THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Tamar J. Sarnoff entitled Metaphors, Cognitive Elaboration and Persuasion and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

Joseph Bonito

Date: August 25, 2009

Chris Segrin

Date: August 25, 2009

Michael Dues

Date: August 25, 2009

Kyle Tusing

Date: August 25, 2009

(Type Committee Member Name here)

Date: (Type defense date here)

Final approval and acceptance of this dissertation is contingent upon the candidate’s submission of the final copies of the dissertation to the Graduate College.

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

Dissertation Director: Joseph Bonito

Date: August 25, 2009
STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his or her judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: Tamar J. Sarnoff_____________________________
ACKNOWLEDGEMENTS

This work is more than the efforts of the author whose name appears on the front. This work could not have been completed without the support, guidance and funding of the Faculty of the Department of Communication. The patience, wisdom and steadfastness of my adviser, Joseph Bonito, was above and beyond what is called for, and more than sufficient to complete this project. This work would not exist without his unwavering optimism and thoughtful guidance. I also want to acknowledge the efforts of my committee members, Michael Dues, Chris Segrin and Kyle Tusing, for their open-mindedness, and for providing expert advise and resources. I am thankful for the unwavering support and confidence of Stephanie Sarnoff, and Robert Cudmore, without whom this project would not have been completed. In addition, I would like to acknowledge my M.Q.D., family, friends, and fellow students who have been so patient and understanding throughout this process.
DEDICATION

This work is dedicated to the memory of my grandparents,

David and Helen Geshwind.
# TABLE OF CONTENTS

Abstract .................................................................................................................. 13

Introduction ............................................................................................................ 14

Literature review .................................................................................................... 18

Characteristics of metaphor .................................................................................. 18

Metaphor types ...................................................................................................... 18

Standard metaphors ............................................................................................... 19

Conceptual metaphors ........................................................................................... 21

Contextual metaphors ............................................................................................ 24

Functions of metaphor ........................................................................................... 24

Concision .................................................................................................................. 26

Omission ................................................................................................................... 27

Precision ................................................................................................................... 29

Metaphor processing ............................................................................................... 31

Speed ......................................................................................................................... 31

Effort ......................................................................................................................... 32

Features that affect metaphor processing ............................................................. 36

Aptness ..................................................................................................................... 36

Familiarity ............................................................................................................... 38

Context ..................................................................................................................... 39

Metaphor as compliance-gaining strategy .............................................................. 43
Elaboration likelihood model ................................................................. 44

Types of cognitive processing in the ELM ........................................... 44
  Central route processing ................................................................. 45
  Peripheral route processing ........................................................... 45
  Parallel processing ........................................................................ 45

Message feature .................................................................................. 46
  Argument strength .......................................................................... 46

Factors that moderate the relation between
  Messages, processing and outcomes .............................................. 52
  Source credibility .......................................................................... 52
  Motivation ..................................................................................... 53
  Need for cognition ....................................................................... 53
  Bias processing, ego involvement and prior knowledge ............... 54
  Ego involvement .......................................................................... 55
  Prior knowledge ........................................................................... 58
  Ability ......................................................................................... 59

Research questions and hypotheses .................................................. 60
  Message type ................................................................................. 61
  Hypotheses 1 ............................................................................... 64
  Hypothesis 2 ............................................................................... 64
  Involvement .................................................................................. 64
  Hypothesis 3 ............................................................................... 65
Need for cognition and attitudes .................................................................97
Levels of involvement and cognitive elaborations ...........................................97
Levels of involvement and attitudes ..............................................................98
Argument strength and cognitive elaborations ...............................................100
Argument strength and attitudes .................................................................101
Methodological evaluation ..............................................................................102
Participants ......................................................................................................102
Procedure ........................................................................................................102
Materials .........................................................................................................102
Design ..............................................................................................................103
Future directions .............................................................................................104
Conclusion ......................................................................................................107
Footnotes .........................................................................................................108
Appendices ....................................................................................................109
Appendix A - Value – Involvement Scale .......................................................109
Appendix B - Topics used in Pretest 1 ............................................................112
Appendix C - Merged Attitude Scale ..............................................................114
Appendix D - Experimental stimulus for Pretest 2 .........................................115
Appendix E - Comprehension and Aptness Scale ..........................................119
Appendix F - Implicature Scale .....................................................................120
Appendix G - Cognitive Thought Listing Task ..............................................121
Appendix H - Need for Cognition Scale .........................................................123
Appendix 1 - Experimental stimulus.................................................................126

Tables..................................................................................................................158

Table 1 - Experimental Design for Metaphor Type, Involvement, Topic Replications and Vehicle Replications.................................................................158

Table 2 - Topics, Means and Standard Deviations for involvement in Pretest 1......159

Table 3 - Means and standard deviations for aptness ratings of Pretest 2 messages.............................................................................................................162

Table 4 - Means and standard deviations for attitudes towards topics in Pretest 2...........................................................................................................165

Table 5 - Means and standard deviations by metaphor type................................166

Table 6 - Means and standard deviations for involvement by metaphor type.......167

Figure.....................................................................................................................168

Figure 1 - Conceptual Model for Study Design and Hypotheses.........................168

References.............................................................................................................169
ABSTRACT

Metaphors have long been a subject of interest to philosophers, scholars and researchers. Recent insights into the nature and function of metaphor have spurred new interest in the persuasive effects of metaphor. To date, research on the relation between metaphors and attitudes has produced mixed findings. This paper argues that there are several limitations in previous models and designs and this work attempted to resolve several of them. The rationale for the study is based on the Elaboration Likelihood Model (ELM) of persuasion, which argues that cognitive elaboration is a strong predictor of attitudes. Researchers have posited that metaphors should evoke more cognitive elaboration than literal counterparts. This paper reports the results of a study that tested the relationship between metaphors, cognitive elaboration, and attitudes. Participants were exposed to one of 72 message conditions and responded to a set of psychological and attitude scales. Many of the hypotheses were not supported, including tests of the amount of cognitive effort that subjects reported and results related to attitude change by metaphor type. Results indicated that attitudes were stable across time, which is consistent with the ELM.
INTRODUCTION

Contrary to Aristotle’s suggestion that metaphors are “special” and the product of genius (Aristotle, 1984), metaphors instead have been shown to be a pervasive feature of everyday language (Cienki, 2005; Eubanks, 1999; Pollio, Barlow, Fine, & Pollio, 1977; Pollio & Pickens, 1979). Pollio et al. found that on average, people produce 1.8 novel (new) metaphors per minute of dialogue and 4.08 dead or conventional metaphors per minute of dialogue. Reddy (1978) argues that up to 70% of natural language use employs some type of metaphoric content. Metaphors can be used to describe abstract concepts (Quinn, 2002), to teach (Gentner, 2001), and to explain new and novel concepts such as scientific advancements (Martin & Harre, 1982; Rescher, 1998). Further, metaphors function to fulfill several specific conversational goals, including the ability of metaphor to clarify and add interest to language use (Roberts & Kreuz, 1994). Importantly for this proposal, metaphor is commonly a feature of interpersonal compliance-gaining strategies, including threats (e.g., “The U.S. invasion of Iraq will be another Vietnam”), promises (e.g., “I promise that wind energy will be the panacea to the oil crisis”), requests (e.g., “Can you please turn up the heat so this room won’t be a refrigerator?”), demands (e.g., “This circus of an office must be reorganized”), and most obviously, as statements describing objects or events: “Sally is a block of ice” (from Searle, 1978).

McGuire (2000) recognized the importance of figurative language in compliance-gaining attempts and issued a call for its study, but that call has gone largely unheeded. The purpose of this proposal is to investigate metaphor, as a subset of the general class of “figurative language use”, in interpersonal compliance-gaining situations. The primary
question addressed in this proposal is if the effects of two main types of metaphor-based compliance gaining strategies differ from each other and from more literal ones. The question is divided into three subsidiary issues. The first addresses difference in metaphor type. The two types of metaphors to be considered are what are commonly referred to as “standard” metaphors (Black, 1962) and “conceptual” metaphors (Lakoff, 1980). Even though there is some degree of theoretical overlap between these two types of metaphor, I argue that they have different consequences for interpretive processing that may correspond with cognitive and persuasive effects. To date, none of the communication research on metaphor and persuasion has considered possible differences in metaphor type as a variable of interest. A third set will be considered in this proposal, that of a combination of standard and conceptual metaphors. This set will be referred to as “contextual” metaphors. For example, a statement might start out with “We are fighting a war on cancer” (standard), and continue in the paragraph with sentences that exploit this metaphor; “We will put up the best defenses against the invading cells”; “A healthy diet is the best weapon against the disease”.

The second sub-issue addresses a specific role of metaphors in persuasion attempts, that metaphors allow for a set of assertions to be implied in their processing (Lagerwerf & Meijers, 2008; Phillips, 2005). It will be argued that metaphors cue cognitive elaboration in a unique way that has implications for compliance-gaining and attitude change. Metaphors, as will be discussed shortly, provide the speaker with an opportunity to bypass constraints on literal language use by allowing the speaker to assert and the hearer to infer multiple reasonable interpretations of a metaphoric utterance.
Because there is no single literal referent for a metaphorical utterance that would make sense, the hearer is compelled to search for a reasonable interpretation, or set of reasonable interpretations that can be parsed; these consequences of interpreting that lead to multiple reasonable meanings are referred to as particularized conversational implicatures (commonly simplified to ‘implicatures’). Implicatures allow the speaker to efficiently convey multiple thoughts and concepts with less effort than is involved in making these utterances separately. To date, the literature on metaphor and persuasion has only begun to take this aspect of metaphor into account in understanding how metaphors work in persuasion (McQuarrie & Phillips, 1996; Phillips, 2005).

The third sub-issue is to determine if attitude change related to metaphors persists; no study to date has examined this issue (Sopory & Dillard, 2002). Further, it may be possible that the relatively small effect size of metaphor (r= .07; see Sopory & Dillard) on persuasion fails to capture a delayed attitude change that results from integration of information conveyed in a metaphor. It may be the case that the effects of metaphor on attitude change occur some time after the experimental condition evaluation period has concluded (Cialdini, Levy, Herman, Kozlowski, & Petty, 1976; Chung, Fink, & Kaplowitz, 2008).

In the chapter that follows, I describe the two types of metaphors identified in the literature and explore the predominant theoretical underpinnings regarding important features and functions. Next, I will present the case for multiple assertions in metaphors. I will then turn to the psycholinguistic evidence to support the argument that metaphors should work to enhance elaborated message processing. The final section will argue that
the features and functions of metaphor are well handled and accounted for in compliance
gaining by the ELM.
LITERATURE REVIEW

Characteristics of Metaphor

In this section, I will address the two predominant types of metaphor, what are commonly referred to in the literature as “standard” metaphor and “conceptual” metaphor. To briefly capture what follows, standard metaphors are blatant violations of standard, literal language use, such as poetic metaphors and statements like “Juliet is the sun.” They serve the function of allowing speakers to convey more than what is explicitly uttered in an efficient fashion. Conceptual metaphors, on the other hand, do not necessarily violate the constraints of literal language use only because they are so culturally and cognitively embedded as to be understood in a way much more similarly to processing literally. These metaphors allow a speaker to efficiently speak about topics in such a way as to describe mundane, abstract topics, such as time or emotion in terms grounded in concrete, physical realities. For example, were a speaker to utter “Time is flying by,” a hearer readily understands the underlying principle that when we speak about time, we speak of it in terms of forward movement. Both of these types of metaphors work in large part based on their ability to concisely communicate multiple ideas while omitting features that are irrelevant or undermine the intent of the speaker, and to do so with greater precision than is available through literal language.

Metaphor Types

Over the past 30 years, novel conceptualizations and understanding of metaphors has lead to a new appreciation for different types of metaphors, and research reflects these recent philosophical insights. What are referred to as “standard metaphors” reflect
the long established understanding of metaphor. The more recent contribution to metaphor research is referred to in the literature as “conceptual metaphor.” This elaboration on the standard metaphor has far reaching implications for metaphor research as well as philosophy of language, compliance – gaining, and communication research. These metaphor types are discussed in turn.

*Standard Metaphors.* The standard metaphor format is often described as utterances that are not literally true, but hold the form “A is B,” where A and B are from two distinct categories of objects or ideas (Black, 1962). According to this view, metaphor is often considered non-standard or variant language use, a deviation from normal discourse. Metaphors are non-paraphrasable (Searle, 1978); one cannot accurately rephrase a metaphoric utterance and obtain the same meanings as the metaphor. Given the example “Juliet is the sun,” Romeo intends to assert certain features about Juliet: that she is the center of Romeo’s universe, that she provides life-giving energy, that she illuminates the world and obscures the darkness, among other implications.

For the purposes of consistency, this paper will employ Richards’s (1964) vocabulary for discussing elements of metaphor. Accordingly, one example of a standard metaphor is “Old fools are babes again” (Shakespeare, King Lear, Act I, Scene 3). The “A” term is “Old fools” and is referred to as the topic of the metaphor. This is the term that is being described in a metaphor. The “B” term is “Babes” and is referred to as the vehicle of the metaphor. This is the term that is used to describe the topic of the metaphor.
In the example “Old fools are babes again,” features and relationships that are salient for the vehicle will be imparted onto the topic (Gentner, 2001). If the metaphor is felicitous, then the hearer of this metaphor will be able to understand that while it is patently untrue that King Lear (the old fool) is a babe again, certain characteristics are implicitly asserted in this statement. The extent of these implications is not made explicit by the speaker; both speaker and hearer assume that the reasonable possible implicatures are bound by context. Context limits what would be reasonable to assume to referents that are salient to all participants in a communication event (Sperber & Wilson, 1989).

By not contributing an utterance that is literally true, and therefore has only one reasonable interpretation, metaphors leave opportunities for multiple interpretations in both the sending and receiving of those messages. That there is opportunity for multiple implicit assertions succinctly conveyed by the metaphor is one of the defining functions of metaphor (Bischofshausen, Makoid, & Cole, 1989; Kesckes, 2000; Phillips, 1997; Sperber & Wilson, 1989).

When metaphors fail to be felicitous, the intended speaker meanings are unavailable to the hearer (Gibbs & Moise, 1996). This may be due to an irrelevant comparison, or a metaphor whose vehicle is unfamiliar to the hearer. For example, when a speaker asserts a metaphor where the two terms are so removed from one another as “Juliet is pollen,” the speaker may attempt to find a meaningful relationship, fail, and either discard the statement entirely, or seek refinement from the speaker. That there are, according to Sperber and Wilson (1989), too many weak implicatures that may follow from such utterances, the hearer fails to find amongst them at least one meaningful
interpretation. The same results might follow if the speaker uttered “Juliet is my plasma,” if the hearer is unfamiliar with technical terms associated with features of blood.

*Conceptual Metaphors.* The initial development of the theory of conceptual metaphor is attributed to Reddy’s (1978) essay “The Conduit Metaphor,” wherein he describes how common language used to discuss the process of communication is grounded in an understanding and expression of objects (ideas) and containers (minds). According to this approach, as functional users of a language, we are constrained in our descriptions of abstract concepts; literal language often fails or is overly cumbersome in its ability to describe certain perceptions and features of our world. In order to best convey how it is that a speaker perceives features of the world that cannot be described via strictly literal means, the speaker will attempt to capture as accurately as possible the intended meaning by resorting to descriptions by other, metaphorical means. Functional speakers of a language do this without effort, and hearers understand these utterances with minimal effort (Kesckes, 2000; Pollio, et al., 1977; 1979). In the case presented by Reddy, ideas are objects that are transferred by communication between containers, which are minds.

Lakoff and his colleagues (Gibbs, 1994; Lakoff, 1987, 1996, 2002; Lakoff & Johnson; 1988; Lakoff & Turner, 1992; Turner & Fauconnier, 2001) have elaborated on Reddy’s essay and developed what is now known as the “Conceptual metaphor” or “Embodied metaphor.” The guiding principle is that our understanding of the world around us is metaphorical; we understand things in terms of other things, and we reason analogically. This cognitive – metaphorical system is the basis for conceptual
metaphorical language use. This notion of cognitive is used as an abbreviation of a “cognitive categorical system.” The basic premise is that the organization of information in our minds is based on relationships between ideas which, in turn, are based on metaphorical – analogical relationships, and this is transferred to our use of language.

As cognitively complex and language using creatures, we observe and are taught many things. The most efficient way to organize and make sense of the information we take in about the world is to organize new information in line with what is already known and organized in our thoughts. Recently, Lakoff (1999) has argued that the overarching organizational schema is based on our physical / kinesthetic experience in the world. The most basic means of understanding our world, Lakoff argues, precedes our ability to use language. As infants, prior to language acquisition, our experience of the world is based on the relationships between sensations. Further, because all language users are bound by physical realities (such as gravity), this embodied description is easily accessible to all. Different cultures will exploit different aspects of this to create culturally bounded conceptual metaphors.

Lakoff uses language slightly different from those of Richards (1964) or Black (1962). For Lakoff, in the “A is B” formulation, ‘A’ is the “target,” and ‘B’ is the “source.” To elaborate on one example, Lakoff uses the example of “love relationships are journeys.” Speakers use this framework to create utterances that follow from this basic statement. This framework serves as a cultural truism that is reinforced by the metaphors that follow from and are consistent with it. To explicate this idea, Lakoff
offers linguistic manifestations of these non-hierarchical cognitive mappings / conceptual correspondences:

Lovers correspond to travelers

Love relationship corresponds to a vehicle

Lovers’ common goals correspond to their common destinations on the journey

Difficulties in the relationship correspond to impediments to travel

(p. 207)

These linguistic expressions are radial (Lakoff, 1980) to the core conceptual relationship. Novel expressions that are based on these core correspondences are easily understood, because there is a shared cognitive map. This cognitive map is based on kinesthetic experiences that inform our understanding of the world. It is upon this that the new utterance is based. Whereas standard or novel metaphors are usually explicit statements of a cognitively understood relationship between the terms in a metaphor, the conventionalized forms that result from that metaphoric relationship are the conceptual metaphors with which Lakoff is concerned.

Given this basic structure, speakers of a language can communicate about love in terms of travel effectively, efficiently, and with minimal additional effort. In speaking about love, a speaker can use terms related to movement (and obstacles to movement) and inform a hearer of a great many things. For example, when speaking about love, one can create metaphorical utterances such as, “our relationship hit a bumpy patch” or
“we’re moving towards marriage,” and be understood. This being said, speakers of a language are not constrained to a single conceptual structure for discussing topics. Schon (1978) notes that people will often disagree because they have different conceptualizations of a problem. Lakoff (1996) expands on this point to discuss differences in political ideologies are based on different conceptualizations about the world.

*Contextual Metaphors.* Contextual metaphors are a type of metaphor that have not been fully discussed in the literature, but occur in natural language use frequently. Contextual metaphors are a combination of standard and conceptual metaphors in a series of sentences. For instance, a statement that starts with a standard metaphor, like “Health is War” (Sontag, 1988; Mio, 1997), might be followed with statements that reinforce the metaphor, constrain possible meanings, and encourage elaboration in a specific direction. For example, we might be fighting a war on cancer. Cancer cells are foreign invaders. We will use every medicine in our arsenal to drive the cancer back. We will set up the best defense against future attacks. In this example, the standard metaphor sets up the metaphoric relationship between terms, and the ideas are followed through in the conceptual metaphors. Because this type of metaphor occurs and leads to a specific cognitive outcome (discussed below), it will be considered as a category of interest for the study.

*Functions of Metaphor*

Metaphors pose a set of unique problems. That they are able to convey meanings above and beyond what is actually said (which is often, literally false) quickly and
efficiently is widely accepted, but how this work is done has yet to be fully determined (Eco, 1983; Perelman & Olbrechts – Tyteca, 1969; Richards, 1964). One approach to handling how metaphors function is described by Sperber and Wilson’s (1986) relevance theory. According to this view, metaphors are a sort of “loose talk” that allow a speaker a means of communicating more than what is contained in an utterance by relying on the hearer’s ability to put these sorts of discourses into a rational framework. In doing so, speakers rely on the knowledge that their interlocutors will make contributions that are consistent with Grice’s (1975) cooperative principle.

According to the Gricean model, when a speaker contributes to a discourse, s/he does so in such a way as to contribute a meaningful utterance that is consistent with the dialogue. In entering into a conversation, participants assume that certain conditions will be met, and if they are not, the hearer, with some effort, can discern the speaker’s intended meaning. When a speaker’s utterance fails to follow the principle, it can fail in many ways. Grice (1975) describes four ways (maxims) that a speaker can violate or flaunt conversational norms as to allow for some meaning (or meanings) other than what is expressly communicated to be inferred. These maxims are quality (say what is true, or believe to be true, or are able to provide evidence for), quantity (say no more or less than is required), relevance (make the contribution relevant to the discourse), and manner (make the utterance understandable; avoid obscure terms).

Although many scholars take issue with metaphors as a violation of quality (Searle, 1979), Sperber and Wilson (1989) argue, instead, that the meaningful violation of Gricean maxims is the violation of relevance. In violating any maxim, the hearer must
infer what the speaker implies in the contribution. Sperber and Wilson argue that
speakers rely on the maxim of relevance (e.g., why is this utterance being used instead of
a literal alternative?) to make sense of utterances that fall outside the range of anticipated,
literal speaking turns.

Further, Sperber and Wilson argue that in contributing a metaphor in the course of
a dialogue, a speaker asserts a set of implicatures to be figured out by the hearer. That
there are multiple reasonable propositions that can be gleaned from a metaphoric
utterance is of great concern for the current work. The authors argue that the number of
possible reasonable propositions that are consistent with comprehending a metaphor are
constrained by context. Some of the elements that limit the possible interpretations of a
metaphor include assumed shared salient cognitive information (including speaker
intentions), salient elements of the environment and textual cues. That utterances are
open to numerous possible interpretations not intended by the speaker also allows for the
cancelability of implications (Kesckes, 2000). The speaker can, if called upon to do so,
deny an implication gleaned by the hearer, if it is not in accordance with the intentions of
the speaker.

Concision. Metaphors allow a speaker to communicate with brevity a set of
reasonable implicatures. In uttering a standard metaphor, the speaker may intend to
communicate more than one idea. One can start to list the possible meaningful
interpretations of the speakers intended meaning in uttering a metaphor, but will
inevitably fall short of identifying all the possible interpretations. Given the example
“Old fools are babes again,” we assume that the speaker, Goneril, believes (among other
things) that Lear is unable to care for himself, he is unable to make rational decisions, he must be constantly watched over, and so on. That the metaphor allows for multiple implicatures allows for a level of concision unavailable in literal language use (Ortony, 1978; Sperber & Wilson, 1989). To state explicitly all that is conveyed in the brief utterance that “old fools are babes again” would require many more lines of text, and further, would ruin the poetic succinctness of the current form.

With regard to conceptual metaphors, the speaker is using common linguistic forms that have a metaphoric base to communicate something about the world. When a speaker utters “I’m walking on air,” that speaker is exploiting two cognitive concepts: “happy is up” and “forward movement is progress” (Lakoff, 1998). The speaker concisely conveys something to the effect that his or her general mood is above and beyond standards for normal emotional states, and that this allows for unencumbered progress through the tasks of the day.

**Omission.** Metaphors such as the one attributed to Goneril in King Lear also rely on context to limit to range of possible implicatures that can be made (Lagerwerf & Meijers, 2008). That Goneril is describing her father’s irresponsible and erratic behavior after forfeiting his kingdom to two of his three daughters constrains the possible interpretations of the metaphor. In uttering “Old fools are babes again,” the hearer gleans from the context in which the utterance was made to not consider certain other features of babes that might be made salient, such as the need to clean one’s self after soiling one’s undergarments, the necessity of mother’s milk for nutrition, or the ability to convey through language (as opposed to crying) one’s ideas, wants and needs. Black (1962)
discusses this principle of metaphor in his application of the terms “frame” (for Richards’ “topic”) and “focus” (for Richards’ “vehicle”). Black argues that metaphors allow for the selection of metaphoric terms in such a way as to strategically highlight meaningful features and to omit other less relevant features or features that may contradict the intentions of the speaker.

This omission of features in a metaphor is another defining function of metaphors. Schon (1978) argues that in producing a metaphor, the speaker presents qualities of the topic and vehicle that allow for certain conclusions to be drawn based on those features. Given a finite set of words in a language, with a strict grammar, language still allows for an infinite set of possible combinations of meaningful sentences (Chomsky, 1972). The strategic selection of terms to be used in a metaphor allow for the consideration of certain features, selected by the speaker, as well as the omission of other features. In the example above, that Lear still holds nominal power over part of his kingdom (that he is still king in name and has control over a small standing army) is strategically avoided in the metaphor, and instead only highlights features that support Goneril’s position.

With regard to conceptual metaphors, Lakoff (2000) notes that we are not limited to one way of categorizing information cognitively. Instead, we can hold two or more contrasting ways in which to conceive and discuss topics. Lakoff (1996) notes that this multiple categorization scheme often clashes, most notably with regard to political ideologies and how speakers talk of their positions. Lakoff argues that conservative or “right wing” advocates will employ a “strict father” model for understanding and discussing political and social policy. The crux of this position often involves learned
self-reliance and punishment for “straying from the path”; the individual is responsible for his or her actions, and society is there to punish. The liberal or “left wing” individual will employ a categorization scheme that hinges on a “nurturing parent” model, where self-reliance is encouraged and punishment is a means of self-correction; the individual exists in a nurturing society whose goal is to fully develop people’s potential.

In political discussions, these two ideologies are often at odds because the speakers are highlighting and making salient different aspects of societies and individuals. Further, the underlying assumptions about these two views are made salient by the language employed to explicate the underlying beliefs of the individual. Both groups use language in such a way as to highlight certain characteristics of the individual and society, at the expense of other features which the ideologically opposed consider to be of great importance.

Relevance theory (Sperber & Wilson, 1995) argues that by couching metaphors in a context that limits potential conclusions that can be drawn, speakers attempt to allow the hearers to draw out only those conclusions of relevance to the course of the conversation or the goals of the speaker. There is a degree of speaker intention implicit in the strategic selection of metaphors used. Thus, speakers can exploit what is perceived to be salient relevant knowledge in the hearer to have them draw certain conclusions and not other possible conclusions.

Precision. In making a metaphoric utterance, the speaker makes strategic decisions as to what is being conveyed (Davidson, 1978). In selecting a vehicle for a metaphor, and by flaunting conventions of literal use, the speaker is able to more
precisely convey the intended meanings. For example, it is possible that Goneril, in
describing the state of her father, the king, could say “Old fools are like babes again.”
But in turning the metaphor into a simile (using “like” or “as” in the comparison), the
logical consequences are quite different. In similes, a hearer need only find one instance
of similarity for the utterance to be literally true (Gentner, 2002; Green, 1996). Whereas
metaphors are blatantly false, similes are blatantly true; any two terms can be found to
have at least one matching feature that would allow the utterance to be true. For
example, similes can be as broad as “the highway is like a flower”, where a comparison
might generate “they both grow” or “they are both made of atoms” would fulfill the
requirements for literal truth. In understanding and processing a simile, far less effort is
required to make sense of the utterance, but that utterance is usually considered to be far
less interesting (Glucksberg, 1989; Glucksberg, Gildea, & Bookin, 1982; Glucksberg &
Keyser, 1990). In addition, it lacks the power of a metaphor in that the choice of the
hearer to draw out a particular similarity may not be the one intended by the speaker.

Sperber and Wilson (1995) are concerned with the ability to effectively convey
meaning to a hearer when using literal language fails to provide an efficient way of
communicating an idea or concept. They argue that given Grice’s (1975) principle of
relevance (Make your contributions relevant to the course of the dialogue), speakers can
exploit the grammar of a language to better and more efficiently communicate certain
thoughts. Although new and novel metaphors are not uncommon (Pollio et al., 1995),
they do require some form of cognitive attention by the producer in order for them to be
meaningful. Conceptual metaphors, on the other hand, are so ingrained in how we think as to be created unintentionally and without significant cognitive effort.

Metaphor Processing

Psycholinguistic research on metaphor has examined two main issues: processing speed and processing effort. The findings, when taken together, provide further evidence for metaphors’ unique status among language features. Notably, that the speed involved in understanding metaphors is the same as for understanding literal utterances is fairly well accepted among psycholinguists, which implies that these messages are processed at the same time as a literal interpretation is attempted. What makes metaphor special is that the amount of effort involved in processing metaphors has been shown to be statistically different than for processing literal utterances, and that the amount of effort corresponds to the type of metaphor (standard or conceptual) being used.

*Speed.* The body of literature on the response time for metaphor comprehension encompasses a thorough appreciation of the many features that can influence metaphor processing. One of the first paradigms to be addressed by this research were efforts to discover if, as philosophers had posited, metaphor comprehension is a multi-stage, “literal first” process (Searle, 1978), or if there was some other “special” process by which metaphor was understood.

Reaction time studies are a form of investigation where a subject must respond to a stimulus and the time it takes to respond is the dependent variable of interest. The overwhelming consensus of this literature is that, when provided with an appropriate
context for comprehension, metaphors take no longer to process than literal counterparts (Gibbs, 1994).

The assumption in reaction time studies is that if metaphors take longer to process as the result of a multi-stage comprehension process, then it should take longer for subjects to register a response (e.g., button pushing). The longer the time required, the more steps are involved in processing.

Response time studies have indicated that at almost all levels of evaluation, from sentence level (Ortony, et al., 1978; Gibbs, 1994) to on-line word level (Stewart & Heredia, 2002), when enough context is provided, people take no longer to process metaphors than literal counterparts. This research indicates that processing metaphors is automatic, and that if determining a literal interpretation of the utterance is performed, it is simultaneous with metaphorical processing.

Glucksberg, Gibbs, and Gerrig (1989) found that when asked to judge the truth value (true / false evaluation) of metaphorical and literal statements, subjects took considerably longer to judge metaphors as being literally false and had a higher rate of wrong answers for metaphorical utterances. This research indicates that people have a difficult time discerning “metaphorically true” (felicitous) as different from “literally true.” Further, this provides evidence for the idea that processing metaphors is non-optional, which is to say that when presented with any utterance, one automatically subjects the utterance to a metaphorical analysis, regardless if it exists or not.

Effort. Coulson and Van Petten (2002) argue that lack of differences in reaction times does not necessarily indicate that there is not a difference in effort for processing
metaphors. The authors agree that the lack of difference in processing time indicates that metaphors are processed automatically and non-optionally, but that the speed of processing does not necessarily indicate that there is not a difference in the amount or type of effort that is involved in processing. Rather than rely exclusively on reaction time studies, which have added much to the literature, they turn to a newer technique for analyzing what brain functions are involved in processing metaphor, specifically, Event Related Potential (ERP) tests. Following Pynte et al.’s (1996) initial studies in applying ERP research to metaphor processing, Coulson and Van Petten have tested metaphor processing by examining brain wave activity via scalp probes.

The basic premise for applying ERP to many types of language comprehension has been studied in great detail and many findings for metaphoric language are consistent across conditions. Specific to the current effort are the brain waves related to N400. The N400 ERP reading has been identified as the point 400 milliseconds after exposure to a stimulus (a word, in this instance) that semantic processing occurs. At the 400 millisecond point, there is a negative (hence the “N”) amplitude associated with semantic processing. The processing of semantic information is often used as a general index of the degree of difficulty for retrieving stored conceptual knowledge that is associated with words (Arzuoa, 2007). If this amplitude is greater in the given direction, it is assumed to be the result of more cognitive semantic processing effort.

Pynte, Besson, Robichon, and Poli (1996) were the first researchers to have published results that employed the ERP technique for examining the processing of metaphors. Subjects were presented with metaphorical statements (both familiar and
unfamiliar) and literal statements in the form of “X is Y.” The authors found that statements ending in unfamiliar metaphors elicited larger N400s than familiar metaphors, which elicited a larger N400 than those statements that ended in literal words. Further, consistent with time-response studies, there was no difference in processing times. Thus, unfamiliar metaphors required more processing effort than familiar metaphors, which, in turn, required more processing effort than literal utterances.

Coulson and Van Petten (2002) also examined the N400 in processing different types of metaphors. Their study was structured around Fauconnier and Turner’s (2001) conceptual blending theory. The theory argues that metaphors exist along a continuum, and that metaphors, targets, and vehicles are “blended” together in a separate cognitive space. When presented with literal mappings; people are able to access knowledge of two distinct categories of information to be merged, or blended in a neutral cognitive “space”. The authors argued that these types of utterances are more metaphorical than literal language, but less metaphorical than standard metaphors, and there will be more processing effort than for literal counterparts, but less effort than for strictly metaphorical statements. For example, the continuum of metaphor, as presented by Coulson and Van Petten (2007) contains the following types of statements:

Literal: The secret ingredient in her stew is cayenne.

Literal mapping: The chef apparently uses salt instead of cayenne.

Metaphor: My crazy uncle says jokes are conversation’s cayenne.

(p. 960)
In this set of examples, the literal mapping condition is an attempt by the speaker to get the hearer to “map” concepts in a blended space; only some of the qualities of cayenne are mapped, and these qualities are related to properties of cayenne analogically. Coulson and Van Petten note that in this blending, “such mappings are made possible because of the incorporation of background knowledge, which sometimes includes underlying conceptual metaphors” (p. 960).

The authors found that the metaphorical conditions did elicit larger N400s than literal mappings, which elicited larger N400s than strictly literal utterances. These results have been replicated in several studies (Arzuoan, Goldstein, & Faust, 2007; Coulson & Van Petten, 2007; Rapp, Leube, Erb, Grodd, & Kircher, 2004).

All of this research indicates that metaphors are processed at the same speed as non-metaphoric language. All of the brain research studies thus far have provided further evidence that metaphors require greater processing effort than literal counterparts, and that metaphor type, as operationalized by the various researchers, correlates to the amount of brain activity required for processing; the more metaphoric an utterance, the more effort is expended. Although there has not been as much research on the cognitive processing of conceptual metaphors, what results have been reported indicate that standard metaphors require more cognitive effort than conceptual metaphors to understand, and conceptual metaphors require more cognitive effort than literal – equivalent statements. Although there is evidence of a quantitative difference in amount of effort required to process metaphor, a qualitative difference has yet to be determined.
definitively; there has been no consensus in the research on where in the brain and how
metaphor is processed.

Features of Metaphors That Affect Processing

Research has indicated that the relationship between the terms used in a metaphor
can vary and that this variation has implications for the comprehensibility and ease with
which people understand them (Gibbs, 1994). The most important features of metaphor,
as identified in the literature are aptness, familiarity, and context.

Aptness

Aptness in metaphors refers to the degree to which the metaphoric phrase captures
features of both topic and vehicle to convey the most relevant information. Aptness refers
to the number and strength of shared features between the two terms in a metaphoric
utterance. It also concerns the lack of shared features, and the ease with which this
allows for accessing shared features becomes available (Tourangeau & Sternberg, 1982).
It follows then that the more apt a metaphor is, the less cognitive effort will be required to
comprehend said metaphor. Gentner (1997, 2002, 2001) has argued that metaphor
aptness is the strength of the relationships between terms in a metaphoric utterance,
where strength refers to the functional (meaningful) characteristics highlighted by the
juxtaposition of the terms. For example, if a science teacher were to present a group of
students with the statement “An atom is a tiny solar system,” the features that would be
transferred onto “atom” are not characteristics of solar systems; that the central molecule
is yellow and very hot, and some of the other molecules are capable of sustaining life.
Rather, it is the relationship between the terms asserted in a metaphor that are
communicated; that the central molecule exerts a pull on the other molecules that allow them to rotate and orbit around the central point.

Research has generally supported the hypothesized relationship between aptness and processing. Katz, Pavio, Marschark, and Clark (1988) established that metaphor aptness was an important feature in metaphor comprehension and processing, and that it was strongly correlated with other metaphor features, such as imagery and perceived familiarity. Gagne (2002) examined the role of aptness in ease of comprehension and found that in response time studies, metaphors that had been rated as more apt were understood more quickly and more accurately than those that were rated less apt.

With regard to aptness in conceptual metaphors, another important criterion is that the relationship be meaningful to the hearer and allow for a reasonable interpretation to follow. Although standard metaphors often turn to novelty of the relationship between terms, in a conceptual metaphor this analogical relationship is often times transparent and relies on fundamental cognitive organizations. Conceptual metaphors commonly have fewer referents than a standard metaphor and are thereby limited in their possible interpretations, and in turn, require less cognitive effort. The more apt a conceptual metaphor is, the fewer possible implicatures may follow; ideally, a single interpretation follows. Given the example “I’m walking on air” is easily understood as meaning “I’m in a good mood”.

Following the logic of Sperber and Wilson (1986), an apt metaphor will allow for a smaller and more salient set of possible implicatures that follow from it. An inapt metaphor allows for more and weaker implications to follow, as it requires more effort on
the part of the hearer to reconstruct the speakers’ meaning. If the metaphor is inapt, there
are too many possible interpretations: The hearer may ask for clarification (when
possible), discontinue the search for a meaningful interpretation and ignore the comment,
or be satisfied with an interpretation that is not intended by the speaker or an
interpretation that loosely qualifies as meaningful. This last scenario is similar to the
case in interpreting similes, where only one similarity, which can be a mere resemblance,
can suffice (Kennedy & Chiappe 1999; Ortony, 1985).

**Familiarity**

Familiarity of a metaphor refers to the degree to which hearers are familiar with
the combination of terms in a metaphor. The more familiar the combination, the closer it
is to becoming an idiom, a “dead” or conventionalized metaphor. Familiarity’s converse
is novelty. The more novel a metaphor, the less common and less familiar the
combination is, and the more effort is required by the hearer to interpret such utterances.

As familiarity increases, the metaphor approaches idiomatic or “dead” metaphor
status (Davies, 1983). Idiomatic expressions such as “Kick the bucket” are quantifiably
different from standard metaphors, most notably for the way in which they are
understood by the hearer. Research indicates (Carston, 2002) that idioms are “chunked,”
or understood at the phrase level, whereas metaphors are processed at the word level, one
word at a time (Gibbs & O’Brien, 1990). Given the idiom, “kick the bucket,” a hearer
need not refer to the metaphoric origins of the phrase, but be able to access its literal
equivalent and linguistic convention: that someone (or thing) has died (Davies, 1983).
Although novelty is a defining feature of standard metaphor, conventionality is a key feature of conceptual metaphors. According to Reddy, Lakoff, and other advocates of this approach, conventionalized metaphors tell us a great deal about conceptual metaphoric thought. These terms still hold a metaphoric value, and, when a collection of related conventionalized forms are gathered together, they reveal something about how we think about a topic; certain trends in terminology become apparent. As speakers continue to use a certain metaphor, and if that metaphor is particularly apt or appropriate, its continued use allows for it to be processed at the idiomatic, or phrase level, rather than at the word level. That being the case, metaphors can only be used for a limited time before they are appropriated by cultural forces. This novelty is one of the features that allows us to process metaphors as metaphors and not as idiomatic expressions. For example, a once-novel metaphor that now is idiomatic (conventionalized), is the phrase “I need to crash” to convey to the receiver that the speaker’s energy stores are rapidly depleting, and that he or she will quickly and precipitously need to find a place to rest. Given that there are overarching themes in cognitive constructs, such as “happy is up,” speakers can create and apply novel metaphoric phrasings and retain novelty. For instance, a speaker can utter “I’m dancing on a cloud,” and the receiver can easily infer that the speaker intends to convey something about their positive emotional state.

*Context*

Context refers to the immediate text around the metaphoric phrase, features of the environment, and assumed shared and salient cognitive knowledge, as well as the possible meanings of words in a given language. Context provides a way to limit the
number of possible implicatures that can be made in a given linguistic situation. As discussed earlier, a speaker may assert some metaphoric proposition that can not be taken as literally true, but is intended to contribute meaningfully to the discourse. By violating Grice’s maxims for conversation, a speaker can convey a set of implicatures to be parsed out by the hearer (Martinich, 1984). Context limits the range of possible reasonable implicatures that a hearer can glean from a given metaphor (Kesckes, 2002; Ritchie, 2004).

In different contexts, the same metaphor can contribute different things to a conversation (Leezenberg, 2001). Sperber and Wilson (1986) argue that hearers rely on context to select the most appropriate implicatures from the world of possible meanings. For instance, in uttering “Richard is a bulldozer” when complaining about one’s boss, the speaker may intend for the hearer to gather that Richard has no concern for individuals and will disrupt an existing harmony in order to achieve goals. When the same metaphor is uttered with regard to praising an employee, the speaker may want the hearer to infer that Richard is industrious, hardworking, and works without rest. Lagerwerf (2008) refers to this quality of contexts altering the intended implications as “anchoring.” Carston (2002) argues that the more creative or novel a metaphor is, “the wider the range of possibilities and the weaker the speaker’s endorsement of any specific implicated propositional form” (p. 358). Context helps to defray the cognitive effort in searching for all possible implications.

Ortony and colleagues (Ortony, Reynolds & Arter, 1978; Ortony, Schallert, Reynolds & Antos, 1978) examined the role of context on metaphor processing. In their
pioneering studies, subjects were presented with a concluding statement that could be read either metaphorically or literally. One example from their study involved the target sentence “Regardless of the danger, the troops marched on.” Two contexts were provided, one which allowed for a literal interpretation of the statement (army movements), and one which prompted a metaphorical reading of the statement (misbehaving children). Without context, target sentences took slightly longer to trigger a response from subjects. But when the concluding statements were presented following a context condition that advanced either a literal or a metaphoric interpretation, the response time between literal and metaphoric conditions were insignificant. Ortony and his colleagues determined that when possible interpretations for a metaphoric utterance were constrained by context, the reading of the metaphoric sentences was automatically done, and was done within the same relative time frame as literal counterparts.

Part of the explanation for how context affects the speed of processing is that it allows for priming of a limited set of possible meanings for terms used metaphorically (Stewart & Heredia, 2002). By limiting the set of possible interpretations, those members of the limited set are more salient.

Giora (2000, 2001) has also investigated the role of context on interpretation, but with regard to salient meanings of words. Specifically, she argues that salient word meanings will take priority in interpreting metaphoric uses. Her studies reveal that the priority of salient meanings will encourage understanding along lines consistent with the priority meaning. Only when context cues a different interpretation of salient features will a metaphoric understanding occur. For example, given a term with multiple,
divergent meanings (such as “bank”), context will encourage activation of one meaning over other possible options.

Context, according to the conceptual metaphor model, is the shared cognitive information and exploitation of cognitive schemas to communicate information about perceptions of the world. Often, a text will exhibit multiple instantiations of a conceptual metaphor construct. Taken together, these approximate what Goffman (1962) has termed “frames.” In systematically employing a conceptual category, the metaphor is used throughout the context in various ways. At the most basic level of the embodied metaphor, it is the use of prepositions to describe abstract states. Lakoff (1989) gives as an example “anger is heated fluid.” In applying this concept to language use, someone might utter “He’s going to blow his stack” or “She’s steamed about something.” This allows a user to exploit the conceptual metaphor in such a way to efficiently communicate something about an individual’s emotional state.

Given this presentation, a picture of what is meant by the term “contextual metaphor” should start to emerge. If a standard, novel, and apt metaphor is presented with a suite of conceptual metaphors, there should be greater constraints on the possible elaborations on the metaphors’ meanings.

This review of the metaphor literature helps to explain what mediating effects metaphors should have in persuasion. Although response time studies indicate that non-optional processing of metaphoric meaning will occur automatically and at the same speed as literal counterparts, ERP studies reveal that the effort required to process metaphor is greater than for processing non-metaphoric language. The Elaboration
likelihood model (ELM) predicts that, if other conditions hold, then the more cognitive effort is given in processing, any resulting attitude change will likely be of greater amplitude in the direction advocated in the message, and more persistent, longer lasting and more resistant to counterarguments. Presentation of a metaphor increases motivation to process centrally. If the type of cognitive effort required to process metaphors is related to the type of cognitive effort involved in attitude change, then the more concerted motivation required to process metaphor, as indicated by the ERP studies, should encourage central, concerted processing of metaphoric messages, which should lead to stronger and more persistent attitude change. Together with the metaphoric feature of multiple implicatures, the ELM is posited to best explain the effect of metaphor in persuasive attempts.

Metaphor as a Compliance-Gaining Strategy

There are many theoretical choices that can help to explain what effect metaphors will have in persuasive attempts. In this study, I have chosen to use the ELM because it allows for manipulation of messages as a variable of interest and takes into consideration the amount of cognitive effort and elaboration involved in attitude change, features that are essential in studying metaphors as compliance gaining strategies. Manipulating messages for metaphoric content should allow for a suite of elaborations or implicatures to be processed without awareness and accepted as true, unless the hearer is called upon to actually measure the truth validity of a metaphoric utterance. That metaphors require more effort to process, and that this processing occurs simultaneously with processing literal meaning (as evidenced by reaction times) indicates that there may be multiple
cognitive processes occurring simultaneously. Further, metaphors prompt a set of implicatures should allow for hearers to elaborate on those implicatures. When cognitive elaborations related to the metaphorical implicatures are in the direction advocated by a message, then there is by the ELM account, evidence of centrally processed messages.

Not only does the ELM consider different routes for processing, it makes predictions as to what the persuasive outcome is based on the type of processing that occurs. Thus, the ELM is an appropriate model for evaluating metaphors as persuasive devices, as the ELM specifically allows for control of otherwise ambiguous message features, such as metaphor type, as it relates to argument strength.

Elaboration Likelihood Model

The ELM posits a model in which message features influence cognitive processing of the message, and that the type and degree of processing is associated with attitude change. In addition, there is a set of moderators known to affect processing. In this section, I first address the model’s assumptions regarding the processing of persuasive messages, and then address the characteristics of persuasive messages related to processing. Finally, I discuss a set of moderators relevant to the current investigation.

Types of Cognitive Processing in the ELM

The ELM posits two general types of processing, central and peripheral. In addition, some scholars have proposed a “hybrid” model that contains elements of both processes; others have suggested a continuum. There are both qualitative and quantitative distinctions among the two main processes. Each is discussed below.
Central Route Processing. Central route processing actively engages thoughtful consideration of the message. Arguments and counterarguments are considered and used in the evaluation of the message. Central route processing is more effortful and requires more cognitive activity. This cognitive activity includes evaluating the message, discounting counterarguments, and integrating the information included in the new message with the previously held cognitive evaluation of the message target. Given that central processing requires more work on the part of the receiver, it is anticipated that if central processing occurs, attitude changes that result from processing a message will be greater in the direction advocated by the message and more resistant to counter messages, as counterarguments have already been considered and discounted, and the information is consistent with other cognitively stored information.

Peripheral Route Processing. Peripheral processing requires far less effort, and the receiver will often rely on cues such as source credibility or argument length in determining whether or not to accept the persuasive message. Given that individuals are presented with hundreds of messages each day (Postman, 1994), peripheral route processing provides a receiver with a means to take in messages without exhausting limited cognitive resources. Peripheral processing of messages may lead to attitude change, but these changes tend to be closer to the original attitude evaluation than for messages processed centrally and they lack the persistence in attitude change that accompanies centrally processed messages.

Parallel Processing. Stiff and Mongeau (2000) have argued that there may be an alternative method for processing messages, one that involves a parallel processing
mechanism. As such, messages can be processed simultaneously along both routes, and message evaluations result in a “middle ground” effect.

Evidence from psycholinguistic research indicates that it may be by this method that features of metaphor in persuasive attempts are understood by receivers. That is, metaphors require more effort, but the effort is automatic and done without consideration. Also, given that metaphors are often understood without awareness of a message’s “metaphoricity” would present as peripheral processing in experimental situations.

Message Feature

**Argument strength.** ELM research has not addressed issues of metaphor directly. The current study postulates a correlate between metaphor and argument strength. That metaphors encourage elaboration of multiple different lines of reasoning based on implicatures bears a meaningful resemblance to the effects of argument strength. Argument strength refers to those features of messages that encourage a receiver to generate more thoughts in the direction advocated by the message than thoughts that are contrary to the message position. Weak arguments, according to the model, are those where more unfavorable thoughts are generated with regard to a message than positive thoughts. This operationalization has been criticized as overly vague (Andrews & Shimp, 1990; Areni & Lutz, 1988; Boller, Swasy, & Munch, 1990; Eagly & Chaiken, 1994; Mongeau & Williams, 1996; O’Keefe, 2002, 2007; Stephenson, Benoit, & Tschida, 2001; Stiff & Mongeau, 1986), and thus it will be slightly modified in order to accommodate the variable of interest.
Areni and Lutz (1988) argue that one of the primary criticisms of the ELM’s conceptualization of argument quality is that it confounds argument strength and argument valence, and that previous manipulations termed “argument strength” were in fact manipulations of argument valence. They define valence as the subjects’ perceived desirability of the arguments presented. For example, in an advertisement for razors, “closer shave” was a more highly valenced argument than “designed for the bathroom” (p. 197). That a closer shave is more important to message recipients should impact on message evaluation more so than design features. In their study, they separated the two message features and found evidence that the two devices worked independently from one another. Specifically, messages that contain strong arguments were only effective for highly involved (motivated) individuals, whereas messages containing positively valenced features were more likely to affect subjects at all levels of motivation.

Mongeau and Williams (1996) argue that the main problem with the conceptualization of argument quality in the ELM is that researchers have used argument quality not as a message feature, but as a methodological tool for determining the degree of cognitive elaboration (Petty, Wegener, Farigar, Priester, & Cacioppo, 1993). In so doing, judgments of argument quality are determined as directly corresponding to message evaluation (strong messages lead to a greater number of positive cognitions than weak arguments), rather than as a cue for elaboration, which is a better indicator of message effect. Stiff and Mongeau refer to Johnson and Eagly’s (1989) meta-analysis of ELM research, which found that those not affiliated with the construction of the ELM are unable to replicate the findings of its primary authors. Johnson and Eagly argue that the
lack of replicability is because of the misattribution of argument strength as a methodological issue, and not a message content issue.

O’Keefe (2003) concurs with Mongeau and Williams’ criticism: “Because strong-argument and weak-argument messages are defined on the basis of effects, not intrinsic message characteristics, one does not know what message features might be responsible for receivers’ reactions” (p. 267). The confounding of message content with message effects obscures the role of features of the message itself that may contribute to any effects that those manipulations might have. It is imperative, he continues, that future research more rigorously consider the content of message manipulations as a means of determining what about those messages creates an effect in the receiver.

For the purposes of the current investigation, and in accordance with the reasonable criticisms raised against the concept of argument quality, argument strength will refer to the number of cogent reasons present or implicit in a message for accepting that message. For example, one might try to gain compliance with a recycling program for any number of reasons. Compliance seekers have at their disposal several valid means of gaining assent; that recycling is good for the environment, that it is a cost saving measure, or that social mores dictate that recycling is an appropriate behavior. For the current study, this will be operationalized as the type of metaphoric utterances used in a message’s content. This is to say that some types of metaphors will have a larger set of associated implicatures than others. Further, the evidence from psycholinguistics states that metaphorical messages differ in processing effort by type will contribute to different levels of elaboration. Additionally, following the criticisms of Areni and Lutz (1988), the
lines of reasoning used to support an argument as operationalized as argument valence
will also be controlled for by way of the metaphor vehicles selected. For any given topic
of a message used in an experimental condition, the metaphor vehicle, as a reason to
accept the advocated position, will be considered in message design. Although in and of
themselves, the implicatures are considered “weak” (not expressly advocated by the
speaker), that they are compactly presented in metaphorical form will should encourage
cognitive effort to process, thereby strengthening the message.

One interesting research finding regarding perceived argument strength was that
messages that included metaphors at the onset of the message were found to be more
persuasive than when they are located anywhere else in a message (Sopory & Dillard,
2002). For practical purposes, controlling placement will be feasible for standard
metaphors, but not for conceptual or contextual metaphors, which amounts to the entire
linguistic (textual) context occur throughout the message.

Petty and Cacioppo (1986) define argument strength as the number of cogent
arguments presented in a message that accord with the receivers’ position. If there is
only one argument, the argument is considered weak, and if there are multiple poor
arguments in favor of a position, the argument is also considered weak. Metaphor should
allow for the concise inclusion of multiple arguments. If a metaphor is apt, and enough
context is available to the hearer, then a small set of implicatures should be calculated. It
is on these implicatures that subjects will have cognitions, and this will contribute to
making evaluations of argument strength. Assuming for the moment that a subject is in
favor of the position advocated by a message, he or she will generate more pro-message
cognitions than if he or she were presented with a literal equivalent statement because metaphors contribute more to the argument than a literal counterpart, and because the processing of these metaphors for implicature values is automatic. When other variables are held constant, metaphors should be evaluated as stronger arguments than literal counterparts.

The number of strong arguments, when processed centrally, should lead to more cognitive elaboration and, in turn, a greater degree of attitude change. With regard to the number of arguments, metaphors in persuasive attempts carry multiple implicatures which may act to increase argument strength by the number of arguments implied and the limitations on possible interpretations provided by context. In addition, this increase in implied statements should lead to more cognition elaboration about the metaphoric utterance.

That a metaphor is couched in the context of a persuasive attempt has already primed the audience in such a way as to limit the range of possible implications (Phillips, 2005). Sperber and Wilson (1986) argue that “the wider the range of possible conclusions, the weaker the implicatures and the more the hearer must share in the responsibility for deriving them” (p. 235). Given the persuasive context in which metaphoric utterances will be used, it is assumed that the implications will be limited and stronger than the implicatures one may glean from a poetic metaphor, where the context is broad and the number of possible implicit interpretations is purposefully greater. Sperber and Wilson (1986) argue that there is an inverse relationship between the contextual constraints (which lead to an increase in possible rational implications), and
the strength of those possible implicatures. This increase in arguments, as presented by metaphor, should act to increase argument strength.

Phillips and McQuarrie (1997) found that even when metaphors used in persuasive attempts employ metaphors that make multiple weak assertions, there was still some degree of consensus as to what those implicatures were. Using ads with pictorial metaphors, even under conditions where the implicatures were not strong, there was a general trend towards unity in calculating weak implicatures; up to 33% of participants identified the same weak implicatures in advertisements for consumer goods. When there was a strong implicatures to be found, between one half and up to 92% of subjects correctly identified the intended implicatures. One example from Phillips’ research was an advertisement for a toothpaste designed to make one’s teeth shiny, pearly, and white. A strong implicature (identified by 92% of subjects) was that the toothpaste will make ones teeth as shiny and white as a string of pearls. A weak implicature (identified by 33% of subjects) was that the toothpaste was used by rich people. Phillips (2005) notes that a strong implicature is one where more than half the audience interprets the metaphor as having a specific interpretation. This does not limit the range of other possible implications, but provides a criterion for establishing “strong” and “weak” implicatures.

In a more recent study, McQuarrie and Phillips (2005) found that subjects were able to identify both strong and weak implicatures spontaneously. Further, they found that identifying strong implicatures did not prevent subjects from also identifying weak implicatures. An interesting result from their study indicted that persuasive attempts that
employed visual metaphors were found to produce more positive attitudes towards the
topic than text-based metaphors.

If metaphors are able to concisely convey multiple implicit arguments, that are
processed automatically (but with extra effort), their acceptance requires less work than
their denial. To counter a metaphor’s multiple weak implicit arguments scheme, a
receiver would be required to exert more effort than for mere acceptance.

Argument strength also involves the relationship between the conclusion of the
message and the means of support for that message. If irrelevant information is included
in the argument, similar to Areni and Lutzs’ (1988) “low argument valence,” this should
weaken the argument. For the current purpose, apt metaphors should provide a degree of
relevance to enhance argument strength.

Factors that Moderate the Relation Between Messages, Processing, and Outcomes

Source Credibility. Features of the source are often considered when messages are less
likely to be processed centrally (Petty & Cacioppo, 1986). Perceived credibility of a
speaker should encourage a positive evaluation of the message when it is processed
peripherally. For the current effort, research has indicated that perceived source
credibility is higher when messages are presented using metaphors than when metaphors
are not employed (Sopory & Dillard, 2002). When presented with a message containing
a metaphorical assertion that the receiver is uninterested in (low need for cognition and
low relevance), the evaluation of the source as more credible may influence an initial
evaluation that is in favor of the advocated position than a literal control condition. This
effect, according to the ELM, should not be persistent, and should not be present at a
Time 2 evaluation.

Given that central processing requires more cognitive effort, there are two major
features of individuals that must be met for effortful processing to occur: motivation and
ability. Each of these criteria encompasses a suite of factors that will encourage or
distract from effortful processing. If both conditions are met, the likelihood of central
processing increases.

**Motivation.** Broadly, the amount of motivation present will correlate with the type
of processing that will take place. Higher motivation, when all else is held constant
should lead to a greater likelihood that central processing will occur. Less motivation to
process will decrease the likelihood that a message will be processed centrally. Features
of both messages and individuals influence the amount of motivation an individual will
exert in message processing. In addition to message features such as argument strength,
state and trait psychological features can also function to increase or decrease the
likelihood that a message will be processed centrally. As discussed, central features of
messages that can influence the direction of processing a message include the number
and type of arguments present in a persuasive message.

**Need for cognition.** Need for cognition refers to the trait - psychological feature
of an individual to thoughtfully consider the merits of an argument or message (Cacioppo
& Petty, 1982). Petty and Cacioppo (1986) have found that this feature of individuals
was the most strongly correlated psychological feature for indicating preference for
elaborated, central processing. Those with a high need for cognition are more likely to
evaluate messages and consider counterarguments regardless of the specific content (or level of involvement, discussed below) of a persuasive appeal. It is argued that those with a high need for cognition will be more likely to attend to the multiple implicatures present in a metaphorical message and possibly elaborate on them to create a more reinforced attitude. When there is a high need for cognition and a prior attitude that is at odds with the advocacy of the message will a receiver consider the implications provided by metaphor to the extent that they will discount the message entirely.

Bias Processing, Ego Involvement and Prior Knowledge. Bias processing refers to the notion that when people are presented with a persuasive attempt, they have preexisting ideas about the given topic. That people possess knowledge and opinions on topics influences how messages are received.

An example of the effect of bias processing in persuasive attempts that employ metaphor can be found in Whaley’s (2000) study. Whaley examined the effect of rebuttal analogies (analogies that employ metaphor as a means of contradicting an argument, often as a means of pointing out an absurdity in the reasoning), on subjects who disagreed with the advocated position of the rebuttal analogy. The results indicated that those presented with a rebuttal analogy that was in opposition to the subject’s attitude rated the speaker as less credible and less likeable. Further, subjects reported fewer positive cognitions and more negative cognitions about the message in a thought listing task than for the non-analogy condition. Even though the findings would indicate that attitude evaluation would be less favorable for the rebuttal analogy condition, no such effect was found. The implications for the current research project, using the ELM
paradigm, are that under conditions where subjects are strongly opposed to the message content and are likely to elaborate on the message (as indicated by the NFC scale) there would be a greater chance of a boomerang effect, rather than a general discounting of the message as a whole.

_Ego Involvement._ Ego involvement refers to the degree to which a person is vested in the persuasive evaluation and outcome (Petty & Cacioppo, 1986). In presenting an argument that a person with high ego involvement disagrees with, that individual is more likely to raise counter arguments to the message content than someone who is not as ego-involved. For example, a gay person would be ego-involved about topics related to gay rights (including federally recognized gay marriage rights). Conversely, in presenting an argument that an ego-involved person agrees with will lead to the person having a more positive evaluation of message content than someone less ego-involved (Andrews & Shimp, 1990; Maio & Olson, 1995; Petty & Wegener, 1998; Rydell & McConnell, 2005). For example, someone who is heterosexual, or doesn’t have any reason to hold a particular opinion on gay rights may be considered “low involvement” with regard to issues that affect the gay community. In situations where subjects had low involvement, peripheral cues were responsible for instigating more attitude change than argument strength (Kirby et al., 1998). Someone who is not ego-involved about a topic may be persuaded by the presence of an attractive or admired source than a less attractive or admired source.

Andrews and Shimp (1990) presented subjects with a low-alcohol beer advertisement and found that those who were considered high involvement produced
more pro-message thoughts than anti-message thoughts (as identified in a thought listing task) for messages with high credibility sources (a peripheral cue). Low involvement subjects showed no difference in the production of positive over negative cognitions. Further, the authors found that high involvement subjects reported greater attitude change than low involvement subjects, although low involvement subjects showed greater attitude change after exposure to strong messages than low involvement subjects exposed to weak versions of the message.

Early studies of the ELM have also borne out these assumptions. Petty and Cacioppo (1979) exposed subjects to counterattitudinal messages that had been manipulated for argument strength and level of involvement. The authors found that when the message was classed as a high involvement, strong argument message, subjects were able to produce more attitude change in the direction advocated in the message. But when the involvement level was high and argument strength was weak, there was a decrease in attitude toward the topic. Other studies they have performed (1981, 1984) found similar results; when message involvement is high and argument strength is high, subjects report a greater number of pro-attitudinal messages and display greater attitude change than when argument strength is low.

The concept of involvement as operationalized by the ELM has garnered much criticism, most notably, for the lack of replicability (Johnson & Eagly, 1989). In their meta-analysis of involvement as a mediating factor in persuasive models, Johnson and Eagly found that only the significant experimental findings regarding involvement were achieved by members of the “Ohio School,” the core researchers and advocates of the
ELM. They argue that this may be because ELM researchers have operationalized outcome relevance as the major defining feature of those messages considered either ‘high’ or ‘low’ involvement, where, in other persuasion experiments, involvement has been a better predictor of results when involvement has been operationalized as value-relevant involvement. By value-relevant involvement, the authors assert that the paradigm of involvement is more closely associated with the attitudes that people hold than the implications of a possible outcome, as used by ELM advocates.

Andrews et al. (1988) have also presented reason to be suspicious of how involvement is manipulated by the ELM. These authors argue that there are four major approaches to manipulating the involvement construct. They present reasoning to the effect that the involvement construct discussed and used in designing experiments of the ELM rely on situational or state features of an individual, as the topic relates to them specifically. But, the authors note, this might not be the best way to understand and evaluate the persuasive process. Their main argument is that the type of involvement tested by the ELM may not be the one that is discussed in the conceptual underpinnings of the theory. In addition to this, the exclusive use of researcher – only manipulation checks (i.e., what the researcher thought to be high and low involvement topics) for topic involvement was cause for concern. This project attempts, through two pretests, a means of better operationalizing the notion of involvement for the topics selected for messages.

The way in which the current project manipulates levels of involvement is more closely aligned with Johnson and Eagly’s findings; when persuasive messages are manipulated by levels of value involvement rather than outcome involvement, there is
greater evidence of activation of associated attitudes and cognitions. To this end, in
evaluating topics of interest for the current project, value involvement is used as the
quantifying feature, as is presented in Zaichkowsky’s (1985, 1994) ten-item, seven-point
semantic differential scale; the Revised Personal Involvement Inventory (RPII).
Although the RPII was initially designed to identify attitudes and involvement for brands
in advertising and marketing environments, its strong validity and replicability has
encouraged scores of researchers in various disciplines to employ it as a means of
assessing an individual’s level of personal involvement about an issue (Bae & Kang,
2008; Braun, Gaeth & Levin, 1997; Hardesty & Bearden, 2004; Krishnamurthy &
Sivaraman, 2002; Mothersbaugh, Huhmann & Franke, 2002; Tsai, 2007).

Ottati, Rhoades, and Graesser (1999) manipulated the vehicles in a conceptual
metaphor to determine if metaphors increased motivation to process messages centrally.
They found that when subjects had an affinity for the message vehicle, they were more
likely to agree with the conclusion of the message. Inversely, those who had a dislike for
the message vehicle were likely to construct more counterarguments to the message. In
both instances, subjects failed to identify any metaphoric language that was used in the
presentation of persuasive messages.

*Prior knowledge* is related to ego-involvement, but is not the same concept.
Someone can be very knowledgeable about a topic, but not have high involvement for an
outcome. For instance, in the U.S. Presidential primaries, a person may be
knowledgeable about the different candidates for the party’s nomination, but not have
high ego-involvement for the candidate ultimately selected; they will still vote for whomever their party nominated.

Prior knowledge can still bias processing, just as ego-involvement can. Prior knowledge provides a receiver with a host of reasons to agree with the message, or has allowed for the preparation of counterarguments. A lack of prior knowledge, coupled with a low need for cognition, increases the likelihood that an individual presented with a persuasive message with many arguments (even if those arguments are weak) will more positively, albeit peripherally, evaluate the message. In addition, when the subjects’ knowledge is higher, the effect of metaphoric frames decreases (Barker, 2005).

Further experiments have shown that affinity for the vehicle in a message can impact the evaluation of the topic. When the message topics were consistent with the message vehicles, and the subjects agreed with both, post-stimulus evaluation was higher than when there was discord between the topic and vehicle (Lau & Schlesinger, 2005).

*Ability.* Petty and Cacioppo argue that once a person has enough motivation to process a message, the ability to process a message is the next threshold to central processing. If ability to process a message is compromised, the opportunity to centrally process messages is severely constrained. The authors present several ways in which ability might be compromised. For example, the topic under discussion may be of a highly technical nature, and the concepts and vocabulary involved may be beyond the immediate cognitive reach of a receiver. The present study attempts to hold constant as many of these features as possible.
Features of the environment can moderate the effects of ability, as can physical distractions such as sleepiness, hunger, and so on. Psychological features such as anxiety may also impact on a subject’s ability to fully attend to the stimulus and response sections of an experiment. Repeated exposure to a message may decrease a subject’s ability to fully attend to a message. To the extent that it is feasible to control these features of the environment, measures have been taken to hold constant these spurious variables. Language fluency may also pose a problem for some subjects. Subjects were asked to report age of English language acquisition. If the age is after the “Critical period” (age 5), their responses were not used in the data analysis.

The logic of the ELM and the theories of metaphor processing overlap in several intriguing ways. The moderating roles of need for cognition and cognitive elaboration are relevant to both. Message features also figure prominently in what effects those messages will have. ELM can help explain why different types of metaphors produce the results they do. In order to best highlight features from both approaches, the following research questions and hypotheses have been developed.

**Research Questions and Hypotheses**

Metaphors are a common and pervasive feature of language. In order to understand a metaphor, the hearer is compelled to make multiple reasonable interpretations of the utterance. That there are different types of metaphor, which potentially lead to different forms of interpretation, has yet to be fully addressed in the compliance-gaining literature. One of the most interesting features of metaphors is that although there is no difference in
the time required to understand metaphors and literal utterances, there is a difference in
the amount of processing effort (Coulson & Van Petten, 2002, 2007). This issue of
differential processing effort also has yet to be fully addressed in the compliance-gaining
literature. Based on the evidence available from communication research,
psycholinguistic experiments and philosophy of language theory, there is evidence to
support and explain these findings by means of the ELM. Metaphors should initiate more
pro-message thoughts. As a result, this should lead to more elaborated thinking, and
when certain other conditions are met, lead to stronger and more persistent attitude
change (see Figure 1).

Message Type

As discussed, metaphors can serve as a context in which to understand a target
sentence. Context moderates the relationship among metaphor, cognitive processing, and
attitude change. Therefore, when a standard metaphor is presented without a limiting
context (unlike the case of conceptual metaphor), there should be a greater number of
weak implicatures, and fewer strong implicatures when compared to an implicature-
limiting context (e.g., when a standard metaphor is presented with a consistent conceptual
metaphor, as defined by Phillips & McQuarrie, 2005). (Weak implicatures should lead to
less cognitive effort, and its ambiguity regarding speaker intent should not significantly
aid in attitude change in the direction advocated by the message.)

When the same standard metaphor is presented with a constraining context, such
as when paired with a conceptual metaphor that echoes and reinforces the speaker’s
intentions (e.g., a contextual metaphor), a set of strong implicatures should follow.
Evidence suggests that conceptual metaphors require less cognitive effort to process than standard metaphors because the search for reasonable implicatures is constrained and made easier by a context that supports a strong implicature, or set of implicatures (Coulson & Van Petten, 2002, 2007).

When presented independent of a standard metaphor, a conceptual metaphor acts as a context that should lead to a very limited set of strong implicatures, and few weak implicatures. Research indicates that this requires less cognitive effort than is needed to process a standard metaphor. Sopory and Dillard (2002) found that “elaborated” or conceptual metaphors did produce a persuasive effect, but none of the studies used in their meta-analysis involved a direct comparison of message effects between metaphor types within the same study. Comparing the effects of standard metaphors and conceptual metaphors in the same experiment may yield new information or support common assumptions about their effect. Given the logic of implicatures and cognition, conceptual metaphors should have a smaller effect on attitude change than standard metaphors. As a control, a literal version (the same context as used in the “standard only” paragraph) of the persuasive message will be used to ensure that the findings on implicature are not the result of some other feature of the message.

The logic of the ELM indicates that stronger, more persistent attitude change results from more concerted pro-message cognitive elaboration. The processing of metaphors has a built-in pragmatic (functional) mechanism that compels more processing effort than literal speech. There are two questions of interest in considering metaphor as persuasive device. First, is the quantity of the extra effort involved in processing
metaphors sufficient to engage central route processing, and second, is the quality of effort involved in processing metaphorical messages related to the type of cognitive effort involved in considering persuasive messages? The first part of the question gets at the idea that activation of cognitive processes in metaphor comprehension is greater than is the amount of activation of cognitive processes for literal comprehension. Of great interest is whether that greater amount of effort in metaphor processing is sufficient to cause central elaboration consistent with attitude change. The second part of the question aims to identify if the type of cognitive elaboration involved in metaphor processing is the same sort of processing as is used in cognitions that encourage attitude change.

The ELM argues that argument strength can influence the amount of effort expended to understanding a message. Evidence suggests that metaphors require more effort to process than literal counterparts (Coulson & Van Petten, 2002, 2007). Additional evidence indicates that when metaphors are present in persuasive attempts, those messages are judged by subjects as being more persuasive than literal messages (Mio, Thompson & Given, 1993; Ottati, et al., 1999; Read, et al., 2000; Sopory & Dillard, 2002; Whaley, 2000). Thus, it is reasonable to assume that it is the effect of metaphors on cognition, (an increase in the number of implicatures) that will increase perceived argument strength. Increased argument strength should result in more consideration of messages, and, when subjects agree with the message, should lead to stronger, more persistent changes in attitudes. One of the goals of this project is to determine if it is the cognitive elaboration evoked by metaphor that is responsible for the short term attitude change noted elsewhere in the literature.
As discussed, one of the defining features of metaphors is that they cannot be rephrased with any sort of brevity. This is, in part, due to the nature of non-literal language. In presenting a hearer with a metaphor, the receiver must infer relevant and salient possible interpretations in order to compute a reasonable meaning from the speaker’s utterance. In so doing, potentially more than one proposition is garnered from a reasonable interpretation of a metaphor. Accordingly, metaphors should provide a compact way of communicating multiple lines of reasoning simultaneously. This compactness contributes to argument strength.

H1: Messages that contain metaphors encourage more elaboration (via implicatures) than do literal control messages.

H2a: Conceptual metaphors encourage more elaboration than literal control messages.

H2b: Contextual metaphors encourage more elaboration than either conceptual metaphors or literal control messages.

H2c: Standard metaphors encourage more elaboration than contextual, conceptual or literal control messages.

Involvement

Involvement is defined as the amount of personal relevance a topic has for a person. There is ample evidence from ELM-based research of a positive relationship between involvement and elaboration (Petty & Cacioppo, 1986). This relationship is expected to hold in the current study – regardless of message type, there should be a main effect for involvement on elaboration collapsing across message types.
H3: Elaboration is greater when involvement is high than when involvement is low.

At issue for the current study is if hypothesized the differences between the message types hold within levels of involvement. Evidence against an interaction effect comes from psycholinguistics, which has shown that people process metaphors automatically and non-optionally (Gibbs, 1994; Ortony, 1979; Stewart & Heredia, 2001). This ability to comprehend metaphors is so transparent that when called upon to identify metaphors in messages, most people are unable to do so without effort (Bosman, 1976; Bosman & Hagendoorn, 1979; Mio, Thompson & Givens, 1993; Pawlowski, Badzinski & Mitchell, 1998; Robins & Mayer, 2000). The relative ease with which metaphors are processed would seem to be independent of involvement. Evidence for an interaction effect is that the cognitive effort required to process metaphoric messages will exist even for participants exposed to low-involvement topics. These participants are expected to be less motivated to elaborate on the messages than for subjects exposed to high-involvement messages, but will be cued to elaborate because of metaphoric content. Thus, difference between a metaphoric message versus a literal message will be greater for subjects exposed to “low-involvement” messages than for those exposed to “high-involvement” messages.

H4: Level of involvement moderates the relationship between metaphor type and elaboration.
Attitude Change

If the ELM is correct in predicting that greater cognitive processing effort leads to stronger and more persistent attitude change, metaphors, which require more cognitive effort should encourage more elaborated processing, and have a corresponding impact on attitude change.

H5: Cognitive elaboration positively influences attitudes at time 1.

Research has shown that metaphors require more cognitive effort to process than literal counterparts. The ELM argues that increased cognitive effort in the direction advocated by the message should lead to stronger, more persistent attitude change. Further, the type of metaphor will influence amount of cognitive effort required to understand a message. As noted, standard metaphors require more cognitive effort than conceptual metaphors, which, in turn, require more effort than literal messages. Accordingly, the different message types should produce a trend in the comprehension in persuasive messages. To date, no studies of long term attitude change resulting from presentation of metaphor have considered the role of cognitive elaboration as impacting on persistence of attitude change.

Evidence from psycholinguistic research has shown that cognitive effort required to process metaphors exceeds the amount of processing effort required to comprehend literal language (Arzuoa et al. 2007; Coulson & Van Petten, 2002; 2007; Pynte, 1996). Of interest for the current purposes is whether or not the degree and quality of effort expended in processing metaphors is sufficient to engage central processing.
O’Keefe has noted that the amount of attitude change that is the result of metaphorical messages may be statistically significant, but holds no real world application of any note (O’Keefe, 2004). O’Keefe’s argument applies to relevant research studies, all of which examined attitude change measured directly after the message stimulus, but does not address the relationship between metaphor and the persistence of attitude change. Furthermore, that different types of metaphors may produce different effects in receivers has been of little concern to persuasion scholars. It may be that, given the amount of information conveyed via metaphor requires extra processing effort (but not extra time, see above), the effects of a metaphorical message may require cognitive effort beyond the time frame in a traditional experimental environment. It is posited, therefore, that the effects of metaphorical messages in persuasive attempts may require extra time, and can only be captured in a delayed evaluation of a metaphorical message.

H6: Cognitive elaboration is positively associated with long-term (time two) attitude change.

RQ1: Does level of involvement moderate the relationship between metaphor type and persistence of attitude change?

Need for Cognition

Evidence from Petty and Cacioppo (1979, 1986) indicate that those with a high need for cognition will attend to messages more closely, and consider the arguments presented more thoroughly than those who do not have a high need for cognition. Those with a low need for cognition will only attend to a message when it has a high degree of involvement for the receiver. But metaphors should encourage an immediate elaboration
on messages that yield reasonable implicatures, merely in order for a receiver to make sense of those messages, regardless of level of involvement. This increase in cognitive elaboration is consistent with Petty and Cacioppo’s definition of “elaboration” which should lead to strong attitude change in the direction advocated by a message.

RQ2: Does need for cognition moderate the relationship between metaphor type and elaboration?

RQ3: Does need for cognition moderate persistence of attitude change?

Conclusion

Metaphors pose a curious problem for persuasion scholars. While distinct from literal language, they are processed as quickly as their literal counterparts. But this processing comes at a cost, as more cognitive effort is necessary to process metaphors. The effort exerted in processing metaphors is automatic and unconscious. The quality and quantity of effort required to process metaphors may be the reason why, when presented in persuasive attempts, they result in an increase in persuasive effect.

The rationale for this extended effort comes from the many functions that metaphors perform in their utterance and receipt. Metaphors convey multiple implicatures briefly; make salient shared features between topic and vehicle, at the exclusion of other features. Metaphors are able to more precisely convey cognitive evaluations than literal language.

Given these features and under appropriate conditions, metaphors should encourage subjects to more thoughtfully consider the persuasive messages they are
presented with, than to a literal – equivalent statement. If enough consideration is given
to these messages, stronger and more persistent attitude changes should result.
Employing the ELM is the best way to explain the outcomes of persuasive attempts that
use metaphors.
METHOD

The purpose of this project is to examine the relationship between metaphor type and attitude change. Because this is a message effects study, replications for each message were used to ensure that outcomes are due to the class of messages rather than a single message instantiation (Jackson, 1992, 1994). Two pretests were conducted to validate the study materials. The first pretest identified a set of high and low involving topics, while the second pretest assessed the aptness of the set of metaphors that were used in the main study, as well as determined the validity of the attitude scales. The main experiment employed a 4 (metaphor type) X 2 (involvement) X 3 (topic replication) X 3 (vehicle replication) mixed factor ANOVA with the last two factors (topic and vehicle) treated as random. Subjects were randomly assigned to one of 72 possible messages. Table 1 illustrates the design.

Jackson (1983, 1992a, 1992b, 1994) noted that the use of multiple messages within a category is important for generalizing about message effects. In designing an experiment to investigate effects, the category of messages that provides the stimulus must be treated as a population. In order to make claims about that population, one member of that population is insufficient to generalize to the entire population, just as no serious social scientific study would generalize from one participant to a population of individuals.

There are two implications that follow from this line of reasoning. First, multiple examples from a class of messages must be used in order to strengthen any claims about message effects. Second, message replications must be treated as random factors in the
statistical analysis, much like participants are treated as randomly drawn from a population. The design and analysis in this study will follow these guidelines.

As noted, there are two features related to this study that lend themselves to the use of multiple messages: topic and vehicle. Regarding topic, many messages may adequately qualify as “high involvement.” If a single topic was used, however, it is unclear if the results (e.g., attitude change) would be due to the manipulation of interest (i.e., metaphor type), the topic itself, or many other unaccounted for message features, for example wording effects, imagery, and so on (O’Keefe, 1987). It is impossible to test the population of metaphors that could be included in the study. In order to balance the number of possible messages with what is reasonable for a study of this size, a sample of messages will have to suffice.

Three topics were used for each cell of the metaphor-type by level-of-involvement design. By employing three topics, it is likely that there will be sufficient diversity of high (and low) message involvement topics as to be able to be more confidently claim that the message manipulation and not message topics produced the effects, if any, in question. While the power to determine smaller main effects increases with an increase in the number of message replications, the power to determine interaction effects decreases (Jackson & Brashers, 1992). This experiment attempted to strike a balance between these two competing outcomes.

This study also used message replications for metaphor vehicle. As discussed, one of the major criticisms of the ELM is that the operationalization of argument strength may be inappropriate for the current study. In their discussion of argument valence,
Areni and Lutz (1988) argued that one of the problems with the conceptualization of argument strength is the confounding of number of arguments with the meaningfulness of those arguments. If we accept the premise that metaphor increases argument strength, the way in which those arguments are presented, or the types of claims and lines of reasoning in support of a position, may confound the results. In line with Jackson’s reasoning, there are an infinite set of possible reasons why a person may or may not accept a line of argument. Therefore, in the current study, the metaphor vehicle acted as a line of reasoning for acceptance of a message, and was treated as a sample from a population of possible arguments. Given time and resource constraints on the research, a sample of three possible lines of reasoning was used for each message topic, and were treated as a random factor. For example, “Finding the right job” was supported by three lines of reasoning; that it was (like) drilling for oil, hitchhiking to a destination, and getting into the right college.

Pretest 1

*Overview*

As discussed, the operationalization of involvement within the ELM has garnered criticisms sufficient to justify consideration of an alternate interpretation. The main variable of interest in pretest one was value involvement, which is defined as “the psychological state that is created by the activation of attitudes that are linked to important values” (Johnson & Eagly, 1989, p. 290). The goal of Pretest 1 was to determine which topics are considered to be high value-involving and low value-
involving. This was done in order to better control for any effects on motivation to
process a message, as hypothesized by the ELM.

Participants

Subjects were solicited from an introductory level communication class. Sixteen
self identified Communication department undergraduates (12 females, 4 males)
participated in the first pre-test. Due to recent changes in the informed consent protocol,
the average age could not be assessed. Based on what could be gleaned from within the
limits of the new protocol (asking for “year of birth”), the average age of participants was
23 years old.

Materials

Value involvement was measured using Zaichkowsky’s (1985, 1994) Revised
Personal Involvement Inventory (RPII), a 10-item semantic differential scale. Items on
the scale included word pairs such as “appealing / unappealing” and “fascinating /
mundane.” The 40 topics were selected by the investigator as being suitable for the
subject pool. Topics included “access and cost of parking on campus”, “Energy
efficiency”, and “Federal funding for NASA.” To reduce response fatigue, the 40 topics
were randomly assigned to one of two subgroups—participants evaluated only twenty
topics each. Subject lists were randomly assigned and randomly ordered. No two people
received the same lists. The RPII and the topic list are presented in Appendices A and B,
respectively.
Procedure

After reading over and signing an informed consent form, subjects were presented with pamphlets that asked for identifying information in order to receive course credit (name, class number, and instructor). This information was discarded as soon as it was feasible to ensure anonymity of subjects. The next page asked for demographic information (year of birth, gender, college major). Subjects then evaluated each of 20 topics in their packets for level of involvement by means of the RPII.

Variable

The involvement instrument displayed high reliability ($\alpha=0.91$). This study revealed that the topics presented to subjects varied with regard to personal involvement. The mean average rating for all topics was 2.825 ($SD=1.36$) on a 7-point scale; 1 being “most involving” and 7 being “least involving”. Full results are presented in Table 2.

Pretest 2

Overview

The second pretest used the five highest and lowest involving topics from the first pretest, and (a) determined which metaphors for high and low involvement topics would be best suited for the main study, (b) controlled for differences in metaphor aptness and processing effort, and (c) tested the validity of the attitude scales to be used. This pretest was used to ensure that the effects of any message used in the experiment were the result of metaphor type, and not of a particular message or spurious message features used in support of a position. High and low involvement metaphors that were rated similar in aptness were used in the main study.
Participants

Subjects were solicited from an introductory level communication class. Fifty-nine students (15 males, 44 females) participated in Pretest 2 for class credit. Forty-one subjects identified themselves as communication majors and 18 as non-communication majors. The average (estimated) age was 22 and the average year in school was fourth semester (sophomore). All but one subject listed English as their first language.

Materials

Items from the first pretest that received the five highest and five lowest reported levels of involvement were used to create messages for this pretest. The metaphors used in Pretest 2 were designed by the researcher. The messages used employed single sided, pro-policy arguments. A final selection of five potential standard metaphors for each of the ten topics was presented to subjects for evaluation on three main criteria: attitude toward topic, metaphor aptness, and number of strong and weak implicatures.

The attitude measurements used in the current study have all been used before by various researchers. The majority of attitude measurement scales are 3-item, 7-point semantic differentials. A review of the literature revealed that different scales used different terms to assess attitudes. Combinations of unique items from several widely used attitude scales were merged to form a 7-item, 7-point semantic differential scale. These items were taken from Cialdini and Levy (1976), Gardner (1985), Haugtvedt and Petty (1992), Lord, Lee and Sauer (1995), and Nelson, Shavitt, Schennum and Barkmeier (1997). This merged scale is reproduced in Appendix C.
*Message Stimuli.* In the course of determining the ten appropriate topics for inclusion in Pretest 2, the five highest and lowest rated topics were used. For each of these ten topics, five possible standard metaphors statements were created and tested, for a total of 50 messages. The fifty messages are reproduced in Appendix D.

*Aptness.* Metaphor aptness was measured in Pretest 2 using a scale developed by Tourangeau and Sternberg (1981). This measure employs a 6-item, 7-point semantic differential scale and is presented in Appendix E. In addition, there is one 7-point Likert scale question.

*Cognitive elaboration.* Phillips’s (2005) metaphor implicature elicitation task was used to determine how many strong and weak implicatures each message produced (See Appendix F). Subjects reported their interpretations of message meanings by means of a one-sentence response. Petty and Cacioppo’s (1982) thought listing task (Appendix G) was also used to measure amount of cognitive elaboration for the stimuli.

*Procedure*

Subjects were recruited from an entry level communication class. They were given flyers with a brief summary of the study and a web site address where they could schedule a time to come into the computer lab. Upon arriving at the laboratory, subjects were given a booklet that began with questions that assess basic demographic information (year of birth, gender, major) and identifying information for class credit (name, class number, and instructor). The latter information was discarded as soon as was feasible. Each subject was randomly assigned to respond to five of the 50 standard (“A is B”) metaphors, presented in random order. No subjects saw two metaphors for the same
topic. This allowed for evaluation of each message by five to six subjects. Participants evaluated each metaphor using three instruments. The first was the merged attitude scale. The second was Tourangeau and Sternberg’s (1982) aptness scale, and Phillip’s (2005) implicature elicitation scale was the third. On average, subjects took 20-30 minutes to complete the booklet.

Variables

*Aptness.* Aptness refers to the strength of the relationship between the terms in a metaphor. The instrument used was a set of semantic differential scales for determining aptness, and was found to have high reliability ($\alpha=0.90$) in this experiment. The range for the aptness scales varied from “minimally” apt (7) to “maximally” apt (1). The mean average aptness rating across all 50 messages on this seven-point scale was 3.84 ($SD=1.63$). Mean aptness for all messages used in the main experiment was 3.36 ($SD=1.22$) (see Table 2). The mean average metaphor aptness ratings for topics selected is presented in Table 3. Coordinating lists of the metaphors are reproduced in Appendix G.

*Elaboration.* Elaboration was measured in two ways in this study, by an implicature generating task and a thought listing task. The implicature task was used as an effort to elicit from subjects reasonable interpretations or elaborations of a metaphoric utterance. The thought-listing task was used as an effort to have subjects record what their thoughts were about the message, and is far broader in scope than the implicature task. The data gathered from the implicature task was discarded. The majority of subjects recorded emotional responses to the message in this section instead of reporting
linguistic-based interpretations of those messages. Rather than incorporate responses to the open-ended sections of the study, responses to the quantitative questions alone were used to determine which three metaphors for three topics from each of the levels of involvement were judged to be appropriate and were used in the main study.

**Attitude.** The attitude scale served as an exploratory measure to determine the validity of the scale. The instrument used was a set of semantic differential scales for determining aptness and was found to have high reliability (α=0.90) in this study. The average attitude rating was slightly more positive than neutral (M=2.93, SD=0.66 on a 7-point scale), which shows a slight predisposition towards the message topics. As is seen in Table 3, there is one outlier condition, “increasing gas prices,” that received strong negative reporting from subjects. Including this example in the main experiment allowed for evaluation of messages for topics with strongly held negative attitudes. The attitude rating for topics used in the main experiment was slightly positive (M=3.06; SD=1.62) on the 7-point scale. Table 3 presents this information.

Experiment

**Overview**

The main study examined the effect of metaphor type on attitudes at two times. Using a completely crossed multiple random factors design, this experiment tested the effect of metaphor type and level of involvement on attitudes. Participants were randomly assigned to one of the 72 conditions (a combination of involvement, metaphor type, topic replication, and vehicle replication), read one message, and then responded to survey instruments that contained attitudinal and cognitive elaboration measures. Seven
days after completing the survey, subjects were sent an email asking them to follow a link
to a website and complete the attitude measure again to determine persistence in attitude
change.

Participants

Three hundred-forty undergraduate students from a large Southwestern University
volunteered to participate in the study in exchange for extra class credit. Seventeen
subjects self identified as non-native English speakers (learning English at or after age
six). This data was not included in the statistical analysis. This left a subject pool of
three hundred twenty-three (100 males and 223 females). Two hundred eighty-two self
identified as right handed. Because of an error by the primary investigator at the time of
database construction, year of birth data was not collected. Average time spent in
university was fourth semester.

Materials

Need for Cognition scale. Petty and Cacioppo’s (1982) 18-item, 7-point scale
was used to measure need for cognition (NFC), and is presented in Appendix H.

Message stimuli. Subjects were randomly assigned to one of the 72 messages.
These messages are presented in Appendix I. In addition to the three messages for each
of the six topics, the current study included four different categories of message stimuli:
three types of metaphors (standard, cognitive and combined), and a literal control. The
control message is a literal transliteration of the arguments. The average length per
message was 99.13 words (SD=16.03), and average number of sentences was 7.1 (SD=0.82).
Attitude scale. Subjects responded to the same short (7-item) attitude scale (1 being most positive attitude) used in Pretest 2 (Appendix C). Three items on the scale were reversed.

Message aptness evaluation. Subjects next evaluated message aptness using the same aptness scale described in Pretest 2 (Appendix E). It is a 6-point scale with “1” being most apt.

Cognitive elaboration tasks. Subjects were then asked to perform two short thought listing tasks, one designed by Phillips (2005) and the other by Petty and Cacioppo (1986), both of which are described above. (Appendices F and G)

Procedure

Recruitment of subjects and data collection took place over an eight-week period during the spring semester. Participants were provided with a handout in class briefly describing the nature of the experiment and a web site address to reserve a time slot. Participants signed up via the World Wide Web. Both at 48 and 24 hours prior to their self-selected time slot, subjects received email reminders of their participation.

Upon arrival at the computer lab, subjects were provided with paper versions of the informed consent materials. All other materials were presented to the subjects by means of a web-based interface, available online through a computer lab on campus. Participants were asked to provide their names, the class they wish to receive extra credit for, and the instructor of that class. To ensure anonymity, this information was discarded as soon as possible. Following this, subjects were asked for basic demographic information.
Subjects first responded to an 18-item Need for Cognition scale, and were then presented with the message stimuli. After that, subjects reported their attitudes towards the topic of the message. Subjects were then asked to evaluate the aptness of the message, and then complete two open-ended cognitive elaboration tasks: the Phillips (2005) Implicature task, and the Petty and Cacioppo (1986) thought listing task. After completion of these last two measurements, subjects we informed that their participation in the brief follow up study is an important part of the experiment, and then they were allowed to leave.

Seven days after exposure to the message, subjects were sent an email asking them to follow a link to a website with follow-up attitude questions. A 7-day follow up is consistent with other studies in the field (Chow & Luk, 2006; Evans & Petty, 2003; Holland, Verplanken & Knippenberg, 2002; Kumkale & Albarracin, 2004; Nabi, 2008; Watts & McGuire, 1964). Fourteen subjects failed to respond to the follow up email. The data collected from those subjects was not used in the analysis. Ninety-four subjects failed to respond to the follow-up survey within 48 hours of the email being sent. For those subjects, the average response time varied greatly (M=14.52 days; SD=5.62). Data from all subjects who participated in the follow-up study, regardless of the time it took to elicit a response, was used in the data analysis.

**Independent variables**

**Metaphor type.** The primary independent variable of interest was metaphor type. As noted, the three metaphor types are standard, contextual, and conceptual. In addition,
the study uses a literal-control condition. Means for metaphor evaluation are reported in Table 5.

**Involvement.** High and low value-relevant involvement topics identified in the first pretest were used in the main experiment. Means for the two groups are reported in Table 6.

**Moderating Variables**

**Need for Cognition.** The mean NFC rating for all subjects slightly above the scale median of 3.5 (M= 3.78; SD=0.801).

**Perceived message aptness.** After exposure to the message, subjects were asked to evaluate the message itself, using a 6-item, 7-point aptness scale (see Appendix E). Messages were rated positively. Mean attitude toward the message aptness was 1.68 (SD=0.64), where one is “most apt” and seven is “least apt”.

**Mediating variables.**

**Cognitive elaboration.** The information gathered from the thought listing task was used in the analyses of cognitive elaboration. The average total thoughts generated was 4.59 (SD=2.11). The average positive thoughts generated was 2.09 (SD=1.84), negative thoughts was (M=0.92; SD=1.23), and neutral thoughts was (M=1.94, SD=1.74).

The other measure of cognitive elaboration used was the implicature task. During the analysis and coding of the implicature information, it became clear that many subjects were unable to generate meaningful responses to the two questions. More often than not, subjects were unable to identify the main claim of the 5-sentence argument contained in the stimulus message. Instead of providing information about what the message producer
was intending, many subjects reported emotional responses or counterarguments. The ratio of strong to weak implicatures, often used in implicature analysis (Lagerwerf & Meijers, 2008), was 1.01:1.05, and determined to be statistically insignificant, and the implicature data was discarded. Findings by other researchers have indicated that the number and type of implicatures generated was consistent within messages, and, in general, several strong and weak implicatures were generated for each message. In this case, the lack of comprehension of either the message or the instructions led to subjects providing unique and irrelevant content. When there was consensus as to the strong implicatures (generated by more than 50% of the subjects), there was only one such example. The weak implicatures were unique to each subject (no consensus as to speaker intention).

**Dependent Variables**

**Attitude.** After exposure to the messages, and prior to completion of the implicature task, subjects were presented with a set of items to determine their attitude shortly after exposure to the message. Mean attitude for topics at time one was 4.79 (SD=1.23). Their attitude on the topic was tested again by the same scale in a follow-up survey accessible via a link in an email sent to all subjects. Mean attitude for topics at time two was 4.52 (SD=1.36). This survey used the same 7-item, 7-point scale, and is listed in Appendix C.
RESULTS

Design

The design of the study employed in this experiment is a completely crossed 4 X 
2 X 3 X3 random factor ANOVA. As noted by Jackson & Brashers (1994), random 
factors designs are often less powerful than fixed factor ANOVAs at detecting interaction 
effects. Following Jackson and Brashers (1994—see pp. 54-61), power to detect a small 
effect size ($\theta^2 = .01$) for the metaphor type main effect is .25 with N = 300, but increases 
to .59 if a medium effect size ($\theta^2 = .04$) is considered. In addition, need for cognition 
was included as a covariate. Several research questions required the use of a correlation 
analysis. Cell means and standard deviations for all variables are presented in Table 4. 
All hypotheses and research questions were evaluated at alpha = .05.

Hypotheses 1 and 2

The results for the first two hypotheses are presented here because both are based 
on the main effect for metaphor type. The first hypothesis stated that metaphors would 
produce greater elaboration than would the literal control condition. As noted, all 
questions involving elaboration were based on responses to the thought-listing task. 
These data did not support the hypothesis, as the main effect for metaphor was not 
significant, with $F(3, 72) = 0.82, p=0.84$. The mean for the three metaphor conditions 
was 5.03 ($SD = 0.24$) whereas that for the literal counterparts was 5.01 ($SD=1.02$). 
Metaphor conditions generated 2.1 ($SD=1.92$) positive and 1.89 ($SD=1.89$) negative and 
elaborations, while the literal condition generated 2.14 ($SD=2.12$) positive and 2.08 
($SD=1.83$) negative cognitive elaborations. The set of statements organized under
Hypothesis 2 predict that different types of metaphor would lead to differing amounts of cognitive elaboration. The means for total thoughts were 4.81 ($SD=2.31$) for conceptual messages ($N=78$), 5.17 ($SD=2.23$) for standard metaphors ($N=74$), 5.07 ($SD=2.38$) for combined messages ($N=81$) and 4.89 ($SD=2.29$) for literal messages ($N=80$). The means for positive cognitive elaborations were 1.69 ($SD=1.63$) for conceptual metaphors, 2.14 ($SD=2.12$) for standard metaphors, and 2.17 ($SD=1.97$) for combined metaphors. The means for negative cognitive elaborations were 2.06 ($SD=2.11$) for conceptual metaphors, 2.08 ($SD=1.83$) for standard metaphors. Given the main effect for metaphor type was not significant, follow up tests for the comparisons listed in the hypothesis were not performed.

*Hypothesis 3*

The third hypothesis stated that, consistent with the Elaboration likelihood model (ELM), there would be more cognitive elaborations when involvement was high, and fewer cognitive elaborations when involvement was low. Contrary to predictions made by the ELM, the data suggests that there is slightly more cognitive elaboration for low involvement topics. The ANOVA demonstrated that there is a weak effect of involvement level approaches significance in the direction opposite the one hypothesized: $F(1,4)=5.81, p=0.073 \eta^2=0.01$. Means for total cognitive elaborations were 4.69 ($SD=2.18$) and 5.24 ($SD= 2.37$) for high and low involvement topics, respectively. Additionally, there was no effect of level of involvement on positive elaboration, $F(1,72)=0.92, p=0.65, \eta^2=0.08$ or negative elaboration, $F(1,72)=0.72, p=0.95, \eta^2=.001$. Means in the high involvement condition were 1.84 ($SD=1.76$) for positive cognitive
elaborations and 1.96 (SD=1.86) negative cognitive elaborations, whereas means in the low involvement condition were 2.34 (SD=2.15) and 1.91 (SD=1.9) for positive cognitive elaborations and negative cognitive elaborations, respectively.

**Hypothesis 4**

The fourth hypothesis stated that involvement had a moderating effect on the relationship between metaphor type and amount of elaboration. There was no evidence of a main effect of involvement on elaboration (Hypothesis 3), and involvement did not significantly influence the strength or direction of the relationship between metaphor type and amount of elaboration. The ANOVA analysis demonstrated that there was no evidence of any interaction effect of message type on amount of elaboration, $F(1,3)=0.42$, $p=0.74$, $\eta^2=0.02$.

**Hypothesis 5**

The fifth hypothesis stated that cognitive elaboration would have a positive effect on attitudes at time 1. A correlation analysis revealed no significant relationship between total thoughts and attitude: $r(313) = 0.03$, $p=0.63$. There was evidence of a small correlation between positive thoughts and attitudes at time 2 that approached significance: $r(313) = .10$, $p = .07$. This suggests some sort of “sleeper effect” might be at work. Further, there was an negative correlation between negative thoughts and attitudes at time 2 that also approached significance: $r(313) = -0.11$, $p=0.06$

**Hypothesis 6**

The sixth hypothesis predicted that cognitive elaboration would be correlated with attitudes measured at time two (approximately 7 days after exposure to the message).
Correlation analysis indicated that there was no evidence to support this hypothesis,
$r(313)=-0.001, p=0.99$. The analysis indicated that there was a negative correlation
between negative thoughts and attitudes measured at time 2 that approached significance,
$r(313)=-0.10, p=0.08$, and no significant correlation between positive thoughts and time 2
attitudes, $r(313)=0.03, p=0.66$.

*Research Question 1*

The first research question addressed the role of involvement in moderating
degree of metaphoricity and time 2 attitudes. There was no evidence of a relationship.
An ANOVA analysis of the data indicated that there was no interaction effect, $F(3, 72)=0.16, p=0.93, \eta^2 = 0.003$.

*Research Question 2*

The second research question asked if need for cognition moderates the
relationship between argument strength (operationalized as metaphor type in this
analysis) and the amount of cognitive elaboration. Need for cognition was treated as a
continuous variable in this analysis. No interaction effect was found. The ANOVA
analysis indicated that there was no evidence to suggest that need for cognition
moderated the relationship between amount of cognitive elaboration and argument
strength, $F(1, 72)=0.61, p=0.61 \eta^2=0.00$)

*Research Question 3*

The third research question was concerned with whether there was evidence to
support the ELM prediction that need for cognition would moderate attitudes at time 2.
The analysis suggests that the relationship between need for cognition and time 2 attitudes approached significance, but with a small effect, $F(1, 72)=2.36, p=0.13, \eta^2=0.006$.

**Post-Hoc Correlation Analysis**

Correlations were computed for perceived aptness, need for cognition, attitudes (at two times), and thought listing sums (total, positive, negative, neutral). A correlation analysis revealed that there were several significant correlations of interest. Results indicated that there was a medium effect size for the correlation between attitude at time one and at time two, $r(308) = .51, p < .001$. There was a significant small, negative relationship between need for cognition and perceived message aptness, $r(322)=-.11, p=0.05$. Message aptness appears to correlate with attitudes at both times as well. At time 1, there is a medium sized correlation, $r(322)=.78, p<0.0001$, and a smaller correlation at time 2, $r(309)=.45, p<0.0001$. Further, message aptness was negatively correlated with negative cognitive elaborations, $r(312)= -.16, p=0.004$). Several findings approached significance. Positive cognitive elaborations were correlated with attitudes at time 1, $r(313)=.10, p=0.07$. Negative cognitive elaborations were negatively correlated with attitudes at both time 1, $r(313)=-.11, p=0.06$ and time 2, $r(313)= -.10, p=0.08$. In addition, there was evidence to suggest a significant topic by involvement effect for message type on attitude change $F(4,72)=13.01, p=0.005$, $\eta^2=.45$. 
DISCUSSION

The purpose of this investigation was to examine the persuasive effects of metaphor. Specifically, the model advanced here proposed that message type would lead to differing amounts of cognitive elaboration, which in turn, would predict attitudes at two points in time. The effects of a given metaphor would be moderated by subjects’ need for cognition and a message topic’s level of involvement. This model was tested using a 4 X 2 X 3 X 3 random factors ANOVA, which was chosen as the most appropriate way to examine hypothesized effects of metaphor type and topic on cognitive processing and attitudes, while controlling for extraneous message features. One limitation of this design was that it had limited capacity to detect small effects. Previous message effects research on metaphor have shown that smaller effects are common in metaphor on persuasion. Many of the hypotheses were unsupported, although some analyses showed relationships consistent with the model.

In what follows, I first evaluate the contemporary theory of metaphor in light of the findings of the current study. Next, I will evaluate aspects of the ELM that were relevant to the experiment. I will conclude by discussing ways in which future experiments, based on what was found here, may be conducted.

Theoretical Evaluation

The theoretical bases for this study were traditional approaches to metaphor coupled with Lakoff’s model of metaphor, and the Elaboration likelihood model (ELM). Metaphor was the message feature of interest for the current study. Features and effects of metaphor have been of interest to scholars for centuries, but recent innovations in
theory and experimentation have led to a renewed interest in metaphor as a feature of persuasive messages. The current study attempted to extend the current research by examining message effects in new ways, including the role of cognitive elaboration in persuasion and the effects of metaphor on attitude change at some point after initial exposure. The ELM was chosen as model of persuasion through which an examination of the potential effects of metaphor seemed fruitful. This is in large part due to the models’ ability to take into account features of messages that can impact persuasion. The ELM is flexible enough to allow for message features to be manipulated in many ways. Other models allow for manipulation by a certain message feature, such as language intensity (Burgoon, 1993), gain or loss framing (Tversky & Kahneman, 1979), or emotional content, (Witte, 2000). In addition, the ELM posits that amount of cognitive effort and attitude change are related concepts. Evidence suggests that amount of processing is greater for metaphors than literal statements, which the ELM predicts would lead to greater attitude change. The ELM also argues that in addition to message features, psychological features of subjects predicts the direction and strength of the persuasive effects of messages. The main features that were operationalized in this experiment were need for cognition, level of involvement and argument strength (as metaphor type). Analysis of the data provided limited support for the ELM.

**Metaphor Type**

*Cognitive elaboration.* The ELM argues that the greater the amount of cognitive processing involved in understanding a persuasive message, the greater the likelihood of persuasion. Evidence from psycholinguistics and communication research indicates that
metaphors should require more cognitive effort than literal-equivalent statements. According to the ELM, this should increase central processing, and stronger attitudes should result. Psycholinguistic evidence suggests that there are qualitative and quantitative differences in the processing of metaphoric statements. Event related potential (ERP) studies indicate that there are quantitative differences in metaphor processing (Coulson & Van Petten, 2002). ERP studies test the direction and magnitude of localized brain activity at specific points in time. The majority of research on metaphor processing indicates that the cognitive effort associated with comprehension occurs at 400 milliseconds after presentation of the target word (metaphor vehicles in these studies). Consistently, localized activity associated with areas of the brain that handle semantic meaning present greater negative impulses at this point in time than for literal statements. These studies indicate that the more metaphorical a statement is, the more cognitive effort is used to comprehend that statement.

This psycholinguistic research is supported by fMRI research as well. fMRI studies (Arzuooan, et al. 1996; Coulson & Van Petten, 2007; Kazmerski, 2003) suggest qualitative differences in the cognitive effort required in processing different types of metaphors as well. fMRI studies scan the brain in real time for activity, and the areas that are activated during metaphor processing are different than the areas that are activated during the processing of literal equivalent statements.

Evidence from communication and social psychology research (Lagerwerf & Meijers, 2008; Petty & Cacioppo, 1986; Phillips et al., 2005) indicates that quantitative differences in cognitive effort can be tested by pen and paper methods. The implicature
task (Phillips, 1995) failed to yield significant differences in cognitive elaboration between metaphor types via strong and weak implicatures. The thought listing task (Petty & Cacioppo, 1986) is a broader measure of cognitive elaboration, and was a more successful tool for assessing quantitative differences in cognitive elaboration in this study. While the thought listing task was able to quantify cognitive elaborations, differences between message types were not significant. While there is theoretical support for the position that metaphors should lead to more cognitive elaborations than literal-equivalent statements, the results of this study indicate that different message types did not affect the amount of cognitive elaboration that subjects reported.

One explanation for why there were no significant differences in cognitive elaboration between message types may lie with the messages themselves. Message type was controlled for level of involvement, message aptness, argument strength and argument valence (the relevance of the reasons given in support of a position). The only differences were degrees of metaphoric language used. It may be that aptness, strength or valence (or some combination of these variables) may lead to differences in amounts of cognitive elaboration if they were manipulated variables instead. For instance, if all the messages were rated as “very apt”, or if there was greater variation in aptness, there may have been significant differences in the outcome measures. Differences in cognitive elaboration may also have occurred if messages varied in the number of stated (rather than implied) reasons to support a position, or if there was greater variation in the types of reasons to support a position. While Pretest 1 was designed to test for involvement for potential topics, vehicles were only tested for their relationship to the topic, through the
aptness scale. Metaphor vehicles or the lines of reasoning may have been low involving, which left subjects unmotivated to process the messages. This is discussed further in what follows.

**Attitudes.** The current experiment was also unable to detect any significant effects of metaphor type on persuasion. The differences between attitudes at Time 1 and Time 2 based on message type were not statistically significant, although an interaction of topic by level of involvement was significant. Research on metaphor and persuasion has produced mixed results on the suasivey power of metaphor. In their meta-analysis, Sopory and Dillard (2001) re-examined the extant literature and found that there was a small, positive influence of metaphor on persuasion (.07), and, when conditions were maximally persuasive, the effect increased (.42). One condition of the message stimuli (standard metaphor) presented to subjects fulfilled the requirements discussed by Sopory, but failed to lead to detectable effects, even though the number of subjects used in the experiment should have provided for the medium-sized effect to be detected (Jackson & Brashers, 1994). Additionally, there were no significant differences in attitude between metaphor conditions and a literal control.

Another possible explanation is the role of the message vehicles and the lines of reasoning used to support a position. A study by Barker (2005) on attitudes towards political candidates’ messages and metaphors use found that different metaphor frames (vehicles) that exploited receivers’ values were influential in determining attitudes. For instance, those who valued “freedom” over “equality” were more influenced by messages that employed a frame consistent with a “freedom” line of reasoning. It may be that by
framing the topics in the experiment as being beneficial because of one reason might not have encouraged elaboration and attitude change as much as another line of reasoning that exploited a different frame may have. Indeed, Barker notes that “…voters only resist messages that provide suspicious cues (such as egalitarian cues amongst a republican audience) to the extent that they are able to recognize such cues as suspicious” (p. 379).

Barker goes on to note that, at least with regard to political messages that level of education is positively correlated with ability to identify these sorts of framing cues, and discount them if they are inconsistent with their own value system.

Ottati, Rhoades and Graesser (2002) found a similar effect in their study involving college students who were exposed to a message that employed a frame that people were likely to hold strong opinions about. In presenting subjects with a message about academic policy, subjects were either presented with a “no frame” condition, or a “sports” frame condition. Those who enjoyed watching or participating in sports were more receptive, and reported higher attitude evaluations for the topic when the message employed the sports frame, while those who did not like watching or participating in sports were more likely to be opposed to the sports frame than to the no frame condition.

It may be the case that the “frames” (vehicles) used in the creation of the messages for this study did not appeal to subjects, and was partly responsible for the lack of significant differences in attitude change.

This research project failed to find significant results that were consistent with previous research on metaphor with regard to quality of cognitive elaboration and most of the previous research on metaphors and attitudes. While some of the reasoning for this
lack of replication may be the result of methodological issues (below), it may reflect a flaw in an underlying assumption in the contemporary theory of metaphor; that metaphors are inherently more persuasive than other non-literal or literal messages. Instead, the extra processing effort used in metaphor processing appears unrelated to the cognitive effort that influences and directs attitude change. Theory suggests that metaphors should require more cognitive effort and lead to small but significant attitude change. The data did not support these hypotheses, on either account. There was no evidence to support the position that metaphors encouraged more cognitive elaboration, or that metaphor types influenced attitudes.

In their meta-analysis, Sopory and Dillard (2001) argue that the results of their analysis support a “superior organization hypothesis” for metaphors’ persuasiveness. This hypothesis argues that metaphors help structure cognitions about a topic in a way that facilitates attitude change. There was little evidence to support this position in the current experiment. While many subjects referred to the metaphor, or repeated the metaphor in the open-ended response sections, it did not impact on attitude change.

The post-hoc correlation analysis revealed that subjects’ perceived message aptness was a feature that was strongly correlated with attitudes at Time 1 and Time 2. Metaphor aptness, or the appropriateness of the juxtaposition of topic and vehicle was found to correlate with attitudes. Katz et al. (1988) found that a similar concept, semantic relatedness, the “similarity in meaning between tenor (topic) and vehicle terms” (p. 195), was strongly correlated with several other defining features of metaphor, including comprehension ($r = .89$), ease of interpretation ($r = .88$), metaphor goodness ($r = .87$),
and metaphor imagery \((r = .87)\). Consistent with findings presented here, aptness, or relatedness, in the Katz et al. study not well correlated with the number of alternate interpretations (weak implicatures): \((r = .61)\). Based on this finding, it appears that metaphors exploit these qualities in messages, and it is this exploitation of features that lead to changes in cognitive elaboration and attitudes. Message appreciation, not the metaphor per se, is a significant mediator of any difference in attitudes.

**Elaboration Likelihood Model**

The ELM was used as a model to explain the relationship between amount of cognitive effort and differences in attitude change. The ELM argues that features of messages and trait qualities in subjects can determine the likelihood of concerted, effortful message processing. If this effortful processing occurs, the likelihood of stronger attitudes should be an outcome. The ELM allows for manipulation of messages in many ways, and can easily accommodate metaphor types as a message variable. The ELM also allows for control of message and subject characteristics, such as level of involvement and need for cognition.

*Need for cognition and cognitive elaboration.* The ELM predicts that those with a greater need for cognition will be more likely to process messages, and exhibit greater cognitive elaboration. The relationship increases when subjects high in need for cognition are presented with high involving messages. The current experiment did not replicate this finding. Need for cognition did not influence the number or type (i.e., positive, negative or neutral) of cognitive elaborations that subjects reported. There were no significant differences in the number of cognitive elaborations between those high in
need for cognition and those who were low in need for cognition. One possible explanation for the lack of differences is that subjects may already be familiar with the topics of high involving messages, and have already elaborated on possible cognitions prior to exposure. Given that subjects likely would have already formed an opinion, reciting the rationale for those decisions might be taken as a given. On the other hand, subjects exposed to low involving messages may have not had prior opportunity to consider the topic, and will report cognitions that help them develop whatever attitude or opinion they will hold.

Need for cognition and attitudes. The ELM predicts that those subjects high in need for cognition who are exposed to high involving messages are more likely to process the message centrally, and any resulting changes in attitudes will be more persistent than messages processed peripherally. Given that there were no significant differences in amount of cognitive elaboration based on need for cognition, it is consistent within the model that there should be no significant differences in attitudes. There was no evidence to contradict this finding. Indeed, there were no discernible differences in attitude change based on need for cognition, and there was no interaction between need for cognition and message type.

Level of involvement and cognitive elaboration. The ELM also predicts that those who are exposed to high involving messages will be more likely to be motivated to have more cognitive elaborations about the message than those who are exposed to low involving messages, and will report that in a thought-listing task. The two main problems with this line of reasoning, lack of reproducibility across studies and poor
operationalization of the concept, were discussed and an additional test, for value-involvement rather than outcome involvement, was performed to address these concerns.

However, the current experiment failed to reproduce results seen elsewhere in the literature. There was evidence that approached significance indicating that when subjects are presented with low involvement topics they report a greater number of overall cognitive elaborations than those exposed to high involving topics. One explanation is that when presented with a topic with which subjects had little or no experience, nor any opportunity to think about at length prior to exposure, subjects may have put down thoughts that would have otherwise been internally resolved, had they been exposed to the topic before. The three low-involving topics may have been so far removed from the experiences of college-aged subjects (regulating herbal supplements, labeling organic foods, and increased federal funding for NASA), that in order to understand the messages, they may have had no heuristic or background knowledge on which to rely. Compared with “high involving” messages, which subjects likely had knowledge of, and had previous cognitions about (finding a job at graduation, the quality of a university education, and increasing gas prices), they may not have had to “work through” the messages to the same extent as those exposed to new and novel topics.

Level of involvement and attitudes. Contrary to predictions made by the ELM, level of involvement did not affect the reported attitudes of subjects at either time of evaluation in this study. This result may have been the result of certain message features, such as the direction of advocacy of messages. Reasonable attempts were made to ensure that “involvement” was operationalized in a way to attend to contemporary criticisms of
the ELM. All the messages used employed single-sided, pro-policy messages. This feature may have contributed to the lack of significant results. Subjects were asked to respond to messages that advocated such positions as stricter criteria for graduating, higher gas prices or more federal regulation of herbal supplements or organic foods. It may be that subjects were generally predisposed to be against such positions because of parental or peer influences. For instance, subjects may not be in favor of greater government control (over food and drug issues, as were examples used here), they may not see the need for group “sacrifices” like taxing gasoline to fund research into renewable energies, and they may not be interested in making college any more difficult than it already is. While they may agree with the general principle of the messages (something needs to change to make the world better), that they are asked to contribute and participate in such changes may be counter to what they believe the extent of their personal responsibility to effect change may be. In future iterations of this kind of experiment, testing for political tendencies may help explain results like the ones found here.

Motivation to hold attitudes consistent with the position advocated by the message was not effected by the type of metaphor used in the stimuli. Metaphor type and message topic did not effect motivation to process. Future experiments may benefit from presenting subjects with one of two sides of a given argument and examine if differences in cognitive elaboration or attitudes differ based on this variable. For example, rather than arguing that herbal supplements need federal oversight in order to ensure truth in advertising and quality control, subjects may have responded differently if the argument
presented was the converse; that market forces should dictate the quality and efficacy of herbal supplements on the market. A subsidiary issue may be one of the rationales used to support a given position. For instance, all 12 messages about “Increasing Federal funding for NASA” used rationales based on financial gains and enhancing the cultural zeitgeist, rather than focus on specific scientific advancements that might bring about those two results.

*Argument strength and cognitive elaboration.* Argument strength is another oft-criticized concept from the ELM. The main arguments in the literature address the lack of replicability, confounding argument strength with argument valence, and self-reflexive operationalization (messages that elicit more cognitive elaborations must be stronger than messages that elicit fewer cognitive elaborations). This study attempted to control the argument strength feature of messages by arguing that metaphor types should differ in amount of lines of reasoning necessary to “figure out” a message. In other words, the degree of metaphoricity would be a way to vary argument strength. Metaphors should provide more opportunities for subjects to develop more arguments than literal statements. In this way, metaphor messages were “stronger” than literal-equivalent statements. As discussed, metaphor type had no influence on the amount of cognitive elaborations that subjects reported, and there were no significant differences between the amounts of cognitive elaboration based on message type.

*Argument strength and attitudes.* Argument strength was operationalized in this experiment as metaphor type. No significant differences in attitude resulted from manipulation of argument strength. This finding is consistent with the ELM, as there
were no differences in the amount of cognitive elaboration, there should not be
differences in reported attitudes. Argument strength was operationalized differently from
how it was originally conceived by Petty and Cacioppo, in order to address more recent
concerns expressed in the literature. Notable criticisms include post hoc categorization of
messages being strong or weak, based on reported cognitive elaborations, as well as the
confounding of argument strength with argument valence.

The results of this experiment may have suffered from problems of argument
valence. While all the positions advocated some benefit to the individual (direct or
indirect), they also required some level of action (paying more for gas, accepting a bigger
role for government) that may have gone against what these individuals see as being
beneficial to themselves. Further, the benefits might not have been sufficiently tangible
or immediate enough (value gained after new energy sources found, or the “right job”
acquired) for subjects to feel that the reasons supporting a position were strong enough.
If, instead of arguing that increasing the quality of education would directly lead to a
better paying job at graduation (rather than feeling of pride, for example), subjects may
have responded more positively than they did to the reasons cited in the experimental
stimuli.

Methodological Issues

Participants. The subjects used in this experiment were all undergraduate
students from a large, Southwestern university. It is possible that there was some degree
of homogeneity in attitudes and prior knowledge which may have influenced the results
obtained. A more diverse subject pool, with greater “real world” experience and varying
degrees of education may be affected differently by the types of messages used in this experiment. Barker (2005) notes, levels of education can play a role in subjects’ reactions to metaphorical messages. By adding “level of education” and having subjects with children to the subject pool, future metaphor experiments may provide greater insights into what processes are at work in persuasive metaphorical messages.

Procedure. The laboratory environment is specifically designed to control spurious environmental variables, but this comes at the cost of artificiality. Having subjects perform an experiment on a computer in a room with a person monitoring their progress is far removed from how people experience persuasive attempts in the real world. Creating a more naturalistic setting may help overcome problems of ecological validity. One small way this could be done is by presenting the stimulus messages in a different way. Either producing professional quality magazine-like pages, or embedding the stimulus message in a longer text, such as a newspaper editorial or news piece. Subjects may also be more receptive to video or audio messages than to text based messages.

Materials. All of the measurement instruments used in this experiment were previously published tools, with high alphas. With one exception, the materials appeared to be reliable measurements of the desired variables. The one exception was the Implicature Task (Phillips, 1995). The implicature task failed to be of any value to this experiment, and the thought listing task appears to have been able to account for cognitive elaboration adequately.

Messages were created specifically for this experiment. A few were based on Lakoffs’ scheme (for example, the “nurturing parent” or “education is a journey”), but
many were novel metaphors created specifically for this experiment. Varying the level of novelty in metaphor may also influence the direction and strength of cognitive elaboration and attitude. As previously noted, there may have been too much consistency within and between topic metaphors to allow for differing amounts of cognitive elaboration and attitude change to occur.

*Design.* The design of the study employed both a random factors analysis and a correlation analysis. The random factor ANOVA was far more stringent a statistical device than what is commonly employed in metaphor and persuasion research. While the rationale behind using this tool is reasonable (treating individual messages as cases rather than categories), it does present problems that are difficult to overcome in message effects research. The primary problem for finding significant results is that the number of subjects necessary to detect small effects can be quite large. This study had over 300 subjects, and only had a 25% likelihood of detecting small sized effects. In comparison, roughly 350 participants are needed to detect a reasonably small effect \((d = .3)\) with power \(= .80\) in an independent samples t-test. In order to have a greater likelihood of detecting small effect sizes, the subject pool size would have to be increased several fold. It is also the case that additional power increases with additional message replications. If each subject were to see three messages instead of one, the ability to detect small effects would have been greatly increased.

*Future Research*

The current experiment was an attempt to clarify and extend previous research on metaphor and persuasion. That the results provided limited support for the hypotheses
should not imply that there were not interesting findings that should be studied further. These features include including prior attitude as a variable of interest, more variation in the reasons to accept a claim, treating features of metaphor as variables that may influence persuasion, randomly assigning subjects to complete a cognitive elaboration task, further investigations of the effect of metaphor on attitudes at different times post-exposure, and continued use of random factor designs.

Subjects’ attitudes towards the topics may have influenced the effectiveness of the persuasive attempts. A future study on this topic would benefit from designing a variable condition where messages could be either or in favor of a position or against that same position. For instance, “regulating herbal supplements” can be argued for or against. Related to this is having more variation in the reasons to accept a claim. It is possible to use the same metaphor and exploit different relationships between terms to develop a list of novel reasons to support a claim. For example, “A quality education is a difficult journey” could focus on the preparation, the journey itself or the destination. Prior attitudes may influence subjects’ attitudes towards the topic more than message features would. Randomly assigning subjects to a pro or con condition about a topic may provide further insights about how to maximize the effectiveness of metaphors. Also, by presenting all subjects with a one-sided pro-policy message may have influenced the outcome of the study. In their meta-analysis of message sidedness and persuasion, Allen, et al. (1991) found that one sided non-refutational messages were less persuasive than two-sided refutational messages, but more persuasive than two-sided non-refutational messages. Varying the sidedness in future experiments may prove successful.
The post-hoc correlation analysis found that evaluation of the messages’ aptness was a better correlate with attitude than any other message feature measured. Testing subjects’ evaluations of other message features, such as novelty, vividness or poetic-ness may allow researchers to better understand why it is that some metaphoric messages are more persuasive than others.

Another possible direction for future metaphor research would be to vary levels of aptness in conjunction with message positioning to ask which is more influential, the position or the aptness, as well as varying aptness with level of involvement and ask which has a stronger influence, involvement or aptness. All of the messages used in this experiment were rated as slightly more apt than the scale median. Varying this feature may prove insightful.

Subjects may have become fatigued during the course of the experiment, and upon reaching the last sections, which required the most cognitive effort, were unable to satisfactorily respond to those measures. Another issue raised by employing a cognitive elaboration task is whether or not asking subjects to report cognitive elaborations alters the persuasive effect. If subjects are asked to think about a message that is known to be processed automatically, non-optionally and without conscious awareness, having them attempt to “tap in” to that thinking process may influence the intended persuasive effect. A future experiment may benefit from randomly assigning subjects to complete a thought listing task, some decoy task, or no alternate task at all. A comparison of results to attitude scales between those who are asked to report their thoughts about a stimulus
message, and those who are not asked to perform such a task can help direct future research on metaphor and persuasion.

This is the first known study that examined subjects’ attitudes towards topics after initial exposure to a stimulus. Researchers appear confident in the effect of metaphor on persuasion, but little is known about the lasting effects of these sorts of messages. It may be the case that metaphors are more akin in persuasive effect to humor appeals, where people have memory for the humor (or metaphor), but not for the topic (Markiewicz, 1974, Weinbereger & Gulas, 1992). Inclusion of these sorts of features may distract the subject from attending to the message topic, focus on style instead and may lead to less central processing, and reduce the likelihood of long-term attitude change.

Another feature unique to this study which should be used in future experiments is the use of a random factors ANOVA design. The greatest limitation of this design is that in order to detect the small effects commonly observed in metaphor effects research, it is necessary to recruit upwards of 1,000 subjects to detect significant effects with any confidence. But the strength of the results, should effects be found, would be significant for the field and further encourage future research on a unique linguistic feature.

Conclusion

The current study failed to yield as many significant results as was expected. The findings here indicate that there is still much work to be done. While metaphor type was not shown to direct the amount of cognitive elaboration or attitude, a significant number of features were controlled to encourage future investigations. Level of involvement and metaphor type did not impact on either dependent variable, but subjects’ evaluations of
metaphor aptness may have played a role. Given that certain features were shown not to influence persuasiveness, other features can now be used as variables of interest. Examining argument valence and message aptness may provide useful insights about how metaphors function. Randomly assigning subjects to a cognitive elaboration task or not may also tell us what effect thinking about a message has on persuasive outcomes. By using this study as a template for future experiments, and employing the strict statistical model employed, researchers can be much more secure in the outcomes of future experiments, what ever they reveal.
FOOTNOTES

1 The notion of heliocentricity had been discussed by Copernicus earlier that century, and it can be assumed was a concept known to Shakespeare’s learned contemporaries.

2 Originally, “to kick the bucket” was a reference to the slaughter of animals, where a creature was hung upside down and its throat slit. A bucket was placed underneath the animal in order to collect the blood. An animal, in its death throes would often kick the bucket, knocking over a bucket of blood.

3 Only a handful of subsequent studies have shown results contrary to these (see Thomas and Bever, 1982; Gibbs, 1990; Onishi and Murphy, 1993); where context did not effect the speed with which metaphors were processed, and response times were slower than for literal counterparts.

4 Eta squared was calculated using the formula discussed in Jackson & Brashers (1990) $\eta^2 = \frac{\text{partial sum of squares}}{\text{total sum of squares}}$. 
Appendix A

Value – Involvement Scale

INSTRUCTION PAGE

The purpose of this study is to measure a person’s involvement or interest about various topics. To take this measure, we need you to judge various topics against a series of descriptive scales according to how YOU perceive the topic you will be presented with.

Here is how to use the scales:

If you feel that the topic that appears at the top of the page is very closely related to one end of the scale, you should place your check mark as follows:

UNIMPORTANT [X] [___] [___] [___] [___] [___] IMPORTANT

OR

UNIMPORTANT [___] [___] [___] [___] [___] [X] IMPORTANT

If you feel that the topic is quite closely related to one or the other end of the scale (but not extremely), you should place the check mark as follows:

APPEALING ___ : X : ___ : ___ : ___ : ___ UNAPPEALING

OR
APPEALING [___] [___] [___] [___] [___] [X] [___] UNAPPEALING

If you feel the topic seems only slightly related (but not really neutral) to one end of the scale, you should place your check mark as follows:

UNINTERESTED [___] [___] [X] [___] [___] [___] [___] INTERESTED

OR

UNINTERESTED [___] [___] [___] [___] [X] [___] [___] INTERESTED

Important

1. Be sure that you check every scale for every topic; do not skip any.
2. Never put more than one check mark on a single scale.

Make each item a separate and independent judgment. Work at a fairly high speed through this questionnaire. DO not worry or puzzle over individual items. It is your first impressions, the immediate feelings about these topics that we want. On the other hand, please do not be careless, because we want your true impressions.
Zaichkowsky’s (1994) Revised Personal Involvement Inventory

To me, (TOPIC) is:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPORTANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNIMPORTANT</td>
<td></td>
</tr>
<tr>
<td>BORING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>INTERESTING</td>
<td></td>
</tr>
<tr>
<td>RELEVANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IRRELEVANT</td>
<td></td>
</tr>
<tr>
<td>EXCITING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNEXCITING</td>
<td></td>
</tr>
<tr>
<td>MEANS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MEANS A LOT TO ME</td>
<td></td>
</tr>
<tr>
<td>NOTHING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNAPPEALING</td>
<td></td>
</tr>
<tr>
<td>APPEALING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FASCINATING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MUNDANE</td>
<td></td>
</tr>
<tr>
<td>WORTHLESS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VALUABLE</td>
<td></td>
</tr>
<tr>
<td>INVOLVING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNINVOLVING</td>
<td></td>
</tr>
<tr>
<td>NOT NEEDED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NEEDED</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Topics used in Pretest 1

Quality of university education *
Reputation of Communication Department *
Job prospects at graduation *
Gas Prices *
Sexually Transmitted diseases *
Identity theft
Sex Education
Personal Appearance
Breast / testicular cancer
University funded gym
Skin cancer
Reputation of University
Immigration reform
Graduation requirements
Government Funded WI-Fi
Energy Efficiency
Abortion rights
Federal funding of stem cell research
Jobs moving overseas
Drug enforcement
University parking policies
Legality of downloading music / movies / software / textbooks
Drunk Driving enforcement
Federal funding of alternative energy
Quality of campus / dorm food
Federal regulation of genetically modified foods
Recreational Drug Use
Global warming
Recycling policies / Enforcement
US reputation abroad
Cost of textbooks
Legalization of Gay Marriage
Student loans
Class course loads
Doping in sports *
Tuition Prices
Energy Drinks *
Federal regulation of organic foods *
Federal funding of Space program (NASA) *
Federal regulation of herbal supplements *
Appendix C

*Merged Attitude Scale*

Please rate the topic by using the scale below.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BAD</td>
</tr>
<tr>
<td>UNEASANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PLEASANT</td>
</tr>
<tr>
<td>FAVORABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNFAVORABLE</td>
</tr>
<tr>
<td>UNAPPEALING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>APPEALING</td>
</tr>
<tr>
<td>POSITIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NEGATIVE</td>
</tr>
<tr>
<td>HARMFUL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BENEFICIAL</td>
</tr>
<tr>
<td>WISE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FOOLISH</td>
</tr>
</tbody>
</table>
Appendix D

Experimental stimulus for pretest II

*Topic 1

1*. Getting a quality education is getting army basic training for life skills.
2. Getting a quality education is a rite of passage into adult membership in a democracy.
3. Getting a quality education is getting braces / orthodontic work.
4*. Getting a quality education is receiving a medal of honor.
5*. Getting a quality education is making a difficult journey.

*Topic 2

6. The reputation of the communication department is a great interview suit.
7. The reputation of the communication department is a type of branding (Nike).
8. The reputation of the communication department is membership in an elite club.
9. The reputation of the communication department is a fraternity / sorority of peers.
10. The reputation of the communication department is a code word for quality.

*Topic 3

11. Finding a job at graduation is (like) dating.
12*. Finding a job at graduation is drilling for oil.
13. Finding a job at graduation is a marathon.
14*. Finding a job at graduation is as difficult as getting into the right college.
15* Finding a job at graduation is hitchhiking to a destination.
**Topic 4**

16. Preventing sexually transmitted diseases is like learning to drive.

17. Preventing sexually transmitted diseases is riding a bike.

18. Preventing sexually transmitted diseases is playing football.

19. Preventing sexually transmitted diseases is preparing a new recipe.

20. Preventing sexually transmitted diseases is preventing cancer.

**Topic 5**

21*. Increasing gas prices is a necessary obstacle.

22. Increasing gas prices is a gift to the future of our country.

23*. Increasing gas prices is (like) taxing cigarettes and alcohol.

24. Increasing gas prices is (like) taxing non-essential food items.

25*. Increasing gas prices is an IRA (401k) account.

**Topic 6**

26. The regulation of herbal supplements is having a lifeguard at the pool.

27*. The regulation of herbal supplements is having a police presence in your neighborhood.

28*. The regulation of herbal supplements is what a nurturing mother would do.

29. The regulation of herbal supplements is what a strict father would do.

30*. The regulation of herbal supplements is a pharmacist telling you about your medications.

**Topic 7**

31*. Federal funding for NASA is venture capitalism.
32*. Federal funding for NASA is a piggy bank.
33*. Federal funding for NASA is an insurance policy for the future.
34. Federal funding for NASA is academic scholarships for university students.
35. Federal funding for NASA is an anti-espionage (spying) technique.

*Topic 8*

36*. Federal regulation of organic foods is what a nurturing mother would do.
37*. Federal regulation of organic foods is what a strict father would do.
38. Federal regulation of organic foods is being told what is fiction and what is non-fiction at a book store.
39. Federal regulation of organic foods is a food referee.
40*. Federal regulation of organic foods is labeling milk as 1%, 2% or whole.

*Topic 9*

41. The effectiveness of energy drinks should be monitored is regulating alcohol.
42. The effectiveness of energy drinks should be monitored is rating movies.
43. The effectiveness of energy drinks should be monitored is keeping dangerous drugs (like heroin) off the streets.
44. The effectiveness of energy drinks should be monitored is a mother protecting her young.
45. The effectiveness of energy drinks should be monitored is a traffic light.

*Topic 10*

46. Steroid use in sports is plastic surgery.
47. Steroid use in sports is cheating on a test.
48. Steroid use in sports is bad accounting (like Enron).

49. Steroid use in sports is perjuring your self on the witness stand.

50. Steroid use in sports is a type of gambling.
Appendix E

*Comprehension and Aptness Scale*

“How easy was it to figure out what the message was trying to convey?” (1=very easy; 7=very difficult)

<table>
<thead>
<tr>
<th>GOOD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>BAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROPRIATE</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>IN-APPROPRIATE</td>
</tr>
<tr>
<td>DULL</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>INTERESTING</td>
</tr>
<tr>
<td>LIKE</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>DISLIKE</td>
</tr>
<tr>
<td>DIFFICULT TO UNDERSTAND</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>EASY TO UNDERSTAND</td>
</tr>
<tr>
<td>QUICKLY UNDERSTOOD</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>SLOW TO UNDERSTAND</td>
</tr>
</tbody>
</table>
Appendix F

*Implicature Scale*

What do you think the message producer was trying to communicate in this message?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

How do you know what the message producer was trying to communicate with this message? What makes you think so?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Appendix G

*Cognitive Thought Listing Task*

We would now like you to list your thoughts about the message you just read. Simply write next to the number the first idea that comes into your mind about the message, the second idea about the message on the next to the second number, etc. Please put only one idea next to each number. Your ideas about the message may be favorable, unfavorable or neutral. Remember: Your thoughts should be about the message, not the topic.

1. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

2. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

4. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

5. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

6. __________________________________________________________
   __________________________________________________________
Appendix H

Need for Cognition Scale

For each of the statements below, please indicate whether or not the statement is characteristic of you or what you believe. For example, if the statement is extremely uncharacteristic of you or of what you believe about yourself (not at all like you) please place a “1” on the line left of the statement. If the statement is extremely characteristic of you or of what you believe about yourself (very much like you) please place a “7”. You should use the following scales as you rate each of the statements below.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th></th>
<th>2</th>
<th></th>
<th>3</th>
<th></th>
<th>4</th>
<th></th>
<th>5</th>
<th></th>
<th>6</th>
<th></th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extremely unlike me</td>
<td></td>
<td>Somewhat unlike me</td>
<td></td>
<td>Slightly unlike me</td>
<td></td>
<td>Uncertain</td>
<td></td>
<td>Slightly like me</td>
<td></td>
<td>Somewhat like me</td>
<td></td>
<td>Extremely like me</td>
</tr>
</tbody>
</table>

1_______ I PREFER COMPLEX TO SIMPLE QUESTIONS

2_______ I LIKE TO HAVE THE RESPONSIBILITY OF HANDLING A SITUATION THAT REQUIRES A LOT OF THINKING.

3_______ THINKING IS NOT MY IDEA OF FUN.

4_______ I WOULD RATHER DO SOMETHING THAT REQUIRES LITTLE THOUGHT THAN SOMETHING THAT IS SURE TO CHALLENGE MY THINKING ABILITIES.

5_______ I TRY TO ANTICIPATE AND AVOID SITUATIONS WHERE THERE IS LIKELY A CHANCE I WILL HAVE TO THINK IN DEPTH ABOUT SOMETHING.
6. I find satisfaction in deliberating hard and for long hours.

7. I only think as hard as I have to.

8. I prefer to think about small daily projects to long term ones.

9. I like tasks that require little thought once I’ve learned them.

10. The idea of relying on thought to make my way to the top appeals to me.

11. I really enjoy a task that involves coming up with new solutions to problems.

12. Learning new ways to think doesn’t excite me very much.

13. I prefer my life to be filled with puzzles I must solve.

14. The notion of abstract thought is appealing to me.

15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

16. I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.
IT’S ENOUGH FOR ME THAT SOMETHING GETS THE JOB DONE; I DON’T CARE HOW OR WHY IT WORKS.

I USUALLY END UP DELIBERATING ABOUT ISSUES EVEN WHEN THEY DO NOT AFFECT ME PERSONALLY.
Appendix I

*Experimental stimulus*

1ai

Standards for a quality college education should be made more difficult. A quality college education should prepare students with life skills, which it currently is not doing. A quality college education should be intellectually grueling. While writing essays and taking tests might not be a directly applicable skill, it will prepare students with critical thinking skills necessary for success in the workforce. A quality college education should allow instructors to hold students to very high standards, and be able to reward excellence and punish mediocre performance. A quality college education should be for a limited amount of time, in order that students will be prepared for deadlines and other challenges of adulthood. The intensity of this phase will allow for students for forge friendships for life.

1aii

Standards for a quality college education should be made more difficult. A quality college education is Army basic training for adulthood. A quality college education should be intellectually grueling. While writing essays and taking tests might not be a directly applicable skill, it will prepare students with critical thinking skills necessary for success in the workforce. A quality college education should allow instructors to hold students to very high standards, and be able to reward excellence and punish mediocre performance, because their future success depends on the skills they learn here. A quality
college education should be for a limited amount of time, in order that students will be prepared for deadlines and other challenges that will come next. The intensity of this phase will allow for students to forge friendships for life.

Iaiii

Standards for a quality college education should be made more difficult. A quality college education is Army basic training for adulthood. Basic training is physically and emotionally grueling. While doing push-ups might not be directly applicable to fighting, it prepares the body for the challenges of what comes next. A quality college education should allow instructors to be drill sergeants and hold people to very high standards, as well as be able to reward excellence and punish mediocre performance, because their future success depends on the skills they learn here. Basic training is a limited, intense program that should prepare people to meet expectations and challenges for what comes next. In addition to preparing people for what lies ahead, a rigorous basic training program allows people to forge friendships for life.

Iaiv

Standards for a quality college education should be made more difficult. A quality college education should prepare students with life skills, which it currently is not doing. Basic training is physically and emotionally grueling. While doing push-ups might not be directly applicable to fighting, it prepares the body for the challenges of what comes next. A quality college education should allow instructors to be drill sergeants and hold
people to very high standards, as well as be able to reward excellence and punish mediocre performance, because their future success depends on the skills they learn here. Basic training is a limited, intense program that should prepare people to meet expectations and challenges for what comes next. In addition to preparing people for what lies ahead, a rigorous basic training program allows people to forge friendships for life.

1bi

Standards for a quality college education should be made more difficult. A quality college education is not something everyone can acquire. A quality college education should not be assumed as a matter of paying tuition and showing up for classes, but the result of academic rigor and excellence. Receiving a quality college education is the result of a job well done. A quality college education is something that no one can ever take away from you. A quality college education is the result of great effort; not everyone can achieve it, and a quality college education is something to be proud of. Completion of a quality college education is recognition by your academic superiors of a job well done.

1bii

Standards for a quality college education should be made more difficult. A quality college education is a medal of honor. A quality college education should not be
assumed as a matter of paying tuition and showing up for classes, but the result of academic rigor and excellence. Receiving a quality college education is the result of a job well done. A quality college education is something that no one can ever take away from you. A quality college education is the result of great effort; not everyone can achieve it, and a quality college education is something to be proud of. Completion of a quality college education is recognition by your academic superiors of a job well done.

1biii
Standards for a quality college education should be made more difficult. A quality college education is a medal of honor. Receiving a medal of honor is not a matter of just showing up, but of excellence in work. A medal of honor is recognition of great efforts. A medal of honor is something that cannot be taken away. Not everyone can get a medal of honor, and for that, it is something to take great pride in. A medal of honor is a way for your superiors to recognize a job well done.

1biv
Standards for a quality college education should be made more difficult. A quality college education is not something everyone can acquire. Receiving a medal of honor is not a matter of just showing up, but of excellence in work. A medal of honor is recognition of great efforts. A medal of honor is something that cannot be taken away. Not everyone can get a medal of honor, and for that, it is something to take great pride in. A medal of honor is a way for your superiors to recognize a job well done.
1ci

Standard for a quality college education should be made more difficult. A quality college education is the product of great effort over an extended period of time. Each class you take should present you with new challenges. Choosing a major will focus your attention in challenging ways. As you continue with your studies, the classes you take should get more difficult and better prepare you for what will follow. A quality college education should have a definite conclusion, as recognized by university standards. Upon graduation, you will be able to reflect on the challenges you managed and make your accomplishment that much more meaningful as you enter the workforce.

1cii

Standard for a quality college education should be made more difficult. A quality college education is a long and difficult journey. Each class you take should present you with new challenges. Choosing a major will focus your attention in challenging ways. As you continue with your studies, the classes you take should get more difficult and better prepare you for what will follow. A quality college education should have a definite conclusion, as recognized by university standards. Upon graduation, you will be able to reflect on the challenges you managed and make your accomplishment that much more meaningful as you enter the workforce.

1ciii
Standard for a quality college education should be made more difficult. A quality college education is a long and difficult journey. Each class you take will make you navigate over new and unexplored territory. Choosing a major is choosing a path to follow, each one has its own set of challenges. As you travel over the difficult terrains of new classes, you are better prepared for the steep trails of future classes. Making it through the pitfalls and impasses of the journey will lead you to the end of this journey; the university has designated an end to this path. Once you’ve reached the end of the journey, you can look back and see how far you’ve come, and be better prepared for the journey into the workforce.
2ai
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding the right job will take multiple applications at many locations. Not all of your job applications will lead to the right job. You might need a special skill set or knowledge base to get the right job. When you do find the right job, the rewards are many. Hiring a specialist can make it easier for you to get the best job possible.

2a(ii)
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding a job is drilling for oil. Finding the right job will take multiple applications at many locations. Not all of your job applications will lead to the right job. You might need a special skill set or knowledge base to get the right job. When you do find the right job, the rewards are many. Hiring a specialist can make it easier for you to get the best job possible.

2a(iii)
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding a job is drilling for oil. Drilling requires multiple attempts at multiple locations. Not everyplace you drill will strike oil. Finding the right spot to drill requires special skills and equipment. But when you do strike oil, the rewards are great. Hiring a specialist can make striking oil easier for you.
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Drilling for oil requires multiple attempts at multiple locations. Not everyplace you drill will strike oil. Finding the right spot to drill requires special skills and equipment. But when you do strike oil, the rewards are great. Hiring a specialist can make striking oil easier for you.

Finding the right job at graduation can be as difficult as getting into the right college. There are many places hiring, but not all of them will be a good fit for your skills and interests. Not everyplace you submit a job application will be interested in you as a candidate. Some places that may be interesting to you may ask too much of your time. You may have to consider taking a job far from home. A job counselor can help you find the best fit and have the greatest chance of success.

Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding a job at graduation can be as difficult as getting into the right college. There are many places hiring, but not all of them will be a good fit for your skills and interests. Not everyplace you submit a job application will be interested in you as a candidate. Some places that may be interesting to you may ask too much of your
time. You may have to consider taking a job far from home. A job counselor can help you find the best fit and have the greatest chance of success.

2biii
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding a job at graduation can be as difficult as getting into the right college. There are so many colleges that seem like they might work out, but not all of them would have been a good fit. Some colleges didn’t think you’d be a good match for their school. Some schools demanded too much of your time and energy. Some schools were far from home. A job counselor can help you find the best fit and have the greatest chance of success.

2biv
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. When you applied to colleges, it seemed like they might all work out, but not all of them would have been a good fit. Some colleges didn’t think you’d be a good match for their school. Some schools demanded too much of your time and energy. Some schools were far from home. A job counselor can help you find the best fit and have the greatest chance of success.

2ci
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. The process of finding the right job can take a long time. You may have to take a job in the meanwhile just to make ends meet. You need to be able to stay focused on what you want from your job in order to succeed. You may need to accept help from people and work sites you might not otherwise have considered. Hiring a counselor may help you get the job you want faster.

2cii
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding the right job at graduation is hitchhiking to your goal. The process of finding the right job can take a long time. You may have to take a job in the meanwhile just to make ends meet. You need to be able to stay focused on what you want from your job in order to succeed. You may need to accept help from people and work sites you might not otherwise have considered. Hiring a counselor may help you get the job you want faster.

2ciii
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding the right job at graduation is hitchhiking to your goal. Hitchhiking means that you may not be able to take the most direct route to your destination. You may not be able to get the assistance you need to get to that destination. You may have to take work along the way just to make ends meet. You have to remain
focused on what your destination is in order to succeed. Hiring a job counselor can help you get to your destination sooner.

2civ
Finding the right job at graduation can be very difficult. You should consider hiring a job counselor at graduation. Finding the right job can be a long and indirect process. Hitchhiking means that you may not be able to take the most direct route to your destination. You may not be able to get the assistance you need to get to that destination. You may have to take work along the way just to make ends meet. You have to remain focused on what your destination is in order to succeed. Hiring a job counselor can help you get to your destination sooner.

3ai
We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. But increasing gas prices is necessary as we want to become less dependent on foreign oil. We have been very lucky up until now, but if we don’t start increasing gas prices, we might not become energy independent until it’s too late. Once we realize that we can’t maintain our levels of consumption, we will start to develop better sources of fuel. The sooner we develop alternative energy sources, the better and cheaper they will be in the end.
We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. Increasing gas prices will be a difficult obstacle. But increasing gas prices is necessary if we want to become less dependent on foreign oil. We have been very lucky up until now, but if we don’t start increasing gas prices, we might not become energy independent until it’s too late. Once we realize that we can’t maintain our levels of consumption, we will start to develop better sources of fuel. The sooner we develop alternative energy sources, the better and cheaper they will be in the end.

3aiii

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. Increasing gas prices will be a difficult obstacle. Dealing with this obstacle now will make us less reliant on foreign oil sources. The road until now has been smooth, but the path ahead is treacherous, unless we start making changes. Once we overcome this obstacle, we can develop better and cheaper energy sources. The sooner we deal with this obstacle in our path to energy independence, the better and cheaper they will be down the road.

3aiv

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. Dealing with this obstacle now will make us less reliant on foreign oil sources. The road until now has been smooth, but the path ahead is treacherous, unless we start making changes. Once we overcome this obstacle, we can develop better and cheaper energy
sources. The sooner we deal with this obstacle in our path to energy independence, the better and cheaper they will be down the road.

3bi

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. But our dependence on foreign oil is not good for the country. If we increase gas prices through taxes, those tax dollars will benefit endeavors to develop new sources of energy. In addition, increasing gas prices may deter people from using so much. As a country, we are too reliant on foreign oil. By increasing gas prices, we can start to develop safe alternatives now.

3bii

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. But our dependence on foreign oil is not good for the country. We need to tax gas the way we tax cigarettes and alcohol. If we increase gas prices through taxes, those tax dollars will benefit endeavors to develop new sources of energy. In addition, increasing gas prices may deter people from using so much. As a country, we are too reliant on foreign oil. By increasing gas prices, we can start to develop safe alternatives now.

3biii

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. But our addiction to foreign oil is not good for the country. We tax alcohol and
cigarettes, why shouldn’t we tax gas? Taxes from alcohol and cigarettes help fund schools and health awareness programs. Taxing cigarettes and alcohol have acted to deter consumption. As a result of these taxes, we have developed healthy alternatives. We need to kick our addition to gas.

3biv

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. But our addiction to foreign oil is not good for the country. Taxes from alcohol and cigarettes help fund schools and health awareness programs. Taxing cigarettes and alcohol have acted to deter consumption. As a result of these taxes, we have developed healthy alternatives. We need to kick our addition to gas.

3ci

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. By increasing gas prices now, we will be able to raise money to allow us to develop new energy sources for the future. It will allow us to develop “green” technologies. By increasing gas prices now in small incremental amounts, we prevent an economic shock when it becomes absolutely necessary to change. We need to develop a long term vision for the future of our country. By introducing small incremental increases in gas prices now, we will be better able to ensure the future for generations to come.

3cii
We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. Increasing gas prices by a small amount now is investing in our country’s retirement plan. By increasing gas prices now, we will be able to raise money to allow us to develop new energy sources for the future. It will allow us to develop “green” technologies. By increasing gas prices now in small incremental amounts, we prevent an economic shock when it becomes absolutely necessary to change. We need to develop a long term vision for the future of our country. By introducing small incremental increases in gas prices now, we will be better able to ensure the future for generations to come.

3ciii

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. Increasing gas prices by a small amount now is investing in our country’s retirement plan. By investing in our future now, we will be able to retire from our dependence on foreign oil. Investing in this plan will help us create a greener future. By making small increases in contributions now, we won’t have to make huge investments when the time to stop using foreign oil is very close. Have a gas retirement plan gives us more control over our long term goals for the future. By investing in a gas retirement plan now, we can make sure that future generations are taken care of.

3civ

We need to increase gas prices. Of course, increasing gas prices will be uncomfortable. By investing in our future now, we will be able to retire from our dependence on foreign
oil. Investing in this plan will help us create a greener future. By making small increases in contributions now, we won’t have to make huge investments when the time to stop using foreign oil is very close. Have a gas retirement plan gives us more control over our long term goals for the future. By investing in a gas retirement plan now, we can make sure that future generations are taken care of.

4ai

The Federal government needs to regulate herbal supplements. Unregulated supplements can be dangerous, and allow for unwanted and hazardous substances to get into what are supposed to be healthy products. Federal regulation would mean that companies can’t make misleading claims about the benefits of their products. Federal regulation would mean that consumers have recourse if a product doesn’t work, or is dangerous. Federal regulation means that companies won’t be able to use exotic ingredients from endangered animals and plants. Federal regulation would mean that the market won’t be flooded with useless or harmful products.

4aii

The Federal government needs to police herbal supplements. Unregulated supplements can be dangerous, and allow for unwanted and hazardous substances to get into what are supposed to be healthy products. Federal regulation would mean that companies can’t make misleading claims about the benefits of their products. Federal regulation would mean that consumers have recourse if a product doesn’t work, or is dangerous. Federal
regulation means that companies won’t be able to use exotic ingredients from endangered animals and plants. Federal regulation would mean that the market won’t be flooded with useless or harmful products.

4aiii

The Federal government needs to police herbal supplements. Policing herbal supplements will prevent dangerous criminals from putting unwanted and hazardous substances into products that are supposed to be healthy for us. Policing supplements would mean that companies couldn’t make misleading claims about their products. Policing would mean that citizens would have recourse if a product doesn’t work or is dangerous. Policing would prevent companies from putting exotic ingredients from endangered animals and plants. Policing herbal supplements would mean that the market won’t be flooded with useless or harmful products.

4aiv

The Federal government needs to regulate herbal supplements. Policing herbal supplements will prevent dangerous criminals from putting unwanted and hazardous substances into products that are supposed to be healthy for us. Policing supplements would mean that companies couldn’t make misleading claims about their products. Policing would mean that citizens would have recourse if a product doesn’t work or is dangerous. Policing would prevent companies from putting exotic ingredients from
endangered animals and plants. Policing herbal supplements would mean that the market
won’t be flooded with useless or harmful products.

4bi

The Federal government should regulate herbal supplements. The government should be
cared for her children. The government should be working to make sure that its citizens
concerned about the health and well being of its citizens, the way a nurturing mother
cares for her children. The government should be working to make sure that its citizens
aren’t putting toxic substances into their bodies. The government also needs to make
people aware of potentially dangerous side effects of herbal supplements. The
government also needs to make sure that people are knowledgeable about the
effectiveness of different herbal supplements. The government should make sure that the

4bii

The Federal government should regulate herbal supplements. The government should be
cared for her children. The government should be working to make sure that its citizens
aren’t putting toxic substances into their bodies. The government also needs to make
people aware of potentially dangerous side effects of herbal supplements. The
government also needs to make sure that people are knowledgeable about the
effectiveness of different herbal supplements. The government should make sure that the
people have a safe environment to determine what remedies will work best for the individual.

4biii

The Federal government should regulate herbal supplements. The government should be concerned about the health and well being of its citizens, the way a nurturing mother cares for her children. A nurturing mother wouldn’t let her children consume dangerous toxins that may be in some herbal supplements. A mother would want her children to be as healthy as possible. A mother would tell you if what you ate might have bad side effects. A mother would want her children to know as much about what we put into our bodies as possible. A mother would create a safe environment for her children to determine what is right for them and their health.

4biv

The Federal government should regulate herbal supplements. The government should be concerned about the health and well being of its citizens. A parent wouldn’t let their children consume dangerous toxins that may be in some herbal supplements. A mother would want her children to be as healthy as possible. A mother would tell you if what you ate might have bad side effects. A mother would want her children to know as much about what we put into our bodies as possible. A mother would create a safe environment for her children to determine what is right for them and their health.
The Federal government should regulate herbal supplements. The government should make people aware of potentially dangerous interactions between different supplements. The government should make people aware of potentially dangerous interactions between herbal supplements and medical conditions. The government should make people aware of potentially dangerous interactions between herbal supplements and medications. The government should help people make informed decisions about which herbal supplements will be beneficial, and which will have no effect. The federal government needs to establish recommended daily allowances for herbal supplements.

The Federal government should regulate herbal supplements. People treat herbal supplements as medications, and the government needs to act the pharmacist. The government should make people aware of potentially dangerous interactions between different supplements. The government should make people aware of potentially dangerous interactions between herbal supplements and medical conditions. The government should make people aware of potentially dangerous interactions between herbal supplements and medications. The government should help people make informed decisions about which herbal supplements will be beneficial, and which will have no effect. The federal government needs to establish recommended daily allowances for herbal supplements.
4ciii
The Federal government should regulate herbal supplements. People treat now herbal supplements as medications, and the government needs to act the pharmacist. A pharmacist would tell you if there were dangerous interactions with your different medicines. A pharmacist would be able to inform you if a medication would have a dangerous effect on another medical condition. A pharmacist should be able to tell you in an herbal supplement might affect the potency of a drug. A pharmacist can tell you which medications may be useless and which might help you. A pharmacist can tell you about what the right amount to take everyday should be.

4civ
The Federal government should regulate herbal supplements. People now treat herbal supplements as medications. A pharmacist would tell you if there were dangerous interactions with your different medicines. A pharmacist would be able to inform you if a medication would have a dangerous effect on another medical condition. A pharmacist should be able to tell you in an herbal supplement might affect the potency of a drug. A pharmacist can tell you which medications may be useless and which might help you. A pharmacist can tell you about what the right amount to take everyday should be.

5ai
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Federal funding of NASA doesn’t guarantee financial
success, but we need to fund as many potential future technologies as possible. Increasing funding for NASA will mean thinking on a grand scale. Increased funding for NASA would be based on making informed decisions about where our tax dollars would go. Increasing funding for NASA may lead to the discovery of resources on nearby planets and moons which will give us a competitive edge in the global economy.

5aii

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Federal funding of NASA is a type of venture capitalism, and doesn’t guarantee financial success, but we need to fund as many potential future technologies as possible. Increasing funding for NASA will mean thinking on a grand scale. Increased funding for NASA would be based on making informed decisions about where our tax dollars would go. Increasing funding for NASA may lead to the discovery of resources on nearby planets and moons which will give us a competitive edge in the global economy.

5aiii

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Federal funding of NASA is a type of venture capitalism. With any sort of venture capitalism, there is some risk involved. But we need to invest in
as many potential future technologies as possible. And investing in NASA will mean investing on a grand scale. Investing more in NASA will be based on informed decisions about where our national capital will go. Investing in NASA may lead to the discovery of resources on nearby planets and moons which will give us a competitive edge in the global economy.

5aiv

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Federal funding of NASA doesn’t guarantee financial success, but we need to invest in as many potential future technologies as possible. And investing in NASA will mean investing on a grand scale. Investing more in NASA will be based on informed decisions about where our national capital will go. Investing in NASA may lead to the discovery of resources on nearby planets and moons which will give us a competitive edge in the global economy.

5bi

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Even though funding won’t necessarily provide results right away, increasing funding for NASA will keep our country at the forefront of science. Funding NASA is funding American innovation and boosts the American psyche. American innovation can be turned into commodities we can sell to other countries. Increased funding for NASA is good for the future of America.
5bii

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Increasing funding for NASA is putting money in a national piggy bank. Even though funding won’t necessarily provide results right away, increasing funding for NASA will keep our country at the forefront of science. Funding NASA is funding American innovation and boosts the American psyche. American innovation can be turned into commodities we can sell to other countries. Increased funding for NASA is good for the future well being of America.

5biii

The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Increasing funding for NASA is putting money in a national piggy bank. Putting money in this piggy bank means that we won’t see it again for a while, but we know it will be there later. Putting money in this piggy bank is one way we can make sure America continues to be at the forefront of science. Putting money in the piggy bank is good for the American psyche. The money we put away can be turned into something we can sell to other countries in the future. Putting money in this piggy bank is good for the future well being of America.

5biv
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Investing in NASA won’t necessarily provide returns right away. Putting money in this piggy bank means that we won’t see it again for a while, but we know it will be there later. Putting money in this piggy bank is one way we can make sure America continues to be at the forefront of science. Putting money in the piggy bank is good for the American psyche. The money we put away can be turned into something we can sell to other countries in the future. Putting money in this piggy bank is good for the future well being of America.

5ci
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Increased funding for NASA is an important way to plan for the future. Funding NASA may lead to developing colonies off-planet. Increased funding may lead to the creation of new energies, and energy efficient technologies. Increased funding for NASA may yield practical solutions to global warming. Increased funding for NASA may lead to new treatments and cures for diseases. Increased funding for NASA may lead to the development of long range space travel.

5cii
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration). Increased funding for NASA is an insurance policy for the future. Funding NASA may lead to developing colonies off-planet. Increased funding
may lead to the creation of new energies, and energy efficient technologies. Increased funding for NASA may yield practical solutions to global warming. Increased funding for NASA may lead to new treatments and cures for diseases. Increased funding for NASA may lead to the development of long range space travel.

5ciii
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration. Increased funding for NASA is an insurance policy for the future. This insurance policy may lead to developing colonies off-planet. This insurance may lead to the creation of new energies, and energy efficient technologies. The insurance policy may yield practical solutions to global warming. This insurance policy may lead to new treatments and cures for diseases. The insurance policy may lead to the development of long range space travel.

5civ
The Federal government should increase funding for NASA (the National Aeronautics and Space Administration. Increased funding for NASA is an important way to plan for the future. This insurance policy may lead to developing colonies off-planet. This insurance may lead to the creation of new energies, and energy efficient technologies. The insurance policy may yield practical solutions to global warming. This insurance
policy may lead to new treatments and cures for diseases. The insurance policy may lead to the development of long range space travel.

6ai

The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. If the Federal government employed stricter organic food regulations, then people wouldn’t consume things that are bad for you, like certain pesticides. If there was stricter regulation, then consumers could make better informed decisions about what to eat. Stricter regulation would encourage ecologically sound food production. If the Federal government had stricter regulations, then standards would be the same across the country.

6a1i

The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens, the way a mother expresses concern for her children. If the Federal government employed stricter organic food regulations, then people wouldn’t consume things that are bad for you, like certain pesticides. If there was stricter regulation, then consumers could make better informed decisions about what to eat. Stricter regulation would encourage ecologically sound food production. If the Federal government had stricter regulations, then standards would be the same across the country.
6aiii
The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens, the way a mother expresses concern for her children. A parent would want its children to make the most informed decisions possible. A parent has its children’s safety as its primary concern. A concerned parent wouldn’t want you eating things that are bad for you, like strange things you found on the ground. A parent would treat all their children equally and have equal rules for all of them.

6aiv
The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. A parent would want its children to make the most informed decisions possible. A parent has its children’s safety as its primary concern. A concerned parent wouldn’t want you eating things that are bad for you, like strange things you found on the ground. A parent would treat all their children equally and have equal rules for all of them.

6bi
The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. The government should be able to punish those who mislabel foods as organic. The government should be able to hold farmers accountable to high standards for food
production. The government should be able to prosecute grocers who label foods as organic when they are not. After all, we shouldn’t have to pay more for lesser quality foods. And higher prices reward organic farmers for all their hard work.

6bii

The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. The government needs to be a strict parent who enforces the rules. A parent would be able to reward adherence to rules and punish failure to abide by rules. The government should be able to punish those who mislabel foods as organic. The government should be able to hold farmers accountable to high standards for food production. The government should be able to prosecute grocers who label foods as organic when they are not. After all, we shouldn’t have to pay more for lesser quality foods. And higher prices reward organic farmers for all their hard work.

6biii

The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. The government needs to be a strict parent who enforces the rules. A strict parent would be able to punish someone who lied about their product. A strict parent would be able to hold food producers accountable to high standards. A strict parent would be able to go after grocers who label food as organic when it is not. After all, our parents wouldn’t let
us [ay more for lesser quality foods. And paying higher prices for organic foods is a way to rewards organic farmers for all their hard work.

6biv

The Federal government should have stricter regulations on organic food labeling. The government should have great concern for the health and safety of its citizens. A strict parent would be able to punish someone who lied about their product. A strict parent would be able to hold food producers accountable to high standards. A strict parent would be able to go after grocers who label food as organic when it is not. After all, our parents wouldn’t let us [ay more for lesser quality foods. And paying higher prices for organic foods is a way to rewards organic farmers for all their hard work.

6ci

The Federal government should have stricter regulations on organic food labeling. Food products are labeled so that consumers can make informed decisions about purchases. We have food grades so that consumers can determine what quality of food they wish to purchase. If we label meats, cheeses and dairy products for fat content, we should also be able to label foods for pesticide content. After all, different food grades tell us different things about the production of those food items. Any way, there’s a difference in taste between organic and non-organic foods.

6cii
The Federal government should have stricter regulations on organic food labeling. Food products are labeled so that consumers can make informed decisions about purchases. Labeling food as organic is what we do for milk and meats. We have food grades so that consumers can determine what quality of food they wish to purchase. If we label meats, cheeses and dairy products for fat content, we should also be able to label foods for pesticide content. After all, different food grades tell us different things about the production of those food items. Any way, there’s a difference in taste between organic and non-organic foods.

6ciii
The Federal government should have stricter regulations on organic food labeling. Food products are labeled so that consumers can make informed decisions about purchases. Labeling food as organic is what we do for milk and meats. Those products are labeled so that consumers can make informed decisions about the qualities of foods they purchase. Meats are labeled as grade “A”, or “lean”, or “free range”, and milk is labeled as “whole”, “part” or “skim”. If we take the time and trouble to label meat and milk, we can easily label foods as organic or inorganic. It’s important because those different types of milk and meat taste different, and so does organic and non-organic food.

6civ
The Federal government should have stricter regulations on organic food labeling. Food products are labeled so that consumers can make informed decisions about purchases.
Products are labeled so that consumers can make informed decisions about the qualities of foods they purchase. Meats are labeled as grade “A”, or “lean”, or “free range”, and milk is labeled as “whole”, “part” or “skim”. If we take the time and trouble to label meat and milk, we can easily label foods as organic or inorganic. It’s important because those different types of milk and meat taste different, and so does organic and non-organic food.
Table 1

*Experimental Design for Metaphor Type, Involvement, Topic Replications and Vehicle Replications*

<table>
<thead>
<tr>
<th>Involvement</th>
<th>Type</th>
<th>Topic</th>
<th>Topic</th>
<th>Topic</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Conceptual</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Contextual</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Literal</td>
<td>4 5 6</td>
<td>4 5 6</td>
<td>4 5 6</td>
<td>4 5 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Involvement</th>
<th>Type</th>
<th>Topic</th>
<th>Topic</th>
<th>Topic</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Conceptual</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Contextual</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td></td>
<td>Literal</td>
<td>4 5 6</td>
<td>4 5 6</td>
<td>4 5 6</td>
<td>4 5 6</td>
</tr>
</tbody>
</table>
Table 2

*Topics, Means and Standard Deviations for involvement in Pretest 1*

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>MEAN</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of university education *</td>
<td>1.7</td>
<td>1.03</td>
</tr>
<tr>
<td>Reputation of Communication Department *</td>
<td>1.75</td>
<td>1.09</td>
</tr>
<tr>
<td>Job prospects at graduation *</td>
<td>1.8</td>
<td>1.59</td>
</tr>
<tr>
<td>Gas Prices *</td>
<td>1.94</td>
<td>0.99</td>
</tr>
<tr>
<td>Sexually Transmitted diseases *</td>
<td>1.94</td>
<td>0.96</td>
</tr>
<tr>
<td>Identity theft</td>
<td>2.08</td>
<td>1.14</td>
</tr>
<tr>
<td>Sex Education</td>
<td>2.14</td>
<td>1.08</td>
</tr>
<tr>
<td>Personal Appearance</td>
<td>2.29</td>
<td>1.2</td>
</tr>
<tr>
<td>Breast / testicular cancer</td>
<td>2.29</td>
<td>1.06</td>
</tr>
<tr>
<td>University funded gym</td>
<td>2.3</td>
<td>1.56</td>
</tr>
<tr>
<td>Skin cancer</td>
<td>2.35</td>
<td>1.32</td>
</tr>
<tr>
<td>Reputation of University</td>
<td>2.48</td>
<td>1.74</td>
</tr>
<tr>
<td>Immigration reform</td>
<td>2.53</td>
<td>1.16</td>
</tr>
<tr>
<td>Graduation requirements</td>
<td>2.54</td>
<td>1.15</td>
</tr>
<tr>
<td>Government Funded W1-Fi</td>
<td>2.56</td>
<td>1.61</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>2.59</td>
<td>1.7</td>
</tr>
<tr>
<td>Abortion rights</td>
<td>2.62</td>
<td>1.34</td>
</tr>
<tr>
<td>Federal funding of stem cell research</td>
<td>2.67</td>
<td>1.28</td>
</tr>
<tr>
<td>Issue</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Jobs moving overseas</td>
<td>2.71</td>
<td>1.93</td>
</tr>
<tr>
<td>Drug enforcement</td>
<td>2.71</td>
<td>1.72</td>
</tr>
<tr>
<td>University parking policies</td>
<td>2.75</td>
<td>1.55</td>
</tr>
<tr>
<td>Legality of downloading music / movies / textbooks</td>
<td>2.81</td>
<td>1.86</td>
</tr>
<tr>
<td>Drunk Driving enforcement</td>
<td>2.84</td>
<td>1.78</td>
</tr>
<tr>
<td>Federal funding of alternative energy</td>
<td>2.91</td>
<td>1.51</td>
</tr>
<tr>
<td>Quality of campus / dorm food</td>
<td>2.91</td>
<td>1.28</td>
</tr>
<tr>
<td>Federal regulation of genetically modified foods</td>
<td>3.04</td>
<td>1.53</td>
</tr>
<tr>
<td>Recreational Drug Use</td>
<td>3.05</td>
<td>1.23</td>
</tr>
<tr>
<td>Global warming</td>
<td>3.1</td>
<td>1.48</td>
</tr>
<tr>
<td>Recycling policies / Enforcement</td>
<td>3.13</td>
<td>2.18</td>
</tr>
<tr>
<td>US reputation abroad</td>
<td>3.25</td>
<td>1.37</td>
</tr>
<tr>
<td>Cost of textbooks</td>
<td>3.29</td>
<td>2.11</td>
</tr>
<tr>
<td>Legalization of Gay Marriage</td>
<td>3.75</td>
<td>2.85</td>
</tr>
<tr>
<td>Student loans</td>
<td>3.76</td>
<td>1.67</td>
</tr>
<tr>
<td>Class course loads</td>
<td>3.8</td>
<td>2.23</td>
</tr>
<tr>
<td>Doping in sports *</td>
<td>3.9</td>
<td>2.16</td>
</tr>
<tr>
<td>Tuition Prices</td>
<td>3.97</td>
<td>2.04</td>
</tr>
<tr>
<td>Energy Drinks *</td>
<td>4.23</td>
<td>2.09</td>
</tr>
<tr>
<td>Federal regulation of organic foods *</td>
<td>4.27</td>
<td>1.98</td>
</tr>
<tr>
<td>Federal funding of Space program (NASA) *</td>
<td>4.28</td>
<td>1.73</td>
</tr>
<tr>
<td>Federal regulation of herbal supplements *</td>
<td>5.11</td>
<td>1.5</td>
</tr>
</tbody>
</table>

*Note:* *Topics used in Pretest II*
Table 3

*Means and standard deviations for aptness ratings of Pretest 2 messages*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Vehicle</th>
<th>Message</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Education</td>
<td>Basic training</td>
<td>1*</td>
<td>3.83</td>
<td>1.21</td>
</tr>
<tr>
<td>Rite of passage</td>
<td></td>
<td>2</td>
<td>2.70</td>
<td>1.33</td>
</tr>
<tr>
<td>Getting braces</td>
<td></td>
<td>3</td>
<td>4.53</td>
<td>1.77</td>
</tr>
<tr>
<td>Medal of honor</td>
<td></td>
<td>4*</td>
<td>2.80</td>
<td>1.56</td>
</tr>
<tr>
<td>Difficult journey</td>
<td></td>
<td>5*</td>
<td>3.20</td>
<td>0.76</td>
</tr>
<tr>
<td>Reputation of Dept.</td>
<td>Interview suit</td>
<td>6</td>
<td>4.27</td>
<td>0.45</td>
</tr>
<tr>
<td>Commercial branding</td>
<td></td>
<td>7</td>
<td>3.90</td>
<td>1.82</td>
</tr>
<tr>
<td>Elite club</td>
<td></td>
<td>8</td>
<td>3.87</td>
<td>1.39</td>
</tr>
<tr>
<td>Fraternity / Sorority</td>
<td></td>
<td>9</td>
<td>4.93</td>
<td>1.24</td>
</tr>
<tr>
<td>Code word</td>
<td></td>
<td>10</td>
<td>4.17</td>
<td>1.13</td>
</tr>
<tr>
<td>Finding a job</td>
<td>Dating</td>
<td>11</td>
<td>3.40</td>
<td>1.85</td>
</tr>
<tr>
<td>Drilling for oil</td>
<td></td>
<td>12*</td>
<td>2.70</td>
<td>0.84</td>
</tr>
<tr>
<td>Running a marathon</td>
<td></td>
<td>13</td>
<td>2.33</td>
<td>1.08</td>
</tr>
<tr>
<td>Entering college</td>
<td></td>
<td>14*</td>
<td>2.87</td>
<td>1.12</td>
</tr>
<tr>
<td>Hitchhiking</td>
<td></td>
<td>15*</td>
<td>3.33</td>
<td>1.81</td>
</tr>
<tr>
<td>Preventing STDs</td>
<td>Learning to drive</td>
<td>16</td>
<td>4.57</td>
<td>1.24</td>
</tr>
<tr>
<td>Riding a bike</td>
<td></td>
<td>17</td>
<td>3.83</td>
<td>1.75</td>
</tr>
<tr>
<td>Playing football</td>
<td></td>
<td>18</td>
<td>5.70</td>
<td>0.67</td>
</tr>
<tr>
<td>Category</td>
<td>Item</td>
<td>Score</td>
<td>Trend</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------</td>
<td>-------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Preparing a recipe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detecting cancer</td>
<td></td>
<td>20</td>
<td>3.63</td>
<td></td>
</tr>
<tr>
<td>Increasing gas prices</td>
<td>Necessary obstacle</td>
<td>21*</td>
<td>3.43</td>
<td></td>
</tr>
<tr>
<td>Gift to the future</td>
<td></td>
<td>22</td>
<td>2.93</td>
<td></td>
</tr>
<tr>
<td>Taxing cigarettes</td>
<td></td>
<td>23*</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td>Taxing non-basic foods</td>
<td></td>
<td>24</td>
<td>5.17</td>
<td></td>
</tr>
<tr>
<td>Investing in an IRA</td>
<td></td>
<td>25*</td>
<td>3.97</td>
<td></td>
</tr>
<tr>
<td>Herbal supplements</td>
<td>Lifeguard</td>
<td>26</td>
<td>4.23</td>
<td></td>
</tr>
<tr>
<td>Police</td>
<td></td>
<td>27*</td>
<td>4.10</td>
<td></td>
</tr>
<tr>
<td>Nurturing mother</td>
<td></td>
<td>28*</td>
<td>3.07</td>
<td></td>
</tr>
<tr>
<td>Strict father</td>
<td></td>
<td>29</td>
<td>4.50</td>
<td></td>
</tr>
<tr>
<td>Pharmacist</td>
<td></td>
<td>30*</td>
<td>3.07</td>
<td></td>
</tr>
<tr>
<td>Funding NASA</td>
<td>Venture capitalism</td>
<td>31*</td>
<td>3.83</td>
<td></td>
</tr>
<tr>
<td>Piggy bank</td>
<td></td>
<td>32*</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>Insurance policy</td>
<td></td>
<td>33*</td>
<td>3.23</td>
<td></td>
</tr>
<tr>
<td>Academic scholarships</td>
<td></td>
<td>34</td>
<td>4.13</td>
<td></td>
</tr>
<tr>
<td>Anti-espionage</td>
<td></td>
<td>35</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>Organic food labels</td>
<td>Nurturing mother</td>
<td>36*</td>
<td>3.57</td>
<td></td>
</tr>
<tr>
<td>Strict father</td>
<td></td>
<td>37*</td>
<td>3.53</td>
<td></td>
</tr>
<tr>
<td>Fiction vs. Non-fiction</td>
<td></td>
<td>38</td>
<td>4.47</td>
<td></td>
</tr>
<tr>
<td>Food referee</td>
<td></td>
<td>39</td>
<td>4.07</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Item</td>
<td>Rating</td>
<td>SEM</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------</td>
<td>--------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Energy Drinks</td>
<td>Labeling milk 1%, 2%</td>
<td>40*</td>
<td>3.33</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>Regulating alcohol</td>
<td>41</td>
<td>4.23</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Rating movies</td>
<td>42</td>
<td>5.87</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>Dangerous drugs</td>
<td>43</td>
<td>4.57</td>
<td>1.83</td>
</tr>
<tr>
<td></td>
<td>Protective mother</td>
<td>44</td>
<td>4.63</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td>Traffic light</td>
<td>45</td>
<td>6.80</td>
<td>1.04</td>
</tr>
<tr>
<td>Steroid use</td>
<td>Plastic surgery</td>
<td>46</td>
<td>2.17</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>Academic cheating</td>
<td>47</td>
<td>2.27</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>Bad accounting</td>
<td>48</td>
<td>4.07</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>Perjury</td>
<td>49</td>
<td>4.53</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>Gambling</td>
<td>50</td>
<td>4.00</td>
<td>1.72</td>
</tr>
</tbody>
</table>

*Note: * Items used in main experiment
Table 4

*Means and standard deviations for attitudes towards topics in Pretest 2*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Education</td>
<td>1.34</td>
<td>0.55</td>
</tr>
<tr>
<td>Reputation of Communication Dept.</td>
<td>1.90</td>
<td>0.98</td>
</tr>
<tr>
<td>Preventing Sexually Transmitted diseases</td>
<td>1.76</td>
<td>0.69</td>
</tr>
<tr>
<td>Job prospects</td>
<td>2.54</td>
<td>1.48</td>
</tr>
<tr>
<td>Increasing gas prices</td>
<td>6.14</td>
<td>0.87</td>
</tr>
<tr>
<td>Regulating herbal supplements</td>
<td>3.11</td>
<td>1.27</td>
</tr>
<tr>
<td>Increased funding for NASA</td>
<td>2.71</td>
<td>1.17</td>
</tr>
<tr>
<td>Regulating organic labeling</td>
<td>2.55</td>
<td>1.34</td>
</tr>
<tr>
<td>Regulating energy drinks</td>
<td>3.86</td>
<td>1.56</td>
</tr>
<tr>
<td>Steroid use</td>
<td>3.37</td>
<td>1.60</td>
</tr>
</tbody>
</table>
Table 5

*Means and standard deviations by metaphor type*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Literal</th>
<th>Standard</th>
<th>Combined</th>
<th>Conceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>N</td>
<td>84</td>
<td>81</td>
<td>80</td>
<td>77</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>3.95</td>
<td>0.27</td>
<td>3.80</td>
<td>0.37</td>
</tr>
<tr>
<td>Attitude : Time one</td>
<td>4.70</td>
<td>0.75</td>
<td>4.90</td>
<td>0.72</td>
</tr>
<tr>
<td>Message Aptness</td>
<td>5.00</td>
<td>0.47</td>
<td>5.05</td>
<td>0.59</td>
</tr>
<tr>
<td>Attitude: Time two</td>
<td>4.56</td>
<td>0.86</td>
<td>4.74</td>
<td>0.90</td>
</tr>
<tr>
<td>Attitude: Change</td>
<td>-0.17</td>
<td>0.83</td>
<td>-0.12</td>
<td>0.67</td>
</tr>
<tr>
<td>Strong Implicature</td>
<td>1.00</td>
<td>0.00</td>
<td>0.94</td>
<td>0.24</td>
</tr>
<tr>
<td>Weak Implicature</td>
<td>0.74</td>
<td>0.47</td>
<td>0.86</td>
<td>0.54</td>
</tr>
<tr>
<td>Thought Listing Task: Total</td>
<td>5.01</td>
<td>1.02</td>
<td>4.99</td>
<td>1.27</td>
</tr>
<tr>
<td>Thought Listing Task: Positive</td>
<td>2.37</td>
<td>1.08</td>
<td>2.18</td>
<td>1.17</td>
</tr>
<tr>
<td>Thought Listing Task: Neutral</td>
<td>0.93</td>
<td>0.58</td>
<td>0.99</td>
<td>0.68</td>
</tr>
<tr>
<td>Thought Listing Task: Negative</td>
<td>1.72</td>
<td>0.77</td>
<td>1.81</td>
<td>0.97</td>
</tr>
</tbody>
</table>
Table 6

_Means and standard deviations for involvement by metaphor type_

<table>
<thead>
<tr>
<th>Condition</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>N</td>
<td>152</td>
<td>170</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>3.80</td>
<td>0.41</td>
</tr>
<tr>
<td>Attitude: Time 1</td>
<td>4.73</td>
<td>0.74</td>
</tr>
<tr>
<td>Message Aptness</td>
<td>4.97</td>
<td>0.60</td>
</tr>
<tr>
<td>Attitude: Time 2</td>
<td>4.39</td>
<td>1.05</td>
</tr>
<tr>
<td>Attitude: Change</td>
<td>-0.30</td>
<td>0.98</td>
</tr>
<tr>
<td>Strong Implicature</td>
<td>1.01</td>
<td>0.06</td>
</tr>
<tr>
<td>Weak Implicature</td>
<td>0.83</td>
<td>0.45</td>
</tr>
<tr>
<td>Thought Listing Task: Total</td>
<td>5.12</td>
<td>1.13</td>
</tr>
<tr>
<td>Thought Listing Task: Positive</td>
<td>2.26</td>
<td>1.29</td>
</tr>
<tr>
<td>Thought Listing Task: Neutral</td>
<td>0.97</td>
<td>0.53</td>
</tr>
<tr>
<td>Thought Listing Task: Negative</td>
<td>1.88</td>
<td>1.11</td>
</tr>
</tbody>
</table>
Figure 1

*Conceptual Model for Study Design and Hypotheses*

```
Metaphor Type

ELM variables: Need for cognition / Level of involvement RQ4

Amount of cognitive elaboration / number of implicatures H1 / H3

Attitude change at T2 / Long-term attitude change H5

Attitude change at T1 / Short-term attitude change RQ2
```
References


