primarily a matter of thought and action and only derivatively a matter of language.'' Thus, metaphor is fundamentally a kind of mental mapping from which certain patterns of conventional and novel metaphorical language arise. These regular patterns of metaphorical thought appear as a response to the co-activation of two domains resulting in a recruitment of neural circuitry linking them. Thus, the motivation for metaphorical language is found in recurring sensorimotor patterns of experience that are continually enacted as neural processes in the moment of thinking, speaking, and understanding. Such recurring sensorimotor patterns at least motivate the existence and continued use of many conventional metaphors and some novel extensions or elaborations of these in creative metaphorical language. What motivates many novel metaphors that are not mere extensions or elaborations of conventional metaphors is a little more complicated than that. Cognitive linguists see the existence of many novel metaphorical expressions as arising from complex blending processes that reflect ad hoc, creative, thought processes.

Relevance theory's suggestion that metaphor expresses one form of ''loose talk'' rests on an important distinction between 'descriptive' and 'interpretive' representations. Any representation with a propositional form can either describe states of affairs (including hypothetical states of affairs) or interpret another representation with a propositional form. Sperber and Wilson (1995) claim that the relationship between an utterance and a thought of the speaker is always one of interpretive resemblance between the propositional forms of the utterance and the thought. Consequently, a listener understands a speaker's utterance by making interpretive assumptions about the speaker's informative intention. In line with the nowadays fairly uncontroversial rejection of a maxim of truthfulness, an utterance (including its possible implicatures) need not be completely identical with the speaker's thought (Wilson and Sperber, 2004). But in most cases, it may not even be possible to find a literal utterance for a complex thought that we want to communicate and so we speak loosely. In relevance theory, the qualitative difference between literalness, (i.e., identity between the utterance's proposition and the thought's proposition), and only a very small resemblance between those two propositions is seen as a continuum. Metaphor is somewhere on this continuum and there is no difference in kind between metaphor processing and the processing of non-metaphorical utterances. Listeners will never assume that the speaker's utterance is literal, they will only assume that it is optimally relevant. In order to achieve optimal relevance, we are often forced to speak loosely and therefore hearers do not expect us to talk literally. Thus, the general motivation for metaphor is the presumed fact that often a metaphorical utterance is more relevant than any literal alternative(s). This means that often the cognitive effects the speaker intends his addressee to gain could not be achieved in any other way with less processing effort for the hearer. Again, relevance theorists maintain that we sometimes conceptualize the world metaphorically, because it is the most relevant option.

However, if a speaker's thoughts can be an interpretation of another representation (an actual or a desirable representation) or a description of a state of affairs (either an actual or a desirable state of affairs) (Sperber and Wilson, 1995), and if a speaker's mental representation is loosely used (i.e., it stands in an interpretive relation to another representation), then it seems possible that a thought could consequently stand in a metaphorical relation to another representation. For

this reason, we are not sure why relevance theory resists the notion of enduring metaphorical thought. The cognitive principle of relevance clearly is a statement about cognition in general and not just about utterance understanding. Furthermore, loose use and ad hoc concepts are not necessarily ideas restricted to lexical semantics. Many of the concepts we entertain are non-lexicalized and are built in an ad hoc fashion. Consequently, we believe that a focus on metaphorical thought is not inconsistent with a relevance-theoretic approach to communication and cognition.

Overall, both theoretical frameworks are well equipped to make statements about why we speak and think metaphorically, but only cognitive linguistics studies the motivation for individual metaphors, classes of metaphorical statements, and metaphorical inference patterns. Furthermore, relevance theory focuses more on the role of metaphor for communication, and thus the pragmatics of metaphor, whereas cognitive linguistics focuses more on the role of metaphor in our conceptual system. We do not see these varying approaches to be at all contrary. Individual scholars may perhaps be critical of some of the analyses offered in support of conceptual metaphor or blending theory within cognitive linguistics, or of the analyses provided in support of relevance theory's assertions that metaphors are examples of loose use. But there still may be an important sense in which metaphorical thinking may shape metaphorical speaking and understanding, as well as how metaphorical communication may create, even if temporarily, metaphorical thoughts. Integrating the conceptual and pragmatic principles associated with cognitive linguistics and relevance theory seems very desirable, for these very reasons, as we will pursue in more detail below.

4.2. Metaphor generality

A second consideration, which is closely related to the first, is the matter of metaphor generality. How much of metaphorical language can each theory explain? To what extent does each theory aim to seek possible correspondences between metaphorical language and metaphorical thought? One of the great differences in approaches to metaphor lies in the type of metaphoric language scholars wish to account for. Although many traditional theories of metaphor typically study classic "A is B" or resemblance metaphors, such as "Lawyers are sharks" or "My job is a jail," cognitive linguists have focused on metaphors that have implicit source domains, often ones rooted in correlations in bodily experience, such as "My marriage is on the rocks" or "I don't see the point of your argument." Understanding a conventional expression like "I don't see the point of your argument" depends on accessing an enduring pattern of metaphorical thought, or a conceptual metaphor, or in this case a primary metaphor such as KNOWING IS SEEING. On the other hand, the primary emphasis in understanding resemblance metaphors is to recognize, usually for the first time, the way that the source and target domains interact to give raise to novel metaphorical meaning. Not surprisingly, then, work on resemblance metaphors, as seen in relevance theory, emphasizes novel metaphors and how they are understood.

Why have cognitive linguists mostly focused on metaphors with implicit source domains and relevance theory on resemblance metaphors? The answer to this question is not surprising, especially given what we described in the previous section on the motivation for metaphor. For cognitive linguistics, the discovery of systematicity among conventional expressions provides the primary source of evidence for the existence of conventional metaphorical thought. Accordingly, cognitive linguists frequently distinguish between the terms metaphor and metaphorical expression, where the former refers to cross-domain mappings in the conceptual

system (e.g., ARGUMENT IS WAR) and the latter to linguistic expressions (words, phrases or sentences; e.g., ''He attacked my arguments,'' ''His criticism was right on target''). At the very least, one of the main contributions of cognitive linguistics has been its discussion of the generality and systematicity of metaphorical thought as evidenced by the frequency of metaphorical language.

Relevance theory's primary focus on novel metaphors (e.g., classic ''A is B'' metaphors) makes sense given their assumptions about the distinction between descriptive and interpretive representations. As we argued above, it may be possible within this framework to assume the existence of enduring metaphorical representations. Nonetheless, it is not clear exactly how relevance theory can be extended to deal with people's use and understanding of conventional metaphorical expressions like ''We're spinning our wheels'' (referring to a romantic relationship). Would this expression and others like it, be understood via the construction of ad hoc categories? Or might relevance theory assume that access of conceptual metaphors, which may be part of our encyclopedic knowledge, shape pragmatic processes of interpretation to facilitate the recovery of speakers' metaphorical meanings? We see these questions as important challenges for future research, and offer our own brief views on how this may possibly work below.

Finally, cognitive linguistics and relevance theory have both primarily focused on the creation and understanding of individual metaphorical expressions, often in discourse. But discourse and literary scholars have also employed cognitive linguistic ideas to explore metaphorical themes or schemas in extended discourse such as literature and poetry (Freeman, 1995; Lakoff and Turner, 1989). Psycholinguistic studies have examined the impact of reading different metaphorical expressions that are consistent or inconsistent with single conceptual metaphors to see if switching between metaphorical themes disrupts processing and thus far found mixed results (Langston, 2002; Shen and Balaban, 1999). Relevance theorists would assume, however, that discourse coherence is established in terms of the ease of satisfying expectations of relevance with metaphors not being different from any other form of language in this regard. For this reason, perhaps, relevance theory has not explicitly addressed issues related to processing of metaphorical discourse.

4.3. The nature of metaphorical meaning

Both cognitive linguistics and relevance theory claim that metaphorical meaning is not simply based on the similarity of features between the target and source domain terms, nor is it merely a matter of comparison between the target and source. But the two perspectives differ considerably in their explanation of metaphorical meaning.

Cognitive linguistics has traditionally argued that the meanings of conventional conceptual metaphors are primarily image-schematic (e.g., based on recurring patterns of embodied experience). Image-schemas can generally be defined as dynamic analog representations of spatial relations and movements in space. For instance, our BALANCE image-schema emerges through our experiences of bodily equilibrium and disequilibrium and of maintaining our bodily systems and functions in states of equilibrium. The BALANCE image-schema supports understanding of literal expressions such as ''He balanced the weight on his shoulder'' and is metaphorically elaborated in a large number of abstract domains of experience (e.g., psychological states, legal relationships, formal systems), as seen in expressions like ''He was psychologically imbalanced'' and ''The balance of justice'' (Johnson, 1991). Image-schemas have internal logic or structure that determines the roles these schemas can play in

structuring various concepts and in patterns of reasoning. It is not the case that a large number of unrelated concepts (for the systematic, psychological, moral, legal, and mathematical domains) all just happen to make use of the same word ''balance'' and related terms. Rather, we use the same word for all these domains because they are structurally related by the same sort of underlying image-schemas, and are metaphorically elaborated from them. In this way, many aspects of metaphorical meaning are image-schematic in nature.

There are continuing discussions and debates over the very nature of image-schemas and their psychological reality (see Hampe, 2006). For instance, some scholars suggest that image-schemas are not merely representative of universal body experience, but are crucially tied to specific socio-cultural cognition (Kimmel, 2006; Sinha, 2002; Zlatev, 2006). Yet most of the literature on image-schemas implicitly assumes that these entities are encoded as explicit abstract mental representations in long-term memory, and serve as the enduring foundation for abstract concepts and many different facets of linguistic meaning. One proposal has recently suggested that image-schemas are best characterized as experiential gestalts, following the traditional view of images schemas (Johnson, 1987), but only momentarily emerge from ongoing brain, body, and world interactions (Gibbs, 2006b). Thus, image-schematic reasoning, such as that seen in the inference patterns arising from source-to-target domain mappings in metaphorical language use, involves the embodied simulation of events, and is not simply a matter of activating pre-existing representational entities. At the very least, though, characterizing metaphoric meaning in terms of image-schematic structures offers a powerful analytic tool to describe systematic patterns of metaphorical meaning, and concretely shows how metaphorical thought and language is grounded to a significant extent in recurring aspects of bodily experience.

One proposal in cognitive linguistics argues that there may be a diversity of projections that constitute metaphorical meaning. Conceptual projection may follow from different routes (Ruiz de Mendoza Ibáñez and Díez Velasco, 2003): (1) interaction based on image-schemas, (2) interaction between propositional cognitive models, (3) interaction involving metonymic models such as double metonymy, and (4) interaction between metaphor and metonymy.

Image-schema-based metaphors involve the mapping of image-schematic structure of domains like container, path, contact, bodily orientation (front-back, up-down, center-periphery). Consider the statement ''Plans are moving ahead''. A path schema in the source domain input space is mapped onto the target input space. The generic space contains abstractions from the two input spaces that relate, in this case, to the structure and logic of a business deal (i.e., a source, a destination, and various phases of the business deal in between). In the projection, or blend, the plans are seen as travelers and the progress as movement toward the destination.

Interaction between propositional cognitive models deals with cases that link the propositional contents of two or more idealized cognitive models (ICMs). Consider the expression ''Judge Griffith is a deciding machine''. This metaphor involves the conceptual metaphor PEOPLE ARE MACHINES in which the features of machines (i.e., doing a lot of work without reflection) contained in the two input spaces (machines and judges) are mapped onto a target space (i.e., a certain judge is like a machine in the manner by which he decides cases—unreflectively, ceaselessly). This type of conceptual projection, therefore, has five spaces—two source input spaces, a target input space, a generic space, and the blend.

The third type of projection is double metonymy that produces a repeated metonymic mapping of the same expression. The expression ''Wall Street will never lose its prestige'' creates a single target-in-source metonymy (i.e., PEOPLE FOR THE INSTITUTION). But in ''Wall Street is in a panic,'' there is a double metonymy, A PLACE FOR AN INSTITUTION FOR PEOPLE. This metonymic chain reduces the target domain people to the institution, which is

then reduced to its location. A different metonymic chain involves domain expansion. For instance, the expression ''His sister heads the police unit'' takes a source-in-target metonymy and expands the domain ''head'' into that of LEADER, and further into that of ACTION OF LEADER.

The final type of conceptual projection consists of the interaction between metaphor and metonymy, or metaphtonymy (Goossens, 1990). The expression to beat one's breast reflects a metaphor whose source is a source-in-target metonymy (with the source of breast-beating and the target ''breast-beating to show one's sorrows''). This scene is then mapped onto the target of a ''person pretending to show sorrow for a situation.'' In this way, the metonymy is part of the metaphor's source domain. A metonymy may also be a part of the target domain. In ''Peter knitted his brows and started to grumble,'' the source domain of knitting clothes is mapped into the target of ''one's facial expression of displeasure'' which contains a target-in-source domain metonymy whereby the state of frowning is conveyed as the facial expression of drawing one's eyebrows together.

These conceptual projections rely on different forms of conceptual representations (e.g., image-schemas vs. propositions). In fact, many cognitive scientists now contend that the complexity of human behaviour requires that different kinds of representations be used to handle the complexity of human experience (Kintsch, 2001; Markman, 1999). Thus, people's varied abilities, from perception and motor control to language and problem-solving, may not all rest on the same representational base (e.g., featural representations, structured representations, mental models, image-schemas). Conceptual projections of the sorts described above, using different representational formats may be needed to explain the diversity of metaphorical language. This conclusion suggests that both cognitive linguistic and relevance theory research contributes to an overall theory of metaphoric meaning and are not necessarily in opposition to one another.

Relevance theory claims that metaphorical meaning is represented in the form of explicatures and implicatures, as is the case with all linguistic expressions. Unlike cognitive linguistic theories, traditional relevance theory does not assume that metaphor is a matter of cross-domain mapping, and instead claims that metaphorical utterances are an instance of the loose use of language and are therefore prime examples of an interpretive relation between the propositional forms of utterances and the thoughts they represent. Thus, according to the traditional view, the gap between the utterance and the thought of the speaker is fairly obvious, and consequently metaphors do not communicate explicatures, but only a set of implicatures with varying strengths. Conventional metaphors are represented by at least one strong implicature without which the utterance would not be accepted as being relevant and an array of weak implicatures the derivation of which lies in the responsibility of the hearer. More figurative metaphors may only communicate several weak implicatures. The web of implicatures creates a so-called poetic effect.

Carston (2002) emphasizes the importance of ad hoc concepts in relevance theory. As a consequence of this move, metaphorical utterances are assumed to communicate both explicatures and implicatures. It was mentioned above that many questions about how an ad hoc concept is actually created and, even more fundamentally, about which types of words (e.g., natural kind terms, abstract terms, function words, content words, etc.) trigger the creation of an ad hoc concept remain unresolved. Nevertheless, there is much evidence in favor of the ad hoc-concepts view. What the more traditional view of relevance theory and the more recent relevance theoretic view seem to have in common is the conviction that communicated meanings, be they literal or metaphorical, are represented is in the form of propositions.

Consider, for example, the problem of understanding so-called cross-category cases of metaphor (e.g., ''Robert is a bulldozer''). It is unclear how ad hoc concepts for the vehicle terms

are created. Carston (2002: 356; italics in original) acknowledges that it is an issue ''whether an approach in terms of propositional *conceptual representations* (explicatures and implicatures) can ever do full justice to the processes and results of comprehending a metaphor. From a phenomenological perspective, what is striking about so many metaphors is their imagistic quality.'' Apparently, the move from a fairly static view of what constitutes a concept to the dynamic view of ad hoc concepts is not enough to account for the full complexities of the nature of metaphors. Thus, Carston (2002) does not really have an answer to the question of how to close the gap between an encoded concept and an ad hoc concept in cross-category metaphors.

Wilson and Carston (2006), however, claim that this 'emergent property issue' is something that relevance theory can cope with and they suggest a thoroughly inferential account of metaphor interpretation. In fact, they provide two inferential models. The first option they give is that attributes typically associated with bulldozers like '''powerful', 'obstacle', etc. have both a basic physical sense and a broader, superordinate sense (POWERFUL*; OBSTACLE*, etc.) whose denotation includes both physical and psychological instances.'' Of course, it might be the case that these attributes are lexicalized with both a physical and a psychological sense; however, this does not answer the question why a physical attribute can acquire a psychological sense. Cognitive linguists would say that the existence of the MIND AS MACHINE metaphor is the reason. According to the second inferential model attributes like 'powerful' have two distinct senses, one physical (POWERFUL) and one psychological sense (POWERFUL**). Understanding an utterance like 'Robert is a bulldozer' then includes the creation of a superordinate ad hoc concept POWERFUL* covering both POWERFUL and POWERFUL**, a proposal that is similar to the interactive property attribution model of Glucksberg (2001). If we understand Wilson and Carston (2006) here correctly, we ask ourselves why a hearer should construct a more abstract concept (POWERFUL*) after having accessed a more specific concept (POWERFUL or POWERFUL**).

In their concluding remarks, Wilson and Carston (2006: 429) argue that mappings between cognitive domains may only alter ''the accessibility of contextual assumptions and implications, but the resulting overall interpretation will only be accepted as the speaker's intended meaning if it satisfies the hearer's expectations of relevance and is warranted by the inferential comprehension heuristic.'' We support the idea that mappings play a significant role in accessing contextual assumptions and we also agree with the idea that metaphor interpretation works according to expectations of relevance. However, we would go a step further and claim that mappings do not just modify accessibility of assumptions and thereby the processing effort of interpreting metaphors, we believe that mappings are responsible for the connection between, for example, physical and psychological senses of concept attributes like 'powerful'.

Part of the reason why we believe that the differing views of cognitive linguistics and relevance theory on metaphorical meaning are complementary goes beyond their respective emphases on image-schematic and propositional views of meaning. Instead, these two perspectives contribute different ways of looking at how metaphorical language expresses meaning. Cognitive linguistics, with its interest in metaphorical thought, studies entrenched metaphorical mappings, and has done extensive work illustrating the range of meaning correspondences that arise in the source to target domain mappings within conceptual metaphors, for instance. Relevance theory, on the other hand, explores the meanings that arise in specific contexts, and aims to demonstrate how these cognitive effects are constrained by the principle of optimal relevance. As we explore in more detail below, there is surely a mixture of conceptually entrenched metaphorical knowledge with immediate contextual information, all of which is once more constrained by a principle of optimal relevance, which determines the particular meanings

that listeners and readers typically infer during online metaphor interpretation. Thus, we again see how cognitive linguistic and relevance theory views provide important, complementary information within a broader cognitive theory of metaphor use.

4.4. Pragmatics and online metaphor use

A fourth concern for a cognitive theory of metaphor is the matter of online metaphor use and the effects of the context on metaphor understanding as it is studied in pragmatics. This issue is a very central one for any theory of metaphor, which is also reflected in the length of this section. Thus, any theory of metaphor use and understanding should be able to explain not only what and why metaphors mean what they do, but also describe the mostly rapid, unconscious mental processes that people engage in when they produce and understand metaphor. Both cognitive linguistics and relevance theory agree that listeners do not have to go through a stage of literal interpretation after which they derive a speaker's metaphorical meaning, contrary to the widely held standard pragmatic theory (Grice, 1975; Searle, 1979). In fact, a large body of evidence from psycholinguistics supports this contention (Gibbs, 1994). But how does context and pragmatic knowledge shape online metaphor understanding?

Conceptual metaphor theory is predominantly concerned with generalizations about metaphor and therefore cognitive linguistics has not shown a huge interest in the role of context in metaphor understanding. Nevertheless, Lakoff and Johnson (1980: 184; italics in original) do acknowledge that ''meaning is always meaning *to* someone,'' and they explicitly deny the possibility of sentences having meaning in themselves. They seem to be well aware of the pragmatic intricacies of metaphorical utterances, but nevertheless they have not devoted much work to this issue. However, conceptual metaphor theorists study one very important aspect that determines the (broadly understood) context of metaphor comprehension and interpretation to a large degree. According to conceptual metaphor theory, conceptual metaphors belong to our knowledge of the world and we understand most metaphorical expressions by activating corresponding conceptual metaphors. Furthermore, conceptual metaphors may be activated as part of people's understanding of contexts, which in turn facilitates inferring the metaphorical meanings of utterances encountered at a later stage in discourse. In this way conceptual metaphors are often part of the context, because the mappings between the source and the target domain of a conceptual metaphor become available and restrict possible entailments of a metaphorical utterance. This understanding of what constitutes a discourse context is compatible with relevance theory's notion of a cognitive environment that encompasses a set of assumptions we use in the online processing of an utterance. The set of conceptual metaphors we access upon understanding metaphorical utterances can most definitely be regarded as a decisive part of the cognitive environment and it becomes strongly manifest if activated by keywords in an utterance.

These ideas have been supported by experimental research in psycholinguistics. For example, Nayak and Gibbs (1990) show that people tacitly recognize that idiomatic expressions like ''blow your stack'' are more appropriate, if they are used in a context that is structured around the idea of ANGER IS HEATED FLUID IN A CONTAINER, compared to alternative idioms having roughly the same figurative meaning, such as ''bite your head off'', which is motivated by a different conceptual metaphor (e.g., ANGER IS ANIMAL BEHAVIOUR). Moreover, people find certain idioms appropriate to use in contexts in which all the correspondences arising from the underlying conceptual metaphor are consistent with the information in the context (Gibbs, 1992). These data provide evidence that the contextual appropriateness of metaphorical language is partly due to the overlap

in the way contexts and speaker's utterances metaphorically conceptualize certain abstract concepts. Similarly, that the availability of conceptual metaphors facilitates metaphor understanding has been shown in various psycholinguistic studies (Albritton et al., 1995; Gibbs, 1992; Nayak and Gibbs, 1990). When primed by an appropriate conceptual metaphor, people understand metaphorical utterances faster than without priming. This supports the hypothesis that conceptual metaphors are accessed during the immediate online processing of metaphors.

Consider the conventional metaphoric expression ''My marriage has hit the rocks.'' Cognitive linguistic analyses and some psychological research suggest that people's understanding of what this expression means is tied to their activating a conceptual metaphor that provides part of the motivation for why this phrase exists in the first place, namely LOVE RELATIONSHIPS ARE JOURNEYS (Gibbs, 1994). But it is not clear from cognitive linguistic studies or the extant psychological experiments whether people merely access the conceptual metaphor LOVE RELATIONSHIPS ARE JOURNEYS as part of their comprehension of ''My marriage has hit the rocks'' or whether people must first access the conceptual metaphor and use that information to infer the intended meaning of this expression. The difference between these two possibilities is very important. In the former possibility, people understand ''My marriage has hit the rocks'' and then access the motivating conceptual metaphor LOVE RELATIONSHIPS ARE JOURNEYS, perhaps in an associative manner, without necessarily using this conceptual metaphor to compute what the conventional linguistic expression means. This possibility may seem especially likely given people's familiarity with highly frequent conventional expressions like ''My marriage has hit the rocks.''

On the other hand, the latter possibility implies that conceptual metaphors are necessary to compute or infer that ''My marriage has hit the rocks'' means that my marriage is in trouble. Under this scene, people may recognize that ''My marriage has hit the rocks'' refers to some mappings of journeys onto marriages and specifically refers to one of the entailments of this conceptual metaphorical mapping, such that difficulties to travel are difficulties in the relationship. There may still be two further ways that this can be accomplished. People may access the relevant conceptual metaphor and then compute the source-to-target domain mappings, see what entailments or correspondences can be easily generated, and then determine if any of these entailments best explain what the linguistic expression likely means. For instance, people hearing ''My marriage has hit the rocks'' infer the conceptual metaphor LOVE RELATIONSHIPS ARE JOURNEYS, then begin to compute source-to-target domain mappings (e.g., difficulties in travel are difficulties in the relationship), and then stop doing so when one of these seems most consistent with the expression's contextual meaning. A similar possibility is that people hearing ''My marriage has hit the rocks'' access the conceptual metaphor LOVE RELATIONSHIPS ARE JOURNEYS along with a pre-existing list of entailments from which they select the one that appears to provide the best interpretive fit.

Gibbs (1994) argues that these ideas may be broken down into a number of more specific hypotheses: (1) metaphorical thought plays some role in changing the meanings of words and expressions over time but does not motivate contemporary speakers' use and understanding of language. (2) Metaphorical thought motivates the linguistic meanings that have currency within linguistic communities or may have some role in an idealized speakers'/hearers' understanding of language. But metaphorical thought does not actually play any part in an individual speaker's ability to make sense of or process language. (3) Metaphorical thought motivates an individual speaker's use and understanding of why various words and expressions mean what they do but does not play any role in people's ordinary online production or comprehension of everyday

language. (4) Metaphorical thought functions automatically and interactively in people's online use and understanding of linguistic meaning.

These hypotheses are not mutually exclusive of one another but reflect a hierarchy of possibilities about the interaction between metaphoric patterns of thought and different aspects of language use and understanding. Many psycholinguistic experiments support the claim in hypothesis (3) that metaphoric thought motivates why many words and expressions mean what they do to contemporary speakers and also influences people's learning of different linguistic meanings (Gibbs, 1994). Finally, psycholinguistic studies suggest that hypothesis (4) might be true to some extent (Gibbs et al., 1997a). This work includes studies investigating people's mental imagery for conventional metaphors, including idioms and proverbs (Gibbs and O'Brien, 1990; Gibbs et al., 1997b), people's context-sensitive judgments about the figurative meanings of idioms in context (Nayak and Gibbs, 1990), people's immediate processing of idioms (Gibbs et al., 1997a), people's responses to questions about time (Boroditsky and Ramscar, 2002; Gentner and Boroditsky, 2002), readers' understanding of metaphorical time expressions (McGlone and Harding, 1998), and studies looking at the embodied foundation for metaphoric meaning (Gibbs, 2006c; Gibbs et al., 2004, 2006). At the same time, Coulson (2001) describes several neuropsychological studies whose results are consistent with some of the claims of blending theory, particularly the idea that understanding metaphors demands various blending processes, which require cognitive effort.

These various studies suggest that we often access conceptual metaphors as part of how we understand metaphorical expressions, but this experimental work does not explicitly address which elements from a source domain actually get mapped onto the target domain. This issue is a concern for many other psychological theories of metaphor that are not conducted within either the cognitive linguistic or relevance theory frameworks (e.g., Bowdle and Gentner, 2005; Glucksberg, 2001). Of course, a single metaphorical utterance does not exploit all the elements that could potentially be mapped from source to target domain. Lakoff and Johnson (1980) also point out that conceptual metaphors are always only partial mappings. The speaker intends only a small part of what a conceptual metaphor makes available and the listener will typically access only a small part.

A significant issue for a processing account of metaphor is how we get from particular words in discourse to an underlying conceptual metaphor. To answer this question we have to consider the role of lexical semantics in cognitive linguistics. Lakoff and Turner (1989: 109) claim, ''words are sound sequences that conventionally express concepts that are within conceptual schemas.'' Part of our knowledge of concepts concerns the domain they conventionally belong to. In the network of conceptual knowledge, we also get information about the conceptual metaphors that this domain is involved in. Thus, a particular word can evoke a conceptual metaphor that gives us a mapping between two domains.

Still, cognitive linguistic theories generally suffer from a lack of precision as to exactly how metaphorical thought is recruited during linguistic interpretation. For example, are conventional expressions, such as ''We're spinning our wheels'' (in reference to a romantic relationship) only understood because of the activation of the LOVE IS A JOURNEY metaphor, or might this conceptual metaphor arise as a post-hoc product of understanding the conventional expression? Similarly, does the activation of a conceptual metaphor during metaphor processing carry with it all the established correspondences normally assumed by cognitive linguists, or might these be generated selectively, or strategically, depending on the context and motivation of the listener? Might there, for instance, be some trade-off between maximizing cognitive effects, or the established correspondences, and the cognitive effort expanded during metaphor processing in

exactly the way suggested by relevance theory? To what extent are image-schematic representations activated or inferred during linguistic metaphor understanding? Altogether, this theory is vastly underspecified as an account of moment-to-moment metaphor processing. There are, at this point, no studies that provide definitive answers to any of the mentioned questions, and it is not clear whether cognitive linguistic theories are presently in a position to offer specific hypotheses in regard to any of these issues. Perhaps conceptual metaphor theory's treatment of novel metaphors could be more explicit if it had some notion of how the context of an utterance determines particular mappings. With creative, novel metaphors the problems are even bigger. Very creative metaphors not always relate to pre-established conceptual metaphors and therefore we need to have a mechanism that works out the meaning of the utterance if a metaphorical utterance cannot be associated with a conceptual metaphor.

Conceptual blending theorists see their framework as better accommodated to issues relating to the online processing of metaphor: ''In conceptual metaphor theory, metaphors are seen as instantiations of entrenched mappings between cognitive domains, while in blending theory, the meaning of a metaphor is constructed on-line in conceptual integration networks'' (Coulson, 2001: 178). Thus, blending theory claims to be well suited to describe online processes of understanding, and it also stresses the importance of context for online processing. For example, Fauconnier (2004: 658) states that ''language does not 'represent' meaning: language prompts the construction of meaning in particular contexts with particular cultural models and cognitive resources,'' and Coulson (2001: 17) points out that ''contextual variation in meaning is ubiquitous because context is an inherent component in the meaning construction process.'' She further says, ''because cognitive activity mediates the relationship between words and the world, the study of meaning is the study of how words arise in the context of human activity, and how they are used to evoke mental representations.'' Thus, blending theory acknowledges the significance of contextual factors, but it does not make a principled distinction between semantics and pragmatics, because such a distinction would presuppose that utterance comprehension first delivers a context-invariant representation that can be linguistically described by compositional rules linking the morphology, semantics (i.e., truth-conditional semantics) and syntax of a sentence, and that only afterwards pragmatics would work on the purely linguistic representation to accommodate it to the context. Blending theory instead claims that both the context and the sparse information provided by language together evoke a conceptual representation.

The major structural unit in blending theory is the mental space. Fauconnier and Turner (2002: 40) define mental spaces as ''small conceptual packets constructed as we think and talk, for purposes of local understanding and action.'' The notion of mental spaces is apparently a lot more context-dependent and dynamic than conceptual metaphor theory's notion of domains. Fauconnier and Turner (2002: 102) further explain, ''mental spaces operate in working memory but are built up partly by activating structures available from long-term memory.'' This characterization of mental spaces is fairly similar to Carston's notion of ad hoc concepts. Mental spaces may be more complex than ad hoc concepts, because a mental space is a structured set of knowledge that may include mental frames possibly containing several individual concepts. An ad hoc concept, however, is only a particular kind of concept. But then again, if we take Carston's (2002: 359–364) speculative thoughts seriously and broaden the picture of concepts to the idea of ''concept schemas'' where words are pointers to ''conceptual spaces,'' then we are approaching the idea of Fauconnier's (1985) notion of mental spaces to a very large degree.

Blending in verbal communication starts out with activating elements in mental (input) spaces by the use of particular words. Next to lexical cues, blending is also influenced by the grammar of

the sentences, but whereas words open the door to particular mental spaces, the grammatical cues provide information about the mapping schemes that are cued by the utterance. These processes are in principle identical in the interpretation of metaphorical and literal language; so the differences between metaphorical and literal processing must lie elsewhere. In order to get a more precise idea of these processes, let us take a look at the following two examples (Fauconnier and Turner, 2002: 155):

(3) ''Paul is the father of Elizabeth.''

(4) ''Vanity is the quicksand of reason.''

A major difference between (3) and (4) is that (3) is not metaphorical, whereas (4) is metaphorical. The mapping schemes are the same in both examples, but the types of integration networks they exemplify are different. An utterance of (3) elicits the creation of a 'simplex network' in which the roles (i.e., ''father'' and ''child'') are projected from one mental space and values for these roles (e.g., ''Paul'' and ''Elizabeth'') are projected from the other mental space. The organizing frame of the blend is taken exclusively from the input space of family relations. In (4) this is different, because (4) generates a 'double-scope network' in which the inputs have different organizing frames. Moreover, the blended space has its own organizing frame, too. Thus, a high potential for emerging structure is given and therefore a high degree of elaboration is required. ''Vanity'' and ''reason'' in one input space, as abstract characteristics, have an organizing frame that naturally differs very much from an organizing frame for ''quicksand'', which is a concrete element in the other input space. So, one input space is about abstract human personality traits and the interrelationships among these personality traits. The other input space refers to more concrete entities like quicksand and some entity that is swallowed by the quicksand. We can vividly imagine and simulate such a situation mentally. The utterance of (4) does not make it entirely clear what the counterpart of 'reason' in the quicksand input space could be, but a hearer who is familiar with quicksand will be able to call up a mental space which provides candidates for this counterpart relation with ''reason''. One option is that the counterpart of 'reason' is 'human', because in the metaphor the relation between ''vanity'' and ''reason'' seems to be the same as the relation between 'quicksand' and 'human': one entity takes away the other entity. Ultimately this question will be resolved individually while calling up the individually bound input spaces and constructing and running the blend.

The construction of blended spaces works according to the three basic processes of composition, completion and elaboration. 'Composition' refers to the projection of elements from the input spaces to the blended space. The mapping usually remains partial and the mechanisms that govern the selection of elements in the mapping processes have not yet been fully understood. Fauconnier and Turner (1998, 2002) claim that certain optimality or governing principles restrict blending processes. One of those optimality principles is the principle of 'good reason': ''All things being equal, if an element appears in the blend, there will be pressure to find significance for this element. Significance will include relevant links to other spaces and relevant functions in running the blend'' (Fauconnier and Turner, 2002: 163). A possible combination of relevance theory and blending theory is very obvious at this point, as the principle of good reason at best seems to be something like an informal version of relevance-theoretic ideas.

The second process in developing the blend is a pragmatic process called 'completion'. It refers to the incorporation of background knowledge into the blended space. For example, we complete the blend elicited by (4) by introducing the feature that vanity is a force that can capture reason so that reason gets lost when vanity prevails. This inference is not part of any input space.

We use our knowledge of quicksand to make sense of the counterpart relations that lead to the fused elements in the blend. Additionally, the blend may be further specified by emergent structure. For example, it is possible that in the blend we have the insight that vanity is a natural force that reason cannot stand up to. In creative metaphors, completion might be a part of the whole process of understanding metaphor where the comprehension of literal utterances differs slightly from the comprehension of a metaphorical utterance. However, we do not believe that blending theorists have commented on this possibility.

The third process is called 'elaboration' and it refers to the mental simulation of the situation depicted by the blend. New features may be included in the blend through simulating and running the blend. This offers the possibility to construct very creative blends, because elaboration is not governed by the linguistic form anymore. The blend in (4) can, for instance, be elaborated by imagining a person 'drowning' in his/her own vanity and losing all his/her reason. This situation can then be further elaborated by drawing inferences from this concrete image, etc. In theory, blends can be elaborated ad infinitum. In practice, however, the process of elaboration is certainly subject to relevance considerations and therefore restricted by the goal to minimize processing effort.

These suggestions certainly offer a very interesting perspective on online processes of metaphor comprehension. But blending theory leaves several issues unresolved. For instance, how are the input spaces determined? It would of course not make sense to expect a predictive mechanism for the content of mental spaces. This is not possible, because mental spaces are constructed ad hoc and for local purposes. However, blending theorists have not described in sufficient detail which image-schemas, frames, conceptual metaphors and metonymies are recruited in the formation of mental spaces and what the selection mechanisms are for creating these spaces. What are the constraints on composition, completion and elaboration? What determines and constrains the determination of a particular integration network (e.g., simplex, single-scope, double-scope)? Fauconnier and Turner only provide a partial answer to such questions in the form of their 'optimality principles' (Fauconnier and Turner, 1998) or 'constituting' and 'governing principles' (Fauconnier and Turner, 2002). But might one of these principle have processing priority over the others? Might the creation of blended spaces be more simply constrained by principles such as (a) test interpretive hypotheses in order of accessibility and (b) stop when expectations of relevance are satisfied, as suggested by relevance theory? More generally, blending theory has not been made explicit enough yet to make clear predictions that can be falsified. As one commentator aptly noted, blending theory offers, "a kind of snapshot of the nature of a dynamic process, but is not the process of change itself" (McNeil, 2005: 74). Altogether, we believe that both conceptual metaphor theory and blending theory would benefit if they also incorporated relevance-theoretic ideas.

The relevance theory model of metaphor is a direct product of the larger relevance-theoretic framework, and it is in many respects more explicit than that of most cognitive linguistic theories in regard to moment-to-moment metaphor processing. The overall interpretation process can be divided into two main parts, each having several subparts. The first part encompasses the creation of the logical form(s) of an utterance. The logical form is derived from one's knowledge of morphology, syntax and semantics. The result is an abstract frame that is not propositional. In order to achieve full propositionality, pragmatics needs to enter the interpretation process. On the basis of the utterance and our cognitive environment we derive explicatures and implicatures, which are the bearers of communicated meaning. This portrayal has often been interpreted as if there were two chronologically ordered steps: first a logical form is created and then the communicated propositions are generated, i.e., explicatures and/or implicatures. Wilson and

Sperber (2004), however, point out that these different processes do not happen consecutively. Instead, the hearer starts working on the linguistic input as it is coming in and thereby successively creates the logical form, but at the same time he already starts using his pragmatic abilities in order to create explicatures and implicatures. Wilson and Sperber (2004: 615) further explain that ''comprehension is an online process, and hypotheses about explicatures, implicated premises, and implicated conclusions are developed in parallel against a background of expectations which may be revised or elaborated as the utterance unfolds.'' Thus, relevance theory does acknowledge different activities in interpreting an utterance, but it does not posit that they happen one after the other.

Metaphor interpretation works in accordance with the principles just outlined. The only differences between metaphorical utterances and less figurative utterances lie in the quality of the ad hoc concepts that are formed. However, this is a difference that has no impact on the steps needed to process an utterance, irrespective of whether it is a literal or a metaphorical utterance. In metaphor interpretation, we build ad hoc concepts which we get by processes such as loosening and narrowing, but because we probably also use the same processes for concepts which are used in non-metaphorical ways, the difference cannot be a difference in kind but rather one of degree. To illustrate this point consider the following two examples:

(5) ''The room is empty.''
(6) ''My head is empty.''

Whereas the utterance in (5) is not metaphorical, the utterance in (6) is arguably metaphorical and metonymical. This is the case although the same lexeme 'empty' is used as subject complements in both examples and more importantly, in both examples the lexeme 'empty' has to be narrowed.

Let us assume that (5) is being uttered in a situation in which the speaker expected that there are students in the room. In that situation, the denotation of 'empty' is loosened to the extent that the lexeme 'empty' can be predicated of subjects that are not purely empty. The subject complement 'empty' can be predicated of rooms that are, in fact, fully equipped with furniture, if what the lexeme modifies is a loosened version of the subject 'room', for example 'a room containing students'. Thus, it is conceivable that a loosening of the lexical concept ''room'' to the ad hoc concept 'room*' ('a room containing students') goes hand in hand with a loosening of the subject complement 'empty' to 'empty_1*' ('empty of students'). The process of loosening is clearly guided by expectations of relevance that derive from the context.

The utterance in (6) contains the same subject complement, this time predicated of a different subject. Just as in (5), the subject complement 'empty_2' has to be loosened to 'empty_2*' (empty of thoughts), because the speaker's head is not empty in a strict sense. Again the subject concept is created ad hoc. This ad hoc concept formation is at least partly based on a metonymic process. 'Head' is modified into 'head*', so that 'head*' does not only refer to the top part of the human body. 'Head' is first of all metonymically related to the brain, which is a part of the head, and furthermore the brain is metonymically related to the mind, because the brain is understood to be the centre of the mind. Therefore, we have a double metonymy at work where 'head' stands in a metonymical relationship with 'brain' and 'brain' stands in a metonymical relationship with 'the mind'. The complete utterance is furthermore structured by the MIND AS CONTAINER metaphor, which provides the relevant inferences in this example. If the container, which in this case metonymically relates to the mind, is empty, then the speaker of (6) intends to communicate that he feels unable to think and not that his head does not contain brain tissue, blood vessels, etc.

In general, the subject and the subject complement in (6) are created as ad hoc concepts. These two processes of ad hoc concept formation are mutually adjusted to one another and are guided by expectations of relevance. Hence, the basic processes in (5) and (6) in terms of ad hoc concept construction are very much alike, despite the fact that (5) would probably be considered literal and (6) would probably be considered metaphorical.

Carston's (2002) ideas on ad hoc concepts furnish relevance theory with a psychologically realistic model of lexical semantics and pragmatics, which is important for an online theory of metaphor (see Rubio Fernandez, 2007). However, there are still two weak spots in the theory. The first one concerns the specific details of how we form ad hoc concepts or more particularly, how we loosen or narrow lexical concepts into ad hoc concepts (but see Rubio Fernandez, 2007 for psycholinguistic studies on different patterns of suppression in metaphor comprehension). The second weak spot concerns the ignorance of a wider network of metaphorical expressions and conceptual metaphors. Without using notions such as conceptual metonymy and metaphor it would have been very hard to explain how the ad hoc concepts in (5) and (6) could have been created.

Relevance theorists argue that the processes involved in metaphor processing are not special in any way. However, this claim does not automatically imply that metaphorical expressions are understood as quickly as are other types of expressions. In fact, a few scholars working within the relevance-theoretic framework insist that there must be extra processing associated with understanding a well-chosen metaphor. Very often the underlying idea is that metaphors communicate additional cognitive effects, which require additional processing effort. Noveck et al. (2001) present results from a reading-time study which indicated that reading speed of referential metaphors (e.g., ''All toads to the side of the pool'') increased with age, and that sentences containing metaphors were read more slowly than those containing the non-figurative control expressions (e.g., ''All children to the side of the pool''). Noveck et al. interpret these results as demonstrating that there is an extra cost associated with processing metaphor. Noveck et al. did not establish if additional benefits are the result of the extra cost in understanding referential metaphors over synonymous expressions, although it seemed as if the adults inferred the referent a little more successfully having read the metaphorical expressions. More generally, Noveck et al. argue that previous experimental studies showing faster reading times for metaphors than for nonmetaphoric control expressions can be traced back to rich contexts priming the readers' understanding of metaphoric phrases, but not of nonmetaphorical control statements. In summary, Noveck et al. say, ''The work reported here shows that metaphors can be seen to be costly in contexts that are arguably neutral otherwise'' (Noveck et al., 2001: 119).

Gibbs and Tendahl (2006) questioned the generality of Noveck et al.'s experimental findings, and their conclusions about metaphor processing in neutral contexts. First, Noveck et al. only compared non-metaphorical referring expressions (e.g., ''All children to the side of the pool'') against metaphorical referring expressions (e.g., ''All toads to the side of the pool''), the latter of which both picks out a referent and expresses a property attribution, unlike the first expression which is only referential. It may indeed take extra time to pick out a referent and make a property attribution while achieving additional cognitive effects. Yet metaphorical referring expressions are not representative of the kinds of metaphors studied in most linguistic and psycholinguistic studies. In fact, as mentioned above, many psycholinguistic studies show that metaphors can be processed as quickly, or even more quickly, than their so-called nonmetaphorical equivalents. Furthermore, most experimental studies comparing figurative and nonfigurative language processing take care that metaphoric and literal expressions are roughly equally appropriate in the contexts in which they are seen (Gibbs, 1994). At the same time, the contexts in which

metaphors normally appear are not neutral, but include many related metaphorical words and concepts. We know that people use their metaphorical understanding of texts to process the verbal metaphors presented in these texts (Albritton et al., 1995; Pfaff et al., 1997). We argue that these findings, which are often used to support the importance of conceptual metaphors in processing verbal metaphors, are not at all inconsistent with the general claims of relevance theory. After all, the metaphorical concepts that have been activated when reading texts set up expectations of relevance. These expectations enhance people's immediate processing of appropriate verbal metaphors and reduce their processing effort.

We contend that (a) metaphors do not necessarily take additional effort to process in neutral contexts, (b) the idea of a neutral context is very problematic anyway and (c) novel metaphors may be understood especially fast in contexts that set up expectations of particular kinds of metaphorical statements.

Within relevance theory, Sperber and Wilson argue, ''that the search for the interpretation on which an utterance will be most relevant involves a search for the context which will make this interpretation possible'' (Sperber and Wilson, 1982: 76). It is not just the context which influences the understanding of utterances, but expectations of relevance together with utterances may also determine the context we incorporate into our interpretation endeavours. More generally, the overall interpretation process is guided by a mutual adjustment of expectations of relevance, the context and the utterance.

Relevance theory also makes suggestions about the mechanisms involved in selecting an appropriate context. The initial context usually consists of the proposition that has been processed most recently, because this context is directly accessible and rather small. Speakers, however, can deliberately or accidentally design their utterance so that sufficient relevance is not immediately achieved. Then the hearer has to extend the context by accessing memories of earlier discourse or preceding deductions, by accessing encyclopedic information attached to concepts or by incorporating information received from sense perception (Wilson and Sperber, 1986). The type of discourse may influence a hearer's willingness to extend the context. For example, in a usual conversation, the duration of the actual utterance limits the processing time, whereas readers of a sacred text devote much more time and processing effort (see Goatly, 1997, for suggestions on how relevance theory offers insights on the trade-off of cognitive effort and effects for different types of text).

According to relevance theory, cognitive effects are achieved by one of the following three types: (1) new information provided by a contextual implication, (2) strengthening of an existing assumption, and (3) a contradiction and possible elimination of an existing assumption. How might these different cognitive effects be manifested with metaphor? One experimental study investigated people's understanding of metaphorical statements, like ''Lawyers are also sharks'' in contexts where a speaker provided new information by using the metaphor, strengthening an existing assumption, and contradicting an existing assumption (Gibbs and Tendahl, 2006). Each of these different meanings is related to the basic metaphorical understanding of the comparison between ''lawyers'' and ''sharks.'' But the cognitive effects one draws from reading this metaphorical utterance in the three contexts nevertheless differ quite a bit. The findings from this study indicated that college students are quite capable of understanding the general metaphorical meanings of the speakers' final expressions, as well as recognizing that these metaphors convey additional cognitive effects that differ across the three types of contexts. A second study in this series examined the speed with which people read these metaphors in the three types of context (Gibbs and Tendahl, in preparation). Participants read these stories one line at a time on a computer screen, pushing a button once they had read and understood each statement. The results showed that people took

significantly longer to read the metaphors in the contradictory contexts (1939 ms) than they did either in the strengthening (1717 ms) or contextual implications (1709 ms) contexts.

These new experimental results are both interesting and important. They provide empirical support for relevance theory's assertion that context critically determines cognitive effort and effects. Of course, the rating task does not cover an exhaustive test of the different cognitive effects that participants may receive in response to the different metaphors and different contexts. However, the results clearly indicate that the cognitive effects of metaphors vary widely according to the context, and specifically show an increase in the cognitive benefit of metaphors from strengthening, via contextual implication to contradiction contexts. At least in this case, there is a strong association between understanding more complex cognitive effects for a metaphor and the time needed to understand those meanings.

In summary, conceptual metaphor theory provides many valuable insights concerning the sort of assumptions we have available when interpreting metaphorical utterances and relevance theory emphasizes the fundamental importance of the context in utterance interpretation. However, it has not yet tried to systematize the information we have available when we interpret metaphorical utterances. Blending theory can be compared to relevance theory in its focus on contextual issues, although Coulson (2001: 37) seems to understand relevance theory in a different way. Coulson assumes that relevance theory is representative of a group of theories positing "a firm distinction between the computation of literal and nonliteral meaning." But as we explained above, Sperber and Wilson claim that the interpretation mechanisms for literal and nonliteral utterances are the same. Furthermore, the logical form in relevance theory can perhaps roughly be compared with the mapping schemes in blending theory. Particular configurations of the logical form call for particular contextual saturation and enrichment just like particular triggers in an utterance open up particular frames leading to frame shiftings and special mapping schemes. Both theories contend that the linguistic form of an utterance does nothing more than provide us with clues about where we should look for conceptual content and how we should process this content.

4.5. Metaphor and idioms

The topic of idiomaticity has always been of interest to metaphor scholars, but often for very different reasons. Traditional accounts of idiomatic phrases, such as "kick the bucket," "spill the beans," and "blow your stack," assume that their figurative meanings arise from forgotten historical reasons such that these phrases now exist as static, frozen dead metaphors in our mental lexicons. But cognitive linguistic research has argued that many idioms have specific figurative meanings that are partly motivated by people's active metaphorical knowledge. For example, the idiom "John spilled the beans" maps our knowledge of someone tipping over a container of beans to that of a person revealing some previously hidden secret. English speakers understand "spill the beans" to mean "reveal the secret" because there are underlying conceptual metaphors, such as THE MIND IS A CONTAINER and IDEAS ARE PHYSICAL ENTITIES, that structure their conceptions of minds, secrets, and disclosure (Gibbs, 1994; Lakoff and Johnson, 1980). Even though the existence of these conceptual metaphors does not predict that certain idioms or conventional expressions must appear in the language (e.g., that we have the expression "spill the beans" as opposed to "spill the peas"), the presence of these independent conceptual metaphors by which we make sense of experience partially explains why specific phrases (e.g., "spill the beans") are used to refer to particular events (e.g., the revealing of secrets).

The cognitive linguistic perspective on idioms has served as the basis for a large body of work in experimental psycholinguistics that demonstrates how conceptual metaphors serve as partial

motivation for how people learn, produce, and understand many idioms (Gibbs, 1994; Gibbs et al., 1997a). Thus, people appear to use their tacit knowledge of conceptual metaphors as underlying motivations for why various idioms have the figurative meanings they do, but also may recruit conceptual metaphors during their immediate processing of some idioms. As mentioned earlier, it is not yet clear whether people necessarily interpret the meanings of idioms online by virtue of the associated conceptual metaphor(s), or whether these metaphorical chunks of knowledge are activated simply because they are passively linked to certain conventional metaphorical expressions. Nonetheless, there is a significant body of work suggesting that most idioms are not understood as dead metaphors, and have meanings that are understood in relation to active conceptual metaphors.

The cognitive linguistic view of idioms also assumes that idioms are partially analyzable, with the figurative meanings of the parts making some contribution to the metaphorical meaning of an entire phrase (Gibbs, 1994). People readily infer, for instance, that the ''spill'' of ''spill the beans'' refers to revealing something with ''beans'' referring quite specifically to some individuated idea or set of ideas. The analyzability of idioms allows some of these phrases to be lexically and syntactically productive to varying degree, and experimental research also suggests that the more analyzable an idiom is the more likely it is motivated by widely held conceptual metaphor (Gibbs, 1994). Idioms that are less analyzable, such as ''kick the bucket,'' tend to express figurative meanings (e.g., to suddenly die) which reflect metonymic relationships that are no longer part of speakers' contemporary understandings.

A relevance theory view of idiom processing assumes that idioms are processed just like any other linguistic expression where listeners seek to find optimally relevant interpretations following a path of least effort (Vega-Moreno, 2004). Consider the expression ''I cannot stand the way my boyfriend is tied to his mother's apron string.'' According to relevance theory, listeners take the encoded concept TIE, and loosely understand that as denoting a process by which some degree of attachment is involved. This ad hoc concept is then continuously adjusted given whatever new information arises as the rest of the utterance is interpreted following a path of least effort in deriving explicatures and implicatures. At some point, the concept encoded by the idiom string as a whole (i.e., tied to one's mother's apron string) is accessed from memory, although exactly when this occurs is unclear within relevance theory. One of the implications of this concept is inferred as a clue to the speaker's meaning, such as for example that someone who is associated with the property of being tied to one's mother's apron string is too close to his mother and not independent enough for his age, etc. This interpretation may be further expanded, again following the path of least effort, to understand that the boyfriend is immature and that the speaker is unhappy with the situation. Under this view, processing of the encoded concept TIE, which is broadened into the ad hoc concept TIE*, is an important part of idiom understanding, and not something that interferes with inferring figurative meaning.

The relevance theory view of idiom processing also aims to describe people's processing of idiom variants. Consider the expression ''I think his father must have pulled a few political strings to get him out of jail.'' Understanding this expression requires that the encoded concepts of PULL and STRING, as well as FEW and POLITICAL, be used as input for interpreting the speaker's message. This results in an adjustment process that lead to the derivation of a few strong implicatures (e.g., Tom's father helped get him out of jail), and several weak implicatures (e.g., some political influence was employed to free Tom, that Tom's father knew influential people, that the procedure by which Tom got out of jail was not completely ordinary or perhaps legal). Once more, the construction of ad hoc concepts online gives rise to an optimally relevant interpretation and not just the set of encoded concepts or those encoded by the original idiom.

This account does not suggest that the literal meaning of an idiom is ever fully derived (i.e., the summation of all the encoded concepts encountered), but only that some highly accessible assumptions from the encyclopedic entries of encoded concepts are processed online by following a path of least effort in deriving implications. Moreover, idiom processing differs, depending on the examples, to the extent that the encoded concepts make contributions to an expression's overall figurative meaning. For instance, the main verbs in ''promise the moon'' and ''start from scratch'' act as strong clues to these idioms' meaning, while the verbs in ''pull strings'' and ''pluck up your courage'' involves words being used literally, while others, such as the main verbs in ''have one's foot in the grave'' and ''put one's feet in one's mouth'' having to be pragmatically encoded in every context, regardless of whether they are seen in literal or idiomatic situations.

Finally, one beauty of the relevance theory account is that by following a path of least effort, listeners need not always derive fully fleshed interpretations of idioms. In many instances, a listener will infer sufficient figurative meanings and implications that make a speaker's utterance optimally relevant with little effort. For example, people may easily understand that ''blow your stack'' means ''to get very angry'' without inferring additional cognitive effects related to the underlying conceptual metaphor ANGER IS HEATED FLUID IN A CONTAINER, such as that the cause of the anger was internal pressure and that the exhibition of anger was involuntary and violent (Gibbs, 1992). People can infer these cognitive effects in particular situations, but relevance theory provides a mechanism to suggest when certain meanings will not be inferred because what has been understood met a criterion on being optimally relevant. Obviously, the more familiar one is with an idiom, and the greater the contextual cues, the less processing effort needed to understand an idiom.

The relevance theory account also explains why some idiom variants are acceptable and others are not. An utterance is deemed optimally relevant if the amount of effort put into its processing is offset by additional cognitive effects. To the extent that some idiom variants do not provide easily describable cognitive effects derivable from the original idiom, the less likely it will be seen as acceptable in context. Consider the difference between ''Many strings were pulled but he was not elected'' and ''He had many feet in the grave when I saw him.'' For the first example, the quantification of ''strings'' offers new cognitive effects (i.e., that many connections were established) not seen in the original idiom. But the quantification of ''feet'' in the second example makes little sense and offers no new cognitive effects over what could be derived from the original idiom. Thus, idiom variants are capable of revitalizing the metaphorical nature of idioms, and can convey new strong and weak implicatures.

Overall, research on idiomaticity in cognitive linguistics and relevance theory are motivated by different concerns. Cognitive linguistic theory aims to explain why certain idioms come into being and typically convey some of the metaphorical meanings they do, while relevance theory provides more details on the specific cognitive effort and effects involved with understanding idioms and their variants. We see no reason why aspects of both approaches cannot be readily combined to determine the conceptual and communicative forces behind the creation and use of idioms, why idioms have the specific lexical and syntactic properties they do, and how the specific pragmatic meanings of idioms are communicated in context.

4.6. Metaphor and polysemy

Metaphor and polysemy are related because many words with multiple linked meanings include conventional metaphorical senses. For instance, the statement ''I see the point of your argument'' employs the word ''see'' in a metaphorical way. The question is whether people

typically understand this expression by accessing the metaphorical meaning from an established network of senses, or do they initially understand some underdetermined sense for ''see'' and then elaborate upon this using pragmatics.

Cognitive linguists are generally more inclined towards a network account of polysemy. Under this view, the meanings of polysemous words may be organized as radial categories, family resemblance structures, or lexical network that may possibly serve as models for the internal mental lexicons of individual speakers (Brugman and Lakoff, 1988). Within such network structures the senses of polysemous words are related to one another according to a variety of cognitive principles (e.g., metaphor, metonymy, and generalization) such that the meanings of polysemous words are, at least, partly motivated (Lakoff, 1987; Taylor, 1995). Often, image-schemas are thought to underlie the meanings of many senses of polysemous words.

Although cognitive linguistic proposals about polysemy may have important relations to both the intuitions and mental representations of ordinary speakers, it is not immediately obvious that linguistic analyses of polysemy are directly relevant to understanding the psychology of word meaning. A few cognitive linguists suggest that some proposals on polysemy are more reflective of what linguists think, or believe, than they are representative of the linguistic behaviour of ordinary speakers (Evans, 2003; Sandra and Rice, 1995). One challenge for cognitive linguistics, and psycholinguistics, is to distinguish between a theory of how people's beliefs and experience motivate the meanings of polysemous words from a theory of how people immediately process polysemy in context. For instance, some network models of polysemous words posit complex networks with over 100 supposed, related senses (connected by a variety of metaphoric, metonymic, and other links). Should we assume that when a person hears a preposition such as ''over'' that he or she will activate all 100 plus senses? Many psychological models of word processing (e.g., multiple-access models) would have to assume an initial activation of all a word's senses. Or is only some part of a network activated (i.e., the contextually appropriate part)? Or might people simply construct online sense interpretations without activating any kind of lexical network? The possibility that people create appropriate meanings online without simply activating all or part of some pre-existing network must be seriously considered. Most generally, linguists and psychologists studying polysemy must not automatically assume that the elaborate network models of polysemy necessarily reflect what is actually in speakers' heads or that language is something entirely removed from other cognitive processes. It might be quite difficult to design appropriate experiments to answer some of the specific questions many cognitive linguists ask about polysemy (e.g., Are words represented in terms of lexical networks or as abstract, monosemous items?), primarily because some theoretical positions seem inherently unfalsifiable, as mentioned above.

Relevance theory assumes that the meanings of allegedly polysemous modals are stored as highly abstract entities with their contextually appropriate meanings only being derived in context using the principle of relevance (Groefsema, 1995; Papafragou, 2002). For instance, studies of English modals suggests, contrary to some cognitive linguistic analyses, that the root and epistemic meaning of modals like ''can,'' ''may,'' ''will'' and ''should'' can be explained by a univocal semantic analysis, with the principles of relevance providing the rationale for contextually different meanings of these words. But more recently, Carston (2002: 219) notes that she is ''uneasy with the assumption that a monosemous analysis is always preferred to a polysemous one,'' because ''it might well be economical to retrieve a clutch of stored senses and choose among them, than to construct an interpretation out of a single sense and contextual information, guided by principles of rational discourse.'' We agree with this scepticism. Beyond

this concern, there is the central problem for monosemy views to even find abstract core meanings of polysemous words. Often it is not possible to find a common and abstract core meaning. For instance, some advocates of the monosemy view admit that the similarity that supposedly exists between all the physical and nonphysical senses of many words is so abstract as to be semantically unspecifiable (Ruhl, 1989). Some scholars accept as a matter of faith the idea that such abstract relations exist and, for the purposes of theories of mental representation, are actually encoded as part of a speaker's knowledge of the meanings of polysemous words. Unfortunately, this view is inherently unfalsifiable in that there is practically no way of testing this theory against alternative possibilities.

Both cognitive linguists and relevance theorists could be right in their ideas about polysemy, but for different reasons. For instance, words may be pointers to conceptual spaces, as Carston (2002) suggests. In addition, conceptual space contains information about conceptual metaphors or image metaphors relating different meanings of a word. Consider the expressions ''I see_1 a tree'' and ''I see_2 what you mean.'' Very obviously 'see_1' refers to the perceptual domain of VISION and 'see_2' refers to the epistemic domain of UNDERSTANDING. The way we see it (pun intended) is as follows: in a situation biasing the listener towards SEE_1 we have direct access to SEE_1 and in a situation biasing the listener towards SEE_2 we have direct access to SEE_2. This seems totally obvious when SEE_2 has become an entrenched meaning of the word 'see'. SEE_1 and SEE_2 are related by the conceptual metaphor UNDERSTANDING IS SEEING, but in this case we are not sure whether the conceptual metaphor has to be active in the online interpretation of an utterance of 'see' or whether it just motivates the relation between SEE_1 and SEE_2, but is not necessarily active in the online comprehension of 'see_2'.

Even If SEE_2 is not an entrenched meaning of 'see', we believe that the listener can first access SEE_2 under the condition that the context favors a domain containing SEE_2 (the domain of UNDERSTANDING). As the conceptual metaphor UNDERSTANDING IS SEEING is part of our conceptual system and the context has already activated the domain of UNDERSTANDING and because SEE_1 is an element of the domain of VISION, we can assume that the conceptual metaphor is directly activated and in particular that a mapping between the two concepts SEE_1 and SEE_2 is created. This mapping is activated unconsciously and automatically in the right context and it supports our understanding of SEE_2.

The relation between SEE_1 and SEE_2 can also be created if the hearer does not even have a pre-existing concept SEE_2, given that the context puts the word 'see' into the domain of UNDERSTANDING rather than VISION. If the hearer cannot find a pre-existing concept SEE_2 in the domain of UNDERSTANDING, then the metaphorical relation to the domain of VISION helps by using our knowledge of SEE_1 in the source domain of VISION in order to create SEE_2 in the domain of UNDERSTANDING. Many studies have shown that conceptual metaphors can be active in the online interpretation of utterances and in the creation of meaning. The only approach that can sensibly formalize such a view of polysemy is a hybrid theory integrating relevance theory, being responsible for the selection processes, with cognitive linguistics, being responsible for the make-up of the conceptual spaces (see Tendahl, 2006).

In summary, the intended meaning of a polysemous word can possibly be directly accessed when this word is seen in an appropriate pragmatic context. The word points to a conceptual space that may contain several domains. If the mapping between the word and the intended concept is not fully entrenched, then a conceptual metaphor can lead to the right understanding of the polysemous word.

4.7. Metaphor and metonymy

Metonymy typically refers to linguistic statements in which one well understood or easily perceived aspect of something is used to represent or stand for the thing as a whole. Consider the following set of statements:

"Washington has started a new war in Iraq."
"The White House isn't saying anything."
"Wall Street is in a panic."
"Hollywood is putting out terrible movies."
"Paris has dropped hemlines this year."

These examples are not isolated expressions, but reflect the general principle by which a place may stand for an institution located at that place. Thus, a place like "The White House" stands for an institution located at that place, namely the United States presidency. Cognitive linguistic studies have suggested that various metonymic models in our conceptual system underlie the use of many kinds of figurative expressions (e.g., THE PLACE FOR THE INSTITUTION LOCATED AT THAT PLACE, OBJECT USED FOR USER, CONTROLLER FOR CONTROLLED, THE PLACE FOR THE EVENT) (Panther and Radden, 1999; Panther and Thornburg, 2003). Within cognitive linguistics, metonymy is viewed as a kind of domain highlighting, while metaphor is characterized as a form of domain mapping. For instance, the domain matrix of "book" comprises the domains of physical objects, artifacts, authorship, reading, etc., and a speaker may highlight any one of these domains in the domain matrix (e.g., "Proust is a fat book," "Proust is difficult to read," "Proust is out of print"). Similarly, the domain matrix of "trumpet" comprises the domains of sound as in "We all heard the trumpet," or the domain of the player as in "The trumpet could not come today."

There is much debate over the relation between metonymy and metaphor (Barcelona, 2000; Croft and Cruse, 2004; Dirven and Pörings, 2002), and there is much discussion within cognitive linguistics of the complex ways that metaphor and metonymy interact. To take one example, Radden (2000) suggests that there are four different types of metonymic bases for metaphor: (1) a common experiential basis, (2) an implicative basis, (3) a category basis, and (4) a cultural model basis.

A common experiential basis of two domains consists of a correlation between the domains on the complementarity of two counterparts. Conventional metaphors that have a metonymic basis include MORE IS UP, IMPORTANT IS BIG, and SIMILARITY IS CLOSENESS (e.g., "close to the truth"). Complementary elements include concepts such as love and unity or body and mind, as in LOVE IS A UNITY and THE MIND IS A BODY.

Implicature gives rise to many extensions, such as seeing something and then knowing it, which motivates the metaphor KNOWING IS SEEING. A more common implicature is the link between a place and an activity performed at that place, which gives rise to metonymic-based metaphors PURPOSES ARE DESTINATIONS, such as "go to church," and "go to bed".

Category structure decides the relationship of inclusion that is exploited in metonymy so that a member of the category may stand for the whole category (e.g., pill for birth control pill). This relationship is exploited as metaphorization processes as when to have something to say in which one form of communication (e.g., saying) stands for the communication of one's opinion.

Finally, cultural models are manifested in various ways by which people understand the model. One such model conceives of physical forms as having internal force or impetus on

objects. Thus, FORCE is metonymically seen as A SUBSTANCE CONTAINED IN CAUSES (e.g., ''His punches carry a lot of force''). The best-known cultural model is the conduit metaphor.

In contrast to the plethora of studies on conceptual metaphor, there are virtually no experimental studies that have explicitly attempted to find evidence on the role of conceptual metonymies in figurative language processing. But some cognitive linguists have explored ways of integrating cognitive linguistic claims about the conceptual nature of metonymy with pragmatic knowledge to explain various kinds of figurative meaning construction. For instance, Panther and Thornburg (2003) claim that metonymy provides what they refer to as ''natural inference schemes,'' because these schemas reflect recurrent, entrenched conceptual mappings. Conceptual metonymies, such as PART FOR WHOLE, CAUSE FOR EFFECT, PERSON FOR ROLE, and REPRESENTATION FOR REPRESENTED, are not just used in inferential communication, but are ''vital relations'' underlying reasoning. Conceptual metonymies reflect an intermediate level of inferential reasoning, precisely because they are sufficiently abstract to serve a wide variety of inferential situations, and yet are specific enough to provide detailed accounts of meaning construction in specific contexts of language use. They determine both explicit meaning (i.e., explicatures) and implicit communication (i.e., particularized conversational implicatures). Various studies explore the ways that conceptual metonymies constrain pragmatic functions such as the referential, predicational, and illocutionary levels of speech acts, as well as shape the organizational content of the mental lexicon, interact with grammatical structure, and are employed in the creation of novel pragmatic meaning (Panther and Thornburg, 2003).

A similar integration of conceptual and pragmatic information may shape metonymy processing (Gibbs, 2007). For instance, the simple expression ''Bush invaded Iraq'' may immediately evoke several different conceptual metonymies such as PERSON-FOR-NATION, PERSON-FOR-EVENT, or PERSON-FOR-PLACE. Which one of these provides the most optimally relevant, and contextually appropriate reading will be constrained by a variety of pragmatic factors, including whether the expression was encountered in a news story, a political commentary, or in answer to the question during a political debate ''Who's responsible for the tragedy in Iraq these days?'' The ad hoc construction of Bush referring to the person primarily responsible for the United States invading Iraq in the most recent Gulf war is not accomplished by the activation of a single conceptual metonymy, but through pragmatic adjustment regarding several possible conceptual metonymies.

Moreover, the conceptual prominence that the metonymic target ''Bush'' has in a discourse situation is not just due to the activation of some conceptual metonymy, but is more precisely shaped by how the pragmatics at hand supports optimally relevant readings (with these being constrained by the principle that utterance interpretation is guided by a trade-off of maximizing cognitive effects while minimizing cognitive effort) (Sperber and Wilson, 1995). For instance, if the expression ''Bush invaded Iraq'' is given as a reply to the question ''Who's responsible for the tragedy in Iraq these days,'' the metonymic reading of ''Bush'' will highlight President Bush's individual role in initiating the Iraq war. In a different context, such as when two people are describing the role that various nations had in the Iraq war, the statement ''Bush invaded Iraq'' will highlight Bush as standing for the United States and perhaps decrease President Bush's individual culpability in waging the Iraq war.

Papafragou (1996) analyzes metonymies as optimally relevant ways of identifying referents and therefore metonymies are means of fleshing out logical forms into explicatures. Papafragou shows how relevance theory can solve problems in the comprehension of metonymies that no

other theory can cope with. Consider the sentence ''The saxophone could not come to London for the VE anniversary'' (Papafragou, 1996: 184). This utterance can only make sense if the subject noun phrase refers to a human being, however, it would not make sense if it was Bill Clinton that this noun phrase refers to. Papafragou argues that this is because 'the saxophone' must be the most relevant information the speaker and hearer have about the referent. If Bill Clinton was the saxophone player, then this condition would not be fulfilled, as there would be more relevant ways of referring to Bill Clinton. Thus, metonymies are generally supposed to simplify the identification of referents. In addition, metonymies can also lead to greater cognitive effects. To display this feature, Papafragou considers ''Peter finally married the free ticket to the opera.'' Here the metonymy is not merely used as a referring expression, but it also communicates that the speaker dissociates himself from the fact that Peter only married his wife, because she gets free tickets to the opera. In passing Papafragou (1996) also shows that metaphors used for referring purposes (e.g., 'My tender rosebud left me.') also contribute to the explicature of the utterance. The classical relevance theory approach would have been to say that metaphorical meaning is always communicated via implicatures. These ideas on metonymy are largely compatible with cognitive linguistic approaches to metonymy. Ruiz de Mendoza Ibáñez and Pérez Hernández (2003), for example, also show how domain mappings and domain highlighting can constrain the formation of explicatures and lead to further implicatures. Even Wilson and Carston (2006) acknowledge the possibility that the accessibility of conceptual metaphors may lead to greater accessibility of contextual assumptions and thereby may contribute to a reduction of processing effort.

To some extent, the work on metonymy, especially within some areas of cognitive linguistics, represent the exact sort of complementary thinking, utilizing concepts from both cognitive linguistics and contemporary pragmatic theory, such as relevance theory, to offer a more sophisticated theory of metonymy understanding than is provided by either theoretical perspective alone.

4.8. Metaphor acquisition

The question of how and when we acquire the ability to process metaphor in thought and language is another issue that is part of a complete theory of metaphor. Cognitive linguists assume that early metaphor development is primarily based on correlations in embodied experience. For instance, Johnson (1999) proposed a theory of conflation and deconflation to account for young children's misunderstanding and eventual understanding of certain metaphorical utterances. Thus, young children, even infants, experience a positive correlation between sensorimotor experience and subjective emotions. A child may experience a correlation between affection and the feeling of warmth from being held closely to parents and caretakers. At first, the domains of affection and warmth are undifferentiated, but over time become deconflated yet still retain a link that forms the experiential basis for primary metaphors. To take another example, children may first have an undifferentiated understanding of seeing something and knowing it, yet over time deconflate these two domains, which nonetheless remain linked as a strong correlation in experience that underlies the primary metaphor KNOWING IS SEEING.

Gibbs (1994, 2006a), Gibbs and Colston (1995) describes evidence from experimental and developmental psychology that is consistent with the idea that (a) very young children possess a rudimentary ability to draw cross-domain mappings, (b) that young children's emerging image-schemas underlie many aspects of concept acquisition, and (c) that children learn the meanings of conventional metaphorical phrases faster when these are motivated by widely known conceptual

metaphors than when such phrases are not related to metaphorical schemes of thought. More recent studies show that children generally learn the meanings of metaphorical expressions that are tied to primary metaphors earlier than they do expressions that are based on novel metaphorical mappings (Siqueira, 2005). Other empirical research shows that non-native speakers better learn and retain the meanings of idiomatic phrases when they are alerted to the conceptual metaphors motivating these expressions (Boers, 2000; Kövecses and Szabó, 1996). These various experimental studies highlight the importance of embodied experience in children's metaphor acquisition, although this fact alone cannot account for all aspects of metaphor development.

Relevance theory suggests that metaphor acquisition is best understood in terms of a child's developing theory of mind and metarepresentational abilities. For example, people who have a theory-of-mind impairment, most notably autistic people, cannot communicate in normal ways because they cannot take into account speakers' intentions (Happé, 1995; Happé and Loth, 2002). Although autistic individuals may be able to use language as a code, this form of communication cannot be compared to the degree of creativity that normal interlocutors put to use even in very ordinary interchanges, not to mention in figurative uses of language. Understanding metaphor requires that individuals form first-order representations while understanding ironic statements demand that a higher-order metarepresentation inference be drawn (i.e., a representation about another representation such as a thought about a thought, a thought about an utterance, an utterance about a thought). In fact, studies show that autistic children, especially those diagnosed with Asperger's Syndrome, a milder form of autism, are able to form first-order metarepresentations and are able to understand metaphors, but not ironic utterances that again demand a second-order metarepresentational inference. Psycholinguistic studies with normal adults show that people draw metarepresentational inferences when understanding irony, but not metaphor (Colston and Gibbs, 2002).

As the ability to use metaphors seems to require the ability to form at least first-order metarepresentations, it has often been claimed that our acquisition of metaphors runs parallel to a more general acquisition of a theory of mind. This would mean that normally developing children acquire metaphors during their fourth year (Bezuidenhout and Sroda, 1998; Happé, 1995; Happé and Loth, 2002). But there is other evidence to suggest that very young children have the ability to draw certain cross-domain mappings, and even understand simple primary metaphors (Gibbs, 1994; Siqueira, 2005). Thus, the ability to solve sophisticated theory of mind tasks may not be a prerequisite to using and understanding some aspects of metaphoric language. Furthermore, some scholars claim that children possess the ability to form metarepresentations in communication they acquire the ability to form metarepresentations in other domains (see Happé and Loth, 2002; Bezuidenhout and Sroda, 1998; Sperber, 2000). This too suggests that children may be able to learn metaphor before they can cope with tasks from other domains that require more sophisticated mind-reading skills.

Whereas cognitive linguists have focused on the connections between the acquisition of metaphors and the refinement of conceptual categories in a child's development, relevance theorists have concentrated on children's ability to read minds. It seems as if the types of metaphor that cognitive linguists and relevance theorists have looked at with regard to metaphor acquisition are quite different. Cognitive linguists have predominantly studied how children learn to deconflate conceptual domains and retain connections between the domains that constitute very basic conceptual metaphors. Relevance theorists, in contrast, have studied how children can realize that the main relevance of an utterance lies in a number of weak implicatures. These weak implicatures are dependent on the ability to read the speaker's mind and therefore the

understanding of metaphors is a consequence of a sufficiently developed theory of mind. Perhaps a developing theory of mind is even the driving force for children to deconflate domains, because acquiring a more sophisticated ability to take into account speakers' intentions may lead to the child's insight that its conceptual system is too crude.

5. Making new connections

We do not expect that cognitive linguists and relevance theorists working on metaphor will necessarily agree with our evaluations or our desire to integrate aspects of these two theories. Both cognitive linguistics and relevance theory can continue to make major contributions to the study of metaphor through expansion of their respective research agendas without seeing any need to integrate their complementary perspectives. Yet our hope is that some metaphor researchers will attempt to establish links between the two theories in regard to metaphor and not view the decision to primarily adopt one approach as necessarily implying a rejection of the other. In this spirit, we offer some vague and concrete recommendations for using the best of cognitive linguistic and relevance theory ideas to advance a more comprehensive cognitive theory of metaphor.

Our first recommendation is that metaphor scholars working within each respective framework explicitly address how their various empirical analyses fit, or do not fit, with the assumptions of the other view. Thus, all metaphor scholars should ask is whether there is something unique about their analyses, do they make empirical predictions similar to or different from other theoretical perspectives, and to overtly state why it is that ideas from another perspective may or may not be useful in creating a more comprehensive theory of metaphor. One example of this suggestion refers to claims from conceptual blending accounts that certain blending processes should occur at certain points during metaphor interpretation, a hypothesis that emerges from detailed analysis of the possible blending operations that are needed to fully explain the meanings of individual metaphorical expressions. And indeed, as (Coulson, 2001; Coulson and Van Petten, 2002) has demonstrated in studies measuring the brain's evoked potentials during metaphor comprehension, there appears to be some empirical support for the general claim that blending operations may be mentally effortful. But this sort of empirical result may also be completely consistent with alternative or complementary theories. For instance, relevance theory's basic claim that inferring important cognitive effects, including both strong and weak implicatures, will often be associated with greater cognitive effort, with the trade-off between maximizing cognitive effects while minimizing cognitive effort being determined by the communicative principle of relevance. The important point here is that the same empirical result may be entirely consistent with different theories, and that alternative, complementary perspectives should always be considered as part of any metaphor research program.

Related to this first suggestion is a strong recommendation that metaphor theories aim to articulate falsifiable hypotheses about the role of unconscious conceptual knowledge in metaphor interpretation. Thus, each speculative possibility mentioned (e.g., a particular blending or conceptual metaphor account of how conventional metaphors are understood) should, in principle, be capable of being disproved. Introspective analyses of the sort provided by linguists are quite limited if they cannot be tested through some means, and indeed possibly shown to be false (Gibbs, 2006d). By trying to disprove a theory, and failing to do so, this leads to a tentative acceptance of the idea as having a reasonable degree of empirical support. In combination with the testing of one's own theory against competing and complementary alternatives, formulating falsifiable hypotheses is the best way for any proposal on metaphor to gain wider acceptance within the broad interdisciplinary metaphor community.

We also maintain that situating cognitive theories of metaphor within the context of psychological findings is critical to establishing the validity of any theory. Cognitive linguistics and relevance theory do this to some extent, but in different ways. Cognitive linguists typically cite confirming evidence from psycholinguistics as providing additional support for their views. Relevance theorists, especially most recently, have tried to encompass psychological findings that were originally obtained for completely different theoretical reasons, and make a greater effort to indeed showing the relevance of this perspective for ongoing empirical research in psychology (e.g., Carston, 2002; Wilson and Carston, 2006). Our hope is that the large psychological literature on metaphor will be better utilized in creating comprehensive, cognitive theories of metaphor.

More specific recommendations for drawing connections between cognitive linguistics and relevance theory focus on the role of world/encyclopedic knowledge in metaphor interpretation. A key question here is how the activation of conceptual metaphors constrains the ongoing maximization of cognitive effects and the minimization of cognitive effort when metaphorical language is being processed and interpreted. Conceptual metaphors should be considered as parts of our cognitive environments and may become strongly manifest if either the source domain or the target domain has been activated. A domain may be activated, if a salient element of the domain has been activated.

In fact, Ruiz de Mendoza Ibáñez and Pérez Hernández (2003) have put forward a suggestion about how explicatures and implicatures are derived on the basis of salient conceptual metaphors and metonymies in specific cognitive environments. They stress the fact that the principle of relevance determines which of the licensed explicatures are finally communicated. For example, Ruiz de Mendoza Ibáñez and Pérez Hernández (2003: 32–33) discuss the example ''You're going nowhere that way,'' which may communicate the following explicatures:

(a) 'The addressee is not going to achieve his expected goals (if he persists in his behaviour).'
(b) 'The addressee is not making any progress in life.'
(c) 'The addressee may make progress if he changes his way of doing things.'
(d) 'The addressee is acting in an erroneous way.'
(e) 'The addressee may not have clear goals.'
(f) 'The addressee has erroneous goals.'

Ruiz de Mendoza Ibáñez and Pérez Hernández argue that these explicatures are all based on the JOURNEY metaphor and its associated PATH schema and that the principle of relevance determines that (c)–(f) would be typically analysed as implicatures. However, because these propositions are direct elaborations of what is said and because no extra contextual information other than knowledge about the JOURNEY metaphor and the linguistic utterance itself is required, they argue that these propositions are in fact explicatures. At the same time, the principle of relevance offers a motivated explanation for which of the above-identified meanings may actually be inferred in understanding. Depending on the discourse situation, and what is most accessible from the cognitive environment, processing of ''You're going nowhere that way'' will be limited to the extent that listeners infer sufficient cognitive effects while minimizing cognitive effort. If the conceptual metaphor LIFE IS A JOURNEY is especially salient in context, and part of the cognitive environment in which the metaphorical statement is presented, then it will surely facilitate the rapid drawing of many relevant cognitive effects. If LIFE IS A JOURNEY is less accessible, then listeners may have to expend more effort to infer sufficient

cognitive effects for the utterance to be seen as optimally relevant in context. In other contexts, it may be that people infer LIFE IS A JOURNEY as a consequence of understanding optimally relevant metaphorical meanings, and not as a precondition to understanding a metaphorical utterance.

In general, the above example provides a glimpse of how ideas from cognitive linguistics and relevance theory may be fruitfully applied to the processing of varied meanings communicated by metaphorical statements. We are especially excited about the possibility of creating more detailed, and testable hypotheses from conceptual blending theory that take advantage of ideas from relevance theory on the testing of interpretive hypotheses. Right now, blending theory offers interesting insights into the possible creation of many forms of metaphoric meaning, including both conventional and novel metaphoric expressions. Yet this theory does not properly acknowledge contextual constraints on processing such that many of the rich sets of possible metaphoric meanings typically seen as being interpreted would not under most situations necessarily be inferred because more preliminary meanings are optimally relevant. Similar possibilities for interaction of cognitive linguistic and relevance theory ideas should be explored in regard to the ways that people understand idiomatic expressions, where some are motivated by conceptual metaphors and some not, as well as to how conceptual metonymies shape online metonymic language processing, as we argued in earlier sections. Studies of polysemous word processing may also acknowledge the ways that conceptual metaphors interact with more local pragmatic information to select, in some cases, or create, in other situations, contextually appropriate word meanings. Carston (2002: 360–361) suggests that words may point to a conceptual region that provides information that listeners can use to create ad hoc concepts. But conceptual regions also contain 'free slots' that need to be filled via the activation of 'connectors' to 'external knowledge structures' (Tendahl, 2006). These free slots may be filled by accessing information from memory, from our senses or from the sensorimotor system. Conceptual metaphors may be typical candidates that can be connected to free slots with the context of the utterance shaping which elements from a target domain will be integrated in formation of the ad hoc concept.

One specific area of disagreement between the two perspectives concerns whether metaphors are understood via cross-domain mappings or pragmatic inferential processes. But the debate may dissolve if it is recognized, as Wilson and Carston (2006) have done within relevance theory, that associative links (e.g., conceptual metaphors, blending of features from different domains) ''may affect the outcome of the mutual adjustment process by altering the accessibility of contextual assumptions and implications, but the resulting overall interpretation will only be accepted as the speaker's intended meaning if it satisfies the hearer's expectation of relevance'' (Wilson and Carston, 2006: 429). In line with this important conclusion, it will be interesting to see how relevance theory explains people's understanding of metaphorical language with implicit source domains, such as that typically studied within conceptual metaphor theory. We see no reason why such an account cannot be forthcoming, which may also possibly suggest how both propositional knowledge about domains and image-schematic knowledge structuring those domains, is employed to inferentially derive contextually appropriate metaphoric meanings. The consequence of this acknowledgment of multiple representational formats for metaphor, and that different sources of information constrain the processing and meaning products of metaphor, is that no single approach to meaning will necessarily capture all that gets understood with metaphoric language. Metaphor scholars must expand the types of metaphorical language studied, acknowledge the limitations of some perspectives in being able to explain aspects of metaphor use, and openly reach out to other perspectives and other theoretical notions that may

offer a greater chance at describing the complete dimensions of metaphor in language and thought. At the very least, metaphor scholars would do well to explore the ways that enduring metaphorical knowledge interacts with pragmatic information within the constraints of real-time cognitive processing to offer more comprehensive, and psychologically real, models of realistic metaphoric language use.

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