THE POETRY OF EVERYDAY LIFE: TOWARD A METAPHOR-ENRICHED SOCIAL
COGNITION

by

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I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

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ABSTRACT

How, at a fundamental level, do people construe their social world? Mainstream perspectives on social cognition posit that we do so largely by applying hierarchically structured concepts (or schemas) about similar classes of people and events to selectively interpret and elaborate on the complex array of social information. In this dissertation I propose a complementary perspective according to which people lend meaning to the social world in large part through conceptual metaphors that use the structure of familiar, typically concrete concepts to reason about and evaluate information in dissimilar, typically more abstract conceptual domains. I describe a model of metaphor-enriched social cognition (MESC) that provides a preliminary framework for understanding the role of conceptual metaphor in everyday social thought and action. I review research supporting hypotheses derived from the model with respect to the effects of conceptual metaphor on social perception, attitudes, and behavior, and I present four studies designed to further test these hypotheses. Study 1 shows that the sensation of being physically burdened increased the subjective obligatory nature of everyday activities. Study 2 shows that images depicting historically significant people and events (both positively and negatively valenced) were perceived as larger in size than those depicting historically insignificant people and events. In Study 3, priming participants with the beneficial consequences of physical covering led to more permissive attitudes toward the government withholding information from the public, and this effect was specific to those with ambivalent prior attitudes toward the value of governmental secrecy. Study 4 showed that a heightened motivation to protect one's own body from contamination led to

harsher attitudes toward immigrants entering the United States among those subtly primed to conceptualize the country as a body but not those primed with a literal conception of the country. Although further research and theoretical refinement are necessary, the MESC model is a step toward acquiring a richer, more general conception of everyday social meaning-making and its implications for social life.

INTRODUCTION

My life has no direction.
Jake wants to get out of his relationship.
Military victory is within our reach.

Each of these statements is literally meaningless. People's lives, for example, are not journeys with directions and locations, nor are relationships containers that can be entered and exited. Although statements like these are dismissed by some theories of language and of common sense as "mere" figures of speech, they may turn out to be highly revealing of the organization of our conceptual systems. More specifically, converging lines of theory and evidence within philosophy, psychology, and cognitive linguistics suggest that many domains of experience, such as MILITARY VICTORY, are *conceptualized*, and not just talked about, in terms of very different, typically more concrete domains of experience, such as grasping objects.

The main point I wish to make in this dissertation is that people routinely and automatically conceptualize information in their social world (including themselves, other people, and social situations) using metaphors that shape, at least in part, how that information is processed, evaluated, and acted upon. These points are intended to complement social cognition's traditional emphasis on hierarchical categories by highlighting the role of cross-conceptual metaphor in everyday social meaning-making.

By way of overview, I first present a brief exposition of the evidence supporting the claim that metaphor is an important part of our ordinary conceptual system and not "merely" our language. After pointing out the implications of these discoveries for

various social psychological phenomena, I describe a model of metaphor-enriched social cognition (MESC) that provides a preliminary framework for understanding the role of conceptual metaphor in everyday social thought and action. I review research supporting hypotheses derived from the model with respect to the effects of conceptual metaphor on social perception, attitudes, and behavior, and I present four new studies designed to further test these hypotheses.

Lastly, I discuss how a metaphor-enriched perspective helps us to understand the meaning-making process in a broad and systematic way. Contemporary social psychology has been continually divided between a hard-nosed, computationally rigorous social cognition on the one hand, and a multiplicity of complex forms of culture on the other. Metaphor, however, offers to bridge this gap, highlighting the continuity between everyday social thought and both the psychological foundations of myth, ritual, and religion and the creative discoveries of art and science. The reader will hopefully find this dissertation to be a step toward acquiring a richer, more general conception of human meaning-making and its profound implications for social psychology and for the practical business of everyday living.

I. THE METAPHORICAL BASIS OF EVERYDAY THOUGHT

Philosophical interest in metaphor dates back to Aristotle, who viewed it as one of many verbal devices that could be used in the art of persuasive public speech. Beyond its public, political functions, however, metaphor was assigned no deeper psychological significance. With the rise of scientific rationalism in the seventeenth century, metaphor was denounced as an obstacle to reason and objective truth ("a powerful instrument of error and deceit" John Locke, 1997/1689; cf. Black, 1955; Carnap, 1956; Davidson, 1979; Miller, 1976; see Jakel, 1999 for notable historical exceptions).

In contrast to these early perspective, research conducted by investigators across diverse disciplines reveals that metaphor is one of the most basic cognitive tools people use to make meaningful sense of the world. This section summarizes three sources of evidence supporting the claim that metaphor is an important part of our conceptual system: philosophical investigations into the origins and structure of language, research in cognitive linguistics on metaphor comprehension, and psychological research on the metaphorical nature of perception and judgment (Gibbs, 1992, provides a review other kinds of supporting evidence, including novel extensions of conventional metaphor and polysemy).

Linguistic Analyses

Spurred by a common interest in symbolism and cognition, philosophers in the late nineteenth and twentieth centuries (Cassirer, 1946; Jaynes, 1976; Langer, 1979; Nietzsche, 1873/1974) discovered the metaphorical nature of large swaths of what we

normally take to be straightforward literal language. Julian Jaynes pointed out that a word

as conventional as *to be*, for instance, stems from the Sanskrit *bhu*, "to grow, or make

grow," while the English forms *am* and *is* derive from the Sanskrit *asmi*, "to breath."

Although with time and repeated usage many of these terms become part of a tacit

background of seemingly literal meanings, they serve as a record of people's active

efforts to comprehend complicated or abstract aspects of the world and experience in

terms of other, more concrete phenomena. Supporting this view, we can observe the

creation of metaphors as people attempt to grasp novel concepts and experiences that are

ambiguous or poorly defined in their own terms (a process most evident, perhaps, in the

contexts of artistic creation and scientific discovery; Bronowski, 1956, 1977; Dunbar,

1997).

Jaynes also observed that in addition to individual words and expressions being

rooted in metaphor, multiple metaphorical expressions cohere with each other in

interesting ways:

> *The adjectives used to describe physical behavior in real space are*
> *analogically taken over to describe mental behavior in mind-space when*
> *we speak of our minds as being 'quick,' 'slow,' 'agitated' (as when we*
> *cogitate or co-agitate), 'nimble-witted,' 'strong-' or 'weak-minded.' …we*
> *can be 'broad-minded,' 'deep,' 'open,' or 'narrow-minded'; we can be*
> *'occupied'; we can 'get something off our minds,' 'put something out of*
> *mind,' or we can 'get it,' let something 'penetrate,' or 'bear,' 'have,' or*
> *'hold' it in mind. As with a real space, something can be at the 'back' of*
> *our minds, in its 'inner recesses,' or 'beyond' our mind, or 'out' of our*
> *mind. In argument we try to 'get things through' to someone, 'reach' their*
> *'understanding' or find a 'common ground' or 'point out', etc., all actions*
> *in real space taken over analogically into the space of the mind.*

For Jaynes, the significance of this coherence goes beyond language and reflects the fundamental organization of our conceptual systems - we *understand* our conscious experience (something that, on its own, is elusive and ambiguous) by structuring it in terms of our experience with manipulating concrete objects in space. The claim that metaphors are primarily conceptual rather than linguistic phenomena has been advanced most prominently by George Lakoff and Mark Johnson, whose book *Metaphors We Live By* (1980) presents a particularly compelling case for conceptual metaphor supported by a wealth of linguistic evidence. Like Jaynes, these researchers point to systematicity in the structure of ordinary language as evidence for the pervasiveness of metaphor in our understanding of diverse domains of experience (e.g., TIME, CAUSATION, and EMOTIONS; more focused treatments of these and other domains can be found in Kovecses, 1986; Sweetser, 1990; Turner, 1987).

How do metaphors actively shape thought? According to Lakoff & Johnson, understanding one conceptual domain (the *target domain*) in terms of a dissimilar conceptual domain (the *source domain*) activates a system of *entailments*, defined as correspondences between selected elements of the two domains in metaphoric relation. These corresponding elements can be entities or attributes common to the structure of both concepts as well as common relational and causal structure (much like analogies, Gentner, 1983). Entailments are expressed in language but operate primarily at the conception level. For example, the aforementioned statement *My life has no direction* coheres with other conventional expressions (e.g., *She guided me though some rough parts*) because they instantiate a conceptual mapping according to which entities and

relations in the domain of LIFE (e.g., one's goals, relationships, and conflicts) correspond systematically to parallel elements of the domain of JOURNEYS (e.g., destinations, travel companions, obstacles, respectively).

An interesting corollary of this perspective and others like it (e.g., Fauconnier, 1997; Gentner & Wolff, 1997) is that different source domains project different entailments that highlight and conceal distinct aspects of the same target domain, and this process can significantly alter how target information is interpreted and evaluated. For example, conceptualizing life as a journey may focus the individual on actively "progressing" through a shifting array of experiences and challenges, whereas conceptualizing life in terms of a container (e.g., *My life is empty*; *She fills my life with joy*) may focus the individual on preserving a satisfactory "amount" of whatever is seen as personally fulfilling.

The important point for now is that the systematicity of metaphorical expressions suggests that they are not, as commonly thought, individual "dead" metaphors but rather the instantiations of active metaphorical mappings at the conceptual level.

Research on Metaphor Comprehension

Echoing the development of philosophical treatments of metaphor, early psycholinguistic models treated metaphoric meanings as deviant versions of literal meanings. For example, Clark and Lucy (1975) proposed that comprehending a metaphor involves three serial processing stages: first determine the literal meaning of an utterance, then compare the literal meaning with various contextual and conversational rules, and then, if the literal meaning is deemed inappropriate, apply additional rules to determine

the indirect or nonliteral meaning (for similar views, see Grice, 1975; Searle, 1969). On this account, metaphor comprehension requires special, effortful processing stages over and above routine literal comprehension.

A number of empirical investigations cast serious doubt on these early perspectives by demonstrating that conventional and appropriately contextualized metaphoric expressions are comprehended as quickly as literal expressions (for reviews of this research, see Gibbs, 1994; Hoffman & Kemper, 1987). For example, Blank (1988) found that participants took no more time to judge as meaningful sentences expressing conventional metaphors (e.g., TIME IS MONEY) relative to literal sentences, although responses were slower for unconventional or "poetic" metaphors.

Metaphor processing appears to be obligatory as well as fast: Participants told to focus only on literal meaning are nonetheless unable to ignore metaphoric interpretations (Gildea & Glucksberg, 1981; Glucksberg, Gildea, & Bookin, 1982). In a study by Glucksberg et al. (1982), participants were presented with true statements (*Some fish are trout*), false statements (*Some fish are eagles*), scrambled metaphors (*Some jobs are snakes*) and conventional metaphors (*Some jobs are jails*), and asked to judge whether the sentence was literally true or false. The metaphors are literally false category membership statements, but their metaphoric meanings are readily interpretable. Supporting the idea that metaphoric meaning is processed automatically, participants took significantly longer to judge metaphoric statements as literally false as compared to scrambled metaphors.

Consistent with Lakoff & Johnson's claim that metaphors are active conceptual correspondences between elements in the source and target domains, research shows that

activated metaphors facilitate processing for entailment-consistent information and interfere with processing for entailment-inconsistent information. Kemper (1989) showed that people read the statement *The eager suitor assaulted her defenses* faster than the literal statement *The eager suitor wanted her affection* when they were first presented with the statement LOVE IS WAR. Also, participants were faster at deciding that two metaphoric expressions (e.g., *He laid siege to her heart* and *The eager suitor assaulted her defenses*) were related when they followed from the same metaphor (in this case, LOVE IS WAR). Moreover, participants took longer to understand metaphoric statements derived from conflicting conceptual metaphors, such as *He laid siege to her heart* (LOVE IS WAR) and *He swept her off her feet* (LOVE IS A PHYSICAL FORCE).

In a related line of research, Gentner and Boronat (1992) had participants read a passage that described a debate either literally or using one of two conventional metaphors - A DEBATE IS A RACE (e.g., *He had to steer his course carefully in the competition*) or A DEBATE IS A WAR (e.g., *He had to use every weapon at his command in the competition*). In all conditions, the last sentence in the passage used a RACE metaphor (*His skill left his opponent far behind him at the finish line*). For those reading the "RACE" passage, this last line represents a continuation of an ongoing conceptual mapping. For those reading the "WAR" passage this sentence requires a new metaphorical mapping and should therefore take longer to process. This is exactly what was found.

Taken together, these findings suggest that exposure to a particular metaphor (as a whole or through some portion of its entailments) influences subsequent comprehension for entailment-relevant language. The point here is that it would be difficult to explain

these findings from the perspective that metaphorical expressions are isolated linguistic phenomena or mere "figures of speech"; rather, they strongly suggest that at least some metaphors operate as underlying conceptual mappings between select features of dissimilar domains.

Psychological Theory and Research on Metaphor

The philosophical and experimental investigations just reviewed have made significant contributions to our understanding of metaphor's role in cognition through examinations of ordinary language and language comprehension. Complementing these findings, scholars have noted metaphor's significance in diverse psychological processes peripheral to language. Freud (1900/1965) observed in his clinical practice that commonplace objects and actions could acquire great personal significance in the context of dreams and fantasies through their metaphorical associations with unconscious wish fulfillments. A dream that one is physically choking, for example, might signal an inability to "swallow" a harsh or unacceptable truth in waking life. Dream and fantasy symbols are "imagistic" metaphors - that is, unmediated by language - and yet they can have enormous personal significance. Similarly, visual devices used in the creation and perception of art often serve as vehicles for metaphorical representations of abstract and nebulous concepts and experiences (see Grombrich, 1996; Lakoff & Tuner, 1989).

As discussed in more detail in Section V, theorists such as Ernst Cassirer (1946), Susanne Langer (1979), and Merlin Donald (2001) have provided detailed, empirically substantiated accounts of metaphor's significance in diverse cultural forms ranging from myth to ritual dance. To mention one example, gestures signifying deference to authority

range in different cultures from bowing, kneeling, and hanging one's head, but what underlies them all is a metaphorical conceptualization of authority in terms of vertical position (i.e., UP IS POWER; LOW IS SUBMISSIVE). Although there are certainly straightforward associations between vertical position and power - e.g., the stronger animal tends to stand higher than the weaker, the victor of a fight tends to be standing - the link between these concepts has acquired a secondary or metaphoric meaning that gives rise to diverse cultural practices, such as elevating Olympic champions on pedestals and positioning "top" executives in penthouses.

Complementing these theoretical insights is experimental research showing that perception and judgment within a target domain (the thing being made sense of via the metaphor) are influenced by manipulating aspects of the source domain (the more concrete or familiar concept being used to make sense of the target domain). In one line of research, Boroditsky and colleagues (Boroditsky, 2000; Boroditsky & Ramscar, 2002) assessed the notion that conceptions of time are actively structured in terms of spatial concepts (Jaynes, 1976; Lakoff & Johnson, 1980). They hypothesized that if this metaphor operates at the conceptual level, manipulating spatial experience should influence temporal judgments in a seemingly unrelated task. Participants were first primed with either forward movement (rolling in an office chair across the room) or approaching objects (pulling a chair toward the self with a rope). They were then asked an ambiguous question: "Next Wednesday's meeting has been moved forward two days. What day is the meeting now that it has been rescheduled?" The answer depends on how TIME is conceptualized in terms of SPACE. If, on the one hand, the person imagines

themselves moving forward through time (e.g., "*We are coming up on Christmas*") then moving a meeting "forward" is moving it in the person's direction of motion, that is, from Wednesday to Friday. On the other hand, if the person conceptualizes TIME as coming at them (e.g., "*Christmas is coming up*") then moving a meeting forward is moving it closer, from Wednesday to Monday. As predicted, those who imagined themselves moving forward in space were more likely to think of time as moving forward in space (57% of these participants said Wednesday's meeting has been moved to Friday), whereas those primed with approaching objects were more likely to metaphorically think of time as coming toward them (67% said the meeting is now on Monday). Note that the effect of spatial conceptions on temporal conceptions does not seem to be mediated by spoken language; these results suggest that abstract temporal conceptions are metaphorically "grounded" in concrete spatial experience.

Further support for this claim is provided by recent research by Meier and colleagues on metaphors of light. Across diverse cultures and languages, people tend to associate brightness and light with insight, health, optimism, and virtue and darkness with evil danger, depression, and death (e.g., Allport, 1954; Becker, 1975; Eliade, 1996). In accordance with these observations, social psychological research has shown that people who are well lit are evaluated more positively compared to less illuminated persons (McArthur & Post, 1977). Meier, Robinson, and Clore (2004) went further by assessing whether the metaphorical association between affect and brightness is automatic and obligatory, which would be expected if affective judgments were built on sensorimotor representations (e.g., Barsalou, 1999; Lakoff & Johnson, 1999). Across six studies,

participants had more difficulty categorizing words as negative or positive when there was a mismatch between the valence of the word and the brightness of the letters (e.g., bright, negative words). In related research, Meier and Robinson (2004) examined verticality metaphors for affect (e.g., up = good) and found that a mismatch between stimulus position and valence (e.g., negative, vertically high words) interfered with affective categorization. These findings are consistent with the linguistic, cultural, and social psychological evidence, but by showing that metaphorical associations (e.g., bright = good) shape perception in automatic and obligatory ways, they support the claim that at least some abstract concepts are fundamentally structured around basic sensorimotor experiences (Barsalou, 1999; Piaget & Inhelder, 1969).

II. CONCEPTUAL METAPHOR IN THE SOCIAL WORLD

We just considered the metaphorical nature of everyday thought as suggested by research in philosophy, cognitive linguistics, and psychology. Using a wide range of methods ranging from ethnography to RT experimentation, investigators have shown that metaphor is not a matter if "mere" language; it is a fundamental mental capacity by which people understand vague or abstract concepts by structuring them in terms of other, typically more concrete concepts and experiences, and it has far-reaching influences on perception, attitudes, and behavior. In light of these converging findings, it would be highly surprising if conceptual metaphor was found to have no important role in the processing and use of information encountered in the social world. Still, what evidence do we have of metaphorical *social* cognition?

In one sense, very little. The psycholinguistic research tends to use stimuli that are fairly impoverished relative to the highly contextualized and multidimensional stimuli common to social psychology research (e.g., extended descriptions of other people). Furthermore, this research focuses almost exclusively on metaphor comprehension and therefore has minimal relevance to interpersonal motivation, social perceptions, attitudes, and other variables of social psychological interest. Some psychological research (e.g., Meier et al., 2004) examines affective judgments, but the findings do not pertain directly to social cognition and attitudes.

In another sense, the idea of metaphorical social cognition runs all the way back to the origins of social psychology. One kind of evidence we've reviewed, the

systematicity of metaphorical expressions, was observed fifty years ago by Solomon

Asch (1955), who pointed out that everyday descriptions of people and their personalities

are pervaded by metaphors grounded in concrete aspects of sensory and motor

experience:

> When we describe the workings of emotion, ideas, or trends of character,
> we almost invariably employ terms that also denote properties and
> processes observable in the world of nature. Terms such as warm, hard,
> straight refer to properties of things and of persons. We say that a man
> thinks straight, that he faces a hard decision, that his feelings have cooled.
> We call persons deep and shallow, bright and full, colorful and colorless,
> rigid and elastic. Indeed, for the description of persons we draw upon the
> entire range of sensory modalities. And the language of social experience
> and action reveals the same characteristic. We are joined to people with
> ties and bonds, classes are high and low, groups exert pressure, maintain
> distance from other groups, and possess atmosphere. [1]

Consistent with Asch's observations, many of the examples used by linguists as evidence

of conceptual metaphor draw on socially relevant phenomena (e.g., interpersonal

relationships, emotions, and the self; Fainsilber & Ortony, 1987; Gibbs & Nascimento,

1993; Kovecses, 1986; Lakoff & Johnson, 1980).

To my knowledge, no other early social psychologist followed Asch in explicitly

acknowledging metaphor's role in social thought. However, a number of early lines of

research can be interpreted as showing the effects of metaphorical thought on social

perception and attitudes. For example, Fritz Heider (1958) observed that people routinely

ascribe human-like beliefs and intentions to inanimate objects. In a well known

demonstration, Heider and Simmel (1944) presented participants with a silent cartoon

movie in which three geometric shapes traversed across the screen. Virtually all

participants automatically perceived the shapes' activity in terms of human motivations

and intentions (for recent, related work, see Morewedge, Preston, & Wegner, in press). This penchant for personification is fundamentally rooted in metaphor because it involves conceptualizing entities and forces (e.g., INFLATION, DRUGS, COMPUTERS) in terms of something they are not, namely, mental agents with beliefs, desires, and intentions. Heider's contribution lies in demonstrating that personification metaphors automatically color the perception of action.

Concurrent with Heider's observations, researchers in the New Look tradition began investigating how motivational factors shape lower-level perceptual processes, and some of these findings can be interpreted as evidence of metaphoric social cognition. For example, BIG is established early in development as representing social significance and power (most likely due to the early association of parental dominance with physical superiority; e.g., B. Schwartz, Tesser, & Powell, 1982), and more of something (like food) is typically more adequate in satisfying needs (like hunger). These early, inherently evocative experiences form the basis for the metaphor SIGNIFICANT IS BIG (He's a *giant* among sociologists. This problem is *bigger* than we can handle. I got myself into a *huge* mess). Research by Bruner and colleagues showed that metaphoric associations between subjective value and size influence not only language but even basic visual perception. In one study by Bruner and Goodman (1947), children were asked to adjust the diameter of a circle of light until it was equal in size to various objects. Participants in one condition estimated the sizes of coins ranging from a penny to a half-dollar; those in the control condition judged gray cardboard disks of identical size to the coins. Consistent with predictions, coins were judged as larger in size than gray disks. Furthermore,

economically disadvantaged children showed more pronounced overestimation bias relative to their affluent counterparts. In subsequent research, Bruner and Postman (1948) found that both positive (dollar sign) and negative (swastika) symbols are judged as larger than a neutral symbol. Although a bigger quarter is not literally more money and a bigger swastika not literally more dangerous, the cultural and subjective significance (or "value") placed on these symbols influences even basic perceptions of their size (this idea receives further empirical attention in Study 2).

The metaphor SIGNIFICANT IS BIG figures in a number of other social psychological phenomena. Research on the door-in-the-face technique of interpersonal influence shows that individuals led to reject a large initial request are more likely to comply with a subsequent request requiring a more moderate level of compliance (Cialdini, Vincent, Lewis, Catalan, Wheeler, & Darby, 1975). One theoretical explanation of door-in-the-face efficacy proposes a cognitive mechanism of perceptual contrast by which people compare, in their "mind's eye," the "size" of the critical request against the previously established anchor of an outlandish request (Dillard & Burgoon, 1982). That is, the second request appears to be mild because it is, in a sense, perceived as "smaller" than the mental representation of the "larger" initial request. The important implication for our current purposes is that people understand the severity of requests and obligations in large part by conceptualizing them in terms of their relative size. Although we are certainly faced with everyday situations in which physical size and task severity are literally linked, the interesting phenomenon is that those concrete associations are

used as the grounding for metaphorical conceptions of abstract concepts such as *request*, *unreasonable*, and *obligation* (see Study 1).

Contemporary research has directly examined the role of conceptual metaphor in diverse social phenomena, including persuasion (Ottati, Rhoads, & Graesser, 1999), beliefs about social dilemmas (Allison, Beggan, & Midgley, 1996), political attitudes (Blanchette & Dunbar, 2001), and stock market judgments (Morris, Sheldon, Ames, & Young, 2007). I'll review some of these lines of research in the context of describing the MESC model in Section III.

Broadening our perspective for the moment, we can point to the metaphorical nature of a host of foundational concepts in social psychology. Some of these concepts are better understood as the theoretical tools of the social psychologist (e.g., Heider's [1954] notion of the intuitive scientist, or Tetlock's [2002] theory of intuitive politicians, theologians, and prosecutors in judgment and choice). Many others, however, are assigned psychological significance in the minds of ordinary persons.

To take just one example, the notion of "psychological distance" has pervaded social psychology since its theoretical origins in the works of Kurt Lewin (1951). Normally, when people encounter a desired object, they move towards it or use their arms to pull it toward themselves (approach behavior); conversely, when people encounter an undesirable object, they move away from it or push it away (avoidance behavior). This provides the basis for the metaphors GOOD IS TOWARD/CLOSE; BAD IS AWAY/DISTANT. That is, *toward* and *away* have acquired a broader significance in the structure of

attitudes, as reflected in people claiming to be *closer* to Bush than to Kerry, *running away* from their responsibilities, and *embracing* their new roles.

Although these common metaphorical expressions may simply be figures of speech, diverse lines of research provide converging evidence that evaluations of abstract social stimuli are conceptually structured around concrete approach and avoidance tendencies. For example, Ross and Wilson have examined how people maintain high levels of self-regard by comparing their current self to past selves or outcomes, and they've shown that perceptions of self-improvement over time are intimately wrapped up with subjective spatial distance. In one set of studies (Wilson & Ross, 2001) participants were induced to feel that the beginning of their present academic term was either relatively close or distant through the use of different spatial representations of time; they then retrospectively evaluated themselves at the start of the term. Even when the actual temporal distance was the same for all participants, individuals in the subjectively distant condition were more disapproving of their earlier selves as compared to those in the subjectively close condition. Subsequent research (Ross & Wilson, 2002) showed that, across achievement and social outcomes and after controlling for actual temporal distance, participants reported feeling "closer" to past selves and experiences with favorable rather than unfavorable implications for their current self-worth. The point is that evaluations of the self and its change through time are lent meaning in large part through our understanding of a different *kind* of thing, namely, spatial distance and distancing behavior.

Psychological distance plays a role in how social stimuli are interpreted as well as evaluated. Research inspired by Trope and Liberman's (2003) construal level theory shows that temporally distant events are represented by their abstract, global features (high-level construals) whereas temporally near events tend to be represented in term of their specific concrete features (low-level construals).

To summarize, I've attempted to illustrate the metaphorical nature of psychological processes central to social psychological research. These processes include, but are not limited to, perceptions of personal significance and authority and attribution of mental states. I then focused on psychological distance as an example of a metaphorical concept central to social psychological theory and research. The metaphorical nature of many other, equally fundamental concepts could have been discussed, including "internal/external" (and intrinsic/extrinsic), "social exchange," and "above/beneath consciousness."

Despite converging evidence for metaphorical social cognition, mainstream models of social cognition do not acknowledge metaphor's significance in everyday social thought. As a general characterization, these perspectives characterize meaning-making in terms of the selective processing and elaboration of available information in light of concepts (i.e., schemas, scripts, frames) - mental structures that organize one's knowledge about *similar types of things* and that allow for inferences and expectations about the attributes of a given social stimulus (see, e.g., Fiske & Taylor, 1991; Hamilton, 2005; Kunda, 1999; Moskowitz, 2005) [2]. According to these perspectives (characterized in Figure 1), social information is conferred meaning primarily through the activation of

stored conceptual knowledge pertaining to the relevant (i.e., activated) categories, and in some cases through the activation of schemas representing more abstract concepts. Although concepts often include information about different types of things (a concept for "Oranges" may contain information about "Supermarkets"), the critical point is that one type of thing is not understood *in terms of* another type of thing (Oranges are not understood in terms of supermarkets, or vice versa). Rather, meaning on this theory is a primarily *intra-conceptual* affair.

FIGURE 1: The Standard Model of Social Meaning-Making

Process 4: Activation of Higher-
Order, Abstract Concept
(*"An orange is an edible object"*)

Process 3: Activation of
Concept/Schema - Organized
knowledge structure relevant
to the category.
(*"Good for me; grown in
Florida; this one almost
overripe"*)

Process 2: Classification;
Activation of a Category
(*"This is an Orange"*)

Process 1: Stimulus Detection
(*" Round, rough texture"*)
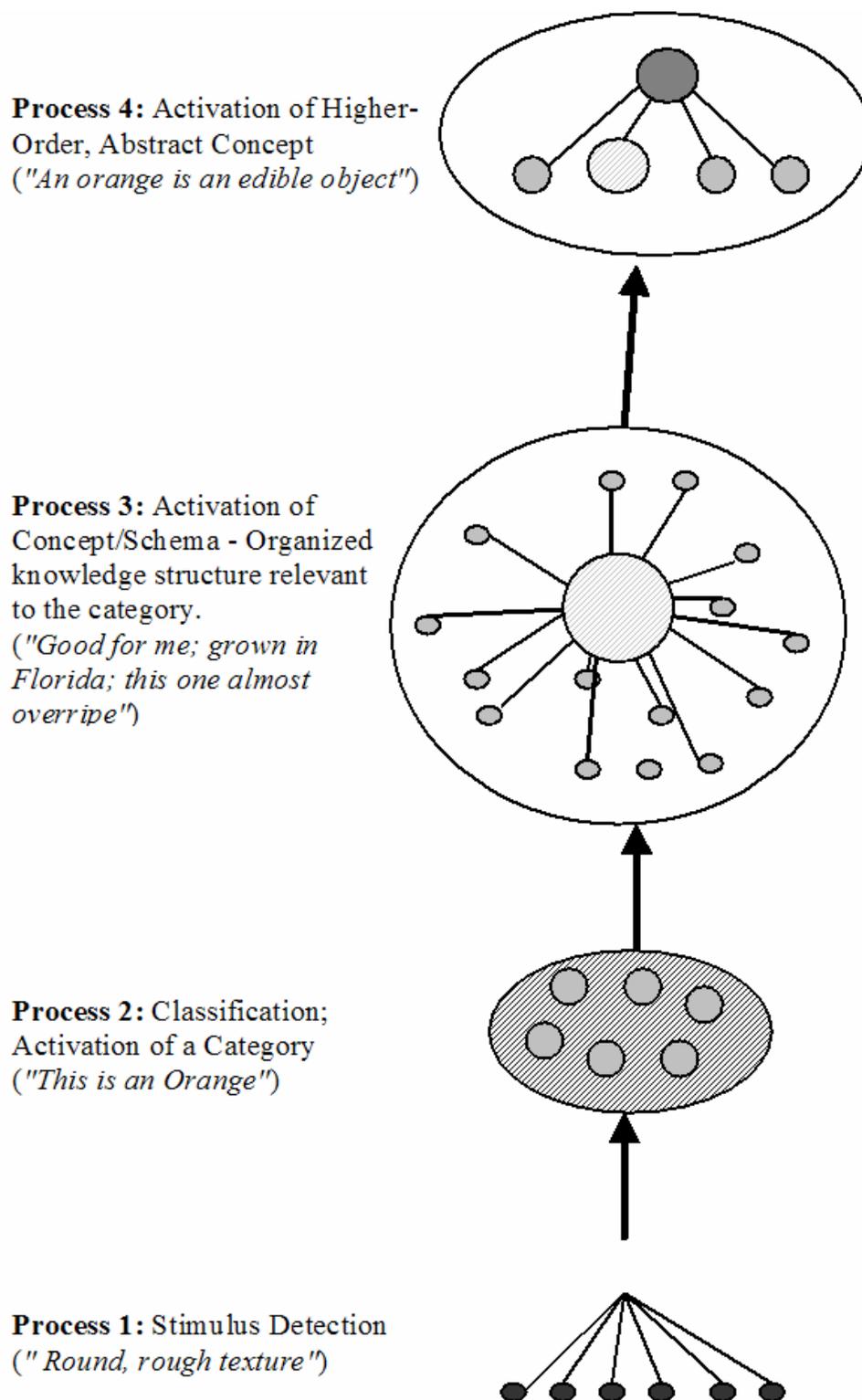
This "standard" perspective has made significant advances in mapping the cognitive underpinnings of social thought, judgment, and action. It has inspired a great deal of research that informs a detailed picture of the structure of concepts and their role in attention and interpretation. But there are important aspects of everyday meaning-making that are not easily captured by this perspective. As an illustration, consider the aforementioned association between SOCIAL SIGNIFICANCE and physical SIZE. Although these concepts are related in a straightforward, literal sense (indeed, such relations probably provide the basis for their metaphorical relation; Lakoff & Johnson, 1999), the fact remains that an object's perceived significance *is of a different type of thing* than our sensorimotor experience with physical size. That is, knowledge about each is "contained" in two respective concepts. And yet the research reviewed so far shows that:

> a. Dozens of conventional expressions about significance are *systematic* in that they cohere around the structure of our conceptual knowledge of physical size. That is, we talk about significance in ways that reflect our knowledge about things increasing and decreasing in size, size comparison, size illusions, circumnavigating objects of varying size, and so on. Furthermore, we typically have no difficulty creating and comprehending novel metaphorical expressions that cohere in the same way (e.g., *Listen, Dave, for you the ceremony is a puddle; for her it's the ocean*; Lakoff & Johnson, 1980).

b. Comprehension of conventional expressions instantiating the metaphor

SIGNIFICANT IS BIG is automatic, unconscious, and obligatory (cf. Glucksberg et

al., 1982).

c. People overestimate the size of subjectively valued objects (Bruner &

Goodman, 1947).

d. Metaphors such as SIGNIFICANT IS BIG play an at least tacit role in diverse social

psychological phenomena that may be peripheral to language, such as compliance

to social influence strategies that operate on perceptual contrast of requests

(Cialdini et al., 1976).

Taken together, these findings provide strong empirical support for the basic

premise of a metaphor-enriched perspective on social cognition, namely, that social

concepts (e.g., SIGNIFICANCE) are routinely and automatically represented metaphorically

in terms of dissimilar concepts and that metaphorical social cognition has systematic

effects on perception and judgment. To understand something in terms of a dissimilar

concept (i.e., to understand it metaphorically) requires the activation of a set of

systematic entailments between corresponding elements of the two concepts in relation

(Figure 2). On this view, metaphorical social cognition operates along-side conceptual

processing as typically characterized by mainstream social cognition.[3] In the following

section I present a more detailed model of how metaphors shape social information

processing.

FIGURE 2: The Role of Conceptual Metaphor in Social Meaning-Making

Conceptual Metaphor:
Activation of *Dissimilar*
Concept and a set of
Systematic Entailments
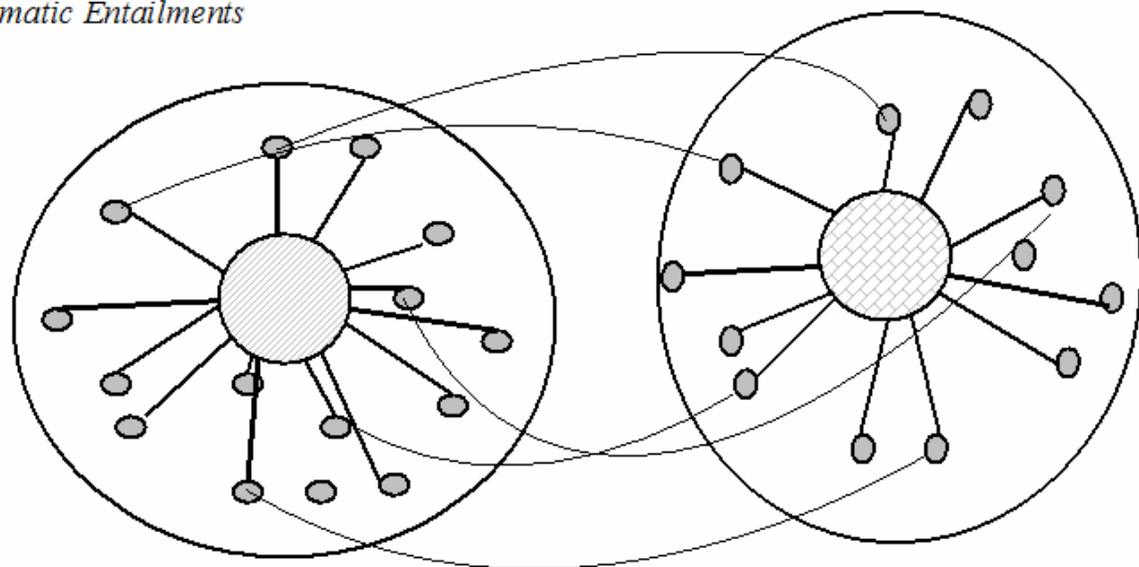
III. THE MESC MODEL

The primary claim of Section II is that conceptual metaphors play a fundamental and pervasive role in everyday social cognition because they allow us to map the structure of a familiar conceptual domain onto corresponding elements of a more abstract or complex conceptual domain of a different kind. Although metaphoric language pervades our patterns of talking about the social world, this provides only partial support for the broader notion that people conceptualize and evaluate social concepts using the structure of dissimilar concepts. Complementary support comes from experimental evidence for the active role of conceptual metaphor in diverse social psychological processes.

In this section I present the metaphor-enriched social cognition (MESC) model of the causes and consequences of metaphoric social cognition (see Figure 4 for a graphic depiction). The purpose of this model is to provide a working framework for organizing existing social psychological research that examines (explicitly or implicitly) the role of conceptual metaphor in social perceptions, attitudes, and behavior, and to identify gaps in our understanding of metaphoric social cognition and suggest avenues for future research. To this end, I present four new studies testing hypotheses derived from the MESC model regarding the role of metaphor in social perceptions and attitudes.

FIGURE 3: A model of metaphor-enriched social cognition

-Chronically active metaphors
-Individual differences in source
    familiarity & target motivation
-Situationally activated metaphors
-Culturally pervasive metaphors

STEP 1:
FACTORS
INFLUENCING
METAPHOR
ACTIVATION

Set of Candidate
Metaphors for a Given
Target Domain

Potential
Source
Domain

Activated
Metaphor

TARGET
DOMAIN

Potential
Source
Domain

Activated
Source
Domain

STEP 2:
ENTAILMENT
CONSISTENT
PROCESSING

EFFECTS ON
TARGET
INTERPRETATION
AND EVALUATION

Step 1: Factors that Influence Metaphor Activation

A conceptual metaphor will shape social thought when it is activated, and conceptual metaphors vary in their accessibility. Chronically activated metaphors are deeply entrenched in the individual's conceptual system as a result of cultural experience, dispositional characteristics, and shared aspects our species-typical physical and social constitution. The target domains of chronically active metaphors are routinely and automatically conceptualized metaphorically in terms of specific source domains without their metaphoric relation being explicitly acknowledged or made salient.

Individual differences in metaphor activation may exist by virtue of variability in familiarity with or personal investment in a source domain. Individuals may also show preference for metaphors that highlight and downplay social information in a way that accords with their motivation to maintain specific beliefs or to persuade others to adopt those beliefs.

Situational and cultural factors also influence whether and what type of metaphor is used to conceptualize a given social stimulus. Situational factors may heighten the ambiguity of a social concept and thus increase people's preference for a metaphoric over a literal conceptualization. Aspects of the situation may also increase the availability of one of several source domains used to structure a target domain. Cultural differences in metaphor activation will be seen when a culture or a subculture embraces metaphors that are coherent with their unique social ideologies, knowledge, and values. Also, cultures exist within physical environments, some of them radically different, and this can impact the types of metaphors members of that culture routinely use to find meaning in their

experience. For example, among the Fang culture of western Africa, the skill with which

a member of the council house hears debates and settles disputes is described using the

same language used to describe the ability to carefully slice fibrous plants (a clumsy

judge leaves disruptive, "jagged" edges; a wise and eloquent judge ensures "clean"

edges; Fernandez, 1986). It is unlikely that members of another culture would

conceptualize juridical technique using the same metaphor if their everyday livelihood

did not depend as critically on particular types of plants and agriculture.

Step 2: Consequences of Metaphoric Cognition on Target Interpretation and Evaluation

Once a metaphor is activated, the aspects of one conceptual domain are used to

lend coherent meaning to another, typically more abstract, domain of a different kind.

According to Lakoff and Johnson (1980), metaphors confer meaning by projecting

selected elements of a source domain (e.g., object attributes, causal relations) onto

corresponding elements of a target domain. By virtue of these conceptual

correspondences (i.e., *entailments*), activated metaphors highlight, downplay, and conceal

certain aspects of the target domain, exerting a top-down influence whereby thought (e.g.,

judging, drawing inferences) and evaluation of target information are constrained in

entailment-consistent ways (see also Gentner and colleagues' structure-mapping theory;

Gentner & Markman, 1997). Also, an abstract target domain can be metaphorically

structured using diverse source domains (Gibbs, 1996). Building on these insights, the

MESC model specifies two hypotheses:

1. The *inter-conceptual manipulation hypothesis* posits that for two concepts in metaphorical relation, variations in thoughts, feelings, and motivations in one concept will influence interpretation and evaluation of the other concept in line with their metaphoric entailments. For example, if a romantic relationship is metaphorically conceptualized in terms of a JOURNEY, then viewing journeys as tedious, adventurous, or exhausting may result in parallel impressions of relationships.

As discussed shortly, many of the studies supporting this hypothesis show that manipulating aspects of a concrete source domain influence cognitions and attitudes in more abstract target domains. These studies are consistent with the claim that conceptual metaphors shape thought *directionally*, that is, they map structure from a concrete source domain to an abstract target domain but rarely map in the reverse direction (e.g., Glucksberg, McGlone, & Manfredi, 1997; Ortony, 1979). Other studies, however, suggest that conceptual metaphor may have bidirectional effects on social cognition, and I'll present new research further testing this possibility.

2. The *cross-domain mapping hypothesis* posits that applying a given source domain to conceptualize a target domain will project a distinct set of entailments relative to an alternative metaphorical conceptualization or a literal conceptualization; as a result, the structured representations of the source domain (e.g., its objects and their properties, relationship between objects, and higher-order relations) will be used to interpret and evaluate corresponding aspects of the target domain. For example, a metaphor likening a romantic relationship to a JOURNEY will highlight the importance of active participation

and effort more so than if the relationship were likened to a SAFE HAVEN; an individual applying the "journey" metaphor may therefore harbor stronger feelings of resentment if they perceive their partner as investing little effort in actively working to improve and maintain the relationship.

In the following section I show that both MESC-derived hypotheses are supported by evidence that diverse metaphors at varying levels of accessibility shape social thought.

IV. EVIDENCE OF METAPHORICAL SOCIAL COGNITION

Evidence supporting the inter-conceptual manipulation hypothesis

Chronically active metaphors. Some research shows that varying aspects of a source domain influences target domain interpretation and attitudes without their metaphorical connection being explicitly primed or activated. The aforementioned Meier et al. (2004) findings, for example, show that varying the luminosity of words influences assessments of their valence, suggesting that *good* and *bad* are routinely and automatically understood partly in terms of *bright* and *dark*. Though these findings provide evidence for the inter-conceptual manipulation hypothesis, they do not deal with particularly "social" phenomena.

More recently, Schubert (2005) demonstrated that the status of social groups is understood partly in terms of vertical position. Specifically, judgments of a group's social power were facilitated when information about the groups was presented in the positions implied by the metaphor POWER IS UP: powerful groups were identified more accurately as powerful when the group's name was presented at the top of a computer screen, whereas powerless groups were identified more accurately as powerless when they were at the bottom of the screen. Another study ruled out the possibility that these effects were due to an association between power and generic positivity, which is also associated with UP (Meier & Robinson, 2004). These results show that manipulating aspects of a metaphor's source domain (e.g., vertical position) can shape perception and judgment of socially relevant target domains (status) without their metaphorical connection being explicitly primed.

Individual differences in familiarity and motivation. Individuals vary in the strength of motivations associated with a metaphor's source domain, and these differences can influence evaluation of information within a metaphorically related target domain. According to Paul Rozin (Rozin, Haidt & McCauley, 2000), Lakoff & Johnson (1980) and others, the motivation to avoid physical filth and contamination forms the cognitive basis for conceptions – and not merely linguistic expressions – of the otherwise abstract notion of morality. Accordingly, Schnall, Haidt, and Clore (in prep) found that participants high in private body consciousness - a measure of attunement to bodily sensations (Miller, Murphy, & Buss, 1981) - were more condemnatory of moral transgressors if they made their responses in a dirty, disgust-eliciting room as compared to a clean room. Temporarily heightening a source domain motivation influenced target attitudes, but only among those with a dispositionally high level of bodily consciousness.

Situationally activated metaphors. Further support for the inter-conceptual manipulation hypothesis comes from evidence that situationally manipulating how people conceive of / feel about a source domain influences their attitudes toward a metaphorically related target domain. The aforementioned research by Boroditsky and colleagues (e.g., Boroditsky & Ramscar, 2002), for instance, shows that priming different conceptions of spatial movement (i.e., the self moving forward vs. objects approaching the self) influences how people reason about time. The same source domain is being applied to metaphorically structure time, and the operative factor is variation in how that source domain is conceptualized. As with the Meier et al. findings, findings offer general

support for the inter-conceptual manipulation hypothesis but do not address a topic of conventional interest to social psychology.

   Bidirectional effects. The studies just reviewed examine the effects of variations in a concrete source domain (e.g., luminosity, verticality, physical disgust) on abstract target domains. There is also a small body of evidence demonstrating the effects of manipulating aspects of an abstract target domain on perception and behavior within a concrete source domain. As noted earlier, Bruner and Goodman (1947), showed that coins were perceived as larger than cardboard disks of identical size, and that this size overestimation was more pronounced among economically disadvantaged participants (who presumably place greater value on coins than their more affluent counterparts). One interpretation of these findings is that variations in the symbolic value or need attached to an abstract target domain influenced perception in a more concrete source domain (PHYSICAL SIZE). This effect is suggestive but open to a number of potential alternative interpretations. Perhaps the coins were simply brighter or more visually interesting than gray cardboard discs. Indeed, subsequent research by Bruner and Rodrigues (1953) found that, in addition to coins, unmarked metal discs were judged significantly larger than cardboard disks of identical size (although the relative size overestimation from pennies to quarters was more pronounced than was the case for same-sized metal or cardboard disks). Also, Bruner and Goodman assessed pre-existing socioeconomic status as a proxy for the subjective value of money, and therefore it is unclear whether variations in subjective value had a direct causal impact on size perceptions. Indeed, when Bruner and Rodrigues directly manipulated subjective value by directing children in one condition to

imagine the desirable objects afforded by the coins, they found that these children

displayed *less* overall perceptual bias than children encouraged to make accurate

judgments. In short, these studies provide suggestive but inconclusive evidence for

bidirectional effects of inter-conceptual manipulation on perception.

Other evidence comes from research on attitudes and approach and avoidance

behaviors. As discussed in Section II, the domain of PHYSICAL CLOSENESS has an active

role in shaping evaluations of an object's valence. Accordingly, research shows that

manipulating aspects of the source domain (enacting the physical motions associated with

approach and avoidance tendencies) influences attitudes toward novel, abstract stimuli

(Cacioppo, Priester, & Bernston, 1993). Complementing these findings is evidence that

people are faster to exhibit approach-like arm movements while viewing a positively

valenced stimulus and avoidance-like behaviors while viewing a negatively valenced

stimulus (Chen & Bargh, 1999). What makes these findings demonstrative of metaphoric

cognition is that the attitude object - a Chinese ideograph presented on a computer screen

- is not in any straightforward sense a physically appetitive or aversive stimulus, and yet

attitudes toward this abstract object facilitated concrete actions in metaphor-consistent

ways. One could object, however, that the domains of stimulus evaluation and physical

approach/avoidance are superficially similar enough that the finding is indicative of a

literal rather than metaphorical association between affective judgments and physical

closeness.

Summary. In support of the MESC model's inter-conceptual manipulation

hypothesis, the studies just reviewed provide converging evidence that manipulating

aspects of one conceptual domain partly determine how information in a metaphorically related conceptual domain is perceived, interpreted, and evaluated. These studies show effects of inter-conceptual manipulation within chronically active, individually specific, and situationally primed metaphors. There is also a small body of evidence to suggest that inter-conceptual manipulation can operate bidirectionally, with variations in an abstract target domain influencing perception and action in concrete source domains. It may be argued, however, that these findings do not reflect active conceptual mappings so much as simple associations (e.g., between bright and good, up and powerful, away and bad) pertaining to a single stimulus. Stronger support would be provided by evidence that manipulating people's experience within a concrete source domain has similarly automatic and implicit influences on attitudes in an abstract target domain not likely to be experientially associated with the source domain. To assess this possibility, we designed Study 1 (described below) to test whether the sensation of physical burden influences the perceived strength of one's social obligations.

Also, the evidence for bidirectional effects of conceptual metaphor is at present inconclusive. Therefore, Study 2 examines whether manipulating the perceived historical significance of social stimuli influences lower-level (i.e., source domain) perceptions of size.

Lastly, with the exception of the Schubert (2005) findings, the more direct experimental evidence for inter-conceptual manipulation (Boroditsky & Ramscar, 2002; Meier & Robinson, 2004) deals with target domains of peripheral interest to social psychologists. Study 3 was thus designed to assess whether situationally priming

divergent attitudes toward a source domain (physical covering) would influence people's

attitudes toward a metaphorically related target domain (concealing information) in

entailment-consistent ways.

Evidence supporting the cross-domain mapping hypothesis.

      Chronically active metaphors. To my knowledge there are no studies dealing with

chronically active metaphors that show the effects of using different source domains to

structure the same target domain (i.e., that can be taken as evidence for the cross-domain

mapping hypothesis). This is perhaps not surprising given that by chronically active I

mean that a given target domain is routinely and automatically conceptualized in terms of

a particular source domain.

      Individual differences in familiarity and motivation. People may apply different

source domains to highlight and downplay aspects of the target domain in ways that

accord with their experience and motivations. This is perhaps most evidence in the

context of persuasion, where select metaphors can be particularly effective in portraying

people, events, and social issues in certain ways and evoking particular reactions. Partial

support for this hypothesis is provided by Voss et al.'s (1992) content analysis of the

political terminology used during the 1991 U.S. Senate debate over the Gulf War, which

revealed that Democrats and Republicans used specific metaphors to bolster their

respective positions. For example, Democrats emphasized negative aspects of President

George H. Bush's leadership by referring to him as a king (*We still elect our presidents,*

we do not crown them), a gambler (*He upped the stakes from a defensive to an offensive*

position, rolling the dice; strengthened his hand), and a magician (*He plucked January*

15th out of thin air and none of us has a crystal ball). Republicans, in contrast, described

Bush as a captain (*The captain cannot abandon the ship; President Bush has asked us all

to get on board…for if we are not all on board at the time of takeoff, how can we expect

to be on board for the landing?*). Whereas to the Democrats war was a *nightmare, an

unpredictable tiger ride, unleashing a mad Middle East genie form its bottle, not the

Super Bowl, and not an Easter-egg Hunt*, the Republicans referred to war in metaphoric

terms far less often and used monetary metaphors, such as *spending American lives* or

paying the price, and compared war to a chess game, describing people as *political pawns

in the desert*. These results support the notion that discussants on both sides of the

political fence were motivated (implicitly or explicitly) to adopt metaphors with

entailments that were broadly consistent with their political beliefs and attitudes. A series

of studies conducted by Blanchette and Dunbar (e.g., Blanchette & Dunbar, 2001) found

that politicians framed social issues in terms of a diverse range of superficially dissimilar

source domains - ranging from agriculture to the family, sports, magic, and religion - to

map strong emotional connotations from the source onto the political issue (e.g., fear,

disgust, health, and anger). Although these findings are consistent with the cross-domain

mapping hypothesis, the metaphors used by participants in the debate were self-selected,

and so it is difficult to determine whether using different source domains would influence

target interpretation and attitudes.

   Situationally activated metaphors. Aspects of the situation can activate particular

metaphors that are then applied during conceptualization. For example, in the previously

discussed research by Gentner and Boronat (1992), the metaphors A DEBATE IS A RACE/A

DEBATE IS A WAR were activated by descriptions of a debate in line with those metaphors. As evidence that these descriptions activated global, systematic conceptual mappings rather than isolated linguistic expressions, participants were faster to process information when it extended an ongoing metaphorical mapping than when it demanded a switch to an inconsistent source mapping or followed a literal control passage. These findings support the broader idea that using a specific source domain to structure a target domain activates a global conceptual mapping that facilitates processing for information consistent with other entailments of that global mapping but inhibits processing for alternate source mappings or a literal conceptualizations.

In addition to on-line comprehension, situationally activated metaphors influence the extent to which people process social information. Ottati et al. (1999) showed that a metaphoric vs. literal framing of a persuasive message influenced participants' motivation to carefully scrutinize and elaborate on the message, and that this effect is furthermore moderated by individual differences in interest in the source domain. Participants who either liked or disliked sports were given strong or weak literal arguments advocating that college seniors be required to complete a thesis requirement before graduation (cf. Petty & Cacioppo, 1986). In the sports-metaphoric condition, the message was interspersed with filler statements that contained sports metaphors (e.g., "*If you want to play ball with the best…*") or, in the literal control condition, semantically equivalent literal expressions (e.g., "*If you want to work with the best…*"). After listening to the communication, participant reported their attitudes toward the thesis requirement. Among individuals who enjoy sports, sport-metaphorical statements led to more positive

attitudes toward the senior thesis requirement when the arguments were strong but not when they were weak, supporting the hypothesis that a personally preferred metaphor increased interest and motivated systematic processing. A subsequent study ruled out the possibility that these results were due to sport fans simply having more sport-related knowledge. In short, metaphor increased interest in a persuasive communication depending on the degree to which it resonated with the listener's chronic interest.

Summary. Supporting the cross-domain mapping hypothesis, the studies just reviewed show that using specific source domains to make sense of a target domain results in different patterns of interpretation and evaluation than alternate metaphoric or literal mappings. It's important to note that in many of these studies (e.g., Gentner & Boronat; Ottati et al.) the global metaphors were activated by a portion of their respective entailments. For example, participants in the Gentner and Boronat studies were not explicitly primed with the metaphor A DEBATE IS A RACE; rather, that global conceptual mapping was activated by a description of debate strategy, for example, as "steering one's course," and competition as "keeping one's pace." Study 4 was an attempt to build on these findings and examined people's attitudes toward immigration into the United States. To further test the cross-domain mapping hypothesis, we situationally manipulated metaphor activation by framing a portion of the immigration topic in metaphoric or literal terms (specifically, whether the United States is portrayed as a human body or using literal paraphrases). Secondly, we induced in some participants a heightened concern with maintaining the purity of their own bodies. We predicted that

increased concerns with avoiding physical contamination combined with a metaphoric conception of the country as a body would strengthen anti-immigration attitudes.

Overview of the Current Studies

To sum up, the current studies will focus on Step 2 of the MESC Model. The first three studies will assess specific instantiations of the inter-conceptual manipulation hypothesis. Study 1 examines whether sensations in a concrete source domain influence attitudes in a categorically unrelated target domain. Study 2 examines whether altering aspects of an abstract target domain can influence lower-level perceptual processes within a concrete source domain. Study 3 examines whether priming positive and negative attitudes toward the same source domain influences target attitudes. Study 4 assesses an instantiation of the cross-domain mapping hypothesis by examining whether a metaphoric vs. a literal portrayal relevant to a social issue will interact with heightened motivation in the source domain to influence target attitudes.

Study 1

Source Sensation and Target Attitudes

Study 1 was designed to assess the pervasiveness of metaphoric cognition by examining the influence of physical sensation on attitudes toward an abstract but metaphorically related target domain. Cacioppo et al. (1993) found that enacting physical behaviors associated with approach and avoidance tendencies influenced attitudes toward a literally unrelated target, but less is known about the possible effects of differences in physical sensations. Furthermore, these findings may reflect a straightforward, literal link between attitudes and moving "toward" or "away." Study 1 therefore examined superficially remote source and target domains unlikely to be the result of embodiment or experience-based associations.

Specifically, we examined the metaphor OBLIGATIONS ARE PHYSICAL BURDENS. Although this metaphor is reflected in a number of ordinary expressions (e.g., *This dissertation is weighing on me*), there is less evidence that obligations - a presumably abstract notion - are deeply conceptualized in terms of physiological sensations of burdens. Based on the inter-conceptual manipulation hypothesis, I predict that insofar as an active source-to-target mapping exists, participants who are led to experience a pronounced physical burden will perceive personal obligations as more salient compared to physically unburdened participants. I tested this prediction by having participants wear heavy or light backpacks and then rate the degree to which they felt obligated to perform various activities. I also asked participants how much they wanted to perform the same

activities to assess whether physical burden has general effects on motivation rather than the specific predicted effects on feelings of obligation.

Participants and Method

A total of 34 (21 female and 13 male)[4] psychology undergraduates participated in partial fulfillment of a course requirement. Participants were told that they were taking part in an experiment on personality and psychophysiology, and that their participation would entail completing personality questionnaires while having their skin-conductance measured. It was further explained that in place of large, floor mounted measurement device, participants would be equipped with a portable skin-conductance device that they would wear in a backpack for the duration of the study. In separate cubicles, participants completed questions pertaining to their overall health. This questionnaire allowed us to ensure that we did not endanger participants with pre-existing back conditions, and it allowed us to record participants' weight for reasons described below.

Physical burden manipulation. Participants were randomly assigned to wear a heavy or a light backpack. Proffitt et al. (2003) used a similar methodology and determined backpack weight as a proportion (one fifth to one sixth) of participants' reported weight. In light of the fact that we were ran 3 participants in a session and used a sensitive cover story, we decided that this procedure would have been overly time-intensive and therefore standardized the weight of the heavy backpack at 10.5 lbs. and the light backpack at 1 lb. The backpacks were weighted with books that were bound to prevent shifting. Two wire electrodes, allegedly connected to the skin-conductance apparatus, stemmed through an opening in the backpack. The experimenter affixed these

electrodes to the forearm and wrist of the participant's dominant hand after applying

antibacterial lotion (to bolster the cover story). Only 2 participants expressed mild

suspicion about the legitimacy of the cover story. Excluding their data did not

significantly affect the primary analyses, and since the suspicion was not strong, we

included their data in the reported analyses.

　　Feelings of obligation and wanting measure. After completing a couple filler

questionnaires to bolster the personality inventory cover-story, participants completed the

primary dependent measure of feelings of obligation. The questionnaire listed nine

everyday activities (e.g., Attending class regularly; Going out with your friends on the

weekends; Eating healthy) and instructed participants to indicate extent to which they

ought and how much they *want* to perform each activity. Responses were made on 9-

point scales (1 = *not at all*; 9 = *very much*) and were averaged to form composite scores

of feelings of obligation ($\alpha = .85$) and of wanting ($\alpha = .79$).

Results and Discussion

　　Our primary prediction was a main effect for the burden manipulation on the

obligation scores but null effects for the wanting scores. We therefore conducted separate

t-tests comparing heavy and light backpack conditions for the obligation and wanting

measures. In accord with our predictions, participants who were physically encumbered

by a heavy backpack reported stronger feelings of obligation to perform everyday

activities ($M = 8.60$, $SD = .24$) compared to participants wearing a light backpack ($M =$

8.29, $SD = .57$), $t(32) = 2.00$, $p = .05$. In contrast, and also consistent with predictions, the

backpack manipulation did not influence participants' ratings of wanting to perform the

same activities, $t = .23$, $p > .82$ (see Table 1).

TABLE 1: Feelings of Obligation ("Ought") and Wanting ("Want") as a Function of Physical Burden

	Backpack	Mean	SD
Ought	Heavy	8.60	.24
	Light	8.29	.57
Want	Heavy	7.27	.75
	Light	7.20	.80

Note: Scale ranged from 1 - 9, with higher scores indicating stronger feelings of obligation or wanting.

The results of Study 1 support our hypothesis that the physical sensation of being burdened would increase the subjective significance of everyday obligations. Participants encumbered with a heavy backpack were more likely to view everyday activities as obligations - things they *ought* to do – whereas this manipulation did not significantly impact feelings of wanting.

Research by Proffitt et al. (2003) found that participants wearing a heavy backpack estimated the distance of a field as longer compared to their light-backpack-toting counterparts. This finding can be interpreted within the broader perspective of embodied cognition, according to which the body and embodied states shape perception and cognition in ways that cannot be parsimoniously explained from the perspective that human cognition is a computational manipulation of abstract, amodal knowledge representations. The results of the current study are consistent with this general perspective, but extend it in two important ways. First, they show that bodily states influence not only basic perceptual judgment but also abstract social attitudes. Secondly, they support the broader idea that one mechanism underlying embodied cognition is the influence of variations in a concrete source domain on corresponding elements of a target domain by way of metaphoric entailments (I elaborate on this point in Section V).

Study 2

Bidirectional inter-conceptual manipulation: Target attitudes and source perceptions

Metaphoric mappings across conceptual domains are often said to operate directionally (or asymmetrically) from a more concrete source domain to an inherently vaguer target domain (e.g., Glucksberg, McGlone, & Manfredi, 1997; Ortony, 1979; but see Katz, 1992; Shen, 1989; see also Wolff & Gentner, 2000 for evidence of symmetry in metaphor comprehension). When we understand that LIFE is a JOURNEY, for example, we map the conceptual structure of JOURNEYS onto the domain of LIFE, but we do not conventionally map our understanding of LIFE onto our conception of what a journey is (Lakoff & Turner, 1989). Although many metaphors exhibit directionality, the MESC model posits that some metaphors may have bidirectional effects on social cognition, such that manipulating aspects of an abstract target domain can influence cognition and attitudes in a more concrete source domain. We already discussed Bruner and Goodman's (1947) research suggesting bidirectional links between assessments of personal significance (or "value") and perceptions of physical size, but acknowledged that these findings were open to multiple alternative interpretations. Nevertheless, these findings suggest the interesting possibility of bidirectional effects on perception, at least with regards to simple, more linguistically ingrained metaphors such as SIGNIFICANT IS BIG.

Study 2 was therefore designed to directly test whether manipulating the perceived significance of a social stimulus would influence perceptions of its size. The specific prediction is that people and events that are perceived to have played a significant role in human history will be perceived as physically larger than people and

events that played a relatively trivial role in human history. We also considered whether this effect would be moderated by whether the people and events had an overall positive or negative impact on human affairs. In light of previous demonstrations of perceptual overestimation for both positively and negatively valenced objects (Bruner & Postman, 1948, reviewed in Section II), we predicted that images depicting historically significant people and events would be perceived as larger in size regardless of their valence. To test these hypotheses, participants judged the size of images portraying people and events that varied in historical significance and valence.

Method

Thirty-eight participants (22 female, 16 male) participated in this experiment in partial fulfillment of a course requirement. A female experimenter described the study as part of a joint project conducted in collaboration with the Education department to better understand how people interpret and evaluate visual materials in history textbooks. Participants were told that they would rapidly view and make judgments about a number of images being considered for inclusion in future history texts. In separate cubicles, participants were seated in front of a 15" Dell color monitor. Participants read instructions on the screen explaining that at each trial they would first view an amorphous shape somewhere on the screen and, shortly thereafter, an image in another position. They were instructed to decide as quickly as possible whether the second image is smaller, the same size as, or bigger than the initial shape. Participants made their judgments by clicking on one of three radio buttons that appeared at bottom of the screen (labeled *smaller, same,* and *bigger*). The stimuli were presented using MediaLab software

(Jarvis, 2004). We also recorded the reaction time of size judgments, but did not make any predictions for this measure.

Participants were presented with 16 comparison shape/image trials, presented in random order. Unbeknownst to participants, in all trials the comparison shapes and the images were identical in shape and size (during post-experimental interviews, some participants expressed that the task was very difficult; none suspected that the comparison shapes were designed to be identical in size). In all trials, the comparison shape was an amoebic dark grey shape created by the experimenter. It appeared for 1 sec followed by 2 second delay. The target image then appeared. If participants failed to make a size judgment after 3 sec, the image disappeared and the next trial began. To avoid habituation and sustain task attention, the comparison shapes and images appeared at different locations on the screen in a fixed random order. The images were photographs (some color, some black and white) of people and events representing each cell in a Historical Significance X Valence within-subjects factorial design (Significant/Positive: *the moon landing, the battle of Iwo Jima, Abe Lincoln, Einstein*; Insignificant/Positive: *birthday party, sports fans at a stadium, trophy award ceremony, friends at college graduation*; Significant/Negative: *Adolph Hitler, atom bomb explosion, the September 11, 2001 terrorist attacks, a KKK rally*; Insignificant/Negative: *a store on fire, pulling a car from a ditch, women crying, two men in a fistfight*). The images were block randomized. Each block contained an image from one of the 4 conditions.

Results and Discussion

Size judgments. The primary prediction being tested in this study is that historically significant images would be perceived as physically larger than historically insignificant pictures, and that this effect would not be moderated by image valence. To assess this prediction, I coded "smaller than" judgments (where the image was viewed as smaller than the comparison shape) as -1, "same" judgments as 0, and "bigger than" judgments as +1. I then created composite size judgment scores for each type of image (thereby increasing the pre-averaged range of scores to -4 to +4). These size judgment scores were submitted to a 2 (Historical significance: significant vs. insignificant) X 2 (Valence: positive vs. negative) within-subjects ANOVA.

The analysis revealed the predicted main effect for historical significance. Although there was a tendency to perceive historically insignificant pictures as smaller than their respective comparison shapes ($M = -.29$), historically significant pictures were viewed as almost identical in size to their respective comparison shapes ($M = -.01$), $F(1, 37) = 32.74$, $p < .001$. A significant main effect for picture valence also emerged, $F(1, 37) = 6.19$, $p = .02$, such that negative pictures were judged as larger.

The main effects were qualified, however, by a Significance X Valence interaction, $F(1, 37) = 7.05$, $p = .01$. Pairwise comparisons (LSD) and inspection of the means in Table 2 indicate that, as predicted, historically significant, positively valenced pictures were perceived as larger than relatively insignificant, positively valenced pictures $F(1, 37) = 3.95$, $p = .05$. The interaction was due to a more pronounced effect of historical significance when the pictures portrayed negative historical people and events. Specifically, not only were historically significant, negatively-valenced pictures

perceived to be larger than insignificant, negative pictures, $F(1, 37) = 27.83, p < .001$,

they were also perceived to be larger than historically significant, positively-valenced

images, $F(1, 37) = 13.24, p = .001$.

TABLE 2: Mean Size Judgment (relative to size- and shape-matched comparison shape) as a Function of Target Picture Historical Significance and Valence

Significance	Valence	Mean	SD
Significant	Good	-.14	.29
	Bad	.12	.31
Insignificant	Good	-.28	.27
	Bad	-.31	.38

Note: Scale ranged from -1 (smaller) to +1 (bigger)

Secondary analyses: Reaction time. We also looked at the amount of time participants took to make their size judgment responses. As mentioned, we made no predictions for reaction time. The same 2 x 2 repeated-measures ANOVA revealed a main effect for valence, $F(1, 37) = 5.59$, $p = .02$, which was qualified by a Significance X Valence interaction, $F(1, 37) = 10.94$, $p = .002$ (see Table 3 for means).

TABLE 3: Size Judgment Reaction Time (in sec) as a Function of Target Picture
Historical Significance and Valence

Significance	Valence	Mean	SD
Significant	Good	2.02	.56
	Bad	2.44	.87
Insignificant	Good	2.18	.64
	Bad	2.19	.82

Pairwise comparisons show that participants took more time to make size judgments about historically significant, negative pictures compared to historically insignificant negative pictures, $F(1, 37) = 5.12$, $p = .03$, and historically significant positive pictures, $F(1, 37) = 10.88$, $p = .002$. Looking only at positively valenced images, participants took less time to make judgments about historically significant than insignificant images, although the effect was marginal, $F(1, 37) = 3.00$, $p < .09$. These results are not wholly interpretable. One possibility is that relatively insignificant pictures did not evoke any significant emotional response, allowing participants to quickly make size judgments, whereas historically significant, negative images evoked an emotive response that interfered with rapid size judgments. A more speculative, but perhaps more interesting, possibility is that participants viewed the historically significant, negative pictures as bigger and therefore actually took longer to scan these images and make their size judgments. This explanation would have difficulty accounting for the results of historically significant and positive images, however, which were judged as larger than their insignificant counterparts and yet judged (marginally) faster.

The results of Study 2 confirm our hypothesis that, relative to amorphous gray blobs, images of historically significant events would be perceived as larger than images of historically trivial events. These findings support the broader notion that metaphors such as SIGNIFICANT IS BIG are expressed not only in language but represent active conceptual mappings between dissimilar concepts that can influence lower-level perception. The findings of Study 2 also support the notion that at least some conceptual metaphors have bidirectional effects on cognition, such that variations in an abstract

target domain (in this case, SIGNIFICANCE) influence judgments in a more concrete source domain (e.g., SIZE). Further research is necessary to determine why some metaphors operate bidirectionally whereas others operate directionally from source to target domains.

One potential alternative explanation for the observed effects is that historically significant pictures are seen as simply more familiar and thus larger than historically insignificant pictures. We think this is unlikely, however, as the historically insignificant pictures portrayed social scenarios that are arguably more common in everyday life, such as people attending a sporting event and friends consoling each other. Also, if historically significant images were simply more familiar, one might predict that participants would have taken less time to make judgments about them, but this was not the case (at least with the negative valenced images). More generally, although efforts were made to match the historically significant and insignificant pictures on a number of dimensions (e.g., number of people, vividness), additional studies are necessary to rule out other possible confounds. For example, perhaps the historically significant pictures were simply seen as more emotionally impactful.

The interaction between historical significance and valence was not predicted but warrants further consideration. This finding is inconsistent with the aforementioned evidence of value effects on size overestimation for both positively and negatively valenced stimuli (Bruner & Postman, 1948). It may be the case that, at least in some cases, metaphoric influences on perception are more potent with regards to negatively valenced information. Indeed, research shows that people are chronically attuned to

negative information (e.g., Pratto & John, 1991). To my knowledge, this possibility has

not been addressed in theoretical treatments of conceptual metaphor (e.g., Lakoff &

Johnson, 1980); the interesting possibility is that the psychological evidence may reveal

more about metaphoric cognition than an exclusive consideration of ordinary language.

I plan to follow this study with another brief experiment that deals with the same

metaphor but is designed to test the hypothesis that manipulating *source* cognitions

influences *target* judgments. Participants will be presented with a circle and a rectangle,

counterbalanced in order, and asked to rate how significant a role each shape has played

in the history of human civilization (instructions may encourage them to consider, for

example, the technological innovations related to each shape). For half the participants,

the circle will have a larger area than the rectangle; for the other participants, the reverse

will be true. I predict that participants who view a large circle or rectangle will assign it

more social-historical significance as compared to those who view a smaller version of

the same shape.

Study 3

Source Attitudes and Target Attitudes

Consistent with the inter-conceptual manipulation hypothesis, previous research shows that manipulating perceptions within the source domain automatically influences social attitudes in metaphorically related target domains. Schubert (2005) showed, for example, that presenting a social group's label in a high vertical position facilitated judgments for high-status groups as compared to low-status groups. Study 3 was designed to further assess this broad hypothesis by testing whether manipulating source *attitudes* would influence target attitudes in entailment-consistent ways. Specifically, this study deals the metaphoric connection between the act of physical covering and "concealing" or withholding information. Interestingly, physical covering can be viewed as a destructive act (providing the basis for the metaphor DECEIT IS COVERING: "*Sweep that under the rug*") or a physically protective act (thus the metaphor PROTECTION IS COVERING: "*Let's put a lid on this information*"). We hypothesized that leading people to think about the beneficial consequences of physical covering will lead them to show more permissive attitudes toward the government withholding information from the public relative to those led to think about the harmful consequences of physical covering.

To test this hypothesis, participants in one condition read a vignette wherein a person's covering actions were beneficial, providing protection from a larger problem. In the other condition, the vignette portrayed the act of physical covering is a temporary and ineffective solution to an increasingly malignant problem. Following this manipulation,

participants indicated their attitudes toward the government withholding information from the public and having the right to work in secrecy.

We also considered the role of prior attitudes toward governmental secrecy. As discussed in Section I, metaphors are more likely to shape thought when a target domain is vague, abstract, or unfamiliar. It follows that the framing of a source domain such as physical covering would be more likely to influence attitudes among those who lack strong pre-existing attitudes toward the target domain. To assess this possibility, we measured attitudes toward governmental secrecy prior to the experimental session. We predicted that only among those with relatively ambivalent prior attitudes toward the value of secrecy would the source framing manipulation influence attitudes toward concealing information from the public.

Method

A total of 62 (34 females, 28 males) [4] psychology undergraduates participated in partial fulfillment of a course requirement.

Prior attitudes toward governmental secrecy. During a mass screening session approximately 4 weeks prior to the experiment, participants were asked the following question: In your opinion, when is it acceptable for the government to conceal information from the public? (1 = *under no circumstances*; 5 = *under some circumstances*; 9 = *at the government's discretion*). Actual responses ranged from 1 - 9 ($M = 4.24$, $SD = 1.99$).

During the experimental session participants completed a packet of materials ostensibly designed to assess personality, impressions of others, and opinions toward social issues. The contents of the packet are described below.

Covering attitudes manipulation. Following 2 filler questionnaires included to sustain the cover story was an ostensible personality questionnaire that served as our manipulation of attitudes toward physical covering. The instructions explained that participants would read a portion of a transcribed interview describing another person and answer some questions about that interview later in the study. In the *beneficial covering* condition, the story described a camping incident during which "Rick" successfully covered numerous small fires and thereby prevented a forest fire. In the *harmful covering* condition, Rick unsuccessfully attempted to eliminate mold growing in a camper by covering it with carpet, thereby exacerbating damage to the camper.

Government secrecy assessment. The next questionnaire was an attitudes survey designed to assess participants' opinions toward the government's use of secrecy and their right to conceal information from the public. Participants were asked to indicate their agreement with 6 items (e.g., *A government keeping secrets from the public can only cause disaster; At times, it's in everyone's best interest for the government to withhold information from the public* [reverse scored]). Responses were made on 4-point scales (1 = *disagree completely*; 4 = *agree completely*). Responses to the 6 items were averaged after appropriate reverse scoring ($\alpha = .84$), with higher composite scores indicating stronger condemnation of government secrecy.

Covering valence manipulation check. The next page included 2 manipulation check questions included to assess whether the covering attitudes manipulation influenced attitudes toward physical covering and those responsible for it: How much do you like Rick? (-3 = *dislike very much*; +3 = *like very much*); How much did Rick's actions benefit others? (-3 = *not at all*; +3 = *very much*).

<div align="center">

Results and Discussion

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Manipulation check analyses. A *t*-test comparing the two covering valence conditions revealed that, compared to those who read about Rick's harmful covering actions, those who read about Rick's beneficial covering actions showed more positive evaluations of Rick ($M = 1.5$ vs. $M = -.58$) and his covering actions ($M = 2.73$ vs. $M = -2.05$), both ts > 7.80, ps < .001. We are thus confident that the manipulation was effective in temporarily influencing attitudes toward physical covering and those responsible for it.

Primary analysis. The primary hypothesis being tested in this study is that, relative to those led to think about physical covering as a destructive solution, those primed to think about covering as beneficial would be less condemnatory of secrecy on the part of the government, and that this effect would be moderated by prior attitudes, such that manipulating physical covering attitudes would not influence secrecy attitudes among those with staunchly negative prior attitudes toward governmental secrecy. To test this hypothesis, we regressed negative attitudes toward governmental secrecy (collected within the experimental session) onto covering valence (covering is beneficial vs. covering is harmful; dummy coded), prior attitudes toward governmental concealment (continuous and centered) and their interaction.

The analysis revealed a main effect for prior attitudes. As would be expected, those who previously viewed governmental secrecy as permissible under some circumstances were less condemnatory of governmental secrecy in the experimental session relative to those with negative prior attitudes, $\beta = -.41$, $t(58) = -3.58$, $p = .001$. There was no main effect for the covering manipulation, $t < 1$, $p > .85$.

The analysis also revealed the predicted Covering X Prior attitudes interaction, $\beta = .34$, $t(57) = 2.13$, $p = .04$. I plotted this interaction in Figure 4 using 1 SD above and below the centered mean of prior attitudes toward governmental secrecy. At one SD below the mean, the lower plotted point corresponds to approximately 2 on the pre-measure of attitudes toward governmental secrecy and therefore represents those participants with strong convictions that the government is never justified in withholding information from the public. At one SD above the mean, the upper plotted point corresponds to approximately 6 on our (9-point) scale, and therefore represents participants with more ambivalent attitudes, who believe that it may be valuable under some circumstances but do not believe the government should be free to withhold information at its discretion.

Analysis of the simple slopes reveals that, as predicted, the positive portrayal of physical covering led to less condemnatory attitudes toward governmental secrecy as prior attitudes increased in ambivalence, $\beta = -.66$, $t(57) = -4.11$, $p < .001$. In contrast, when physical covering had been negatively portrayed, those with more ambivalent prior attitudes were not significantly less condemnatory of governmental secrecy as those with negative prior attitudes, $\beta = -.18$, $t(57) = -1.11$, $p > .27$.

FIGURE 4: Condemnation of Governmental Secrecy as a Function of Physical Covering
Valence Manipulation and Prior Secrecy Attitude
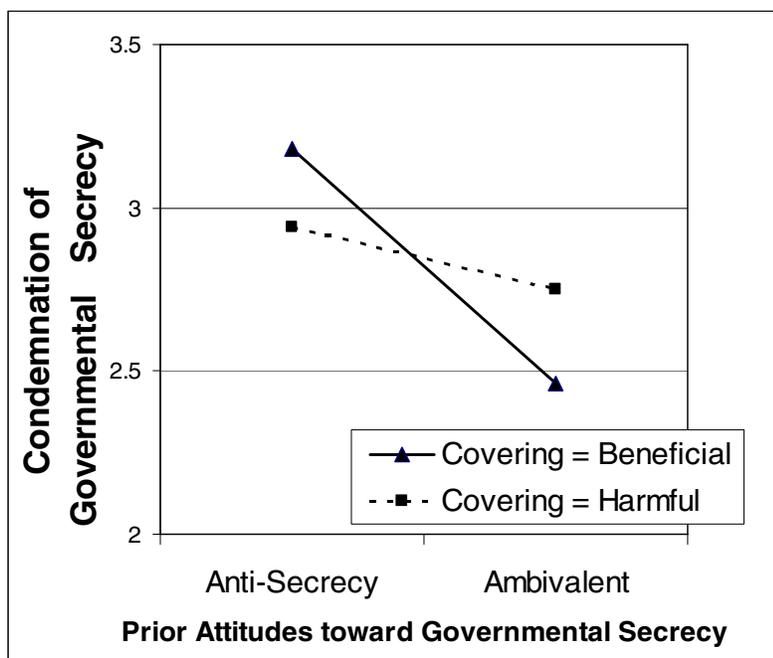
Note: Scale ranged from 1 - 4, with higher scores indicating more negative attitudes
toward governmental secrecy.

Viewed in another way, only among those who came into the experiment with relatively ambivalent attitudes toward governmental secrecy did the source attitudes manipulation influence attitudes toward governmental secrecy, although the difference between the predicted means of beneficial and harmful covering among those with more ambivalent attitudes was marginally significant, $\beta = .26$, $t(57) = 1.65$, $p < .10$.

There was an unexpected trend for those previously opposed to governmental secrecy to become more anti-secrecy when physical covering was portrayed positively, $\beta = -.21$, $t(57) = -1.30$, $p = .20$. One possible explanation for this effect is that these individuals are responding defensively to a (most likely implicit) association between beneficial effects of physical covering and governmental "covering." This possibility warrants additional testing.

The results of Study 3 confirmed our hypothesis that a positive portrayal of physical covering would result in less condemnatory attitudes toward governmental secrecy, and that this effect would be specific to those with ambivalent prior attitudes toward the government's right to secrecy. Also consistent with our predictions, a positive physical covering portrayal decreased condemnation of secrecy among those with more ambivalent attitudes, although this effect was marginally significant. These findings are consistent with previous demonstrations that manipulating aspects of source domains influences target attitudes (e.g., Schubert, 2005) and extend those findings by showing the effects of manipulating attitudes within the source domain.

Although the act of physical covering and the act of withholding information are completely different types of things, the results of Study 3 suggest that we routinely make

sense of secrecy in terms of "covering up" and "concealing" information. Moreover, the finding that prior attitudes moderated the effect of source attitude manipulation suggests that people with more ambivalent attitudes toward an abstract social topic such as the government's right to secrecy are more likely to conceptualize that topic metaphorically in terms of other, typically more concrete types of experience. Perhaps those individuals with strong anti-secrecy attitudes tend to think about the matter in more literal terms, or perhaps they have metaphorical associations that are more resistant to change. These possibilities warrant further testing.

Study 4

Source Motivation and Target Attitudes

As stated earlier, the cross-domain mapping hypothesis states that using one source domain to metaphorically structure a target domain will, via entailments, result in a distinct pattern of target interpretation and evaluation as compared to an alternative source mapping or a literal conception of the target domain. We reviewed evidence showing that dispositionally (Ottati et al., 1999) and situationally (Gentner & Boronat (1992) active source domains significantly shaped target cognitions and attitudes. It is also important to point out that both sets of studies activated only a portion of the entailments of a given metaphor, suggesting that cross-domain mapping effects do not require the activation of a metaphor at its most general level.

Study 4 provides a more direct and challenging test of the cross-domain mapping hypothesis by assessing whether the effect of heightened motivation within a concrete source domain on target attitudes is moderated by the situational activation of a portion of a metaphor's entailments relative to a literal conception. To specify, this study examines the topic of immigration into the United States, a topic often discussed metaphorically in terms of foreign agents entering and contaminating a physical body. This way of talking suggests that attitudes toward immigration may be shaped by the metaphor IMMIGRATION IS THE CONTAMINATION OF A BODY: that is, it may be the case that a concrete concern with protecting one's *own* body from contamination, combined with a metaphorical entailment that likens the U.S. to a body, creates a concern with maintaining the "purity" of the U.S. and therefore unfavorable attitudes toward those seen to be "contaminating" the country.

This is an interesting possibility because it suggests that attitudes toward domestic affairs gain their force partly through motivations in completely different domains of experience.

To test this idea, we predicted that heightening the motivation to protect one's own body from contamination should result in more negative attitudes toward immigration, but only if the country is framed metaphorically as a body. When the country is framed literally, the motivation to protect one's own body is not expected to carry over into the more abstract domain of domestic issues and impact immigration attitudes.

Method

Sixty-nine psychology undergraduates (49 female, 20 male) participated in partial fulfillment of a course requirement. Political orientation was measured during a pre-screen session approximately 1 month prior to the experimental sessions (measured with a single item, 9-point scale; 1 = *very conservative* and 9 = *very liberal*). Thirteen (19%) of the participants reported being of Latino ethnicity [5].

Body threat manipulation. Participants in the bodily threat condition read an article in which airborne bacteria were described as ubiquitous and deleterious to health. A portion of this article states: "In the first nationwide census of naturally-occurring airborne bacteria, scientists are discovering that the air we breathe is crowded with health-threatening airborne substances… It is vitally important to protect your body from becoming infected with an airborne illness. We have to develop more safeguards against these organisms." Participants in the non-threat condition read an article in which airborne bacteria were described as ubiquitous but harmless and, in some cases,

beneficial: "Although some bacteria can be harmful to our bodies' health, you wouldn't want to get rid of all of them. In fact, we couldn't survive a day without them. Our bodies contain approximately 400 species of helpful or "friendly" bacteria, known as 'probiotics'... It has been known for some time that these friendly bacteria aid in our digestion, protect us from environmental toxins, help maintain healthy cholesterol levels, and break down and rebuild hormones.... We need to be careful to allow sufficient exposure to these health-providing organisms."

U.S. embodiment manipulation. In an ostensibly separate study, participants read an essay describing U.S. domestic issues other than immigration, such as pollution and education. This description served as our manipulation of embodied conceptions of the U.S. In one condition, the essay contained language consistent with the metaphor THE UNITED STATES IS A BODY (e.g., "After the Civil War, the U.S. experienced an unprecedented growth spurt ...The country has not always kept in step with the technology, and is scurrying to create new laws that will give it a chance to digest the millions of innovations."). In another condition, the same domestic issues and opinions were discussed using literal paraphrases of the metaphors ("After the Civil War, the U.S. experienced an unprecedented period of innovation...Legislation is not always as sophisticated as the technology, and efforts are now underway to implement new laws capable of regulating and managing the millions of innovations.").

Anti-immigration attitudes measure. The description of the U.S. was followed by two questionnaires intended to measure opinions toward social issues. The first measure was our primary dependent measure of anti-immigration attitudes and consisted of 6

items: It's important to increase restrictions on who can enter into the U.S; It's important to keep out immigrants with undesirable characteristics; An open immigration policy would have a negative impact on the nation; The country is vulnerable to corruption by illegal immigrants; Illegal immigration threatens the integrity of the nation; It's important to construct walls at our nation's borders to protect it from illegal aliens.

Following the immigration questionnaire was a parallel questionnaire with items about minimum wage (e.g., Increasing the minimum wage would be a positive step for this country) [6]. We included this questionnaire to assess the possibility that the manipulations were simply resulting in more conservative responses. Responses to both questionnaires were made on a 9-point scale (1 = *strongly disagree*; 9 = *strongly agree*).

Body threat manipulation check. The final page of the packet included manipulation check questions for the body threat manipulation. The first question assessed comprehension of the bacteria-related article: "The basic message of the editorial on airborne bacteria was that the average person is exposed to ___ substances in the air" followed by four choices: healthy, harmful, salty, arousing. This was followed by two questions assessing concern with bodily safety and purity. "To what extent did the article on airborne bacteria make you more concerned about what substances *your* body is exposed to?" and "To what extent did the article on airborne bacteria increase your desire to protect *your* body from harmful substances?" (1 = *not at all*; 9 = *very much so*). Participants inserted completed packets into a confidential box and were fully debriefed.

Results and Discussion

Body threat manipulation checks. All participants correctly reported that the article reported on the harmful or healthy effects of airborne bacteria as appropriate for their condition. As expected, a *t*-test revealed that participants in the body-threat condition were more concerned about substances their body is exposed to (*M* = 5.64, *SD* = 2.18) compared to participants in the no-threat condition (*M* = 4.48, *SD* = 2.20), *t*(67) = 2.18, *p* = .03. Also as expected, participants in the body-threat condition expressed more desire to protect their own bodies from harmful substances (*M* = 5.60, *SD* = 2.14) compared to participants in the no-threat condition (*M* = 4.70, *SD* = 2.15), *t*(67) = 2.08, *p* = .04.

Anti-immigration attitudes. The primary interest of this study was whether inducing concern with bodily purity would lead to more negative attitudes toward U.S. immigration when the U.S. was metaphorically described as a body.

We formed a composite anti-immigration measure by averaging responses on the 6 immigration items (α = .87). We regressed anti-immigration scores onto Body threat (threat vs. no threat; dummy coded), Embodiment (embodied-U.S. vs. literal-U.S.; dummy coded), political orientation (continuous and centered), and their interactions.

Not surprisingly, we found a main effect for political orientation, such that political liberalism was negatively associated with anti-immigration attitudes, *β* = -.27, t(64) = 2.33, p = .02. We also observed the predicted Body Threat x Embodiment interaction, *β* = .43, *t*(61) = 2.12, *p* = .04. No other main effects or interactions, including the three-way interaction with political orientation, reached significance, *t*s < 1, *p*s > .48. Pairwise comparisons (LSD) and the pattern of means presented in Table 4 reveal that

among participants primed to view the U.S. as a body, those exposed to a threat to the

purity of their own bodies expressed more negative attitudes toward U.S. immigration

compared to participants whose bodily purity was not threatened, $F(1, 65) = 4.29$, $p =$

.04. In contrast, when the U.S. was described in a non-embodied, literal way, body threat

led to a slight but nonsignificant decrease in anti-immigration attitudes ($p > .17$). Also as

predicted, it was only when the U.S. was portrayed as a body did the body threat

manipulation lead to more negative attitudes toward immigration, $F(1, 65) = 4.70$, $p = .03$

(pairwise for embodiment within the no-threat condition, $F < 1$, $p > .34$).

TABLE 4: Anti-Immigration Attitudes as a Function of Bodily Threat and Framing of the United States

Bodily Threat	U.S. Framing	Mean	SD
Threat	U.S. = Body	5.66	1.13
	Literal control	4.44	1.59
No Threat	U.S. = Body	4.43	1.50
	Literal control	4.99	2.25

Note: Scale ranged from 1 to 9, with higher scores indicating more negative attitudes toward immigration.

We conducted the same regression analysis including our two experimental manipulations and political orientation but this time with the composite measure of pro-minimum wage attitudes ($\alpha = .87$). This analysis revealed only a marginal main effect for political orientation, such that increased liberalism was positively associated with favorable attitudes toward a minimum wage increase $\beta = -.27$, $t(64) = 2.33$, $p = .02$, all other ts < 1.11, ps $> .26$. The null interaction for minimum wage attitudes strengthens our confidence that the observed effect is not simply due to a generalized increase in restrictive or conservative attitudes.

We often talk about "threat" and its influence on social attitudes, but what are the cognitive mechanisms that mediate between individual threat and intergroup attitudes? Study 4 tested the idea that attitudes toward broad-level, abstract social threats are conceptualized partly in terms of more concrete threats to one's physical and social well-being. Accordingly, the results show that a heightened motivation to maintain the purity of the body, combined with a subtle prime to conceptualize the country in terms of a body, led to harsher attitudes toward immigrants entering the country.

V. SUMMARY AND CONCLUSION:
TOWARD A BROADER CONCEPTION OF METAPHORIC MEANING-MAKING

How, at a fundamental level, do people construe their social world? Partly we do so by applying stored concepts (or schemas) about similar classes of people and events to selectively interpret and elaborate on the complex array of social information. In this dissertation I proposed that, in addition to using hierarchically structured concepts, people lend meaning to the social world in large part through conceptual metaphors that use the structure of familiar, typically concrete concepts to reason about and evaluate information in dissimilar, typically more abstract conceptual domains. I presented the MESC model of metaphoric social cognition with the goals of organizing otherwise disparate findings and inspiring further research. To these ends, I showed that two MESC-derived hypotheses receive direct or indirect support from diverse lines of research, and that both hypotheses are capable of giving rise to unique predictions that are largely in accord with the data.

A metaphor-enriched model of social cognition does not replace a non-metaphorical model. When people think about immigration, for example, they are certainty using schematic information about immigration *per se*. But any model focused exclusively on concepts/schemas cannot provide a parsimonious explanation of the finding, observed in Study 4, that concerns about protecting the integrity of *one's own body* influence immigration attitudes when the country is subtly depicted in embodied terms. Although further research and theoretical refinement are necessary, a metaphor-enriched model hopefully adds a crucial piece to a comprehensive understanding of the causes and consequences of everyday social meaning-making

To conclude, I'll draw attention to two unique virtues of a metaphor-enriched perspective on social cognition. First, such a view highlights the inter-conceptual fluidity of everyday thought. Second, it highlights functional aspects of everyday thought not featured prominently in standard accounts of meaning-making.

1. Concepts have fluid boundaries and are continually intermingling in the course of everyday thought: Implications for embodiment, cognitive rigidity, and creativity.

A metaphor-enriched view highlights the idea that making sense of one type of thing often entails borrowing the structure of a different type of thing. Although standard models of social cognition discuss conceptual similarity as well as hierarchical organization, they do not lay emphasis on the notion that a given concept can be structured in terms of a coherent set of entailments between corresponding elements of dissimilar concepts.

As discussed, many of the concepts useful in making sense of vague or abstract experiences are domains of experience grounded in concrete, physical interactions with the world. When we deal with abstract concepts - *How are we going to solve the drug problem? How am I going to quit my job? How can I be happy?* - we use more than abstract conceptual knowledge; we also apply our basic understanding of destroying things, getting out of enclosed spaces, finding objects, and so on. Standard models of social cognition tend to overlook the fundamentally embodied nature of everyday thought because they characterize cognition in computational terms as the manipulation of

abstract, amodal bits of information. A metaphor-enriched perspective on social cognition grounds meaning-making in the body, and in this respect is broadly consistent with traditional (e.g., Marleau-Ponty, 1945/2002) as well as contemporary perspectives on embodied cognition (Barsalou, 1999; Churchland, Ramachandran, & Sejnowski, 1994; Clark, 1997; Damasio, 1994; Johnson, 1987; Johnson-Laird, 1983; Zajonc & Markus, 1984). Specifically, the two perspectives converge in their claim that there is no fully autonomous faculty of reason separate from and independent of bodily capacities such as perception and movement, and bodily states derived from direct experience significantly shape the representation and processing of social information.

That said, it's worth noting how the two perspectives diverge. Theories of embodied cognition generally posit that concepts contain not only abstract information but also representations of sensory (e.g., proprioceptive) and motor experiences. Barsalou (1999) proposes that stored within the concept ANGER, for example, are direct experiences of physiological reactions and behavioral responses (cf. Zajonc & Markus, 1984). Support for this contention is provided by evidence that activating a social stereotype engenders implicit mimicry of behavior that is associated with the stereotyped group (e.g., mimicry of the slow walking associated with the elderly; Bargh, Chen, & Burrows, 1996). This finding reflects the activation of embodied representations that are tied to the social stereotype in a literal way. In contrast, the present metaphor-enriched perspective posits that abstract conceptual domains do not only *contain* embodied representations, but are in many cases partially structured *in terms* of those embodied representations by means of active conceptual mappings. For example, the schema for an

emotional state like DEPRESSION may not include an embodied, literally related representation of bounded space, but it may be fundamentally understood *in terms* of bounded spaces, since it can be *fell into*, *crawled out of*, *trapped in*, and *escaped from*. As we've seen, this view is supported by evidence that manipulating how people think about source domains (e.g., SPACE; Boroditsky & Rascar, 2002) or simulating actions associated with the source domain (arm flexion; Cacioppo et al. 1993) can influence how they reason about and evaluate information in a metaphorically related target domain. These findings support the notion that embodied experiences represent not only a portion of the content of abstract social concepts but in many cases serve as source domains for metaphorical conceptions of those abstract concepts. For any given example of body-related concepts influencing judgments in a target domain, specific research will be necessary to determine when such an effect is best conceptualized as an instance of relatively invariant, uni-dimensional embodied cognition or as an instance of more flexible, multi-dimensional metaphoric social cognition.

A metaphor-based view, and its emphasis on inter-conceptual structuring, provides a more dynamic understanding of how social forces shape everyday thought because it highlights the fact that the same concept can receive different kinds of metaphorical structuring. That is, social meanings vary not only because people are using distinct sets of concepts but also because they are working under distinct metaphorical structuring of the same concept. For example, two business partners may both be operating with a similar set of concepts - NEGOTIATION, BUSINESS DEAL, and so on - but may each be metaphorically conceptualizing those concepts in very different ways. One

partner may conceptualize a business deal as a complex DANCE, whereas the other partner conceives of business deals in terms of WAR. This is the basis for the MESC model's cross-domain mapping hypothesis that receives support from prior research as well as the results of Study 4. Additional research is necessary to specify which aspects of the situation and of the individual determine which source domains are used to structure a given concept and how variations in source domain conceptualization impact target domain interpretation and attitudes.

A focus on inter-conceptual structure also sheds light on rigid forms of thought - i.e., beliefs and attitudes that are emotionally salient and highly resistant to change. The structure of a source domain (attributes, relations, etc.) may be highly familiar and straightforward, and by virtue of conceptual metaphor, the structure of the target domain may be viewed as equally obvious and familiar. That is, the metaphorical interpretation can be taken as self-evident, and as a result it seems perfectly obvious that the same beliefs and assumptions that apply in one domain apply in the other (in fact, in these cases, they are not even seen as different in kind). For example, it's evident that, in our everyday physical functioning, being encumbered or restrained against one's will is an aversive state, whereas free, forward, and even upwards movement is a valued state. As a result of conceptual metaphors grounded in these experiences, people may risk everything and place themselves and others at great peril in order to *rise up, move up, move forward, get ahead, advance the human race,* and *destroy any obstacles in our path* without putting much thought into what those social goals mean.

In a similar sense, motives in one domain may contribute to cognitive rigidity in a metaphorically-related domain. For instance, the aforementioned finding by Schnall et al. that moral transgressions were judged more harshly when made in disgust-eliciting environments, as well as the results of Study 4, suggest that the motive to maintain the purity of the body can shape attitudes and behavior toward abstract, metaphorically-related target topics such as moral offenses and immigration. Thus, automatic and seemingly "natural" motives (e.g., to avoid disgusting stimuli and physical contamination) can shape conceptions of abstract social topics in ways that make those conceptions more resistant to change than if they were conceptualized literally or in terms of less "gut-level" experiences.

In addition to shedding light on cognitive rigidity, a metaphor based view helps elucidate the creative leaps of imagination that form the mainspring of artistic and scientific discovery. Bronowski (1977) has argued in a series of essays that underlying art and science alike is the search for "hidden likenesses":

> *A man becomes creative, whether he is an artist or a scientist, when he finds a new unity in the variety of nature. He does so by finding a likeness between things which were not thought alike before, and this gives him a sense at the same time of richness and of understanding. The creative mind is a mind that looks for unexpected likeness. This is not a mechanical procedure, and I believe that it engages the whole personality in science as in the arts.*

That is, the artist and scientist are essentially searching for an underlying order or structure to nature and experience, and this structure often entails linking and organizing phenomena which were thought different in kind. The theory of general relativity links light with gravitation, and a poet uses an inventive, unusual, or arresting metaphor to

yield fresh insight into some experience or situation. Meanings are not always directly functional - metaphor allows people to manipulate them playfully to reveal their potential associations, which can lead to overlapping and sometimes paradoxical meanings. But these creative leaps are not unusual, and they do not require separate and distinct psychologies to understand; rather, they are continuous with routine metaphorical processes inherent in our ordinary conceptual systems. In short, a metaphor-enriched perspective on social cognition may be in a better position than standard models to highlight the continuity between everyday social thought and specific cultural endeavors such as art and science.

2. Everyday cognition functions to resolve the inherent opacity, and not merely quantity, of social information: Connection to myth, art, and ritual

A metaphor-enriched perspective deepens our understanding of the function of social cognition by drawing attention to a property of many social concepts that often goes unnoticed, namely, their inherent opacity. A fundamental assumption behind all mainstream accounts of social cognition is that the primary psychological challenge people face in their everyday lives is coping with the sheer *quantity* of information encountered in the social world (see, e.g., Kunda, 1999; Hamilton, 2005). A person at any given point faces infinite social stimuli, all clamoring for their limited attention and processing capacity (Following Fritz Heider, these accounts also mention the *ambiguity* of social information, typically viewed as the potential for a social stimulus to give rise to

a small set of incompatible interpretations; "*Was that comment sincere or sarcastic?*").

For these perspectives, concepts (i.e., schemas, scripts, frames, theories) are the chief

mental mechanism used to reduce the potentially overwhelming welter of social

information.

But the sheer quantity of social information is not the only processing challenge

people face. People are also trying to understand the meaning and significance of

ordinary concepts and experiences that are inherently *elusive* or *unstructured*, such as

their own feelings, nebulous social problems, and the overall trajectory of their lives. A

central premise of a metaphor-enriched perspective is that conceptual metaphor is the

primary mechanism by which people lend meaning to abstract or elusive concepts by

conceptualizing and communicating about them in terms of other, more structured

concepts and experiences. For example, people use diverse metaphors to make sense of

TIME, which in itself is vague and defies precise, straightforward understanding. People

are not simply cognitive misers; they are also seeking to impose manageable structure

onto otherwise nebulous things in the world.

How does this view help connect social thought with broader forms of culture?

Other vital and universal forms of meaning-making represent attempts to lend meaning to

specific concepts and experiences that carry great importance but are, in themselves,

difficult to conceptualize because of their abstract nature. This is reflected in the mythic,

artistic, and ritual practices common to every known culture.

Myth. Every culture of which we are aware has a supernatural dimension that

deals with the sacred, ineffable, and seemingly impenetrable mysteries inherent in so

many aspects of the world, including famine, disaster, accident, calamity, birth, death, life, growth, time, justice, self, soul, value, virtue, sin, guilt, terror, freedom, limitations, and so on. Mythic forms grounded in metaphor are critical for lending meaning to these mysteries. One prominent example is the use of anthropomorphism - metaphorically understanding a force or entity as a person. For example, believers in the Judeo-Christian God rarely believe that God is literally a man, but among all the sensible things of which people can have experience here on earth, a beautiful and dignified fatherly ruler of infinite splendor is the most fitting metaphor our mind can grasp. Similarly, many cultures recognize agents with human-like mental states as representing time, death, and other existentially pertinent concepts. Anthropomorphism is essentially a metaphor that maps existentially pertinent concepts onto familiar notions of belief, desire, motivation, retribution, and other common mental states. Thus structured, these existentially pertinent forces seem manageable, controllable, and able to be appeased.

Art. Almost all forms of art use metaphorical imagery to lend form to deeper meanings. For instance, when Giotto set down to capture the god-like purity of the Virgin Mary (Figure 5), who Scripture describes as "fairer than the sun, brighter than all the stars, like the radiance of eternal light" he used a background of gold, which is the material with the nearest approximation to light. And when he wanted to represent the mystery of the immaculate conception, he painted Mary's dress blue to represent the vast, unknowable realm of the sea. Similarly, when 600 years later Francis Picabia labeled a spark plug as a "Portrait of an American Girl in the Nude" (Figure 6), he spoke volumes about human sexuality.

FIGURE 5: Giotto's *Ognissanti Madonna*

FIGURE 6: Picabia's *Portrait of an American Girl in the Nude*
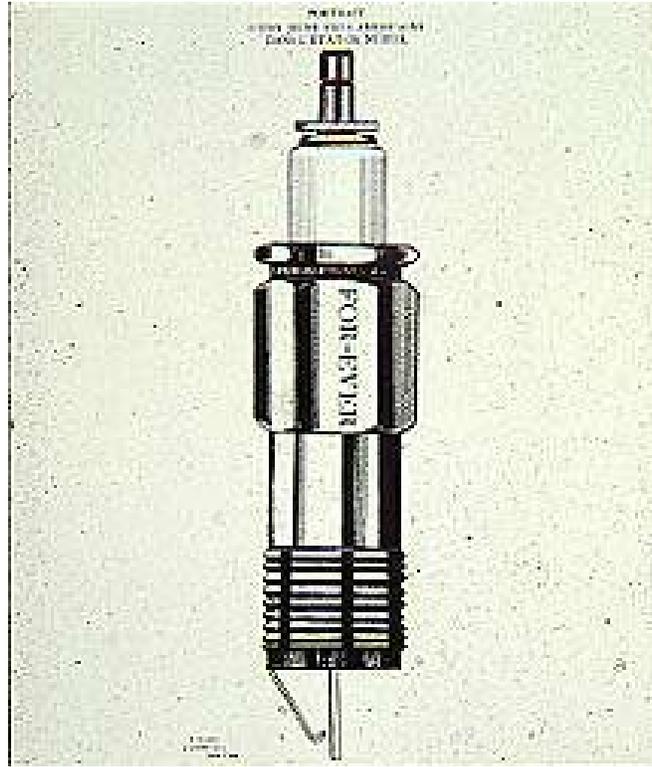
The same applies to music. Master composers such as Bach, Hayden, and Mozart selected from a range of sounds, harmonies, and rhythms that metaphorically expressed and elucidated sacred and mysterious events and forces, such as the sorrow of Christ's passion, the silence of the entombment, and the jubilation of resurrection (e.g., by using an ascending scale to depict Christ's ascension).

Ritual. Susanne Langer argues that objects used in ritual and sacrament are imbued with mysterious significance because they metaphorically represent existential issues of abiding concern:

> *Since the [ritual objects] are consciously regarded not as symbols of Life and Death, but as life-givers and death-dealers, they are not only revered, but also besought, trusted, feared, placated with service and sacrifice. Their power is invoked for the salvation of worshipers in times of danger. They can break the drought, end famine, stay a pestilence, or turn the tide of battle. The sacred ark going up before the Children of Israel gives them their victory. Held by the Philistines, it visits disease on its captors. Its efficacy is seen in every triumph of the community, every attainment and conquest. Specific events as well as definite feelings become associated with a Holy of Holies, and seek expression round the alter* (p. 150).

Through metaphor, even practically useless objects can become imbued with a seemingly intrinsic sacredness and power and elevated to the significance of idols, emblems, and totems. Formalized and ritual gestures and dances similarly serve to metaphorically express some aspect of the culture's beliefs, thereby bolstering faith in the validity of those beliefs, providing a means to commune with arcane cosmic forces seen to be responsible for life and death, and strengthening the sense of congregational or tribal unity.

In sum, the psychological problem people face in everyday meaning-making is not simply information overload; there are also important but arcane concepts that require clear and manageable structure to comprehend. Metaphor, as manifested in everyday thought and also broader forms of culture, functions to make the incomprehensible comprehensible through the symbolic act of likening these concepts to some thing, act, or state that is more clearly structured.

I believe that as long as we view the sole function of social cognition as the reduction of information quantity, we'll continue to view myth, ritual, and religion as bizarre cultural artifacts that are set apart from the whole of social life and that require special psychologies to understand. A metaphor-enriched perspective views everyday social thought as geared not only toward parsimony but also the structuring of inherently abstract and elusive concepts. There is no essential difference, on this view, between our everyday cogitation and the elaborate symbolism inherent in myth, art, and ritual. The differences between these forms lie not in kind but in the degree of conventionality, impact, banality, aptness, and evocative potential.

It's important to note another function of cognition that is even more grossly overlooked by mainstream models of social cognition. So far we have been characterizing the function of cognition as providing clarity and understanding, at revealing at least an approximation of the objective world. But the legacy of Sigmund Freud is that the mind also functions to *conceal* certain meanings, to actively obscure certain realizations that may be threatening or intolerable. And here, again, metaphor

plays a central role, because it allows the person to apply source domains to make sense of concepts in a way that actively downplays (represses) their threatening aspects. At the beginning of this paper we mentioned Freud's insight that an individual's dreams reflect an essentially metaphorical masking of aversive cognitions. Dream analysis is precisely an attempt to understand the motives that lead the mind to select certain metaphors rather than others, and to interpret the reasons that make for the unconscious appeal of certain forms.

Suzanne Langer proposed that, much as metaphoric dream symbols can conceal or express the meaning and emotional significance of unacceptable or inexplicable content on a personal scale, entire cultural ideologies are rooted in metaphors designed to account for the mysteries of life and existence: "The cosmic setting of man's existence is imponderable, or at best a mere nightmare, until the sun and the moon, the procession of stars, the winds and waters of earth, exhibit divine rule, and define the realm of human activity" (1979; p. 180). That is, the regularities of nature, the alternation of night and day, are universally used as metaphors to comprehend phases of life - birth, growth, decadence, and death. These things have a baffling, oppressive ambiguity that we seek to resolve. Metaphor serves an appeasing function, obscuring potentially terrifying existential circumstances, when it allows us to map these experiences onto something more comprehensible and manageable.

In the same way, mystic symbolism common to many cultures is often paradoxical, abstruse, dissonant, and perhaps even repellant because it helps reinforce the idea that the true ineffable mystery lies beyond it, not in it. For example, to represent

TIME in a literal way would reveal uncomfortable truths about one's mortality; depicting

TIME as though it were a magician or a snake eating it its own tail downplays the harsh

reality of finite life and highlights a transcendent meaning beyond appearances. In the

words of Gombrich (1965; p. 454, 456),

> *[Metaphor] exploits the challenge of the enigmatic, the contradictory and unresolved. What it thus loses in clarity it hopes to gain in richness, in that plentitude of meaning that embodies all the ambiguities and ambivalences that orchestrate our experience…[religious, mystic, and artistic metaphors] demonstrate the unwillingness of men to accept the human condition which is grounded in the use of signs. The longing for immediacy, the faith in some direct communication with other minds, if not with spiritual beings, manifests itself in that leap across the 'sign limit' that promises escape from the fetters of reason.*

At both the individual and cultural level, metaphor helps people create a realm where

contradictions are fused and meanings are merged; it is here that threatening facts can be

obscured with creative plays of the imagination.

In sum, metaphor is a mechanism that significantly shapes everyday social

cognition but also lies at the core of myth, ritual, and religion, and we arrived at that

discovery by noting that metaphors, rather than concepts, are useful not only for reducing

information overload but also for lending coherent structure to important concepts that

are otherwise difficult to conceptualize in their own terms. Finally, we noted that

metaphors serve an equally central *repressing* function, at the individual as well as

cultural level, by imposing the structure of non-threatening concepts onto potentially

aversive realities.

FOOTNOTES

Footnote 1. To investigate how culturally prevalent these types of metaphor are, Asch compiled a list of physical terms that English speakers use routinely to refer to psychological and social properties (e.g., *right/left, dull/bright, straight/crooked, sweet/bitter, colorful/pale, white/black, rough/smooth, slippery/ dry, clear/cloudy, deep/shallow, high/low, rounded/sharp, hard/soft*). He then examined whether similar terms appear in historically unrelated languages that refer to the same sets of physical and psychological properties. Scholars and native speakers examined Old Testament Hebrew (dating back to 1000 BC), Homeric Greek (800 BC), Chinese, Thai, Malayalam (spoken in southwestern India), Hausa (spoken in Western Africa), and Burmese. Results showed that, for all languages, informants could provide a term in that language that referred to the same or a highly similar physical or psychological property, and they could illustrate the usage with phrases or sentences in which the word referred to the properties in a way that corresponded to the English equivalent. Most pertinent to our current discussion, many of these usages were metaphorical. For example, in Hebrew, one would complain of the bitterness of the soul; in Greek, the equivalent means bitter pain and bitter tears; in Chinese, bitter fate or hard lot in life; in Thai, bitterness of character or an unpleasant disposition; in Burmese, to speak bitterly is to speak in an unfriendly manner. These correspondences cannot be explained as a matter of simple valence: *bitter* does not stand for just *any* negative psychological quality - it is not employed, for example, to describe weakness or deceptiveness.

Footnote 2. Scripts, concepts, but also Schemata (Piaget, 1937/1954), self-schemas (Markus, 1977), paradigms (Bruner & Postman, 1949), internal working models (Bowlby, 1980), and implicit theories (Murphy & Medin, 1985) - all ways that people cognize their world through mental representations of the qualities and relations of similar types of things.

Footnote 3. One possible alternative to conceptual metaphor is that two concepts are in a hierarchical conceptual relation. To examine this alternative in more detail, consider the metaphor THE MIND IS A PHYSICAL SPACE (Jaynes, 1976), as expressed in dozens of common expressions (e.g.,*"I'm searching for that phone number; I know it's in the back of my mind somewhere"; "Unacceptable impulses are buried in the dark recesses of the individual's subconscious"*). According to a metaphor-enriched perspective, this metaphor arises from a need to conceptualize and converse about abstract phenomena, and so the structure of our conscious minds takes on aspects of the structure of space, and our conceptions of our thoughts and mental operations correspond in part to our conceptions of the movement and manipulation of objects in space: objects are heavy and light, objects closer to us are more attention-grabbing and important, and objects can be lost, retrieved, pushed down, and so on. In other words, our experience with physical space has coherent structure, and by means of metaphoric entailments we map that coherent structure onto our conception of our own minds to create meaning in our internal mental experience.

Alternatively, the schema or concept for MIND may be represented as a subcategory of the more general schema for PHYSICAL SPACE. It is important to distinguish metaphoric structuring from subcategorization. A relationship between two concepts is a clear instance of subcategorization if they are the same kind of thing or activity and they share attributes which are high in salience for both (Lakoff & Johnson, 1980; Rosch & Mervis, 1975). For example, ARGUMENT is a subcategory of CONVERSATION because the same kind of activity occurs in both, namely, talking, and an argument has all the basic structural features of a conversation. In contrast, MIND and PHYSICAL SPACE define *different types of activity*: cogitation does not entail the movement or manipulation of physical objects in any literal sense (regardless of how intuitive the metaphor may be). Furthermore, only selected elements of our overall conception of physical space are used to structure the concept MIND. In physical space objects have mass, are visible to others, and their identity is independent of consciousness. If the schema for MIND were a subcategory of PHYSICAL SPACE, we would expect all these properties to be true of our thoughts (e.g., Fiske & Taylor, 1991), but they are not. Contemporary metaphor theory (Lakoff & Johnson, 1980) explains this partial mapping of attributes by positing that metaphors import a portion of the conceptual structure, and rarely the surface attributes, from one conceptual domain onto another. The important point is that the relationship between two concepts is clearly metaphorical insofar as the concepts define clearly *different kinds* of things or activities.

Footnote 4. In this and the following studies, the analyses were originally conducted with gender as a between-subjects factor. There were no main effects or interactions involving gender. Consequently, gender is not reported in subsequent analyses to simplify the presentation of results.

Footnote 5: Preliminary analyses including ethnicity revealed, perhaps surprisingly, no less anti-immigration attitudes among Latino participants as compared to participants representing other ethnicities. These analyses furthermore revealed no interactions between ethnicity and our primary independent variables).

Footnote 6. We decided not to counterbalance these measures because we were concerned that the minimum wage questionnaire might be too long of a distraction between the manipulations and the dependent measure of primary interest. Future research would more systematically counterbalance the measures.

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