Metaphor as a Psychological Construct
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1. **Introduction**

The Merriam-Webster definition of metaphor (as gotten from [www.merriam-webster.com/dictionary/metaphor](http://www.merriam-webster.com/dictionary/metaphor)) states that a metaphor is a figure of speech in which a word or a phrase literally denoting one kind of object or idea is used instead of another to suggest a likeness or analogy between them. Metaphors are part of figurative language, and have a lot in common with analogy. Throughout history, people have always used metaphors. Aristotle (circa 335 B.C.E) has already narrowly defined metaphor as a linguistic device comparing dissimilar things, with the note that metaphors used in spoken rhetoric can prompt listeners to decipher how dissimilar things are alike. Metaphor is pervasive in language and thought - there is even reason to believe that metaphor is processed in the same basic way as analogy is (Gentner et al., 2001). Yet despite a considerable amount of research, little is still known about how metaphors are psychologically processed, and indeed, the idea that metaphor is a central component of human cognition that is frequently used to understand and communicate abstract and elusive ideas, has only grown in recent years (Arendt, 1977; Cassirer, 1946; Jaynes, 1976; Langer, 1979).

Yet not only the processing of metaphor, and how it is used to make sense of our surrounding is interesting to investigate, but also how metaphors can actually enrich and influence the way people see their social surroundings. (Landau et al., 2010). The question I will thus attempt to answer in this article is if metaphor can be seen as a psychological construct or if it really is only a lexical concept.

In the basic research section of this paper, I will list up several theories on how metaphors can be processed, as well as the similarities and differences of metaphors and analogies, as well as an introduction into the conceptual metaphor framework. Furthermore, I will give a brief summary on how metaphors have evolved over the different years. In the specific problem section, I will delve a little deeper in what ways the use of metaphor can enrich people’s social surroundings, as well as change people’s perceptions of them.

2. **Basic research**

2.1. A Comparison of Theories for Processing Metaphor and Analogy
A metaphor's interpretation arises from the interaction of its base (or source) and target concept (Black, 1979). A couple of models that postulate on how base and target interact are, for example, the pure matching model, abstraction-first, and alignment-first processing.

Pure matching models specify that metaphors are interpreted by matching identical elements in the target and the base. This involves a search for common properties between base and target. (Gentner & Wolff, 1997). Several models of metaphor comprehension draw heavily on these sorts of processes. Ortony (1979), for example, proposed, in his salience imbalance model, that metaphors, like literal similarity assertions, are comprehended in terms of shared features. Unlike similarities, the shared features in metaphors are of high salience in the base term, but of low salience in the target term. There is empirical support for matching processes in metaphor comprehension, yet pure matching models still fail to capture some important metaphoric phenomena. Several of these are addressed by Glucksberg and Keysar (1990, 1993). For example, one problem the pure matching models cannot adequately explain is feature selection, meaning that not every shared feature of the target and base concept is included in an interpretation, (e.g. Camac & Glucksberg, 1984). A second problem would be the matching of similar but nonidentical features. If metaphors are nothing more but pure comparison, it is unclear how nonidentical but similar properties of base and target are matched (e.g. Black, 1962). A third problem is that pure matching models can't really explain the phenomenon of asymmetry (meaning that metaphors often have different interpretations or become anomalous when reversed) or in particular, why metaphors are more asymmetric than literal comparisons (Glucksberg et al., 1997; Ortony et al., 1985). The most serious perhaps, is that pure matching models fail to predict feature importation: the fact that features apparently present in only one of the concepts can enter into an interpretation (Glucksberg & Keysar, 1990).

The issues listed above present important challenges to models based on pure matching alone. Both abstraction-first and alignment-first models offer solutions to most of these problems (Gentner & Wolff, 1997).

Abstraction-first models assume processing begins with the base. In these models, an interpretation is constructed by (1) finding or deriving an abstraction associated with the base; (2) projecting this abstraction from the base to the target; and then (3) verifying the information in the target, by matching the selected abstraction with the target representation (Gentner & Wolff, 1997). As an example, the theory of metaphor by Glucksberg and Keysar (1990) fits into this framework. According to this theory, metaphors are understood by assigning the target to an abstract category associated with the base, which permits the inheritance of features from base to target. These models have several appealing properties. They address the problem of feature
selection (only properties that are part of the category referred to by the base are included), and they predict asymmetry (reversal should result in different categorization). They also explain how metaphors might convey new knowledge about the target, since feature-importation is possible by inheritance of properties from the abstraction associated with the base (Gentner & Wolff, 1997). Abstraction-first models thus address the problems inherent in pure matching models by rejecting matching as an underlying process.

Alignment-first models assume the process of interpretation begins with an alignment of representations between base and target. Like pure matching, they begin by finding commonalities between base and target. Unlike pure matching, however, they match the relations between elements as well as the elements themselves (Gentner & Wolff, 1997). An advantage of using structural alignment as a model for processing metaphor is that it is sensitive to the structural bindings in the base and target representation. SME’s (Falkenhainer et al., 1986, 1989) algorithm, furthermore, operates in a more blind and local manner, allowing the maximal structure to emerge without having to be anticipated. If we look at the algorithm of comprehending metaphor or analogy, we see there are three stages that occur (Falkenhainer et al., 1989). In the first stage, all identical components in target and base representation are matched in parallel without regard for structural consistency. In the second stage, these local matches bind together into structurally consistent connected clusters (or kernels). In the third stage, the kernels are merged into one or a few maximal structurally consistent interpretations. This means that a particular comparison may be compatible with more than one alignment (or have more than one interpretation). The choice of which interpretation to choose is guided partly by the context (Forbus & Oblinger, 1990), but more generally by the systematicity principle (Gentner, 1983, 1989), which says that people prefer the interpretation that preserves the largest and deepest connected structure. This model addresses many of the problems inherent in pure matching. First, feature selection is explained by the systematicity principle. Second, the problem of feature importation is addressed by the projection of candidate inferences (e.g., there are different interpretations possible for one comparison), which can also explain asymmetry. Third, the problem of matching similar but nonidentical features is addressed by the fact that nonidentical functions and objects can be placed in correspondence by virtue of common roles.

Although both the abstraction-first and alignment-first models provide solutions for many of the problems inherent to pure matching models, they are still vastly different in terms of processing assumptions. Gentner and Wolff (1997) have conducted a couple of experiments that compare both models to each other. I will only discuss here what the results were. The first two experiments pitted abstraction-first and
alignment-first against each other, using the method of priming (the hypothesis was that if abstraction-first was used, the people who were primed with the base (vs. target) would be quicker in their interpretation of the metaphors). The results offered little encouragement for abstraction-first models. In both experiments, interpretations were no faster when primed with bases than when primed with targets. It was furthermore unlikely that the failure to find a base advantage was due to the particular details of the procedure, because variations of these procedures resulted in similar findings (Wolff & Gentner, 1992). There still remains the possibility however, that abstraction-driven processing may apply within a limited range of metaphors. It is, for example, possible that abstraction-driven processing occurs only when there is a preestablished metaphoric interpretation (so called conventional or ‘stock’ metaphors), with novel metaphors being processed via alignment.

This got examined in a third experiment, using stock metaphors whose base terms have strongly associated conventional categories (Gentner & Wolff, 1997). The results of this experiment suggest that abstraction-first models may apply to metaphors that already have an associated meaning. The pattern of results could be explained by positing an evolution in the career of a metaphor (Gentner & Wolff, in press; Bowdle & Gentner, 1995; in preparation). The career of metaphor hypothesis states that metaphors are initially processed as full structural alignments of the literal representation of the terms, but that with repeated metaphoric usage, the abstraction will come to be stored as a further word sense of the base, and thus facilitate subsequent metaphoric interpretation. These conclusions must be tentative, however, for two reasons. First, the results on which these are based are drawn from multiple experiments. Second, two different factors were controlled: base conventionality was required to be high, but relational similarity (e.g., metaphorical similarity, which means the degree to which the target already shares the central abstraction conveyed by the base) was required to be low. In a fourth experiment, they tried to find out if abstraction-driven processing could also happen when relational similarity was high (Gentner & Wolff, 1997). The results were consistent with the career of metaphor hypothesis, but there was no base advantage found for high-conventional, high-similarity metaphors. This implies that the existence of a metaphorical abstraction associated with the base is not enough to guarantee abstraction-driven processing. Both processes have its place, but abstraction-driven processes only have a limited sphere of explanatory sway.

Structural mapping offers many advantages, and has several psychologically appealing features. Firstly, structural alignment processes could provide a means by which metaphorical categories are created (Gentner & Wolff, in press; Johnson & Malagdy, 1979). Metaphoric categories come about as a result of comparison processes:
Structural alignment provides the mechanism for the initial extraction of abstract commonalities for novel metaphors. If this common system becomes institutionalized, then it can eventually function as a metaphoric category, facilitating metaphor comprehension. Secondly, structure-mapping can offer an explanation to the fact that metaphors do not appear to require more time than literal comparisons, as would be expected if they involved more processing stages, as was initially believed (Ortony et al., 1978; Inhoff, Lima & Carroll, 1984). The process of alignment, as modeled in SME, typically creates two or three simultaneous interpretations. These may either be literal or metaphorical: the process is indifferent to this distinction. Thus it is possible to arrive at both a literal and a metaphorical interpretation for the same comparison (Gentner & Wolff, 1997). Thirdly, inference occurs as a natural outcome comparison, without special intention. This capacity to produce unanticipated inferences fits with the psychological intuition that inferences often arise unbidden in metaphor (and analogy) and may even surprise the reasoned (Gentner et al., 2001). Research has also shown that early processing of metaphor, as tapped by the interference effect (for more in depth analysis, see Gentner et al., 2001), is symmetrical. However, when full processing is allowed, a pronounced asymmetry appears between forward (and their reversed) metaphors. This pattern fits the structure-mapping claim of initially symmetric processing followed by later directional projections of inferences, accounting for asymmetry and the directionality of metaphor. All these findings suggest that metaphor (as well as analogy) is mostly processed by alignment-driven processes, using structural mapping.

2.2. Dissimilarities Between Analogy And Metaphor

The above section shows us how metaphor is, basically, processed in the same way as analogy (through structure mapping), which means that metaphor and analogy have many commonalities. However, there are also some differences between the two. First, metaphors can be more structurally variable than analogies: They can be attribute matches, relation matches, or both; they can even violate structurally consistency (Gentner, Falkenhainer, and Skorstad, 1988). Second, the term metaphor is often used for novel and vivid nonliteral comparisons (Ortony, 1975). For example, in a study by Bowdle and Gentner (2001) subjects considered novel comparisons more metaphorical than conventional ones. The term metaphor, however, can also apply to systems of extended meanings that are so familiar that they’re almost invisible (Lakoff and Johnson, 1980; Nagy, 1974). Third difference is the
pragmatic function of the figurative language. Gentner (1982) suggested that metaphors are typically used for expressive-affective purposes and analogies for explanatory-predictive purposes. However, seeing as metaphors are also used in science, it might be more accurate to say that analogies are used in explanatory-predictive contexts, while metaphors can be used more broadly, in either explanatory-predictive or expressive-affective contexts.

2.3. How Have Metaphors Evolved Over The Past Decades

An interesting article I have read on the evolution of metaphors, is the one by Gentner and Grudin (1985), that stated that looking at the changes of metaphors used by American Psychologists to describe mental processes would also give us an insight in the changes in the conceptual paradigms used in American Psychology. Indeed, it has been argued that metaphors from other domains have played a role in the shaping of psychological theory. Roediger (1979, 1980) noted several distinct metaphors for human memory, such as Atkinson and Shiffrin’s (1968) storage box. He argued that commonalities among these metaphoric models can reveal deep-seated intuitions of the research community. If metaphors used in psychology reflect the way that researchers see the domain, then changes in the kinds of metaphors used to describe the mind may provide an unobtrusive measure of changes in those conceptual paradigms. Although the article is limited to changes in the use of mental metaphors (defined as nonliteral comparisons in which either the mind as a whole or some particular aspect of the mind is likened to or explained in terms of a nonliteral domain), it is still interesting to look how changes in metaphors can influence the way researchers conceptualize the framework for their theories (Gentner and Grubin, 1985). To find out, the authors went through articles in Psychological Review over the past 90 years, cataloguing which mental metaphors were used, and when it was used.

In the end, they found a total of 265 metaphors that they combined into four major categories of metaphor: Animate-being metaphors (where ideas, or aspects of the mind are likened to creatures), neural metaphors (where the analogical domain is some version of the physical nervous system, as when a disturbance of thought is likened to “short-circuiting too large an amount of excitation (Arnold, 1945)”), spatial metaphors (where the analogical domain is the distribution or movement of objects in space), and lastly, system metaphors (metaphors that liken some mental phenomena to a system of lawfully constrained interactions among elements, often drawn from a physical or mathematical system). In addition to these four categories, the authors also found two other categories: The conventional category, for terms that seem to have some metaphorical
basis but whose metaphors associations may have been lost, and the idiosyncratic category, for metaphors that resisted categorization.

Two patterns emerged from the examination of those mental metaphors. The major finding was the long-term shift in the content domains from which the metaphors were drawn. The domains that dominated in the first tridecade (the first 30 years) were supplanted by new categories by the end of the century. Animate-being metaphors were used frequently in the early period, around the turn of the century, yet this category virtually disappeared by the middle tridecade. The same drop (although less severe) was seen for spatial metaphors, although it should be noted that many system metaphors have a spatial substrate. As these metaphors declined, system metaphors increased from an extremely minor role to become the dominant form. Further, within system metaphors, there was a marked change in the kinds of systems that appeared. The early mechanical system metaphors were joined by metaphors drawn from mathematics, physics, and finally computer sciences. It could be that these changes are attributed to a general tendency to use new technology as a source for metaphor, yet research has shown that influence of new technology does not adequately explain the changes in analogical domains. It is, for example, not until 1935 that influences from mathematics and physics, with terms like “neural flux” (Gray, 1935) were found, yet these were formal systems well before psychologists made use of them. Thus, newness of technology is not necessary, and due to the found selectivity in the choice of mental metaphors (not every new technology is used as a mental metaphor), also not sufficient. The authors instead advanced the possibility that the shift in types of metaphors was related to changes in schools of thought in psychology. The neural flux metaphors, for example, may have revealed the influence of Gestalt Psychology.

A second finding was the U-shaped pattern in the overall numbers of metaphors used in different periods. Metaphors for the mind were abundant at the outset of the sample (1894-1915), dropped sharply from approximately 1925 to 1945, and rose to even greater numbers during the most recent tridecade (1955-1975). The decline of mental metaphors during the middle-third probably reflected the influence of behaviorism, where the internal workings of the mind were mostly disregarded, or deemed as unimportant.

### 2.4. Conceptual Metaphor Framework

Before going deeper into the stated in the introduction, a framework must be given first. In this case, the conceptual metaphor framework as derived from Lakoff and Johnson’s (1980) seminal analysis. This posits that metaphors operate as conceptual mapping between source concepts and superficially dissimilar target concepts. The source
concepts represent commonplace, schematic knowledge about the attributes of familiar referents and the relations among those attributes, while the target concepts represent more abstract referents, which are commonly more difficult to grasp. These mappings involve systems of mental associates (or entailments) between corresponding elements of the source and target concepts in metaphoric relation.

Systems of entailments are furthermore reflected in clusters of metaphoric expressions that are conventionally used to talk about one target concept (e.g. people talking about love being like a journey can use different metaphoric expressions that relate elements of love (the target) to elements of journey (the source). Since they preserve the salient attributes and relations commonly associated with travel, it is unlikely that they are simply isolated idioms stored in one's mental lexicon. (Lakoff & Johnson, 1980). This already gives us a bit of an idea that a metaphor isn’t just a linguistical given.

3. **Specific problem**

In trying to see if metaphor is a psychological construct, we must find out if metaphors operate in a way that they influence diverse cognitive processes and socially relevant outcomes. Furthermore, they have to be distinguished from the other two theories that are prevalent in social cognition: The schema-view and the theory of embodied cognition (Landau et al., 2010).

3.1. The Metaphoric Transfer Strategy

In order to make this distinction, we first need to show that that metaphors influence social information processing in ways that would not be expected from the schema-view or the embodied cognition theory alone. A strategy that could help with this, would be the metaphoric transfer strategy (Landau et al., 2010). This strategy assesses whether manipulating psychological states, such as perceptions and motivations, related to one concept (e.g. travel) changes how people process information related to a dissimilar concept in a manner consistent with their metaphoric relation (e.g. love, with which the popular metaphor ‘love is like a journey’ is meant). Of course, in order to make sure the metaphor is not just a lexical given, these effects of metaphoric transfer should also be obtained in situations and contexts where linguistic expressions of the relevant metaphors are not made salient (Landau et al., 2010). A lot of relevant research has already been done in this field. As such, the effects of metaphoric transfer have already been tested on attention and memory processes, person perception, perception of social symbols and environment, and even attitudes. As to not make this part too long, I will give one
example of a study in each of those categories, as found in the article of Landau et al.

**Metaphoric transfer effects on attention and memory processes.** Most of the work in this category examines metaphors involving the source concept of verticality coupled to the more abstract concept of positive/negative valence (e.g. he is in high spirits today) or high/low social power (e.g. he is at the bottom of the corporate ladder) (Lakoff & Johnson, 1980, linguistic analyses). This suggests that people use these expressions to understand valence and power in terms of verticality – variations in verticality perceptions should therefore systematically relate to people's attention and memory for valence- and power-relevant information (Landau et al., 2010). Some evidence for this comes from studies that correlated individual differences in depressive symptoms and self-perceived social power with vertical spatial attention. It was for example shown that people who score high in depressive symptoms preferentially attend to lower areas of vertical space (Meier & Robinson, 2006).

**Metaphoric transfer effects on person perception.** Personality traits and other nonobservable characteristics of an individual are abstract constructs, which are thus often conceptualized in terms of relatively more concrete concepts. An example of a study in the article that I found quite entertaining, is the one by Williams and Bargh (2008), which provided evidence that interpersonal warmth is understood partly in terms of physical warmth, by showing that participants who simply held a warm (vs. cold) beverage subsequently described a target individual as having a “warmer” personality.

**Metaphoric transfer effects on perceptions of social symbols and environments.** Much as with person perception, research conducted with the metaphoric transfer strategy provides evidence that metaphors shape how people perceive aspects of the social environment that are associated with abstract concepts (Landau et al, 2010). Keeping with the metaphoric relation between perceptions of physical and interpersonal warmth, Zhong and Leonardelli (2008) showed that participants who recalled a time when they were socially excluded (vs. socially accepted) perceived the temperature of the room to be an average of five degrees colder, even though the temperature was the same for both groups.

**Metaphoric transfer effects on attitudes.** Research has also examined metaphors’ role in the formation and expression of attitudes about social stimuli. Going back to the verticality metaphor to understand abstract concepts such negative and positive valence (e.g. “Things have been going downhill” and “We hit a peak last year”), Meier and Robinson (2004) provided evidence such expressions reflect an automatic metaphoric association between affective valence and vertical spatial position. In their study, it got shown that participants
evaluated positive words quicker when they appeared at the top (vs. the bottom) of the computer screen.

3.2. Distinguishing Metaphors From The Schema-View

With the above in mind, let us take a look at the prevailing view in social cognition: The schema-view. This view begins with the assumption that people lack the mental capacity to attend to and process every aspect of their environment at any given time. In order to quickly and efficiently process social information, people classify stimuli into categories (e.g. librarians, joggers, tourists...). To interpret and evaluate their present situation, people access prior knowledge about these categories. Schemas represent and store this knowledge in memory (Landau et al., 2010). Research has already painted a detailed picture of how schemas are mentally activated and used in social information processing. For example, people are more likely to attend to and recall information that is consistent (vs. inconsistent) with their schemas (this has been found in many studies, for instance in the study of Snyder and Cantor (1979) where participants recalled more introverted information about an individual when assessing that individual’s suitability for a stereotypically introverted job).

This view on schemas postulates that schemas operate in isolation (Landau et al., 2010). The evidence found for the metaphoric transfer strategy poses particular challenges or this traditional schema view. For example, it has difficulty explaining why interpretations and evaluations of information related to one concept are consistently influenced by perceptions and evaluations of information related to a superficially dissimilar concept. One argument given by the proponents of the schema view who also believe in associative networks models of concept representation (Collins & Loftus, 1975; Smith, 1998) is that metaphoric transfer effects are merely the result of activation spreading from one construct to an associated construct, making the latter more likely to be applied to process incoming information. While the article by Landau et al. (2010) doesn’t claim that metaphors operate independent from spreading activation, it does say that the conceptual metaphoric framework offers a more theoretically specified and empirically generative account of the structure and organization of those links.

Furthermore, the article doesn’t claim that people do not rely on schemas to impose structure on their social environment. For them, the metaphor perspective complements the schema view by giving emphasis on the fact that many social concepts are abstract and difficult to grasp, and that metaphor is thus a cognitive tool that is frequently used to interpret and evaluate information related to those abstract concepts. (Landau et al., 2010).
3.3. Distinguishing Metaphor From Embodied Simulation

Another view on how people evaluate and interpret their social surroundings is that of embodied cognition. The most influential theory on embodied cognition, within social cognition, is the perceptual symbols systems model of Barsalou (1999, 2008). This model posits that concepts aren’t only represented by a set of amodal symbols (like was previously thought), but that concepts also contain modality-specific representations of sensations, motor activity, and other bodily states that occur during interactions with stimuli corresponding those concepts. Conceptual processing thus involves the neural reactivation (or simulation) of associated bodily states, even when the individual is currently not interacting with relevant stimuli (e.g. thinking about a situation wherein, for example, someone felt humiliated can bring back the sensation of humiliation, even if the individual isn’t experiencing the situation again).

This view and the conceptual metaphor framework share the broad notion that the meanings people give to abstract social concepts are intimately connected with bodily states and recurring interactions with the physical world (Landau et al., 2010). How then do they differ between the two? They posit that embodied simulation and the conceptual metaphor framework differ from each other in the sense that the first is an intraconceptual mechanism in that it involves modality-specific representation about a given concept derived from prior experiences with category members corresponding to that concept, while the conceptual metaphor framework is an uniquely interconceptual mechanism – source concepts of conceptual metaphors are concepts in their own right that can be, but need not be, metaphorically linked to target concepts. For example, it is true that people see the progress of love in terms of a journey, but that doesn’t mean that the concept of ‘journey’ can’t be thought about in its own terms (Landau et al., 2010). In other words, embodied simulations only involve particular bodily states that occur during experience with the abstract concept, while metaphors can draw on concepts representing commonplace knowledge about bodily states. Yet again the authors state that the theoretical distinction between the two doesn’t mean that they are mutually exclusive. It is only used to highlight how conceptual metaphor can use representations of bodily states in a way that is qualitatively different from how embodied simulations are currently characterized to use such representations (more extensive research on the distinction between the two as intra- and interconceptual mechanisms can be found in the article of Landau et al., 2010).

An additional empirical distinction can be made between conceptual metaphor and embodied simulation: Metaphor, but not embodied simulation, can use multiple source concepts to structure a given target concept, and in this way, systematically influence target-relevant
information is interpreted and evaluated. Researchers have examined this possibility using an empirical approach labeled the alternate source strategy. (Landau et al., 2010).

3.4. Alternate Source Strategy

The alternate source strategy involves assessing whether thinking about a given target concept using one source concept will produce interpretations and evaluations of target-relevant information that are consistent with that source concept and that are different from the interpretations and evaluations suggested by thinking about the same target using a different source concept or in a literal manner (Landau et al., 2010). Research using this strategy has shown that linguistically framing a target concept using metaphoric expressions related to one source concept facilitates comprehension and memory for expressions consistent with that metaphor and interferes with the processing of expressions reflecting alternate metaphors (Albritton et al., 1995; Galinsky & Glucksberg, 2000; Gentner et al., 2002; Gibbs & O’Brien, 1990; Hoffman & Kemper, 1987). A study of Gentner and Boronat (reported in Gentner et al., 2001), for example, showed that people reading a passage that described a debate either literally or metaphorically using one of two source concepts (debate as a race, or debate as a war), where the last sentence always included a race-metaphoric expression, the people who read the race-metaphor passage processed the passage easier than people who read the literal or war-metaphor passage, since the last sentence was a continuation of that metaphor.

Alternative source manipulations have also been shown to influence how people make inferences, and also how using alternative source concepts can influence attitudes. For example, participants reading stock market commentaries that linguistically framed price movements in terms of deliberate action of a living agent (vs. in terms of nonagentic activity of an inert object) were more likely, when asked, to infer that a given price trend would continue the following day. (Morris et al., 2007). And linguistically framing a persuasive message in metaphoric terms led people to assimilate the affective connotations of a source concept into their evaluations of a literally unrelated public policy issue. Specifically, participants expressed more negative attitudes towards compulsory seat belt legislation when they were exposed (vs. not exposed) to a statement that metaphorically related that policy to a violation of physical privacy (Read et al., 1990; see also Johnson & Taylor, 1981).

4. **Suggestions for future research**
Most of the research reviewed in the ‘specific problem’ section has a metaphor-focused approach in that it identifies a metaphor reflected in ordinary language and assesses whether that metaphor operates at a conceptual level to influence information processing. Despite the many findings this approach has already yielded, there are still some important limitations to this approach. One of them would be that there are literally hundreds of metaphors, identified by cognitive linguistics, that pervade ordinary discourse about dozens of socially relevant concepts. Investigating each and every one of these metaphors separately would not only be extremely time consuming, it would also result in a proliferation of disparate findings. A second limitation is the fact that the metaphor-focused approach has difficulty modeling the conditions under which people are more or less likely to use metaphors compared to using literal interpretations in making sense of abstract concepts. There is definitely variability in metaphor use across situations and individuals (Landau et al., 2010).

To remedy the fact that a metaphor-focused approach has difficulty modeling the factors influencing the strength and the direction of metaphor use in social information processing, Landau, Meier and Keefer (2010) recommended a phenomenon-focused approach, which entails starting with a phenomenon of social psychological interest, identifying the multiple metaphors observed in discourse surrounding that phenomenon, and then examining the factors of the situation and the individual that determine whether metaphors are used to process the information, which metaphors are used, and the downstream consequences.

One motivational factor that can be explored with the conceptual metaphor framework in future research is the strength of metaphor use, combined with the need for nonspecific closure. Lay epistemology theory posits that situations in which thinking becomes taxing or overly complex can trigger the need for nonspecific closure: a preference for any definite knowledge over informational complexity. The framework adds the complementary insight that people have a general tendency not only to avoid complexity but also abstractness of information. It also posits that metaphors lend structure to otherwise abstract concepts. These insights can form the following hypothesis: The more individuals perceive available information as abstract, the more they will prefer metaphoric interpretations of that information, regardless of the specific conclusions supported by those metaphors (Landau et al., 2010). This is supported by some lines of research, showing that use of metaphor increases with having to interpret information with a high level of abstraction. This goes against what Miller (1976) has argued, saying that metaphors only obscure the precise literal meaning of the message, and metaphor use should thus decrease when the information has a high level of abstraction. The strength of metaphor use is also influenced by individual differences in the motive for clear and
structured knowledge. Personality research shows that people with a high disposition for clear and structured knowledge actually prefer concrete interpretations of social information (Kruglanski et al., 1993; Neuberg & Newsom, 1993; Thompson et al., 2001). Future research could also consider how the individual differences in expertise related to the target concept can influence metaphor use. People will rely more readily on metaphors to comprehend information that appears unfamiliar, whereas they may prefer literal interpretations with increasing expertise (Landae et al., 2010).

To test this, I thought perhaps we could look at how people with low (vs. high) expertise would explain a target concept to other people. If we look at the hypotheses given to us by Landau, Meier and Keefer (2010), we could perhaps assume that people who have low expertise regarding the target concept (e.g., how a computer works) would use more metaphoric expressions in explaining the target concept to someone else than people with a higher expertise on the subject. Of course there could still be other factors at play that will determine the strength of metaphor use, like for example the expertise of the person they are explaining the target concept to, or even the personal disposition for clear and structured knowledge. Those factors should of course be accounted for.

5. **Conclusion**

The most significant benefit, perhaps, of a metaphor-enriched social cognition is that it acknowledges metaphor’s significant and unique role in shaping how people create meaning in the social world (Landau et al., 2010). We cannot honestly say that metaphor is only a linguistic embellishment, and doesn’t have any influence on how people view their social environment. Although there is still quite a bit of research to be done, the research that has already been done has proven that metaphor is more than just a lexical given.

A metaphor-enriched perspective also provides an integrative framework for organizing multiple emerging lines of research in social psychology, cognitive psychology and linguistics. It highlights affinities between superficially unrelated phenomena, provides a window into cultural differences in social thought and attitudes, alerts researchers to the significance of metaphors in social psychological theorizing, and bridges social cognition with other areas of research in psychology. A few examples can be given to each of these points (Landau et al., 2010).

First of all, a metaphor-enriched perspective provides a powerful basis for formulating hypotheses about the relations between seemingly disparate social psychological phenomena. For example, it invites us to observe that people in diverse cultures use the same words and facial expressions to reject physically disgusting stimuli as they do to reject socially inappropriate behaviors such as hypocrisy and betrayal, as conform to their moral attitudes (Haidt et al., 1997). The insight that
moral attitudes and disgust reactions share a common conceptual structure doesn’t follow from either the schema view or embodied cognition theories, which only focus on the representation and use of knowledge within each domain. Also cultural differences can be examined more closely through the metaphor-enriched perspective. A large body of research documents the difference between Western countries (individualism and self-expression) and East Asian countries (the self is interdependent with others) concerning the different construal of self and relationships (e.g., Markus & Kitayama, 1991; Triandis, 1989). A metaphor-enriched perspective could enhance these efforts, and by attending to the metaphors that people in different cultural contexts use to collectively represent abstract social concepts in their language, art, and cultural practices, we could make specific predictions about which social meanings are likely to be culturally widespread or universal and which are culturally specific. (Landau et al., 2010).

Although the article of Landau, Meier and Keefer (2010) mostly focused on people’s ordinary use of metaphor to think and talk about the concepts that are important in their everyday lives, we also cannot ignore social psychologists’ pervasive use of metaphor in characterizing mental structures and processes. Across psychology various metaphors have been used to characterize attention, memory, short-term memory, and visual perception to name just a few. Metaphors can play an integral role in the creation and communication of scientific knowledge (Bicchieri, 1988), which was also noticed when I was discussing the way metaphors on mental processes have evolved over the last 90 years (Gentner & Grudin, 1985). Researchers should, however, still clarify whether their metaphors are intended to characterize the phenomenon of interest as it occurs in individuals’ minds or whether they serve more appropriately as explanatory constructs (or both). We should always critically evaluate the metaphors that make up our theories (Landau et al., 2010).

Last, but not least, a metaphor-enriched perspective can serve as a framework for integrating insights across different disciplines ranging from aesthetics to legal studies to acquire a richer understanding of how social meaning making arises from complex interactions between brains, body, language, environment and culture. A metaphor-enriched perspective can connect social cognition with cognitive linguistics, neuroscience (Feldman (2006), for example, has developed a theory on how metaphoric thought and language are realized in the brain) and evolutionary psychology, as well as environmental psychology, anthropology, cultural geography, and even the study of creativity.

6. **References**


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